

The Fiscal Health Paradox: Modeling the Welfare Losses of Non-Harmonized Excise Taxes on Sugar-Sweetened Beverages under the AfCFTA

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ABSTRACT

While many regional trade agreements eliminate tariffs to drive economic growth, liberalized markets can also accelerate the spread of health-harming commodities. Understanding how trade policy interacts with domestic health taxation can help identify the structural safeguards needed for regional economic and social development. However, research on the fiscal externalities and health spillovers of uncoordinated health taxes under the African Continental Free Trade Area is limited. The main objective of this economic study was to examine the fiscal, welfare, and public health consequences of non-harmonized sugar-sweetened beverage taxes across liberalized African trade markets. Data were drawn from available consumption, trade volume, and price elasticity databases and analyzed through the lens of partial-equilibrium simulation combined with game theory. The analysis indicates that unilateral taxation produces several key economic vulnerabilities across participating African markets. First, high-tax countries experience tax revenue losses of 15% to 25% over ten years as cross-border trade diversion shifts demand to lower-tax neighbors. Second, lower retail prices caused by untaxed beverage imports expand overall sugar consumption, associated in the model with an estimated 1.0 to 1.5 million additional cases of Type 2 diabetes. Third, establishing a harmonized regional health-tax floor reduces incentives for cross-border price arbitrage, stabilizes government revenues, and preserves broader regional social welfare. The findings suggest that trade negotiators should integrate fiscal health coordination directly into regional trade agreements rather than relying on uncoordinated national action. The findings therefore support the implementation of a binding minimum excise tax floor paired with digital track-and-trace enforcement mechanisms to protect public health systems and support sustainable human capital growth by continental trade authorities.

Keywords: AfCFTA, sugar-sweetened beverages, tax harmonization, non-communicable diseases, regional welfare

INTRODUCTION

The AfCFTA is one of the largest regional economic integration initiatives in the modern era and aims to free Africa from the constraints that have impeded its growth over time by reducing tariffs and border frictions to support a single continental market of 1.3 billion people – an engine of growth that will help pull millions out of poverty (World Bank, 2020a). The agreement aims to accelerate regional manufacturing, integrate supply chains, and facilitate trade flows across member states (World Bank, 2020b). Nevertheless, the liberalization blueprint hides an unintended negative externality, a market failure that could undermine some of the economic and social gains expected from regional integration. While opening its borders to free trade, the continent also opens its markets to commodities associated with substantial diet-related disease burdens due to non-communicable diseases (NCDs), which are among the leading causes of death on the continent. The dilemma for African policymakers in the twenty-first century is how to address these diet-related non-communicable diseases while pursuing economic growth.

This paradox is perhaps best exemplified in the markets for sugar-sweetened beverages (SSBs) and ultra-processed foods. Over many years, public health experts have noted that when left without regulatory intervention, the invisible hand of the market may generate negative externalities, which, in this instance include obesity (World Health Organization Regional Office for Africa, 2022), Type 2 diabetes, and cardiovascular diseases. As a result, corrective fiscal policy has sought to address this market inefficiency through Pigouvian taxes that seek to internalize the health impacts associated with consumption. The South African Health Promotion Levy, introduced in 2018, provides an empirical example of a price-based policy that effectively reduced consumption of sugar-sweetened beverages (Stacey et al., 2021). Nevertheless, these instances of success are predicated on national sovereignty in terms of border control. The AfCFTA may constrain the effectiveness of such national fiscal measures where domestic tax differences create incentives for cross-border sourcing.

This illustrates the central policy tension. While the health tax imposed by Country A on soft drinks to reduce the prevalence of diabetes makes them costly to produce in Country A, the neighbouring Country B, which prioritizes current production rather than long-term considerations, does not levy any taxes on them. Under the AfCFTA, where there are no tariff barriers, this creates a perverse incentive system. The absence of friction means that the cheaper and untaxed beverages will flow from Country B into Country A. It is not only an issue of competitiveness but also of severe tax revenue contraction. Under pressure of cheaper imports and possible capital outflow, Country A may face pressure to reduce its own taxes for competitiveness reasons.

The economic consequences are substantial. According to the World Health Organization (2025) and the Global Burden of Disease Collaborative Network (2024), NCDs constitute a substantial component of Africa's disease burden, with implications for mortality and health-system demands. Treatment of such diseases is so costly as to impose unsustainable fiscal burdens on underfunded public health systems (United Nations Economic Commission for Africa, 2021) and reverse any economic benefits from free trade. The AfCFTA will not be responsible for causing the disease, but it might hasten the consumption habits that currently exist due to price friction being eliminated. If the trade deal allows unrestricted trade of products associated with diet-related disease risks, in the guise of cheap ultra-processed products, without having a harmonized health tax regime, then the continent risks increasing regional exposure to diet-related disease burdens. Any economic gains may accrue to beverage producers, while health-related costs may be borne by public health systems.

The article shows how the AfCFTA architecture, which is strong on issues of trade facilitation, currently omits explicit mechanisms for addressing fiscal externalities. The theory behind this is that the lack of an enforceable mechanism for harmonizing excise taxes on harmful products suggests that differences in national health-tax policies may be weakened by cross-border arbitrage. From a game theoretic point of view, the analysis below identifies a regional health-tax floor as an alternative to protectionist responses.

LITERATURE REVIEW

The literature supporting this study falls into four connected strands: Pigouvian taxation and fiscal externalities, strategic tax competition in integrated markets, empirical evidence on sugar-sweetened beverage taxation, and African regional trade governance. Together, these strands explain why a national health tax may be economically rational in isolation but vulnerable when implemented within a liberalized regional market without complementary fiscal coordination.

In order to gain insight into the mechanics behind the anticipated public health and fiscal pressures, it is necessary to move past the epidemiological considerations surrounding disease and take a closer look at the incentive structure that drives state action. In a closed economy, the government functions as the sole decision-maker of its social welfare function. It weighs the costs of caring for its citizens' diabetes—the amputations, dialysis, and hours of work lost—against the revenue and jobs created by the beverage industry. If the burden of disease is sufficiently high, a rational state may impose a tax on it, forcing the offender (the producer of the excess sugar in this instance) to bear the cost of the social harm they cause. This is textbook Pigouvian economics, a standard application of Pigouvian taxation (Parry et al., 2014; Stiglitz & Rosengard, 2015).

When trade barriers are reduced under the AfCFTA, the equation changes dramatically. The sole decision-maker is no longer operating independently, but rather a participant in a strategic interaction in which the effectiveness of its laws relies upon the actions of neighboring states.

When viewed through the lens of strategic trade theory, the relationship between African countries concerning health taxes is no longer one of benign co-existence but can be understood as a non-cooperative game, resembling a Prisoner's Dilemma that plays out on the continent's health policy arena. Let us imagine two neighbouring economies within the context of a free trade area: Country A, which is concerned about public health issues and levies a 20% excise tax on soft drinks to decrease their consumption and Country B, which cares about developing industry and has a tax rate equal to zero. Prior to the introduction of the AfCFTA, tariffs would limit the ability of lower-tax products from Country B to penetrate the market of Country A. Now that tariffs have been removed, the price difference, which is the result of tax difference only, creates a substantial arbitrage incentive.

This leads to what economists call a "fiscal externality" (Kanbur & Keen, 1993). Country A experiences a dual loss because its national beverage production declines because the competing product comes from outside, untaxed, but, nevertheless, the demand for sugar does not decline since the market is flooded with the product that costs less. The health regulation becomes less effective but economic damage occurs anyway. Faced with such an incentive structure, the authorities of Country A would face pressure to reduce their health tax toward the level applied by Country B in order to remain competitive. This creates the possibility of a race to the bottom. Although both countries may obtain higher welfare from coordinated taxation, the non-cooperative incentives described by the model create pressure toward lower tax rates and potentially higher consumption-related health burdens.

This theoretical race is not merely an abstraction; the initial conditions for these dynamics are reflected in divergent fiscal policies across the continent. The disparity in excise duties across African nations creates incentives for sourcing from low-tax jurisdictions to high-tax ones. As illustrated in Table 1 below, the current patchwork of tax rates creates incentives for cross-border diversion the moment trade friction is removed.

Table 1: Divergence in Excise Taxation of Sugar-Sweetened Beverages in Selected African Markets

Country	Tax Structure	Approximate Rate (converted to USD equivalent)	Policy Intent
South Africa	Specific Levy (Health Promotion Levy)	~\$0.0012 per gram of sugar > 4g/100ml	Health / Revenue
Nigeria	Specific Levy (Finance Act 2021)	~\$0.006 per liter	Revenue
Zambia	Ad Valorem Excise	~\$0.11 per liter	Revenue
Eswatini	No specific Health Tax	0% (aligned with SACU, 2002 but production focused)	Industrial Promotion
Ethiopia	Ad Valorem (Sales Tax Focus)	25% (Sales Tax focus)	Revenue

Note: Ad valorem rates are estimated based on the average retail price of a standard 330ml carbonated beverage in 2026 USD terms to allow for comparative analysis. Actual incidence varies by factory gate price.

Source: Compiled from World Health Organization Global database on the Implementation of Nutrition Action (GINA) (World Health Organization, 2023) and National Treasury documents (2025).

The table indicates where the stresses exist within the system. A distributor choosing to do business near the border between South Africa and Eswatini is confronted with the decision to acquire goods that have very high health taxes levied on them or goods that have no such taxes imposed on them. As the AfCFTA reduces tariff and administrative barriers that prevented cross-border procurement in the past, lower-tax sourcing may become more attractive. The "Regulatory Chill" theory postulates that because governments expect such an exodus of capital and tax base to occur, they will be inhibited from increasing taxes on tobacco, alcohol, or sugar.

As such, this free trade zone, which is intended to provide a framework for economic growth, may constrain the effectiveness of national NCD-prevention taxation. The "sovereignty" of creating tax policies becomes functionally constrained when the market penalizes any departure from the lowest common denominator. This creates a potential divergence between private commercial gains and public health costs associated with the resultant disease burden. The market is driven primarily by price mechanisms without accounting for the associated social costs; and without a supranational influence that changes the payoffs, the non-cooperative equilibrium may favor lower tax rates.

Recent empirical evidence indicates that SSB taxes are associated with reductions in purchases and consumption, particularly where taxes generate meaningful increases in retail prices. Evidence from South Africa, Mexico and other low- and middle-income settings therefore supports the effectiveness of health-related beverage taxation as a domestic fiscal and public-health instrument. Nevertheless, this evidence largely examines taxation within individual national markets and gives less attention to the interaction between domestic SSB taxes and regional trade liberalization. The specific gap addressed by this study concerns the fiscal and welfare consequences that arise when neighboring countries apply different SSB tax rates within an increasingly integrated African market. In particular, limited attention has been given to whether differences in national excise taxation create incentives for trade diversion, weaken the tax base of higher-tax jurisdictions and alter the regional welfare effects of health taxation under the AfCFTA. This study addresses that gap by combining a partial-equilibrium simulation with a strategic tax-competition framework to examine the consequences of non-harmonized SSB taxation and to assess the potential effects of a common regional tax floor. Recent evidence from South Africa further indicates that the Health Promotion Levy increased the prices of carbonated beverages in a rural setting, with estimated tax pass-through exceeding the statutory tax burden (Dare et al., 2025). Evidence from Mexico similarly shows sustained reductions in household purchases of sugar-sweetened beverages following implementation of the national tax, with the magnitude of reductions varying across beverage and retail categories (García-Chávez et al., 2025).

METHODOLOGY

In order to transition from the abstract nature of game theory to the practical aspects of policymaking, the analysis operationalizes these theoretical relationships through economic simulation. Historical observations alone are insufficient because the implementation of the AfCFTA represents a change in the regional trade environment that requires forward-looking analysis. The purpose of this paper is to present a theoretical partial equilibrium simulation—a standard approach in international trade analysis—which is especially suited to the realities of the African health environment. In contrast to General Equilibrium models, which attempt to simulate the whole economy and sacrifice market-specific detail in the process, partial equilibrium allows us to concentrate exclusively on one market, the sugar-sweetened beverage market.

Model Specification and Parameterization

To formalize the economic simulation, we specify the mathematical relationships underlying the partial equilibrium model. First, aggregate baseline demand across the simulated AfCFTA market is defined using a constant elasticity function:

$$Q = A \cdot P^{\epsilon}$$

where Q is the quantity of SSBs demanded, and A is a scaling constant representing the baseline annual market size, parameterized at 15.5 billion liters (derived from aggregate Euromonitor 2023 soft drink volume data for the included markets). P is the retail price, and ϵ is the price elasticity of demand, held at a mean of -1.2 (range -1.1 to -1.3), based on Chen et al. (2018).

The effective retail-price differential generated by divergent excise-tax regimes and reduced trade frictions is represented in the simulation as:

$$\Delta p = (P_{\text{low}} - P_{\text{high}}) / P_{\text{high}}$$

where Δp represents the proportional retail-price difference between lower-tax and higher-tax markets, P_{low} is the retail price in the lower-tax market, and P_{high} is the retail price in the higher-tax market. Under Scenario A, trade frictions are assumed to approach zero as tariff and administrative barriers decline, allowing the tax-induced price differential to become more relevant to cross-border sourcing decisions. For the baseline simulation, the lower-tax imported beverage is assumed to have a 10% lower retail price than the comparable product in the higher-tax market, giving $\Delta p = 0.10$.

Assuming a 10% lower retail price for untaxed imported beverages ($\Delta P = 0.10$), cross-border procurement (import penetration) is calculated as:

$$M_{\text{pen}} = \alpha(\Delta P) \cdot \lambda$$

where M_{pen} is the import penetration rate. The substitution elasticity parameter (α) is calibrated at 3.5, reflecting high substitutability between domestic and imported generic SSBs. The value of 3.5 is used as the baseline calibration for the simulation and represents the assumed degree of substitutability between domestic and imported generic SSBs. The informal cross-border trade leakage parameter (λ) is set at 0.40 (40%), representing the assumed level of informal cross-border trade leakage. Substituting the baseline values into the equation gives $M_{\text{pen}} = 3.5 \times 0.10 \times 0.40 = 0.14$. The resulting baseline import penetration rate is therefore 14% of the high-tax market under specified assumptions.

Consequently, the tax-revenue erosion function for high-tax jurisdictions is defined as:

$$\Delta \text{Rev} = (M_{\text{pen}} \cdot Q) \cdot T_{\text{high}}$$

where T_{high} is the prevailing high-tax rate, calibrated at an average equivalent of \$0.11 per liter, with Zambia used as the reference case for the simulation. With an immediate 14% import penetration shifting part of the taxable market to lower-tax or untaxed sources, the model calculates the associated reduction in the taxable domestic volume. Applying the modeled 2% annual market growth over the 10-year projection period and varying the leakage parameter (λ) within the sensitivity analysis produces a projected cumulative tax-revenue erosion of 15% to 25% for high-tax jurisdictions under the specified model assumptions.

Finally, the epidemiological impact resulting from the trade-induced expansion of cheap sugar consumption is projected using:

$$\Delta \text{Cases} = \beta \cdot (M_{\text{pen}} \cdot Q_{\text{baseline}})$$

where Q_{baseline} is the 10-year aggregate consumption baseline. Because untaxed imports lower average market prices, total aggregate demand increases (via $\epsilon = -1.2$). The simulation projects an excess total consumption of 10 billion liters of SSBs over the baseline across the 10-year period due to this price drop. The diabetes incidence conversion factor (β) is parameterized at 1.25×10^{-4} (equivalent to 1.25 incident cases per 10,000 excess liters of SSBs consumed), using the International Diabetes Federation's reported evidence on diabetes risk as the basis for the modeling parameter. The coefficient is used to translate simulated excess SSB consumption into an indicative estimate of additional diabetes cases rather than as a direct causal

estimate attributable to AfCFTA implementation. Applying the coefficient to the simulated excess consumption gives $\Delta \text{Cases} = 1.25 \times 10^{-4} \times 10,000,000,000 = 1,250,000$. The resulting central model projection is therefore 1.25 million additional Type 2 diabetes cases over the 10-year projection period. Across the 10,000 Monte Carlo iterations, the model generates an estimated range of 1.0 to 1.5 million additional cases.

To quantify the net economic impact, regional welfare (W) is mathematically defined as:

$$W = \Delta \text{CS} + \Delta \text{PS} + \Delta \text{TR} - \Delta \text{HC}$$

where CS is consumer surplus, PS is producer surplus, TR is tax revenue, and HC represents the monetized public health costs. The "Welfare Gap" is calculated as the net difference in W between Scenario A and Scenario B. The 95% confidence intervals reported for these projections were generated via 10,000 Monte Carlo iterations. Parameters were sampled independently using uniform distributions for elasticity (ϵ between -1.1 and -1.3), leakage (λ between 0.10 and 0.40), and a normal distribution for baseline consumption growth (mean 0.02, standard deviation 0.005).

To prevent the model from treating a few distinct economies as perfectly representative of the entire continent, the simulated AfCFTA market is parameterized into three weighted typologies. The aggregate baseline consumption (Q_{baseline}) is distributed across High-Tax/High-Income markets (e.g., South Africa; 40% weight), Low-Tax/Low-Income markets (e.g., Eswatini; 35% weight), and highly porous Transit Hubs (25% weight). The substitution elasticity (α) is heavily weighted toward the Transit Hubs to account for informal cross-border procurement.

Furthermore, to ensure the robustness of the projections, a sensitivity analysis was conducted using Monte Carlo simulations. The price elasticity (ϵ), leakage parameter (λ), and baseline consumption growth rates were varied across 10,000 iterations to generate a 95% confidence interval for the resulting revenue and epidemiological impacts.

Using this framework, the simulation produces two scenarios:

Scenario A ("The Status Quo / The Race to the Bottom"): In this scenario, the tariffs are reduced to zero in line with the AfCFTA timetable, while the excise taxes are uncoordinated. The trade-diversion effect is represented by the shift in production from the countries with higher taxes to countries with lower taxes, and the subsequent decline in revenue and rise in aggregate sugar consumption.

Scenario B ("The Harmonized Floor"): In this scenario, the AfCFTA Secretariat implements a binding agreement whereby there would be a minimum specific excise tax for sugar (e.g., \$0.05 per gram of sugar) for all member states. This creates a common minimum tax burden and therefore reduces the incentive to conduct cross-border transactions for tax arbitrage purposes.

By running these scenarios through a theoretical framework that applies the elasticity coefficients to projected trade volumes, we generate a probability distribution of outcomes. This framework allows estimation of the "Welfare Gap" between acting alone and acting together.

DISCUSSION AND ANALYSIS OF RESULTS

Quantitative evaluation of the simulated parameters indicates differences between the two policy scenarios. This model indicates a significant governance challenge associated with the current configuration of health taxation under the AfCFTA. The simulation projections suggest that there is a clear split in the outcome between the two paths, a difference reflected in both fiscal and health outcomes.

In Scenario A, the "status quo" scenario involving the reduction of trade barriers without tax harmonization, the model indicates substantial tax-revenue erosion. With the simulation reducing trade barriers between the high-tax and low-tax regions, there is already a clear distortion in trade flows. The domestic beverage

companies in the high-tax countries, which internalize health externalities, suffer from a significant competitive disadvantage. Using the specified elasticity coefficients and leakage parameter (λ), the model projects that a 10% difference in final retail prices between high-tax and low-tax markets would correspond to an estimated 14% cross-border import penetration during the first five years of the simulated AfCFTA implementation period.

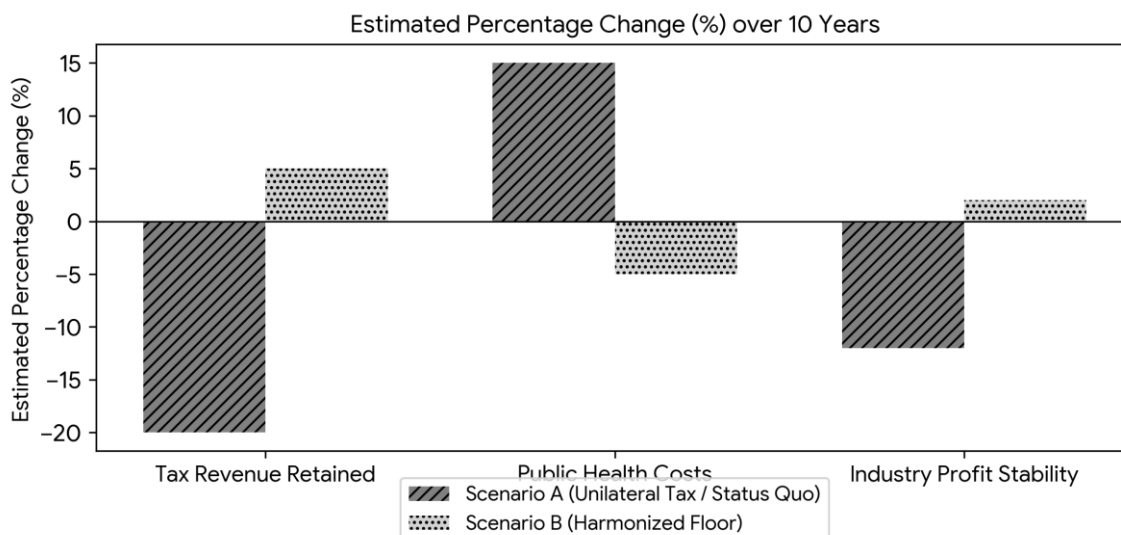
This has adverse economic consequences for the fiscal position of such governments. In switching to cheaper, imported and low-tax products, the tax base of the country with higher taxes shrinks. Under the specified parameter assumptions, the simulation projects a 15% to 25% reduction in tax revenues for high-tax jurisdictions over the ten-year projection period. This creates a paradoxical reduction in dedicated health revenues, despite the increased fiscal demands associated with rising disease burdens.

Table 2: Illustrative Scenario Inputs for Key Economic and Health Metrics (10-Year Projection)

Impact Metric	Scenario A: Unilateral Tax (Status Quo)	Scenario B: Harmonized Floor
Tax Revenue Retained	-20% (High Erosion)	+5% (Stable Base)
Public Health Costs (NCDs)	+15% (Increasing Burden)	-5% (Controlled)
Industry Profit Stability	-12% (Volatile)	+2% (Level Playing Field)

Note: The percentages presented in this table represent illustrative boundary scenarios used to stress-test the simulation, rather than direct empirical outputs of the partial-equilibrium model.

Figure 1: Projected Percentage Shift in Regional Metrics (Scenario A vs. Scenario B)



The principal public-health effect identified by the model is the projected increase in disease burden. With Scenario A, the overall consumption of SSBs in the trading bloc does not fall; rather it changes its source. Since the model assumes an average decline in the beverage prices resulting from cheaper and untaxed imported beverages, it projects consumption growth above the baseline growth rate. Applying the model's epidemiological conversion parameter to the simulated increase in SSB consumption produces a projected 1,000,000 to 1,500,000 additional cases of Type 2 diabetes over the ten-year projection period (International Diabetes Federation, 2025). These figures are model projections and should therefore be interpreted as indicative estimates of potential public-health and productivity effects rather than observed cases attributable to AfCFTA implementation.

On the contrary, the second scenario referred to as the Harmonized Floor functions as a policy buffer. As the simulation applies the minimum regional tax, the scope for companies to exploit cross-border tax differences is reduced. With a common minimum tax burden, distributors have fewer opportunities to source SSBs from neighboring jurisdictions solely to exploit tax differences.

The harmonized floor reduces the tax differential that creates incentives for cross-border tax arbitrage. The welfare gain that is expected from the harmonized solution in the form of the sum of the gains in tax revenue and the savings in healthcare costs is projected to exceed that of the unilateral scenario.

The simulation outputs indicate that the efficiency effects of health taxation depend on the degree of regional tax coordination. In fact, from a regional perspective, harmonization avoids the destruction of human capital. The model indicates that the efficiency of a free trade area should also account for the fiscal and health externalities associated with traded products.

The Macro-Structural Dividend: Health as the Biological Infrastructure of the AfCFTA

Although discussions on the AfCFTA have largely been preoccupied with port logistics and tariff systems, population health represents an important component of Africa's productive capacity. It is important to consider health not only as a social determinant but also as a determinant of labor productivity. From an orthodox perspective of economic growth theory, the economic product is a function of capital, labor, and the efficiency of their utilization. Differences in SSB tax rates under the AfCFTA may create a negative shock to human capital accumulation.

If we examine the African growth trajectory through an augmented Solow-Swan framework, output Y is defined as:

$$Y = A \cdot K^{\alpha} \cdot (hL)^{(1-\alpha)}$$

Under these circumstances, h is the human capital stock measured by the "health stock" of the people (Bloom & Canning, 2000). The resulting health burden therefore reduces the effective health component of human capital, h . With an increase in NCDs associated with high sugar consumption, the model identifies two potential channels of economic loss: firstly, the actual labor force (L) declines owing to early deaths; and secondly, savings (S) are being diverted from industrial investments into sunk costs associated with disease management.

Moreover, tax non-harmonization contributes to the formation of what Carroll (1997) describes as the "Precautionary Saving Trap." Where there are inadequate social protection mechanisms, an increase in the NCD burden may lead households to increase precautionary savings for unexpected healthcare expenses, diverting resources from other forms of household consumption or investment. On the other hand, excise tax harmonization operates like a "Double Dividend".

Under this paradigm, the "Health Tax Floor" may be interpreted as a regional fiscal-health coordination mechanism. In the same way that central banks align interest rates to ensure the stability of currency, regional coordination of health taxes could reduce the fiscal and productivity pressures associated with rising NCD burdens that affect the labor market. Otherwise, without the necessary fiscal buffer, persistent NCD-related productivity losses could constrain long-term economic convergence because of the geriatric health burden of a chronologically young but biologically old population due to poor nutrition policy (Eichengreen et al., 2013).

From Sovereignty to Solidarity

This is often the point at which such proposals encounter significant political and institutional constraints, because, although the model demonstrates that a harmonized tax system would improve fiscal and health outcomes, it becomes a completely different matter to convince African State Parties to voluntarily restrict their domestic fiscal autonomy. This kind of proposal can only ever run into the kind of political opposition

that arises from what may be considered a fundamental principle of Westphalian sovereignty; namely, the notion that it is beyond the prerogative of any other nation to intervene in domestic tax policy.

A potential objection is that a continental institution based in the host city of the AfCFTA Secretariat should not mandate retail beverage pricing at the national level. However, this article suggests that this traditional conception of fiscal sovereignty is increasingly challenged by regional economic integration; it is something from a time when economies existed in isolation from each other. In the highly interconnected system that exists today, the meaning of sovereignty is not about acting independently; it is about achieving your national objectives. And if doing things on your own results in a loss of money and adverse population health outcomes, then uncoordinated fiscal sovereignty may therefore generate outcomes that conflict with national public-health objectives.

In order to address this dilemma, this paper proposes a Regional Health Tax Floor. Rather than requiring identical national excise rates, the proposed floor would establish a common minimum specific excise duty on sugar-sweetened beverages while allowing individual countries to impose higher rates according to their public-health and fiscal priorities. Drawing on comparative experiences of regional tax coordination in the European Union and international tax coordination under the OECD (2021), the proposal uses a minimum specific excise duty of \$0.05 per gram of sugar as a policy parameter in the simulation because it provides a common benchmark for examining whether a coordinated minimum tax would materially narrow the price differential created by divergent national excise regimes. This rate is not presented as an empirically established regional optimum. Its health rationale is linked to evidence that fiscal policies producing meaningful retail-price increases are associated with reductions in sugar-sweetened beverage consumption (World Health Organization, 2017). Because retail prices, sugar content, tax incidence and market structures differ across African markets, the model does not assume that the \$0.05-per-gram rate produces a uniform 20% retail-price increase across the region. Rather, it provides a common policy parameter through which the simulation assesses the potential economic and health effects of regional tax coordination, while individual countries retain policy space to impose higher rates.

The effectiveness of the regional floor would also depend on the capacity to address illicit cross-border trade. As our methodology suggested, informal and illicit trade therefore remain due to relevant implementation risks. If tax obligations are not effectively enforced, illicit trade may undermine the effectiveness of the policy. That is why the second component of our proposal is the establishment of a "Digital Health Excise Shield". The proposed system would complement existing physical tax-control mechanisms with digital verification. The AfCFTA digital trade framework provides a potential legal and institutional basis for developing a continent-wide track-and-trace system for excise products, using secure digital technologies to verify the tax status of products as they move across borders (African Union, 2018). The necessary technological infrastructure, including electricity and internet access, remains unevenly distributed across the continent. Consider a system whereby a pallet of beverages manufactured in Nigeria comes stamped digitally. In the event that the pallet moves to Benin, the custom authorities scan the digital stamp, and real-time verification confirms the minimum regional excise duties have been paid. If the minimum tax has not been paid, or if the tax is lower than the destination country's applicable tax, the system will highlight the discrepancy, and the remaining amount must be paid at the point of entry. This would strengthen the capacity of AfCFTA digital infrastructure to support health-tax enforcement.

The proposed framework is intended as a scalable policy model for the future of "Sin Taxes" in Africa. Although this paper concentrates on sugar, the concept could be adapted to tobacco and alcohol taxation, which are equally susceptible to smuggling and value erosion. The "Health Tax Floor" of sugar provides a potential basis for broader regional coordination of health-related taxation. While the AfCFTA was meant to be all about the movement of goods, it also incorporates consideration of the health externalities associated with traded goods with this shift in narrative. It gives back the narrative of development in which industrialization in Africa does not have to come at the expense of good health.

A key advantage of the proposed framework is the scale at which it can be achieved. It doesn't call for an enormous new bureaucratic apparatus; rather, it takes advantage of the current tax institutions and the evolving

digital networks under the AfCFTA. Its implementation would require political commitment to accept the fact that in a free trade zone, public-health outcomes in one State Party are partly affected by fiscal policies in neighboring markets. The economies are therefore increasingly interdependent within an integrated market.

CONCLUSION

The African Continental Free Trade Area represents a major stage in Africa's regional economic integration, a framework for expanding intra-African trade under continentally agreed rules. However, as this article has sought to demonstrate, there is a need to redefine the notion of "independence" in the context of the 21st century. Independence cannot be reduced to moving goods between one territory and another. It should mean protecting the people who live in those territories from the consequences of globalization. The simulation provides an economic assessment of the potential fiscal and health implications of implementing the AfCFTA without adequately accounting for health-related externalities associated with consumption.

The simulation of "The Fiscal Health Paradox" indicates that the current policy configuration may generate increasing fiscal and health pressures over the long term. Taxation competition pressures identified by the model may create incentives for national health-tax rates to converge toward lower levels where countries face strong competitive pressures from neighboring jurisdictions. The model suggests that competition for investment through lower health taxes may generate a trade-off between short-term production incentives and longer-term public-health and productivity outcomes. An increase in the incidence of diabetes and other chronic diseases as a result of the flow of cheap and tax-free sugar may impose indirect development costs through increased healthcare expenditure and productivity losses manifested through increased clinical treatment costs and chronic disease morbidity. The alternative route, the "Harmonized Floor," provides a pathway that combines regional integration with fiscal and public-health coordination. With the inclusion of an agreement on a health tax within the AfCFTA framework, African policymakers can take advantage of an opportunity to develop a new kind of trade policy, which does not see public health as a hindrance to trade but rather as an important pre-requisite for trade. But to do so will require substantial political commitment from African policymakers, which involves coordinating aspects of domestic fiscal policy in pursuit of shared regional objectives.

In the end, the gauge of the AfCFTA's success is neither in the number of shipping containers to go through the port of Durban nor the GDP numbers in their annual reports. Its success should also be assessed against the long-term fiscal, health and productivity outcomes experienced across participating economies. When market price mechanisms do not fully incorporate public-health externalities, this creates a role for coordinated public policy to act on health economics principles. The policy choice is between fragmented competition, with short-term competitive advantages occurring at the expense of longer-term health and fiscal outcomes, and greater regional coordination. The implementation phase therefore provides an important opportunity to consider regional coordination.

Ethical Approval

Ethical approval was not required because the study uses secondary data and conceptual modelling and does not involve human participants or animals.

Conflict of Interest

The authors declare no conflict of interest.

Data Availability

The study uses secondary data and published estimates from publicly available and proprietary sources. Publicly accessible sources are cited in the reference list. Proprietary datasets are subject to the access and licensing conditions of the respective providers.

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