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Tax Reforms with Revenue Replacement: Economy-wide Effects of Food Tariff Liberalisation in Sri Lanka

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Tax Reforms with Revenue Replacement: Economy-wide Effects of Food Tariff Liberalisation in Sri Lanka

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ABSTRACT

Despite the well-documented consumer benefit of import liberalisation in net-importing countries, many governments hesitate to pursue deeper tariff reforms due to concerns about declining government revenue. Consequently, domestic taxation is commonly viewed as a mechanism for replacement. This study examines the economy-wide effects of reforming food import tariffs in Sri Lanka along with domestic taxes using the Global Trade Analysis Project (GTAP) model and database. Two policy scenarios are analysed: (i) a reduction in food import tariffs (IMT) and (ii) a combined reform involving tariff reduction and a compensatory domestic output tax on food products (IMT+DMT) to maintain government revenue neutrality. Domestic output taxation is selected because it provides a direct means of examining whether lost tariff revenue can be replaced through taxation of domestic food production and how this alternative affects food prices, production incentives, and economic welfare. The results indicate positive net welfare gains under both scenarios. These gains are primarily driven by allocative efficiency improvements which outweigh the adverse terms-of-trade effects and savings–investment effects. Although the combined reform generates slightly higher overall welfare gains, it also produces more negative terms-of-trade and savings-investment effects. These findings suggest that compensatory domestic output taxation can maintain revenue objectives while preserving positive aggregate welfare outcomes; however, its implications for food prices, domestic production competitiveness, and the distribution of benefits require careful consideration in trade and fiscal reforms in Sri Lanka.

Keywords: Trade Liberalisation, Domestic Taxation, Food Sector Welfare, GTAP Model

JEL Classification Codes: F13, H25, Q18, C68

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1. INTRODUCTION

In Sri Lanka, import tariffs have traditionally been used as an important mechanism for revenue generation. However, import tariffs represented only about 2.8% of total tax revenue in 2024, compared with 32.5% from VAT, 25.5% from income taxes, and 14.8% from excise duties, indicating that tariffs account for a relatively small share of overall tax revenue despite their importance as a trade-policy instrument (CBSL 2025). The latest government policy directions outlined in the national framework policy namely, 'A Thriving Nation – a Beautiful Life', highlight the significance of rationalising para-tariffs, increasing transparency, and macroeconomic stability coupled with commitments to the World Trade Organization (WTO). In this respect, there is a need to systematically assess the combined economic effects of import tariff reduction and domestic taxation on food products in Sri Lanka. Understanding these interactions is critical for designing trade fiscal reforms that balance revenue sustainability, food affordability, producer incentives, and overall welfare.

Recent empirical evidence indicates that trade liberalisation can alter the composition of government revenue, with reductions in trade duties potentially accompanied by increases in domestic tax revenue (Kassim 2024; Makun and Singh 2025). Theoretical research further suggests that coordinating tariff reductions with domestic tax reforms can help maintain government revenue while generating potential welfare gains under certain market conditions (Chang and Sargsyan 2022). However, tariff liberalisation is not distributionally neutral. Changes in import prices and domestic production incentives can redistribute income and economic gains across consumers, producers, workers, and sectors. Ahmed and O'Donoghue (2010), using a CGE model for Pakistan, show that tariff reduction can generate overall welfare gains while producing heterogeneous effects across economic agents. Therefore, assessing tariff reform requires consideration not only of aggregate efficiency and revenue effects but also of its distributional consequences. These results are particularly important for Sri Lanka since a significant proportion of household expenditures is allocated towards food. According to the Household Income and Expenditure Survey (HIES) 2019, food accounts for 35.1% of total household expenditure in Sri Lanka, indicating the high sensitivity of household welfare to changes in food prices (DCS 2021).

In Sri Lanka, policy reform has historically occurred at a rapid and often erratic pace, which has resulted in the inability of policymakers to adequately balance their need to generate revenue against the desire to provide low-cost food to consumers while protecting local producers. These challenges can be further amplified when reforms coincide with exogenous economic shocks, which may alter food prices, household incomes, production incentives, and food security conditions. Evidence from Pakistan during the global economic crisis highlights how such external shocks can generate significant poverty and food-security consequences, particularly for vulnerable households (Ahmed and O'Donoghue 2010). Trade liberalisation can improve food availability and affordability

by lowering trade barriers, expanding import opportunities and helping countries offset domestic supply shortfalls. However, increased import competition can place pressure on domestic farmers, particularly where productivity, access to finance and capacity to adjust are limited. The overall effects therefore depend on domestic production conditions and the extent to which lower import costs translate into lower retail food prices (OECD and FAO 2024; Gilbert et al., 2024). The introduction of domestic output taxes creates additional complexity for policymakers. Domestic output taxes may generate revenue and create an additional layer of complexity within the domestic price structure of goods yet may add to farmers' production costs and further exacerbate the burden placed on consumers unless they are coupled with targeted social assistance programmes (IRD 2024).

However, there are also significant gaps in the current literature on likely combined effects of domestic taxation and import tariff liberalisation in developing economies. Except for a few studies, the majority examine either tariff reform or domestic taxation associated with trade policy and consumption, rather than modelling them together to show the resulting changes in prices, production, fiscal revenue and welfare at the same time.

Moreover, despite the extensive use of CGE models to examine trade and tax reforms, there is limited empirical evidence for small, net food importing economies such as Sri Lanka on how food tariff liberalisation interacts with domestic taxation under a revenue neutral fiscal constraint. Existing studies have largely examined tariff and tax reforms at the economy-wide level, while less attention has been given to the food sector, where tariff changes directly affect food prices, consumer welfare, domestic production incentives, and food-processing competitiveness**.** This study addresses this gap by providing a country-specific CGE assessment of food import tariff liberalisation and its interaction with compensatory domestic taxation in Sri Lanka. The analysis makes three specific contributions. First, it isolates the effects of food-specific import tariff reduction, rather than examining trade liberalisation only at the aggregate level. Second, it introduces a revenue-neutral policy experiment, in which domestic output taxes are calibrated to offset the government revenue loss associated with tariff reduction, allowing the welfare and efficiency effects of alternative fiscal instruments to be compared while approximately maintaining government revenue. Third, it evaluates the distributional and economy-wide transmission mechanisms through which these alternative reforms affect food prices, production, imports, household consumption, government revenue, macroeconomic performance, and overall welfare. CGE modelling, particularly the GTAP framework, provides an appropriate platform for capturing these simultaneous interactions. Accordingly, the study compares food import tariff liberalisation with a combined tariff-reduction and compensatory domestic tax scenario to determine whether replacing tariff revenue with domestic taxation preserves the welfare and efficiency gains from trade liberalisation.

The novelty of this study therefore lies not in establishing that domestic taxation can offset tariff revenue losses, which is well established in the literature, but in quantifying how this trade-off operates in the food sector of Sri Lanka under a revenue neutral reform. By

focusing on a net food-importing developing economy and explicitly comparing tariff liberalisation with calibrated domestic output taxation, the study provides country- and sector-specific evidence on whether fiscal revenue replacement can be achieved without undermining the consumer, efficiency, and welfare gains associated with food tariff reform.

2. METHODOLOGY

In many developing economies, including Sri Lanka, import tariffs on food products serve both as protection for domestic producers and as a source of government revenue. While tariff liberalisation is often proposed to improve market efficiency, reduce consumer prices, and enhance food availability, such reforms may also reduce government revenue. Policymakers therefore face the challenge of identifying alternative domestic tax instruments that could compensate for the loss of tariff revenue while maintaining fiscal balance. Hence, the real-world policy question addressed in this study concerns how governments can reform trade taxes without undermining fiscal stability.

The model and database developed by GTAP were adopted for this study. The database has been compiled to accommodate bilateral exports and imports and tariffs of 163 regions and 65 main sectors. Also, five factors of production and identities to compute intermediate demand, final demand by private households, government, and investment are included in the database. In GTAP, taxes are explicitly incorporated as policy instruments that create price wedges between producers, consumers, and international markets. These taxes influence production, consumption, trade flows, and welfare outcomes in the model. The GTAP framework represents several types of taxes that can be shocked during policy simulations. Import tariffs, export taxes, output taxes, intermediate input taxes and consumption taxes are applied to domestic production and are represented by GTAP. These taxes increase the cost of producing goods and create a wedge between producer prices and market prices; input and consumption taxes affect prices, production, trade, welfare, and macroeconomic equilibrium outcomes.

Economic welfare in the GTAP model is represented as being derived from the allocation of national income between private consumption, government consumption, and savings. The standard GTAP framework (version 12) was used to apply policy-specific shocks with adjustments in closures.

2.1 GTAP Closure Conditions

Import tariffs are the most direct trade policy instrument and are represented in GTAP by the import tax rate (*tms*) on commodities imports.

A reduction in tariffs (negative *tms* shock) simulates trade liberalisation and reduces domestic prices, while a positive shock captures protective or distortionary effects. This mechanism directly affects the cost of imported food commodities and the competitiveness of domestic producers.

The GTAP model captures domestic fiscal policies through output taxes (*to*) on producers as well as trade policies through import tariffs (*tms*) on importers. Domestic taxes in GTAP are represented by the following parameters:

to(i,r) = output tax on domestic production of good *i* in country *r*

A positive 'to' represents an increase in taxation, raising consumer or producer prices, while a negative value simulates tax reductions or subsidies. These measures influence domestic demand and production, altering welfare outcomes through changes in real consumption and output levels.

If to > 0 → output tax

If to < 0 → output subsidy

If to = 0 → no tax or subsidy on output

2.2 Simulation Experiments

The original GTAP dataset was aggregated into 8 regions and 8 sectors. The regional aggregation includes Sri Lanka, India, China, the European Union, Bangladesh, the UK, the Middle East and a residual 'Other' region. The sectoral aggregation was undertaken to reflect Sri Lanka's major food imports and domestic production priorities, resulting in eight key sectors: other foods, wheat, cereals and grains, vegetables, edible oil, milk powder, rice and sugar.

Base year import tax rates (*tms*) represent the average ad valorem tariffs applied to each food products category in the GTAP database and reflect the initial level of border protection prior to policy simulations. This aggregation strategy ensures that the model captures Sri Lanka's most critical import sources and food consumption patterns, thereby enabling a more precise assessment of the effects of tariffs and domestic taxation on food security and welfare outcomes.

Table 1: Policy Variables and Purposes of Simulation

Policy Description	Policy Variable	Purpose	Name of the Scenario
Import tariffs	*tms*	To evaluate import tariff effect	IMT
Domestic tax	*to*	To assess domestic tax effect	DMT

Source: Authors' simulations using GTAP 12 Database.

In this study, import tariffs *(tms)* and domestic taxes *(to*) were treated as exogenous policy instruments. By altering these exogenous variables, the model is instructed to simulate how the economy adjusts when policymakers change tariff rates or modify domestic tax structures. In contrast, endogenous variables are those that the model allows to adjust

automatically in response to policy shocks, following economic theory embedded in the GTAP structure. These include prices, output levels, trade flows, household consumption, wages, investment, and welfare indicators.

When an exogenous policy variable such as *tms* is reduced, the model endogenously recalculates how import prices fall, how domestic producers respond, how consumption patterns shift, and how welfare changes through allocative efficiency, terms-of-trade, and investment-savings channels. Similarly, adjusting the *to* triggers endogenous changes in production costs, consumer prices, and expenditure patterns. The domestic tax rate used in the IMT+DMT scenario was calibrated to maintain revenue neutrality following the reduction of import tariffs. In the base year, government tax revenue amounts to USD 10,913.97 million. When import tariffs on essential food commodities are reduced by 15%, total government revenue declines to USD 10,845.25 million due to the loss of tariff income. To offset this reduction and maintain the same level of government revenue as in the baseline equilibrium, a compensatory domestic tax is introduced. The model simulation determines that domestic output tax rates set at 400% of their respective base-year rates (calibrated across the respective food sectors) are sufficient to recover the revenue loss from tariff reductions and restore the total tax revenue of the government to its baseline level. The resulting output tax rates remain below 1% in all food sectors (Figure 1).

Table 2: Scenarios, Variables, Current Status and Shock Values

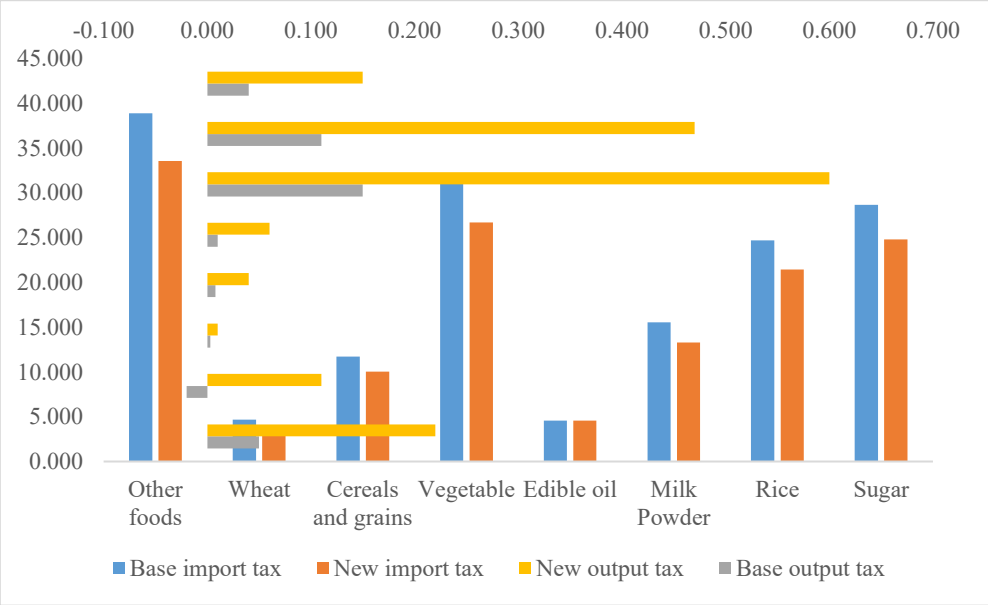
Scenario	Description	Variable	Shock Value on Each Variable
IMT	Import duty	tms	-15%
	Domestic tax	to	0
IMT+DMT	Import duty	tms	-15%
	Domestic tax	to	400% of the respective base-year output tax rate

Source: Authors' simulations using GTAP 12 Database.

Treating tariffs and domestic taxes as exogenous shocks, while letting macroeconomic and sectoral variables adjust endogenously, provides a robust and transparent framework for analysing the impacts of trade and fiscal reforms on food systems, welfare, and macroeconomic performance of Sri Lanka.

Tax Reforms with Revenue Replacement

Figure 1: Base Year Tax Rates and Updated Tax Rates



Note: Left axis: import tariffs; right axis: domestic taxes.

Source: Authors' simulations using GTAP 12 Database.

Policy Scenario 1: IMT

This scenario involves a 15% reduction in tms on foods. The results of this scenario are used to determine the effects of the import tariff reduction when existing import tariffs on essential food items are reduced by 15% while keeping the import tariffs on other sectors at their baseline levels.

Policy Scenario 2: IMT + DMT

This scenario involves imposition of output taxes on essential food items set at 400% of the base-year output tax rate.

Import tariffs – the graph shows base year average import tax rates and the corresponding policy shocks, where import tariffs are reduced by 15% from base year levels under the import liberalisation scenario. The variation across food categories reflects different initial levels of border protection.

Output tax – the graph presents base year output tax rates and the adjusted rates applied under the domestic tax simulation, where output taxes are raised to 400% of their base-year rates to compensate for tariff revenue losses. The variation across food products reflects differences in initial tax levels and the relative fiscal burden imposed under the policy scenario.

3. FINDINGS AND DISCUSSION

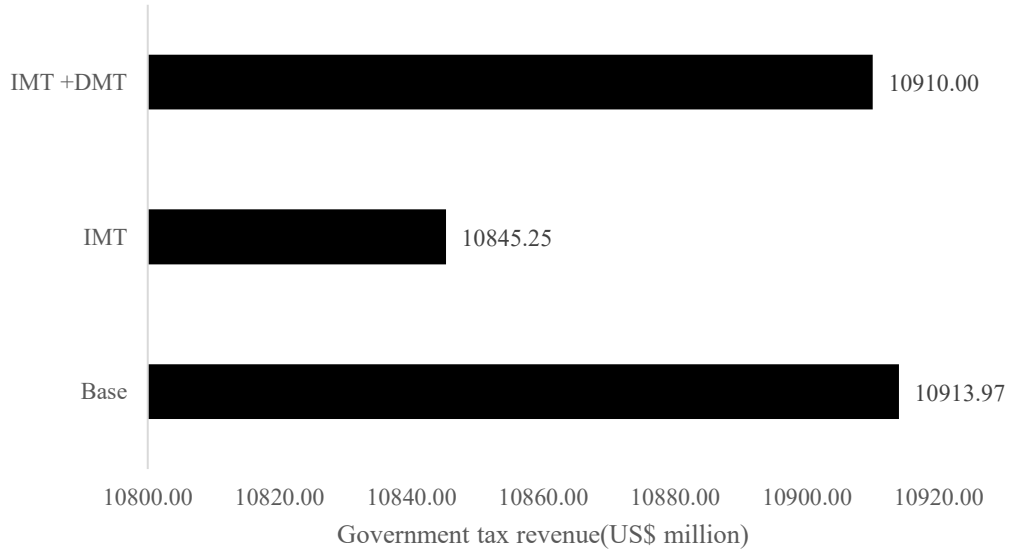
In this section, the results of the simulations on the macroeconomic variables, namely tax revenue, food imports, market price levels, industry output, GDP, consumption expenditure, and welfare decomposition are presented.

3.1 Changes in Tax Revenue

Tax revenue associated with the fiscal and trade policy simulation is shown in Figure 2. In the base year, the revenue to the government through taxation was USD 10,913.97 million and it would decrease to USD 10,845.25 million when import tariffs on essential food have been reduced. The IMT+DMT scenario was designed to maintain government tax revenue at approximately the baseline level by raising domestic output tax rates to 400% of their respective base-year rates, thereby compensating for the revenue loss resulting from food import tariff reductions.

Recent fiscal policy research highlights the importance of strengthening domestic tax systems as countries liberalise trade, particularly where government revenue depends heavily on import duties. Broadening domestic direct tax and goods and services tax bases can help offset tariff-related revenue losses, although the effectiveness of revenue replacement depends on tax administration and country-specific conditions (IMF 2024).

Figure 2: Change in Government Tax Revenue

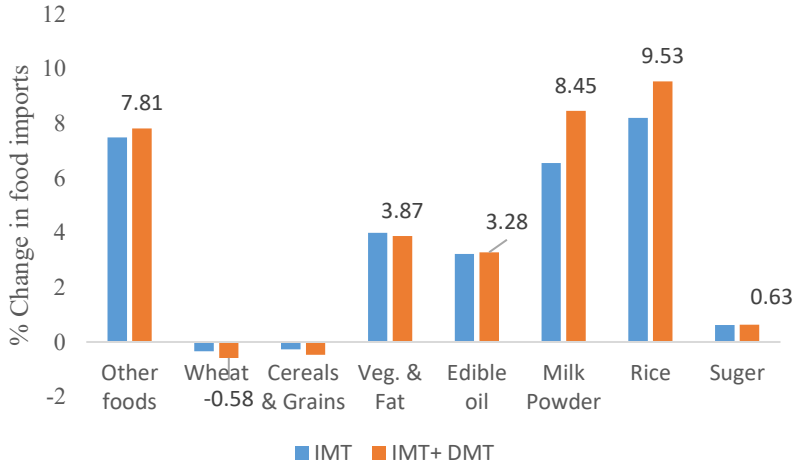


Source: Authors' simulations using GTAP 12 Database.

3.2 Food Imports of Sri Lanka under Different Scenarios

Figure 3 indicates that food imports into Sri Lanka are affected by both IMT and IMT+DMT policy scenarios differently, but all of the scenarios created marked effect overall. In the IMT policy scenario, a 15% reduction in import tariffs marked increases food imports. This increase reflects higher volumes of imports of milk powder (6.54%), edible oils (3.22%), rice (8.2%), vegetables (3.99%), and sugar (0.62%). These results are consistent with both theoretical literature and empirical research. Tariff liberalisation reduces the tariff component of import costs and can strengthen competition between imported and domestically produced goods by increasing competitive pressure on domestic firms. Recent empirical research shows that tariff reductions under trade agreements encourage market entry and reduce exporters' price–cost markups, thereby intensifying competition in product markets (Crowley et al., 2024). However, the effect on observed import prices depends on tariff pass-through, exporter pricing behaviour, and changes in product quality and sourcing patterns (Hayakawa et al., 2022). The increase in imports in the IMT+DMT case exceeds the gains in the IMT only case for the product categories: milk powder, edible oil, rice, vegetables, and sugar. This demonstrates how an unanticipated consequence of domestic output taxes results in more growth in imports with the combination of IMT+DMT compared to the imposition of IMT alone. While the domestic taxation system primarily aims to provide compensatory income for the loss of revenues from tariffs, it also implies that it would lead to other unforeseen economic costs in terms of increased dependency on imported goods. The literature highlights that when demand is highly inelastic, or supply chains are fully integrated globally, policy-induced price changes generate smaller marginal adjustments consistent with evidence from staple commodity markets in other developing economies.

Figure 3: Changes in Food Imports Under Different Scenarios



Source: Authors' simulations using GTAP 12 Database.

When DMT scenario is applied in isolation without lowering import tariffs, only modest increases in food imports can be observed (not shown in the figures). Import volumes rise slightly across most categories, including sugar (0.01%), processed rice (1.32%), milk powder (1.91%), and edible oils (0.09%). These moderate increases suggest that domestic taxation raises local production costs, which lead to increased imports.

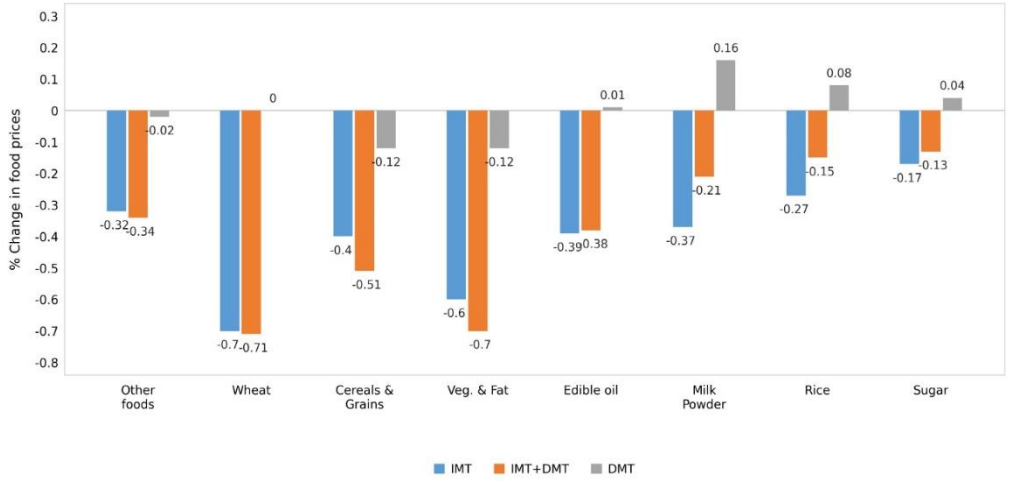
3.3 Changes in Market Price under Different Policy Scenarios

The effect on food prices in Sri Lanka under the IMT and IMT+DMT scenarios are shown in Figure 4. For comparison purposes, the results of DMT scenario in isolation are also shown in the same figure. Under the IMT scenario, a 15% reduction in import tariffs leads to price declines across all major food categories in Sri Lanka. This shows that lower border prices are directly passed on to markets and it also shows that there is more import competition and that the difference in prices between domestic and international markets is getting smaller for retail food prices.

When the DMT scenario is applied without an import tariff reduction, domestic food prices increase in some product categories, although the magnitude of the changes varies by commodity. Price increases are observed for edible oils (0.01%), milk powder (0.16%), rice (0.08%), and sugar (0.04%), indicating that the imposition of domestic output taxes raises production costs and is partially transmitted to consumer markets.

The IMT+DMT scenario generates a mixed but largely adverse price response in domestic food markets. The imposition of an output tax raises domestic production costs, which constrains supply and weakens the price-reducing effects of import tariff liberalisation. In the GTAP framework, output taxes create a wedge between producer and market prices, reducing producer incentives and shifting the domestic supply curve upward (Hertel and Tsigas 1997). Hence, it can be reasoned that even though the reduction of tariffs reduces border prices, it also increases taxes on domestic food commodities, thereby offsetting the gain.

Figure 4: Change in Market Prices



Source: Authors' simulations using GTAP 12 Database.

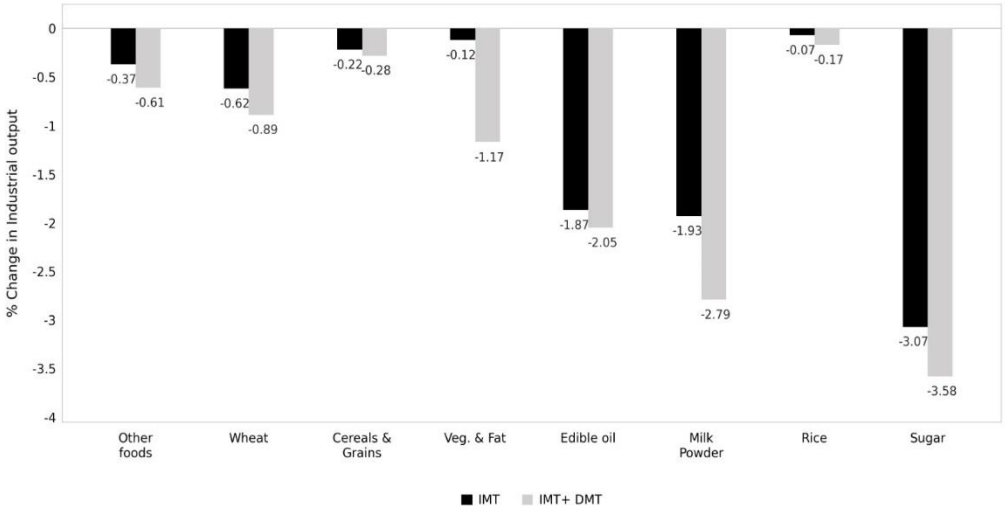
The effects of domestic taxation on consumer prices and welfare depend on the extent to which taxes are passed through to prices, the responsiveness of domestic supply, and prevailing market conditions. Recent CGE evidence from Burkina Faso indicates that VAT reforms affecting agricultural products can increase poverty and food insecurity, highlighting the potential welfare costs of taxing essential food commodities (Mamboundou 2022). Furthermore, evidence from developing economies demonstrates that the distributional effects of consumption taxes depend on household consumption patterns and the role of informal markets (Jensen 2024). Economy-wide modelling also shows that changes in food-sector activity can affect agricultural prices, factor returns and household welfare through intersectoral linkages (Kinkpe et al., 2024). These findings underscore the importance of evaluating domestic food taxation alongside tariff reforms, taking account of production responses, import competition and household expenditure patterns.

These findings suggest that the use of domestic output taxes to maintain tariff-equivalent government revenue imposes a cost in terms of higher market prices for food commodities. Consequently, although domestic taxes may support fiscal objectives, their use as a substitute for food import tariffs carries risks for consumer welfare.

3.4 Changes in Industrial Output

It is clear from the results of the simulation shown in Figure 5 that import competing sectors of Sri Lanka will be negatively affected due to tariff and tax reforms. For example, output in sugar processing, milk powder, edible oil, cereals, and rice milling will decline by 3.58%, 2.79%, 2.07%, 0.28%, and 0.17% respectively.

Figure 5: Change in Industrial Output



Source: Authors' simulations using GTAP 12 Database.

Trade liberalisation can encourage resources to shift towards more productive firms and sectors by intensifying import competition and improving access to imported intermediate inputs (Grieco et al., 2022). Trade liberalisation induces structural adjustment by shifting resources away from previously protected, less productive industries towards sectors with higher productivity and comparative advantage. As import competition increases, industrial output in inefficient sectors may contract, while more competitive sectors expand, leading to improvements in aggregate economic efficiency.

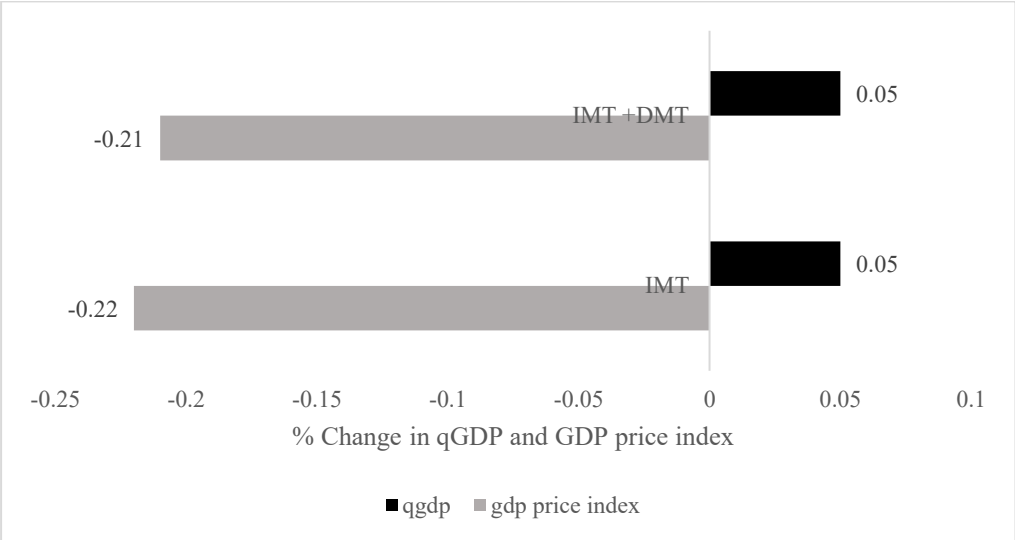
Under the IMT+DMT scenario the effects are more significant. The output tax on the domestic food sector increases the relative production cost and compresses the producer margin. This leads to greater substitution towards imported products. Similar patterns emerge in CGE studies of agricultural policy, which demonstrate that sector-specific tax and trade distortions can alter relative prices, resource allocation and agricultural competitiveness. Evidence from 15 developing countries highlights the importance of intersectoral linkages and country-specific characteristics in determining the effects of agricultural taxation and trade policies. Global agricultural modelling further shows that removing domestic support can reallocate resources across agricultural sectors, while tariff liberalisation can expose less competitive producers to import competition (Holtman et al., 2022).

3.5 Changes in Gross Domestic Product

Change in GDP Quantity Index and Price Index

These simulation results suggest that the proposed trade-fiscal reforms have a modest but positive impact on the quantity index of GDP (qGDP). Under the IMT scenario, qGDP increases by 0.05% from the base year and it is driven by allocative efficiency gains due to import tariff liberalisation. Under the IMT+DMT scenario, qGDP is also increased by 0.05% from the baseline equilibrium.

Figure 6: Change in GDP Quantity Index and GDP Price Index



Source: Authors' simulations using GTAP 12 Database.

Figure 6 shows the effects of the policy reforms on the GDP price index. Relative to the base-year equilibrium, the GDP price index declines by 0.22% under the IMT scenario and 0.21% under the combined IMT+DMT scenario, indicating a reduction in the aggregate price level of domestically produced goods and services. The downward pressure on domestic prices is consistent with recent trade-policy research showing that tariff reductions can lower the prices of imported consumer goods and intensify competition for domestic producers. Evidence from China indicates that consumer-goods tariff reductions can strengthen domestic market competition through price effects (Zhang et al., 2025), while research on Indian manufacturing shows that the effects on firm markups differ between final-goods and intermediate-input tariff reductions. These findings suggest that the price and competitiveness effects of tariff liberalisation depend on the type of goods affected and the extent to which domestic producers rely on imported inputs.

The decline in the GDP price index also helps explain why the positive change in the real GDP quantity index (qGDP) can coexist with a decline in the monetary value of GDP. The qGDP index captures changes in real economic activity, whereas GDP value is influenced by both quantity and price changes. Therefore, an increase in real GDP alongside a decline in GDP value is not necessarily contradictory; it reflects the combined effects of changes

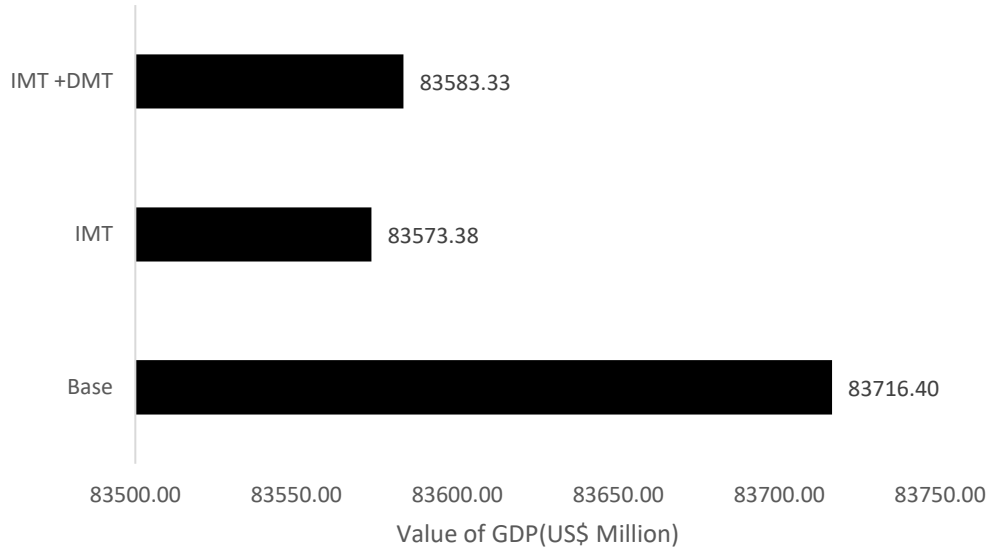
in real output and the aggregate price level. However, the magnitude of the GDP value change also depends on the model's accounting measures and the underlying adjustments in production, expenditure, and trade.

When DMT is applied without reducing import tariffs, the GDP quantity index increases marginally (0.003%), while the GDP price index increases by 0.009%, indicating modest real output gains alongside a slight increase in the overall price level.

3.6 Change in Value of GDP

The simulation results presented in Figure 7 indicate that the trade and fiscal reforms introduced caused negative effects on the value of the GDP in Sri Lanka. Under the IMT scenario the GDP value decreased to USD 83,573.38 million compared to the base-year value of USD 83,716.40 million. Under the IMT+DMT scenario the GDP value decreased to USD 83,583.33 million. Notably, this contraction occurs despite an increase in the GDP quantity index under both scenarios. This apparent divergence can be explained by distinguishing changes in real GDP volume from changes in GDP at current market prices. In CGE simulations, tariff liberalisation may improve allocative efficiency and reduce the cost of imported inputs, potentially increasing the real GDP quantity index. However, the monetary value of GDP may decline if reductions in import tariff revenue and changes in domestic prices outweigh gains in real output. National accounting guidance confirms that GDP at market prices incorporates taxes less subsidies on products, while real GDP measures changes in output volume after adjusting for price movements.

Figure 7: Change in Value of GDP



Source: Authors' simulations using GTAP 12 Database.

When DMT shock is applied without an import tariff shock, the value of GDP rises slightly to USD 83,726.35 million from the base-year value of USD 83,716.40 million, consistent with the marginal increases in both the GDP quantity index and the GDP price index.

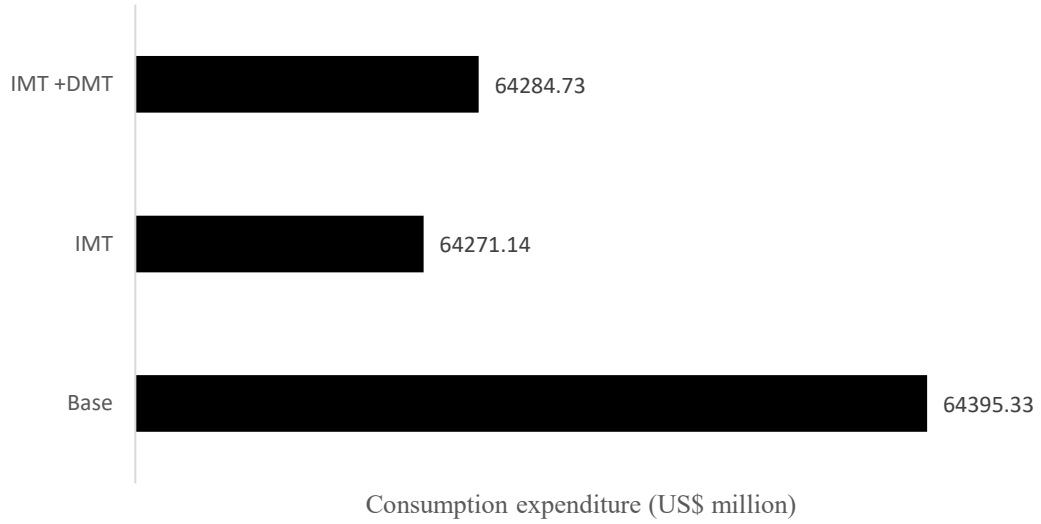
Additionally, the findings show that through sustenance of government revenue by introducing domestic output taxes on the food sector, the real income of the country falls. This is owing to higher prices for several food stuffs caused by high domestic taxes. CGE and general equilibrium studies indicate that tariff liberalisation can generate welfare gains through improved resource allocation and lower trade costs. However, these gains are not guaranteed to be substantial or sustained, as the fiscal consequences of tariff reductions and the choice of replacement taxes can influence overall welfare. Chang and Sargsyan (2022) show that the welfare effects of coordinated tariff and domestic tax reforms depend on market structure and the design of the tax adjustment. Evidence from Kenya further demonstrates that tariff liberalisation can affect GDP, investment, production, and government revenue in different ways (Mwatu et al., 2024).

3.7 Changes in Consumption Expenditures

The simulation results presented in Figure 8 demonstrate that the import tariffs and domestic tax reforms that were implemented had a negative effect on household consumption, which represents the expenditure-side component of GDP. Under the IMT scenario household consumption declines to USD 64,271.14 million compared to the base year value of USD 64,395.33 million. Under the IMT+DMT scenario, household consumption is estimated to have decreased to USD 64,284.73 million. This outcome is consistent with recent CGE research showing that improvements in aggregate output do not necessarily translate into equivalent gains in household consumption or economic welfare. Economy-wide effects depend on changes in relative prices, household income, investment, government revenue, and the allocation of resources across sectors (Raouf and Chtouki 2022). Accordingly, the increase in the GDP quantity index alongside a contraction in real expenditure suggests that efficiency gains in production may be offset by adverse income and price effects. This divergence highlights the importance of examining real GDP, household consumption, and welfare indicators separately when assessing the effects of trade-policy reforms.

Reductions in government revenue, rising domestic prices, and adjustments in factor incomes collectively dampen household purchasing power, thereby suppressing consumption demand.

Figure 8: Change in Consumption Expenditure



Source: Authors' simulations using GTAP 12 Database.

When the DMT shock is applied without lowering import tariffs, consumption expenditure also declines, indicating a reduction in household real purchasing power. This suggests that domestic output taxation raises costs and prices sufficiently to weaken consumer demand and overall expenditure levels.

3.8 Changes in Welfare Effect under Different Scenarios

The results of welfare analysis are shown in Table 3. Under the IMT scenario, the gains from the increase in resource-use efficiency amount to USD 41.69 million. This was largely owing to the liberalisation of food processing industry that was highly protected before. The resources that were used earlier in food manufacturing have moved towards the industries that are relatively more efficient. Tariff liberalisation can reduce domestic prices for imported goods and inputs while improving allocative efficiency through greater competition and more efficient resource allocation. However, the magnitude and distribution of these gains depend on the initial tariff structure, sectoral linkages, and the fiscal and production characteristics of the economy (Bhushal and Lal 2026). Recent CGE evidence for Sri Lanka also suggests that tariff reductions can produce modest or uneven welfare gains, highlighting that lower tariffs do not automatically translate into economy-wide efficiency improvements.

Table 3: Welfare Decomposition

Scenario	Change in Overall Welfare (EV) and its Components (Measured in USD Million)			
	Allocative Efficiency	**Terms of Trade**	**Savings and Investment Effect**	**Total EV**
IMT	41.69	-22.75	-2.17	16.77
IMT+DMT	43.86	-23.09	-3.11	17.65

Source: Authors' simulations using GTAP 12 Database.

Table 3 illustrates that the negative terms-of-trade (TOT) effect reflects a deterioration in Sri Lanka's relative export–import price ratio following the reduction of food import tariffs under both scenarios. In the GTAP framework, tariff reduction lowers domestic prices of imported goods and stimulates import demand of tariff-sensitive food commodities. Expansion of exportable sectors driven by cheaper imported inputs takes place. Hence, the TOT impact would result in a requirement to export a greater volume of products to finance a given level of imports affecting equivalent variation in Sri Lanka. This outcome is consistent with recent trade-policy research showing that the TOT effects of trade liberalisation depend on a country's market size, international price-taking behaviour, and trade structure. For small open economies that cannot influence world prices, unilateral tariff liberalisation may improve domestic allocative efficiency without generating favourable TOT effects. Recent CGE research further highlights the importance of explicitly accounting for international trade linkages when evaluating TOT and welfare outcomes (Demidova et al., 2024). These findings suggest that domestic efficiency improvements do not necessarily translate into TOT gains, particularly for small economies operating under the world-price-taking assumption.

Table 3 also illustrates the negative investment–savings (IS) effects. The adverse IS effect under the IMT scenario primarily reflects the decline in government savings resulting from lower import tariff revenue. Under the GTAP savings-driven investment mechanism, regional investment is linked to national savings and the global pool of savings. The reduction in public savings is only partially offset by changes in private savings, as lower food prices influence household consumption and saving behaviour. Consequently, national savings decline, exerting downward pressure on investment and contributing to welfare losses through the IS channel. Nevertheless, the overall equivalent variation remains positive under IMT because the allocative efficiency gains outweigh the adverse terms-of-trade and IS effects. To assess the robustness of this result, a sensitivity analysis was conducted using an alternative savings allocation mechanism in which regional savings are allocated according to rates of return. The IS effect changed only marginally, suggesting that the main welfare result is relatively robust to this alternative investment–savings specification.

The IMT+DMT shock leads to a gain in allocative efficiency of USD 43.86 million. The allocative efficiency effect under the IMT+DMT scenario exceeds that of IMT alone

because the combination of tariff reduction and output taxation accelerates the reallocation of resources away from previously protected food-processing sectors towards relatively more productive activities. This happens because the combination of tariff reduction and output taxation creates pressures for structural adjustment. The overall welfare effect is USD 17.65 million. The TOT deteriorates by USD 23.09 million. The IS effect is sharply negative at USD 3.11 million. This is because the import tariff reduction and the domestic tax reduce investment incentives and capital accumulation. This combination leads to a deterioration in the TOT, which offsets part of the allocative efficiency gain. The IS effect is indicating a decrease in national savings and investment. The negative impact of the domestic output tax, while raising additional revenue for governments losing revenue due to the reduction of tariffs, also increases several prices in a country, thereby reducing real income for consumers of food crops. Therefore, savings fall resulting in a loss in welfare via the IS effect. An increase in production costs, as well as a decline in domestic demand, lowers sectoral capital accumulation, thereby intensifying the negative impact of the IS effect. From literature, it is evident that using domestic taxation as a compensation mechanism is likely to generate a negative effect on savings and investment due to higher prices, especially for economies with small budgets, as observed by Becker et al. (2024).

The welfare effects of the decomposition using both scenarios reveal an increase in the allocative efficiency of import tariff liberalisation owing to the reduced distortions in resource pricing. However, the effects of import tariff liberalisation occur at the expense of the negative TOT effects and IS effects, highlighting the worsening of export prices compared to import prices and macro-economic savings and investment balances. Under the IMT+DMT scenario, the domestic output tax on foodstuffs adds to the negative TOT and IS effects, although the overall welfare gain remains slightly higher than under IMT.

When the DMT scenario is applied without reducing import tariffs, a positive total EV of USD 0.88 million is recorded. Although allocative efficiency improves slightly (USD 2.17 million), this gain is outweighed by negative TOT (–USD 0.34 million) and investment–savings effects (–USD 0.94 million), reflecting lower real incomes and reduced savings. Compared with IMT, which generates positive welfare through lower prices, and IMT+DMT, which combines efficiency gains with stronger distortions, the DMT scenario illustrates that domestic taxation alone can stabilise revenue but at the cost of higher food prices and reduced consumption, with only a marginal welfare gain. Overall, the comparison highlights that domestic taxes, when used without accompanying efficiency-enhancing trade reforms, may generate limited growth benefits while increasing consumer burdens in the food sector of the country.

4. CONCLUSION

This study examines the economy-wide effects of food import tariff liberalisation and compensatory domestic taxation in Sri Lanka using the GTAP model. The results demonstrate that under the IMT scenario, a 15% reduction in food import tariffs leads to

declines in domestic food prices across all major categories, particularly for import-dependent commodities. These price reductions enhance consumer welfare and improve allocative efficiency by reducing distortions in resource pricing. However, the IMT+DMT scenario, which combines tariff reduction with domestic output taxes designed to maintain revenue neutrality, generates mixed outcomes. While tariff reduction lowers border prices, the imposition of domestic output taxes raises production costs and partially offsets the consumer price benefits, resulting in higher market prices for essential food items compared to the IMT scenario alone.

The sectoral and macroeconomic impacts reveal significant structural adjustments under both policy scenarios. Domestic food processing industries experience substantial output contractions due to increased import competition, with more pronounced declines observed under the IMT+DMT scenario. Domestic output taxes erode the competitiveness of local producers, further intensifying reliance on imported goods. Despite improvements in the GDP quantity index driven by allocative efficiency gains, the value of GDP declines under both scenarios, reflecting adverse price effects.

The welfare decomposition analysis provides critical insights into the transmission channels of policy shocks. Under the IMT scenario, allocative efficiency gains amount to USD 41.69 million, driven by improved resource allocation following tariff liberalisation. However, these gains are partially offset by negative TOT effects and IS effects, resulting in a modest net welfare gain of USD 16.77 million. The negative TOT effect reflects deterioration in Sri Lanka's export-import price ratio as import demand expands, while the adverse IS effect stems from reduced government savings due to tariff revenue losses. Despite these offsetting factors, the positive overall welfare outcome indicates that tariff liberalisation enhances internal resource allocation and consumer welfare, though at the cost of external price pressures and fiscal adjustment challenges.

In contrast, the IMT+DMT scenario produces a net welfare gain of USD 17.65 million, owing to higher allocative efficiency gains (USD 43.86 million) than under the IMT scenario. However, this is accompanied by more pronounced negative TOT (–USD 23.09 million) and IS effects (–USD 3.11 million). The imposition of domestic output taxes raises production costs and intensifies import dependence, thereby amplifying TOT losses. Simultaneously, higher domestic food prices for some commodities reduce income and savings, generating a sharper negative IS effect. These findings suggest that while domestic output taxes can stabilise government revenue and preserve aggregate welfare gains, their use as a compensatory mechanism for tariff revenue losses distorts production incentives, raises consumer prices for some essential foods, and may undermine macroeconomic stability. Furthermore, the findings are also supported by commitments of the country under the IMF-supported Extended Fund Facility, which emphasises trade tax rationalisation, revenue diversification, and growth-friendly fiscal consolidation. Replacing tariff revenue with distortionary output taxes on essential food items appears inconsistent with those goals. Hence, the results underscore the critical importance of carefully designed revenue

replacement strategies that avoid distortionary taxation on essential food items and instead emphasise broader-based, growth-friendly fiscal reforms.

Although the estimated welfare gain of USD 17.65 million under the combined policy scenario may appear modest in macroeconomic terms, its broader implications for income distribution and structural adjustment warrant attention. In particular, changes in food prices, domestic production incentives, and import dependence may disproportionately affect low-income households and small-scale farmers, with potential consequences for food affordability and food security. However, the GTAP model represents households and producers through aggregated representative agents and therefore cannot capture distributional impacts within the country. Future research should address this limitation by integrating macroeconomic CGE models with household-level microdata through macro–micro modelling frameworks, such as those developed and applied by the Partnership for Economic Policy (PEP). Such approaches would provide a more detailed assessment of the effects of food trade and tax reforms across different income groups and household types.

Recent studies reinforce the importance of evaluating trade and tax reforms in terms of both aggregate welfare and their broader fiscal and distributional implications. Chang and Sargsyan (2022) demonstrate that the welfare effects of tariff reductions combined with domestic tax reforms depend on the conditions under which revenue neutrality is achieved. Gilbert et al. (2024) highlight the relationship between food trade barriers, retail food prices, and the affordability of healthy diets, while Diallo et al. (2024) demonstrate the value of integrating CGE modelling with household-level microsimulation to identify distributional effects. Consistent with this literature, the present study highlights the need to assess food tariff reforms alongside their implications for government revenue, consumer welfare, and domestic production, while future research could employ macro–micro modelling to investigate impacts across household income groups in Sri Lanka.

5. POLICY RECOMMENDATIONS

The results of this study have important implications for current food trade and fiscal reform agenda of the country. First, import tariffs on vital food items should be liberalised in a gradual and well-sequenced manner. This improves allocative efficiency and reduces consumer prices, enhancing the affordability of food and welfare. Since Sri Lanka is highly dependent on imported food commodities, tariff rationalisation should be done in a transparent and predictable way to lower price distortions while preserving macroeconomic stability. Second, although efficiency gains are obtained from tariff reduction, the loss of revenue remains one of the major policy issues. From the results, it is evident that the replacement of tariff revenue with distortionary taxes levied on essential food production through domestic output taxes is likely to raise production costs, augment dependency on imports and deepen the negative TOT and IS effects, although the overall welfare gain remains positive. It is recommended that the replacement of revenue should focus on sound tax administration structures that incorporate information technology and broaden the

current direct tax base. Third, given the evidence of decline in TOT and IS effects in both scenarios which is more under the combined reform, trade liberalisation will have to be supported by, or be simultaneously implemented with, activities that enhance domestic productivity and export competitiveness. In this regard, investments in agricultural technology, input efficiency, value-chain modernisation, and sanitary and phytosanitary (SPS) measures are considered necessary to overcome external vulnerabilities and to ensure appropriate domestic supply responses.

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