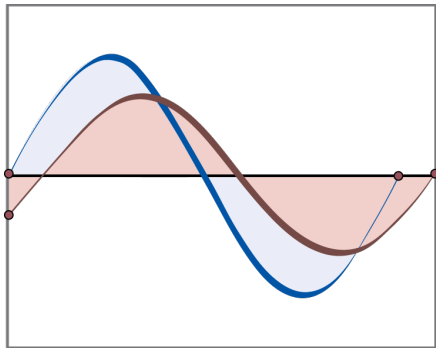


# Working Papers

WP 03/2022 October 2022



## The Impact of Declining Central Government Transfers and Subsidies on the Household Sector: Implications for Financial Stability

Yannick Melville and Nikkita Persad  
Research Department

Following the collapse of crude oil prices in 2014, in an attempt to narrow the fiscal deficit, the Government of the Republic of Trinidad and Tobago embarked on a concerted effort to reduce expenditure by streamlining ‘transfers and subsidies’ – support that has historically run at high costs. As the largest line-item under this budgetary heading is ‘Transfers to Households’, this paper assesses the possible impact of a reduction in this expenditure category on households. Consideration was also given for ‘second-round’ effects by evaluating how key providers of household credit (specifically, commercial banks, credit unions and unregulated loan providers) respond to this course of action – as lower ‘Transfer to Households’ may provoke financial challenges within households. Micro-analyses found that existing poverty metrics and estimates of income inequality may lead to disproportionate outcomes. Meanwhile, macro-analyses showed that a reduction in ‘Transfers to Households’ had a negative impact on rural families, but a positive effect on urban households. There were also some financial stability risks associated with this reform as a decline in transfers and subsidies to households caused a decrease in commercial banks’ income and a rise in credit extended by credit unions and unregulated loan providers.

JEL Classification Numbers: B55, C32, H31, I32, O23

Keywords: education subsidy, financial stability, fuel subsidy, government, households, rural, social protection programs, transfers and subsidies, urban, utilities subsidy

The Working Papers Series includes papers that are primarily written by Central Bank of Trinidad and Tobago research economists in order to solicit comments from interested readers and to stimulate discussion. The views expressed are those of the authors and not necessarily those of the Central Bank. Please send comments to [commentsWP@central-bank.org.tt](mailto:commentsWP@central-bank.org.tt).

# The Impact of Declining Central Government Transfers and Subsidies on the Household Sector: Implications for Financial Stability

Yannick Melville and Nikkita Persad

## 1.0 Introduction

Governments worldwide have provided programs that facilitate cash transfers or subsidies to its citizens in attempt to alleviate poverty and to ensure equity in the provision of public goods. However, on the flip side, these initiatives may: (i) constrain government's fiscal space; (ii) distort prices; (iii) fuel overconsumption; (iv) encourage inefficient allocation of resources; and (v) pose environmental challenges (as energy subsidies heighten fossil fuel consumption which may lead to high greenhouse gas emissions). Given these dilemmas, to improve their carbon footprint, productive capacities and/or sovereign debt positions, governments are often encouraged to remove or phase out transfers and subsidies so that fiscal resources can be rerouted towards more productive endeavours.

In the literature, various countries in advanced, emerging, Latin American and Caribbean economies studied the impact of phasing out or removing government transfers and subsidies to households. Some of the approaches used for this type of analysis included: (i) evaluating household consumption patterns; (ii) input-output analysis; and (iii) equilibrium modelling. The common methodology employed in the literature is that of a general equilibrium model since it was found to be a more accurate approach to observing the impact policy changes have on economic agents, key market inputs and goods across sectors. Despite the approach adopted, results were generally mixed (between low- and high-income groups) on who benefitted the most from subsidy adjustments.

The Government of the Republic of Trinidad and Tobago (GORTT) allocates significant financial resources to transfers and subsidies – 53.6 per cent of total expenditure in fiscal year (FY) 2021. 'Transfers to Households' amounted to \$9.2 billion in FY 2021 and accounts for the largest share of expenditure (33.9 per cent) under transfers and subsidies. In recent times, due to energy market pressures and the novel coronavirus (COVID-19), the GORTT's fiscal space has narrowed. Consequently, to ensure fiscal sustainability, the GORTT has sought to reduce 'large ticket items' under transfers and subsidies (for example, the fuel subsidy and government assistance for tertiary education). Further, in the budget statement for FY2022, the GORTT alluded to making additional reductions in transfers and subsidies – by shifting towards a market-based pricing approach for electricity and water utilities and increasing the retirement age. While these changes may improve the countries fiscal balance, households may have to adjust especially those where a large share of household income/expenditure is supported by transfers (senior citizens' grant, public assistance, etc.) and subsidies (transportation, utilities, education, health care and inter-island travel). For heavily indebted households, this in turn may trigger debt-servicing difficulties, leading to a higher incidence of loan defaults and lower income and profits for financial institutions.

As financial instability can have knock-on effects for macroeconomic stability, the paper will: (i) develop a framework to capture the impact of changes in transfers and subsidies on the household sector in Trinidad and Tobago; and (ii) assess how this relationship can in-turn affect domestic financial stability conditions. To achieve this, the paper proceeds as follows; Section 2 examines empirical research on the impact of adjustments to transfers and subsidies to households. Section 3 presents background information on transfers and subsidy programs implemented by the GORTT and highlights key findings from past population and household surveys. Section 4 will present the

methodology and data utilised to conduct the analysis. Section 5 will discuss the results of the model while Section 6 will conclude with policy recommendations.

## 2.0 Literature Review

Social protection programs (SPPs) aim to improve the welfare of a population in order to mitigate possible imbalances in the allocation and usage of resources. However, these programs often place a significant burden on government resources. Policymakers therefore have an arduous task of balancing trade-offs between social well-being and improving economic efficiency and growth (Sow 2006). In the literature, many studies have been conducted to evaluate the impact of SPPs. However, the major areas discussed in the literature were: (i) the impact of reducing or phasing out energy and food subsidies; and (ii) pension reform reversals. To undertake these studies, input and output analysis and equilibrium modelling were often employed.

The distributional impact of removing energy subsidies on rural and urban households was undertaken for Ukraine and India. For Ukraine, Ogarenko and Hubacek (2013) assessed the effect of removing indirect energy subsidies in the gas and electricity sectors while Gangopadhyay, Ramaswami and Wadhwa (2005) examined the removal of kerosene and liquid gas subsidies for Indian households. In Ogarenko and Hubacek (2013) this was done by analysing the subsequent increase of relative prices for different economic sectors and the consumption patterns for different income groups. Although a similar approach was taken in Gangopadhyay, Ramaswami and Wadhwa (2005), the authors also used consumption data obtained from a consumption expenditure survey by the National Sample Survey Organization (completed in 1993/94 and 1999/00). Both studies concluded that energy subsidies are utilised more in urban communities – according to Ogarenko and Hubacek (2013), this was because fuel and other energy-related expenses (for instance, utilities) make up a larger proportion of higher income households' monthly expenditure compared to rural families.

Jiang, Ouyang and Huang (2015), Schaffitzel, et al. (2019) and Feng, et al. (2018) utilised input-output price models to analyse the effects of removing energy subsidies for China, Ecuador and, Latin America and the Caribbean respectively. In Jiang, Ouyang and Huang (2015) focus was placed on how the policy change could directly increase household fuel expenses and indirectly increase expenditure on energy-intensive products and services. Results revealed (for China) that removing the petroleum subsidy (compared to electricity and coal subsidies) had the highest impact on wealthier households – oil expenditure being significantly high under the indirect scenario. The rationale given by the authors for this occurrence was that the subsidy removal would lead to price increases in other commodities, resulting in inflation. In the case of Ecuador, Schaffitzel, et al. (2019) utilised household survey data, interviews and IOTs to execute their study. Based on their findings they found that electricity and gasoline subsidy reforms resulted in approximately US\$45 million of added expenditure per month. Moreover, the aforementioned subsidy removals raised indirect expenditure via higher food and transport expenses. Schaffitzel, et al. (2019) also noted that energy subsidies provided greater benefits to higher income households compared to the vulnerable in society. For Latin America and the Caribbean, Feng, et al. (2018) used IOTs to capture the economic structures of Argentina, the Bahamas, Barbados, Chile, Costa Rica, Ecuador, Guatemala, Jamaica, Nicaragua, Paraguay and Uruguay. To obtain the necessary data for their study they utilised statistics from Global Trade Analysis Project database version 9 and energy balance tables obtained from the International Energy Agency. Under direct effects, the authors found that higher gasoline and diesel prices would have a progressive impact on the economies of these countries as fuels were used more by richer households than poorer ones. However, it should be noted that the indirect impacts of gasoline price increases were found to be regressive as it led to higher public transportation costs, electricity

charges and food prices. In the case of Trinidad and Tobago, the International Monetary Fund (IMF) assessed the fiscal, distributional and environmental impact of fuel subsidies (IMF 2016). In their report it was noted that fuel subsidies benefited higher income groups and significantly put a strain on the country's fiscal position. The IMF also investigated the effect of increased petroleum consumption on the environment as a result of low fuel prices. Drawing from the empirical literature, the report aimed to establish a statistical relationship between congestion delays (proxied by average traffic speeds), and several transportation indicators (inclusive of real GDP per capita, annual car-kilometres, road capacity per car, and cars in use per capita). The average traffic delays were then used to deduce a marginal congestion cost of one vehicle to other vehicles. Based on the results, low fuel prices have significantly contributed to traffic congestion.

Other research has noted that the aforementioned methodologies do not accurately reflect the effect of subsidy reforms – as the interactions between economic agents and other productive sectors are not considered. Moreover, results are considered misleading as household consumption pattern evaluations and input-output analysis do not consider the impact of savings gained from reducing or removing subsidies (Timilsina, et al. 2018). To address these short-comings, several researchers have used equilibrium modelling based on countries' social accounting matrices (SAM). This was generally considered to be a more reliable approach as noted in studies in Bangladesh, Egypt, Iran, Indonesia and Mexico. For instance, Timilsina, et al. (2018) used a computable general equilibrium (CGE) model to examine the economic effects of eliminating electricity subsidies and indirect natural gas subsidies for Bangladesh. While the SAM was provided by a policy institute, other data utilised included: (i) elasticity of substitution production functions; (ii) direct government transfers (subsidies) to electric utilities; and (iii) prices of domestically supplied natural gas in Bangladesh and Liquefied Natural Gas imported from India. The authors found that subsidy removal will improve welfare and the savings from the subsidies removal could improve growth prospects.

In Egypt studies were done to evaluate the effects of reforming food and energy subsidies using CGE modelling (Breisinger, Mukashov, et al. 2018, Breisinger, Kassim, et al. 2021) and intertemporal general equilibrium modelling (Elshennawy 2014). The first two papers revealed that eliminating food subsidies would have significantly affected lower income households. However, the savings generated from subsidy removal can be channelled to improve other welfare areas. Elshennawy (2014) focused on energy subsidy elimination in Egypt. Using a CGE, the author found that households will be adversely affected if the energy subsidy was phased out gradually. While the paper did not take into account the potential impact of savings from the subsidy removal, Elshennawy (2014) found that a policy of gradual elimination of energy subsidies combined with gradual elimination of tariffs would reduce the burden of the subsidy removal substantially.

Gharibnavaz and Waschik (2015), Widodo, et al. (2012) and Coady and Harris (2001) looked at similar issues for Iran, Indonesia and Mexico (respectively) via CGE modelling. For Iran, Gharibnavaz and Waschik (2015) found that food and energy subsidy reforms coupled with lump sum payments to households can improve social welfare. Meanwhile, for Indonesia, Widodo, et al. (2012) found that removing energy subsidies adversely affected rural families compared to the urban segment. Finally, for Mexico, Coady and Harris (2001) evaluated food transfer programs. Their study involved comparing the cost of public funds required to fund this SPP across other financing instruments that is, (the elimination of food subsidies –and other conjectural scenarios such as reforms to the value-added tax system). Based on the findings, Coady and Harris (2001) identified that the welfare cost of financing food transfer programs can be improved by restructuring the taxes.

In several European countries pension reform was undertaken to: (i) curb the macroeconomic and fiscal effects of aging; and (ii) promote fiscal sustainability. However, many European countries such as Germany, Slovakia, Spain, Greece and the Netherlands have delayed the process for these reforms. According to Baksa, Munkacsi and Nerlich

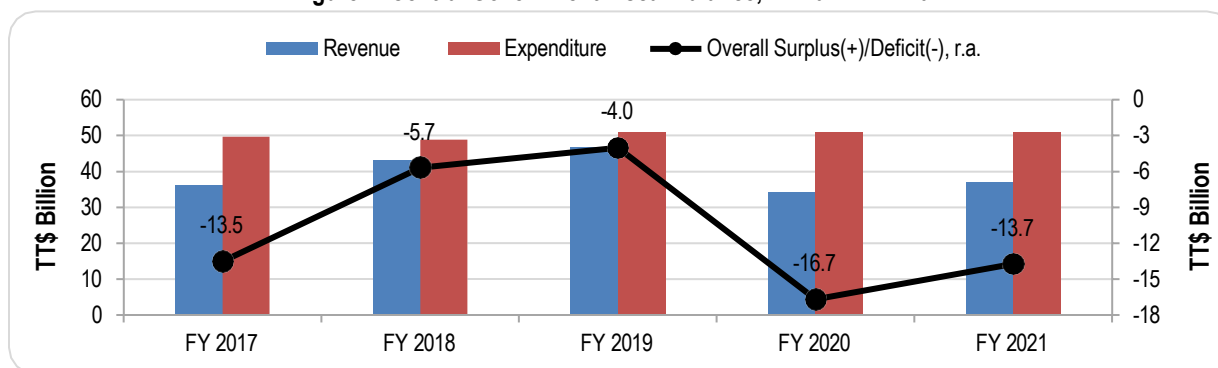
(2020) reform reversals in these countries can increase countries national debt which is a concern to countries with elevated levels of indebtedness. To validate this hypothesis, Baksa, Munkacsi and Nerlich (2020) examined the effects arising from pension reform reversal (for Germany and Slovakia) using a dynamic general equilibrium model – with overlapping generation households, demographic data, and unemployment and wage bargaining information. Their findings proved that if past pension reforms are undone, the public debt-to-GDP ratios for both countries will significantly increase in the long-term. Ketil and Mérette (1998) used the same type of general equilibrium framework to examine the impact of pension reform strategies for the United States, Japan, France, Canada, Italy, the United Kingdom and Sweden. Findings suggested that that a reduction of the government pension would ease the problems associated with an ageing population via the reduced fiscal burden of future pension liabilities and through increased national savings and output.

General equilibrium analysis was highlighted as the most appropriate approach to explore the societal impact of removing SPPs. However, these models often call for granular datasets, which may not be readily available for some countries – for instance, the last publicised ‘supply and use’ table (a key input for the SAM) for Trinidad and Tobago was in 2000 (Ludena and Horridge 2015).

### 3.0 Background

The Central Government fiscal accounts have been in deficit over the past five years (2017-2021), averaging \$10.7 billion over the reference period (Figure 1). A major contributory factor to the deficit position has been the composition of current expenditure.

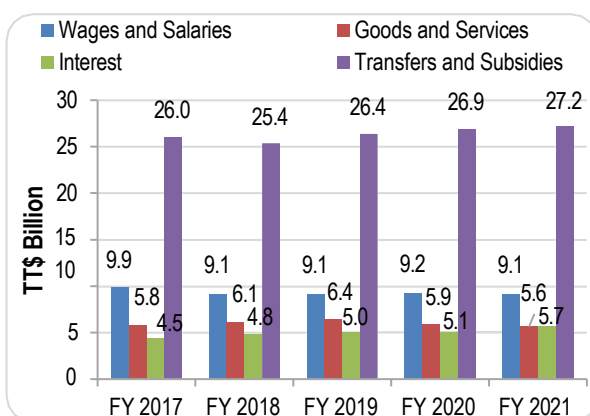
Figure 1: Central Government Fiscal Balance, FY 2017 – FY 2021



Source: Ministry of Finance  
Note: r.a. stands for right axis

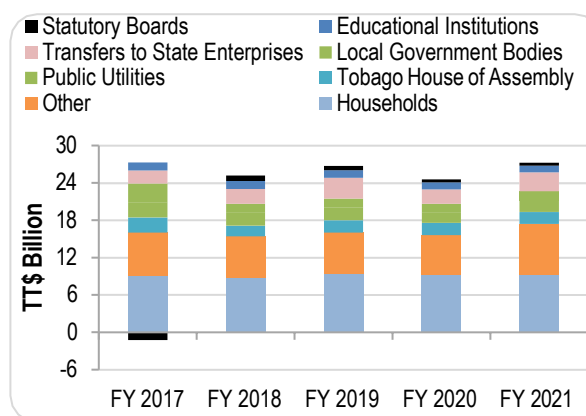
Further evaluation of current expenditure illustrated that transfers and subsidies accounted for the lion's share of total current expenditure at \$27.2 billion in FY 2021 and has grown by 4.7 per cent when compared to FY 2017 (Figure 2). The largest chunk of these transfers and subsidies are to the household sector, which over a five-year period averaged approximately 35.2 per cent of total transfers and subsidies (Figure 3).

Figure 2: Central Government Current Expenditure, FY 2017 – FY 2021



Source: Ministry of Finance

Figure 3: Distribution of Transfers and Subsidies<sup>1</sup>, FY 2017 – FY 2021



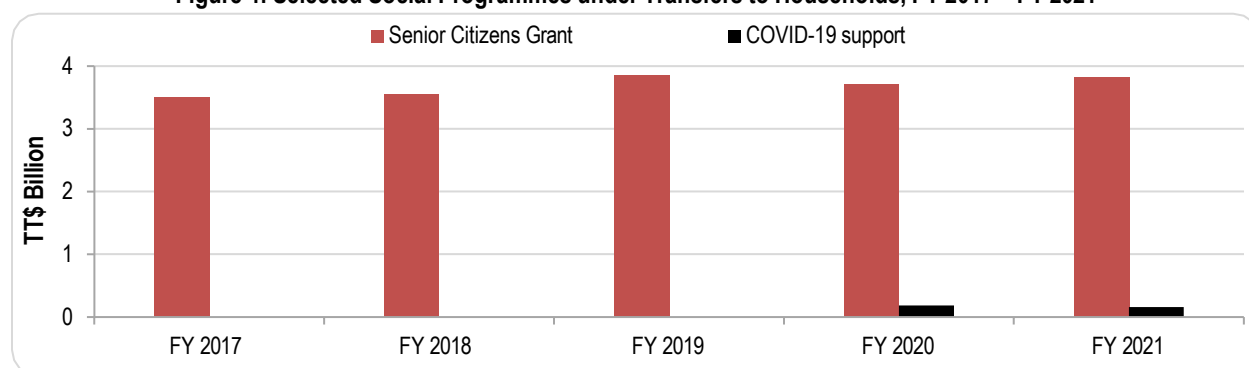
The GORTT provides the household sector with cash transfers via social assistance programmes and also subsidises various products and services (for example, utilities, food, education, fuel and inter-island travel for example). Based

<sup>1</sup> The negative value for statutory boards in FY 2017 reflects a reporting error in a previous period (that is the value was overstated) and is corrected in the current period.

on available information, a significant portion of household transfers are in the form of senior citizen grants which accounted for approximately 41.3 per cent of total household’s transfers a (Figure 4). Notably, since the onset of the COVID-19 pandemic the GORTT expanded the social safety net by instituting a number of additional social programmes such as, the Salary Relief Grant (by the Ministry of Finance), and the Income Support Grant (administered by the Ministry of Social Development and Family Services). While the social assistance over the pandemic helped mitigate the financial impact of COVID-19, the fiscal deficit surged to 11.2 per cent GDP in FY 2021.

The GORTT has been attempting to streamline current expenditure by making adjustments to transfers and subsidies. For instance, in 2015 the GORTT intensified efforts to phase out the subsidy placed on various fuel products (with intentions of having a new fuel pricing regime).<sup>2</sup> Further, in the 2017/18 academic year, the Government Assisted Tertiary Education (GATE) programme was reformed – new applicants were required to enroll in a means-test system to determine how much financial assistance they could qualify for. After the COVID-19 shock, plans to restore fiscal rectitude are in being considered. These plans included: (i) shifting towards a market-based pricing approach for electricity and water utilities; (ii) raising the retirement age; (iii) reducing expenditure on government employment programmes and (iv) additional reductions in the fuel subsidy.

**Figure 4: Selected Social Programmes under Transfers to Households, FY 2017 – FY 2021**



Source: Ministry of Finance

Based on analysis of the 2005 Survey of Living Conditions (SLC) conducted for Trinidad and Tobago, public assistance was a key source of income for the poorest group in the population. Moreover, old age pension, was utilised by all income groups particularly for the middle-income group (KCL 2007). According to the 2008/09 Household Budgetary Survey (HBS), 7.6 per cent and 2.3 per cent of rural households received old age pension and public assistance as sources of income, respectively. Moreover, GATE funding was utilised more by urban households (which accounted for 2.7 percent of total expenditure). The findings also revealed that households spend majorly on food and alcoholic beverages (which accounted for 16.7 per cent of consumption expenditure). This figure rose by 0.7 per cent when compared to the HBS undertaken in 1997/1998 (CSO 2022). Data from the Continuous Sample of Survey of Population (CSSP) indicate that 37.3 per cent of those with jobs are a part of the “Community, Social and Personal Services” sector – the segment which includes government employment programmes such as the Community-Based Environmental Protection and Enhancement Programme and the Unemployment Relief Programme. Collectively, these metrics across the various surveys conducted by the Central Statistical Office (CSO) on the household sector point towards a reliance on social programs to support everyday life by the poor, with the wealthy also enjoying a disproportionate share of subsidies.

<sup>2</sup> The subsidy on Premium 95 gasoline was removed in 2012.

## 4.0 Data and Methodology

A two-pronged approach (micro and macro) was taken to assess the potential financial stability implications of a reduction in transfers and subsidies to households. Micro-analyses were based on past survey data (collected by the CSO) while macro-analyses centred on the Impulse Response Functions (IRFs) of several Vector Autoregression (VAR) models. The micro-analyses gauged the average household's balance sheet position to estimate the degree of reliance on transfers and subsidies. Meanwhile, the macro-analyses explored how transfer and subsidy reductions could: (i) impact households; and (ii) the financial soundness of the largest providers of household credit (namely commercial banks, credit unions and unregulated loan providers)<sup>3</sup>.

As observed in the empirical literature, transfer and subsidy reforms typically have an uneven impact on households as, at its core, SPPs are designed to assist those most in need of financial support. For this reason, studies in this area place emphasis on how transfer and subsidy reductions affect rural and urban families. In keeping with this, for the macro-analysis, the paper used Gross National Income (GNI) data from the CSO and population metrics from the World Bank to estimate rural and urban families' income. However, this information was not entered into the VAR models that explored financial soundness post transfer and subsidy reduction, as the household loan portfolio did not contain any demographic information. Regardless, due to more stringent lending requirements, the paper assumes that commercial banks typically lend to urban families while credit unions and unregulated<sup>4</sup> loan providers typically lend to rural families (as these institutions are known to cater more for low-income families). Although this implies that greater emphasis should be placed on assessing urban households (as commercial banks make up approximately 45 per cent of total financial system assets as at December 2020), the Global Financial Crisis demonstrated that financial institutions are often interconnected, holding bilateral interests such as deposits, loans, investments, shares, etc. These holdings can act as channels through which shocks in one institution can spread and negatively impact the operations of others. For instance, the CL Financial Group (which received extensive liquidity support from the GORTT and the Central Bank of Trinidad and Tobago in 2009) "controlled over TT\$100 billion of assets in more than 50 companies" (CBTT 2018).

### 4.1 Data

For the micro-analysis the paper used secondary data collected by the CSO in their: (i) 2005 SLC; (ii) 2008/09 HBS; (iii) 2011 Population and Housing Census (PHC); (iv) CSSP (for 2000, 2005, 2010 and 2015); and (v) their most recent (September 2020) Labour Force Survey (LFS). This information was used to; calculate the food poverty line, the Gini-coefficient, labour force by income bracket and average income and expenditure (**Table 1**) – to gauge household vulnerability.

As SPPs are used to improve living standards of the vulnerable, a reduction in transfers and subsidies would not have a uniform impact on the total population. Therefore, for the macro-analysis (see variable list in Table 2), emphasis was placed on GNI per capita as well as Urban GNI per Capita and Rural GNI per capita – GNI was used as some transfers and subsidies (for example international scholarships) are directed solely towards non-residents. While urban and rural population statistics for Trinidad and Tobago were sourced from the World Bank, there were no readily available estimates for rural and urban sector GNI. However, given that over the review period (2011 to 2020) GNI and GDP

---

<sup>3</sup> As at December 2020, commercial banks, credit unions and unregulated loan providers provided approximately 59.7 per cent, 21.1 per cent and 3.3 per cent of total estimated household debt.

<sup>4</sup> An entity that is outside of the regulatory ambit of prudential authorities, in this case the Central bank of Trinidad and Tobago.



assume very similar values (varied on average by 1 per cent), the paper follows Winters, Davis and Carletto (2009) and Alobo (2012) and assumes that rural economic activity is equivalent to the agriculture sector's contribution to GDP.

**Table 1: Micro-Analysis Data**

Dataset	Description	Variables of Interest	Used to Estimate
Central Statistical Office and Kairi Consultants Ltd. – Survey of Living Conditions (2005)	Collected information, inter alia, on households' income, employment and education. The results were used to estimate the degree of poverty within the country.	The minimum daily cost diet for an adult (based on 2,400 kilocalories).	- Food poverty line – the minimum level of income needed to secure the necessities of life.
Central Statistical Office – Household Budgetary Survey (2008/09)	Collected information, inter alia, on households' expenditure, income and socio-economic characteristics to give a picture of the average households' living conditions.	<ul style="list-style-type: none"> <li>- Total expenditure.</li> <li>- Disaggregated expenditure.</li> <li>- Total income.</li> <li>- Disaggregated income.</li> </ul>	<ul style="list-style-type: none"> <li>- Household average income.</li> <li>- Household average expenditure.</li> </ul>
Central Statistical Office – Population and Housing Census (2011)	Collected demographic and social statistics.	<ul style="list-style-type: none"> <li>- Household demographic data.</li> <li>- Households with unmet basic needs.</li> </ul>	-
Central Statistical Office – Continuous Sample Survey of Population	The CSSP's primary objective is to provide up-to-date data on the labour force characteristics of the population. Information from the CSSP feeds into the LFS.	<ul style="list-style-type: none"> <li>- Total labour force.</li> <li>- Individual gross income.</li> <li>- Total number of people with jobs.</li> <li>- Total unemployed.</li> </ul>	<ul style="list-style-type: none"> <li>- Unemployment rate (excluding government work programmes).</li> <li>- Labour force by income bracket.</li> </ul>

Source: Authors

**Table 2: Macro-Analysis Data**

Sector	Indicator	Relationship with Households (A Priori Expectations)	Rationale	Data Source	Adjustments Made
Financial Sector	Commercial Banking Sector: Interest Margin-to-Gross Income (%)	Positive	Deterioration in borrowers' net worth can dampen returns on loans (Angori, Arisetei and Gallo 2019).	CBTT	-
	Commercial Banking Sector: Return on Assets (%)				
	Commercial Banking Sector: Consumer Loans, yoy growth (%)	Positive/Negative	"Income significantly influences the desired stock of debt" (Crook, The Demand and Supply for Household Debt: A Cross Country Comparison 2003). Still, other factors (credit and employment history) play a major role in loan access (HRCCU 2021).		
	Commercial Banking Sector: Refinanced and Consolidated Loans, yoy growth (%)	Negative	'Bad times' are typically associated with a rise in debt re-organisation.		
	Commercial Banking Sector: Non-Performing Loans-to-Gross Loans (%)	Positive	Households tend to face difficulties meeting debt obligations in 'bad times'.		
	Commercial Banking Sector: Regulatory Capital to Risk Weighted Assets (%)	Negative	Prudential requirements will influence the availability of loanable funds.		
	Commercial Banking Sector: Liquid Assets-to-Total Assets (%)	Negative	Unemployment is negatively correlated with financial sector liquidity.		
	Unregulated Loan Providers: Loans, yoy growth (%)	Positive	These institutions tend to be more willing to accommodate those who are less well-off.		
Credit Unions and Other Financial Cooperatives: Loans, yoy growth (%)	Positive	Reserves are facilities used to charge off delinquent loans.	World Council of Credit Unions (WOCCU)	Interpolation via the Quadratic-Match Average Method (QMAM <sup>5</sup> ).	
Credit Unions and Other Financial Cooperatives: Reserves, yoy growth (%) <sup>6</sup>					
Fiscal	Central Government: Transfers and Subsidies to Educational Institutions (yoy, % change)	Positive	While transfers and subsidies to educational institutions, fuel products/services and public utilities do not go directly to households, they allow families to secure minimum standards of protection for themselves. Thus, they act indirectly as SPPs by allowing all citizens to have the chance to lead productive, healthy and dignified lives (ADB 2003).	CBTT	-
	Central Government: Fuel Subsidy (yoy, % change) <sup>7</sup>				
	Central Government: Transfers and Subsidies to Public Utilities (yoy, % change)				
	Central Government: Transfers and Subsidies to Households (TT\$ Million)				
	Overall Fiscal Balance (TT\$ Million)	Positive/Negative	Fiscal deficits may generate facilities that improve the well-being of households (CRS 2019). However, deficit financing can also crowd-out private sector borrowing.		
Households	GNI per Capita (\$TT)			World Bank (Total Population, GNI)	Interpolation via the QMAM.
	Rural GNI per Capita (\$TT)			World Bank (Rural Population), CSO (GDP)	
	Urban GNI per Capita (\$TT)			World Bank (Urban Population), CSO (GDP)	

Source: Adapted from several noted studies  
 Note: yoy - year-on-year.

<sup>5</sup> Interpolation converts low frequency data (annual) into high frequency data (monthly or quarterly) when there are no credible sources of high frequency data. For this study QMAM was used as it is less sensitive to outliers (Grossman and Mack 2014).

<sup>6</sup> The WOCCU notes that reserves are "formed from retained earnings and maintained by a credit union as required by law" (WOCCU 2015).

<sup>7</sup> Based on the 'Shortfall in subsidy re sale of Petroleum Products'.

#### 4.1.1 Micro-Analysis

The 2005 SLC and LFS both have a nationally established estimate of the measure of interest (that is, the food poverty line and the unemployment rate). For the other measures of interest, the following equations (**Equation 1, 2, 3 and 4**) were used to derive proxies:

##### Equation 1: Household Average Income

$$\frac{\sum_{i=1}^m \sum_{j=1}^m y_{ij}}{m \cdot n}$$

##### Equation 2: Household Average Expenditure

$$\frac{\sum_{i=1}^m \sum_{j=1}^m x_{ij}}{m \cdot n}$$

##### Equation 3: Household Gini-Coefficient

$$\frac{\sum_{i=1}^m \sum_{j=1}^m |y_{ii} - y_{jj}|}{2 \cdot n^2}$$

Source: (Fang, Zhu and Deng 2013)

Note: where  $II$  is the number household groups,  $y$  the average income of the total population,  $y_{ii}$  and  $y_{jj}$  are the income of household group  $EE$  and  $jj$  respectively. The value of the Gini-coefficient ranges between 0 (perfect/equal income distribution) and 1 (complete income inequality).

##### Equation 4: Labour Force by Income Group<sup>8</sup>

$W_{TLL} - W_{IIIMTII} = EEHNN \text{ IHHITT } T_{00} \text{ EEIooEiiEooHHTTTTHH } \text{LEETT}h \text{ TT } \text{NNHHEETTNNTHHoo } \text{LTTwwHH } \text{NNHHTLLHHHHII } \$0 \text{ TTIIoo } \$2,500$   
 $W_{TLL} - W_{MMEooootTHH} - W_{IIIMTII} = EEHNN \text{ IHHITT } T_{00} \text{ EEIooEiiEooHHTTTTHH } \text{LEETT}h \text{ TT } \text{NNHHEETTNNTHHoo } \text{LTTwwHH } \text{NNHHTLLHHHHII } \$2,501 \text{ TTIIoo } \$5,000$   
 $MMEooootTHH - W_{IIIMTII} = EEHNN \text{ IHHITT } T_{00} \text{ EEIooEiiEooHHTTTTHH } \text{LEETT}h \text{ TT } \text{NNHHEETTNNTHHoo } \text{LTTwwHH } \text{NNHHTLLHHHHII } \$5,001 \text{ TTIIoo } \$7,500$   
 $UUEEEHHNN - MMEooootTHH - W_{IIIMTII} = EEHNN \text{ IHHITT } T_{00} \text{ EEIooEiiEooHHTTTTHH } \text{LEETT}h \text{ TT } \text{NNHHEETTNNTHHoo } \text{LTTwwHH } \text{NNHHTLLHHHHII } \$7,501 \text{ TTIIoo } \$10,000$   
 $UUEEEHHNN - W_{IIIMTII} = EEHNN \text{ IHHITT } T_{00} \text{ EEIooEiiEooHHTTTTHH } \text{LEETT}h \text{ TT } \text{NNHHEETTNNTHHoo } \text{LTTwwHH } \text{NNHHTLLHHHHII } \$10,001 \text{ TTIIoo } \text{HHEE}$

**Table 3** highlights further assumptions made to evaluate households' vulnerability.

<sup>8</sup> There were no nationally established wage income brackets for Trinidad and Tobago. As such, the paper established its own income brackets. The low-income bracket covers those who earn the minimum wage – by 2015 it stood at \$15 per hour (thus, assuming an 8-hour, 5-day work week, the minimum wage per month is approximately \$2,500). The other income brackets were set as \$2,500 increments in the previous income bracket.

**Table 3: Micro-Analysis – Transfer and Subsidy Reduction Simulations**

Dataset Used	Measure of Interest	Possible Relationship with Transfers and Subsidies	Approach Taken to Simulate this Relationship	Approach Taken to Acquire a 2020 Estimate
2005 SLC	- Food Poverty Line	SPPs such as the Food Support Programme (FSP) help keep vulnerable persons and families from falling below the food poverty line by providing grants to purchase basic food items necessary to meet their daily nutritional requirements.	<ul style="list-style-type: none"> <li>- Use the annual food poverty line statistic.</li> <li>- Determine the annual value of the FSP cash facility.</li> <li>- Determine the number of households that fall below the annual poverty line statistic.</li> <li>- Individuals qualify for benefits under the FSP when Net Income <math>\leq</math> Poverty Line (GORTT 2019). The Poverty Line is broken down into indigent (\$255 per month), poor (\$665 per month) and vulnerable. Indigence will be used as this state of poverty is tied to the food poverty line.</li> <li>- Determine the number of households that would fall below the annual poverty line statistic if the FSP was lowered by 30% or 60%.</li> </ul>	<ul style="list-style-type: none"> <li>- Multiply the food poverty line statistic by the food inflation rate. A similar approach was taken in GORTT (2020) – which estimated that the 2016 poverty line was \$17,268.25 (per capita per annum) by inflating the SLC 2005 poverty line with 2016 food prices.</li> </ul>
2008/09 HBS	<ul style="list-style-type: none"> <li>- Household Average Income</li> <li>- Household Average Expenditure</li> </ul>	Transfers and subsidies can have a significant impact on households' expenditure as: (i) transportation; (ii) utilities; (iii) education and health care; and (iv) inter-island travel (a form of entertainment) are all subsidised. Income will also be affected as a number of grants/cash facilities (such as the senior citizens' grant, food support programme, hardship relief, etc.) are offered to citizens.	-	<ul style="list-style-type: none"> <li>- Find the median income and multiply it by the median wage rate quoted in CBTT reports.</li> <li>- Increase average expenditure by the inflation rate.</li> </ul>
2011 PHC	- Gini-Coefficient	At its core, transfers and subsidies are used to improve the allocation of resources between the rich and the poor. However, government redistributive policies, if carried to extremes, can reduce the incentive to work (BCampus 2017).	<ul style="list-style-type: none"> <li>- Find the number of rural and urban persons.</li> <li>- Rural income is proxied as Rural GNI (which mirrors the agriculture sector's percentage contribution to GDP).</li> <li>- Urban income is proxied as Urban GNI (which is equivalent to GNI at time t less Rural GNI at time t).</li> </ul>	<ul style="list-style-type: none"> <li>- Use the World Bank Group's 2020 estimate of Trinidad and Tobago's "Rural Population."</li> <li>- Estimate rural and urban GNI for 2020.</li> <li>- Apply the formula in Equation 3.</li> </ul>
CSSP (2000, 2005, 2010, 2015)	- Labour Force by Income Bracket	Government employment programmes may weaken the wage bargaining power of low skilled workers.	-	-
LFS	- Unemployment	Governments often use employment programmes to mitigate the economic impact of job losses. However, if these programmes replace a significant share of prior income, the incentive to seek private employment may be reduced.	<ul style="list-style-type: none"> <li>- Determine the latest employment numbers for the: (i) Community-Based Environmental Protection and Enhancement Programme (CEPEP); and (ii) Unemployment and Relief Programme (URP).</li> <li>- Add all of the CEPEP and URP employees to the LFS' total unemployed statistic for September 2020.</li> <li>- Divide the new total unemployed statistic by the existing total labour force statistic.</li> </ul>	-

Source: Authors

#### 4.1.2 Macro-Analysis

In the absence of dynamic frameworks to map the impact of an adverse change in one or more variables (in a hypothetical scenario), VAR models are utilised. A VAR provides a systematic way to capture information from the inter-relationships observed across individual time series. More importantly, VARs allow for IRFs<sup>9</sup> – systems that trace the effects of a one-time shock (a one-unit increase) in an independent variable on the future values of the dependent variable. **Equations 5, 6 and 7** explore the impact of a reduction in transfers and subsidies on households, the fiscal balance and credit growth. This approach was taken because: (i) the aim of the reduction in transfers and subsidies is to improve government's fiscal accounts; and (ii) households are likely to borrow to mitigate the short-term impact of sudden adverse changes to income.

##### Equation 5: Household VAR Model

$$ZZHH_{tt} = WW + \Gamma(L)HH_{tt-1} + \varepsilon_{tt}$$

##### Equation 6: Urban VAR Model

$$ZZTT_{tt} = WW + \Gamma(L)TT_{tt-1} + \varepsilon_{tt}$$

##### Equation 7: Rural VAR Model

$$ZZHH_{tt} = WW + \Gamma(L)HH_{tt-1} + \varepsilon_{tt}$$

Where:

- $HH_{tt}$  is the vector of n endogenous variables, specifically – GNI per Capita (TT\$), Central Government: Transfers and Subsidies to Households (TT\$ Million), Overall Fiscal Balance (TT\$ Million), Commercial Banking Sector: Consumer Loans yoy growth (%), Credit Unions and Other Financial Cooperatives: Loans, yoy growth (%) and Unregulated Loan Providers: Loans, yoy growth (%).
- $TT_{tt}$  is the vector of n endogenous variables, specifically – Urban GNI per Capita (TT\$), Central Government: Transfers and Subsidies to Households (TT\$ Million), Overall Fiscal Balance (TT\$ Million), Commercial Banking Sector: Consumer Loans yoy growth (%), Credit Unions and Other Financial Cooperatives: Loans, yoy growth (%) and Unregulated Loan Providers: Loans, yoy growth (%).
- $HH_{tt}$  is the vector of n endogenous variables, specifically – Rural GNI per Capita (TT\$), Central Government: Transfers and Subsidies to Households (TT\$ Million), Overall Fiscal Balance (TT\$ Million), Commercial Banking Sector: Consumer Loans yoy growth (%), Credit Unions and Other Financial Cooperatives: Loans, yoy growth (%) and Unregulated Loan Providers: Loans, yoy growth (%).

Separate VARs were used in the study to verify how transfers and subsidies impact each grouping (total population, urban population and rural population). Also, additional VARs (**Equation 8, 9, 10 and 11**) were ran to explore: (i) which transfers and subsidies have a greater impact on households in general; and (ii) how transfer and subsidy reduction to households impacts the resilience of commercial banks and credit unions (the two largest holders of household debt)<sup>10</sup>.

<sup>9</sup> Accumulated generalised IRFs treat the spikiness in traditional impulse responses, which follows when the endogenous variables are not stationary at level. Further, as one of the main criticisms of traditional impulse response analysis has been the potential to 'manipulate' results (given the sensitivity of impulse response functions to variable ordering) generalised IRFS (which are insensitive to variable ordering) were used.

<sup>10</sup> There were no available measures of resilience for unregulated financial institutions.

**Equation 8: Education Subsidy VAR Model**

$$ZZii_{tt} = WW + \Gamma(LL)ii_{tt-1} + \varepsilon\varepsilon_{tt}$$

**Equation 9: Fuel Subsidy VAR Model**

$$ZZLL_{tt} = WW + \Gamma(LL)LL_{tt-1} + \varepsilon\varepsilon_{tt}$$

**Equation 10: Utilities Subsidy VAR Model**

$$ZZEE_{tt} = WW + \Gamma(LL)EE_{tt-1} + \varepsilon\varepsilon_{tt}$$

**Equation 11: Financial Sector Resilience VAR Model**

$$ZZyy_{tt} = WW + \Gamma(LL)yy_{tt-1} + \varepsilon\varepsilon_{tt}$$

Where:

- $ii_{tt}$  is the vector of n endogenous variables, specifically – GNI per Capita (TTS), Central Government: Transfers and Subsidies to Educational Institutions (yoy, % change), Overall Fiscal Balance (TT\$ Million), Commercial Banking Sector: Consumer Loans yoy growth (%), Credit Unions and Other Financial Cooperatives: Loans, yoy growth (%) and Unregulated Loan Providers: Loans, yoy growth (%).
- $LL_{tt}$  is the vector of n endogenous variables, specifically – GNI per Capita (TT\$), Central Government: Fuel Subsidy (yoy, % change), Overall Fiscal Balance (TT\$ Million), Commercial Banking Sector: Consumer Loans yoy growth (%), Credit Unions and Other Financial Cooperatives: Loans, yoy growth (%) and Unregulated Loan Providers: Loans, yoy growth (%).
- $EE_{tt}$  is the vector of n endogenous variables, specifically – GNI per Capita (TT\$), Central Government: Transfers and Subsidies to Public Utilities (yoy, % change), Overall Fiscal Balance (TT\$ Million), Commercial Banking Sector: Consumer Loans yoy growth (%), Credit Unions and Other Financial Cooperatives: Loans, yoy growth (%) and Unregulated Loan Providers: Loans, yoy growth (%).
- $yy_{tt}$  is the vector of n endogenous variables, specifically – Central Government: Transfers and Subsidies to Households (TT\$ Million), Commercial Banking Sector: Interest Margin-to-Gross Income (%), Commercial Banking Sector: Return on Assets (%), Commercial Banking Sector: Refinanced and Consolidated Loans, yoy growth (%), Commercial Banking Sector: Non-Performing Loans-to-Gross Loans (%), Commercial Banking Sector: Regulatory Capital to Risk Weighted Assets (%), Commercial Banking Sector: Liquid Assets-to-Total Assets (%) and Credit Unions and Other Financial Cooperatives: Reserves, yoy growth (%).

The VARs used quarterly data from March 2011 to December 2020. Also, **Equations 8, 9 and 10** were re-estimated using urban and rural GNI per capita (Appendix A1 contains all statistical adequacy results).

## 5.0 Results and Discussion

### 5.1 Micro-Analysis

The 2005 SLC determined that the annual food poverty line for Trinidad and Tobago was \$3,060 per capita per annum. As in the 2005 SLC Report by Kairi Consultants Ltd. (KCL), expenditure was used in food poverty calculations.<sup>11</sup> Based on this information, 1.8 per cent of surveyed households fell below the food poverty line.<sup>12</sup> In other words, based on existing requirements, 65 households qualified for the FSP - a \$300 to \$500 monthly monetary grant from the GORTT (the size of the grant is dependent on the number of individuals in the household). Although the level of assistance may appear negligible, it has a significant empirical impact on extreme poverty. For instance, when the FSP is taken into consideration in the 2005 SLC, food poverty decreased from 1.8 per cent to 0.5 per cent.<sup>13</sup> However, if the monetary allowances for food assistance decrease, food poverty returns to near pre-FSP levels. For instance, if FSP allowances fell by 30 per cent, food poverty changes to 0.8 per cent – also, if it fell by 60 per cent, food poverty changes to 1.2 per cent. Despite these findings, as 1,013 households (or 29.9 per cent of survey respondents) reported no primary source of income, indigence may be underestimated in Trinidad and Tobago – recall that KCL (2007) used per capita expenditure in their food poverty calculations. Still, in a critique of the 2014 SLC, then Social Development and Family Services Minister (Cherrie-Ann Critchlow-Cockburn) also noted a high number of ‘no income’ responses – which was unlikely as over 210,000 individuals received grants in excess of \$1,100 per month (Tack 2017).

For the 2008/09 HBS, only 2 per cent of survey respondents reported no source of income. More importantly, household’s monthly average income and expenditure at the time was \$7,965.42 and \$7,209.59 respectively. The three largest expenditure items were housing (on average \$1,909.86), food (on average \$1,192.67) and transport (on average \$1,031.72). Given that all of these items are subsidised in some form (through for example; FSP, New Home Subsidy and the fuel subsidy) and the estimated average budget surplus is \$755.83, households do not appear to have much degrees of freedom to accommodate reductions in transfers and subsidies.

From the HPC, there were 401,384 households in Trinidad and Tobago in 2011. Of that total population, 41.1 per cent (543,097) was classed as “rural” and the remainder (779,449) classed as “urban”. Given our estimates of rural and urban GNI, the Gini-coefficient for 2011 was found to be 0.49. While there exists no universal benchmark, Luebker (2010) notes that in several countries a Gini-coefficient of 0.35 is indicative of high-income inequality while 0.5 is indicative of extreme income inequality. In light of this, the paper’s calculated Gini-coefficient aligns with other published estimates of the Gini-coefficient for Trinidad and Tobago.<sup>14</sup> It is also in line with the disparity observed between workers’ income bracket (**Figure 5**) – specifically, upper middle-income and upper-income work groups’ rate of increase is almost three times the rate of decrease in the number of low-income workers.

---

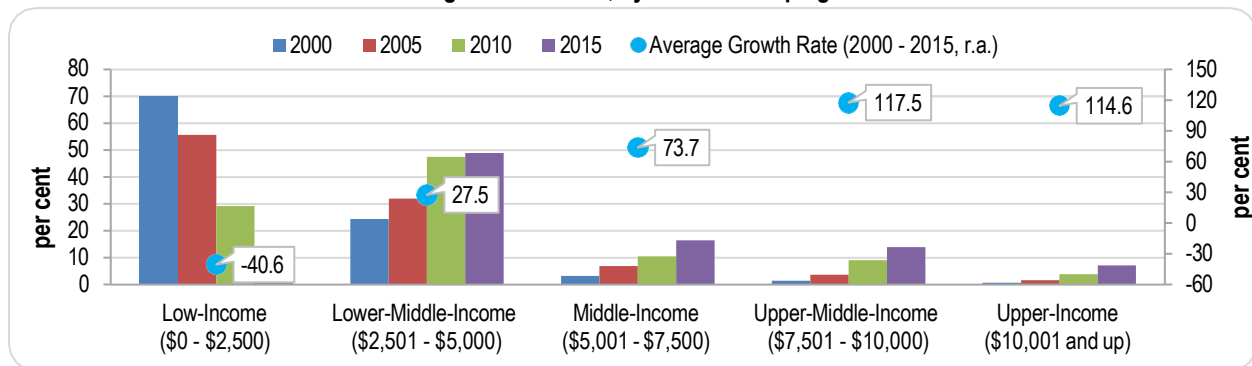
<sup>11</sup> This approach may have been adopted as “there is the long held view that respondents tend to under-report their income, but are likely to be more forthcoming with information on their expenditures” (KCL 2007).

<sup>12</sup> It should be noted that the 2005 SLC Report by Kairi Consultants Ltd. (KCL) found that 1.2 per cent of the respondents fell under the food poverty line. While the difference between the two food poverty estimates may be cause for concern, it should be noted that KCL looked at individual data while this paper used household level information (as food stipends are based on family size).

<sup>13</sup> The paper also makes an assumption that none of the respondents were in the FSP.

<sup>14</sup> KCL (2007) estimate the 2005 Gini-coefficient as 0.39 while the Inter-American Development Bank (using data from the 2014 SLC) found that the Gini-coefficient for Trinidad and Tobago in 2014 was 0.42 (IADB 2020).

Figure 5: Workers, by Income Groupings



Source: CSSP (2000, 2005, 2010, 2015)

A possible explanation for the worsening in income inequality may be over-reliance on government employment programmes. It is often debated that these initiatives have created a ‘welfare dependency syndrome’ that disincentivises individuals in rural communities from improving their self-sufficiency (GORTT 2019). To evaluate this, the paper re-estimates the latest available unemployment statistic at the time of writing (6.1 per cent as at September 2020) by adding the employment numbers for CEPEP and URP to the total unemployed.<sup>15</sup> The Economic Commission of Latin America and the Caribbean (ECLAC 2019)<sup>16</sup> reported that 30,000 and 10,000 individuals were employed under the URP and CEPEP, respectively. Assuming that the employment figures for URP and CEPEP remained unchanged to September 2020<sup>17</sup>, if these SPPs were cut, the unemployment rate could rise from 6.1 per cent to 12.9 per cent. The significant rise in the unemployment rate occurs as the pre-shock and post-shock total unemployed were 36,000 and 76,000, respectively. Regardless, it indicates that a significant number of individuals rely on temporary low-income jobs. In the “Community, Social and Personal Services” sector persons in government employment programmes accounted for 37.3 per cent of the number of persons employed in the sector (as at September 2020). Therefore, policies that impact employment figures in this sector will have a significant impact on the unemployment rate.

Recent statistics on the household sector are scarce. Without adequate data it is difficult to determine if existing SPPs are actually addressing socio-economic issues. In light of this, to complement the more recent unemployment observation, some of the other household vulnerability statistics (discussed earlier) were projected. Based on the assumptions highlighted in **Table 3**, the 2020 annual food poverty line, median income, average monthly expenditure, Gini-coefficient were projected to be \$12,297.93, \$9,037.34<sup>18</sup>, \$11,487.00 and 0.49 respectively.<sup>19</sup> From these projections, it was observed that the annual food poverty line increased by 301.9 percent over the last 15 years. Further, the Gini-coefficient indicates that there is still extreme income inequality.

<sup>15</sup> The paper did not include other popular government work-programmes such as; Youth Training and Employment Partnership Programme, Helping You Prepare for Employment Programme and Youth Apprenticeship Programme in Agriculture as these initiatives are more geared towards learning vocational skills than short-term employment.

<sup>16</sup> The URP coverage estimate from the Economic Commission of Latin America and the Caribbean (ECLAC) is for 2014.

<sup>17</sup> On June 04 2021, CEPEP’s Board of Directors temporarily reduced the working hours, salaries and number of CEPEP workers. Also, on January 12 2022, CEPEP contractors were told to cut their staff by two-thirds (Superville 2022).

<sup>18</sup> The updated statistic may be over-estimating median income as the median wage rates quoted in CBTT reports come from Collective Agreements that trade unions registered with the Industrial Court however, a report in the Trinidad and Tobago Guardian notes that 18 per cent of the workforce (as at 2021) are part of a trade union (John-Lall 2021).

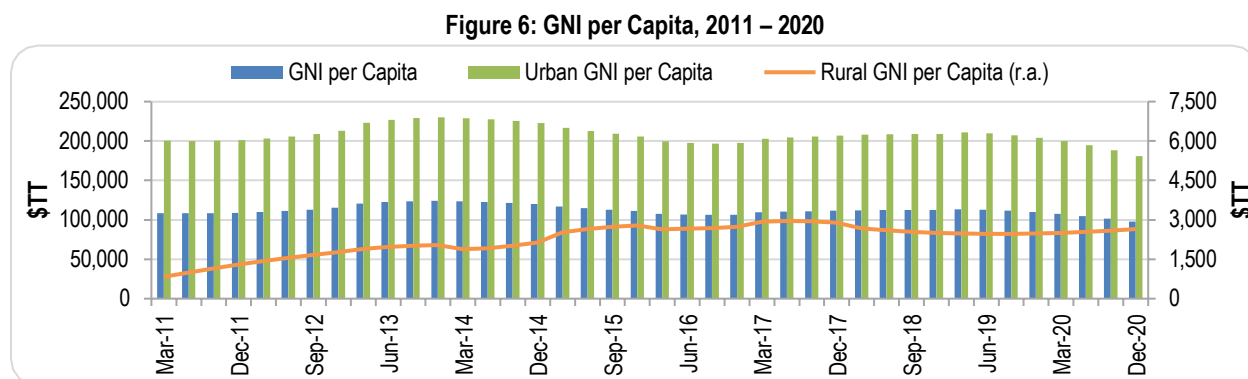
<sup>19</sup> These estimates were based on: (i) average (2006 – 2020) food price inflation of 11.5 per cent; (ii) average (2010 – 2020) inflation rate of 4.4 per cent; and (iii) GDP: Agriculture, forestry and fishing (2020; \$1.6 billion), GDP: Excluding Agriculture, forestry and fishing (2020; \$137.3 billion), rural population (2020; 654,962) and urban population (2020; 744,529).



Based on the discussion thus far, there is a risk that reductions in transfers and subsidies may significantly weaken household's financial positions. This is because: (i) all households benefit in some way from SPPs; (ii) some SPPs may not provide enough financial assistance to meet today's minimum living costs as the remunerations are largely based on 2005 poverty metrics<sup>20</sup>; (iii) over 20 per cent of the population lives below the poverty line (CF 2013); and (iv) rising concerns of 'welfare dependency' (GORTT 2017). Given that credit is often used to offset income gaps, and though most low-income households may not qualify for loans from regulated financial institutions, it is still important to gauge the possible risks to the financial sector as household debt as a per cent of GDP stood at 40.9 per cent (as at December 2020).<sup>21</sup>

## 5.2 Macro-Analysis

**Figure 6** plots the estimates for GNI per capita between March 2011 and December 2020. On average, the quarterly GNI per capita for rural and urban communities was \$2,259.22 and \$208,455.43, respectively. While the extreme difference between the two groups may be cause for concern, rural communities are likely to contain low-income (\$0 - \$2,500) and lower middle-income (\$2,501 - \$5,000) workers. Further, “globally, research shows that children usually account for approximately half of the poor” (UNICEF 2018) – in other words, half of the rural population may not be earning an income – and most of the extreme poor (about 80 percent) live in rural areas (Castañeda, et al. 2018). Meanwhile, at the other end of the spectrum, while 3.3 per cent (on average) of those surveyed in the CSSPs collected a salary of \$10,000 and up, in some cases salaries of \$40,000 a month were being reported. However, there were no existing techniques nor additional databases to identify and extract outliers or top earners from the urban population. As such, urban GNI per capita includes middle-income, upper-middle-income, upper-income and extraordinary earners.



Source: Authors

**Figure 7** plots the IRFs of the VARs that focused on GNI per capita.<sup>22</sup> At first glance, it does not appear that the main goal of a decrease in central government transfers and subsidies to households is realised as the overall fiscal balance assumes negative values throughout the forecast horizon. While this may be cause for concern, it should be noted that

<sup>20</sup> While the monetary allowances of several SPPs have increased since 2005, they are still based (in some manner) on pulling someone out of the 2005 SLC's standards of poverty.

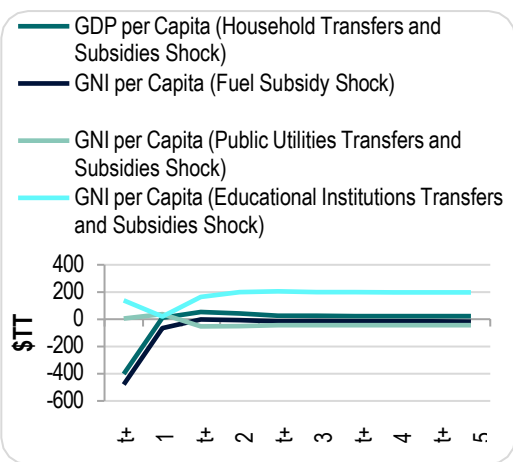
<sup>21</sup> Excessive household debt signals increased vulnerability to economic and financial market shocks.

<sup>22</sup> All of the adverse responses to a decrease in transfers and subsidies GDP was acquired by multiplying the resulting impulse responses by -1. As noted in Ravn (2012) the impulse response to a positive shock is the mirror image of the response to a negative shock (of the same type and size).

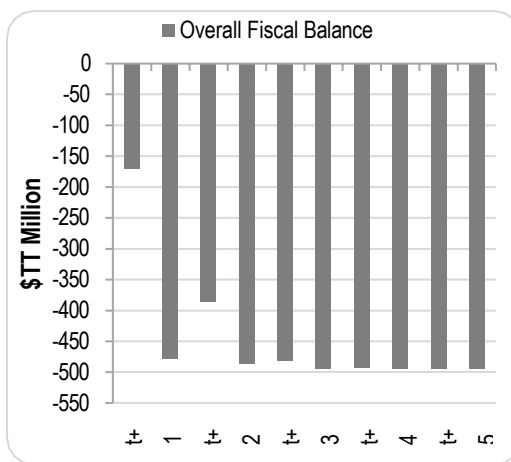
the overall deficits were considerably lower than those reported in recent years – the largest of which was \$16.7 billion (in FY 2020). Further, although low fiscal deficits can imply a lower fiscal impulse, there was economic development as, after a short period (three quarters) of adjustment, GNI per capita rose for the rest of the forecast horizon. Collectively these findings suggest that the decrease in central government transfers and subsidies to households allows for ‘expenditure switching’ to potentially higher value-added activities, (for example, public investment). Still, this policy stance is not without its challenges as it is observed that GNI per capita fell at several points over the forecast horizon. Further, independent reductions in transfers and subsidies for fuel and public utilities reduced GNI per capita. These findings serve as a useful reminder that, while considerable economic benefits can be realised through ‘expenditure switching’, rebalancing policy emphasis is an arduous task that requires a rigorous framework to capture the trade-offs and unintended consequences of the transition (that is, transition risks). For instance, while a reduction in transfers and subsidies to educational institutions may have improved GNI per capita by increasing labour force participation (as prospective students may now need to work to cover the funding gap), lower investment in education can undermine long-run growth prospects.<sup>23</sup> Typically, this is where loans arise as these facilities allow individuals to pursue objectives that they currently cannot finance. However, the IRFs in **Figure 7** suggest that apart from credit unions (and to some extent unregulated loan providers), there was a general unwillingness from key loan providers to extend credit. This development may be because: (i) profit-seeking organisations are likely to implement preventive measures to protect themselves from associated transition risks; and (ii) credit unions tend to be less risk averse as they are regarded as non-profit organisations.

**Figure 7: GNI per Capita – Selected VAR IRFs**

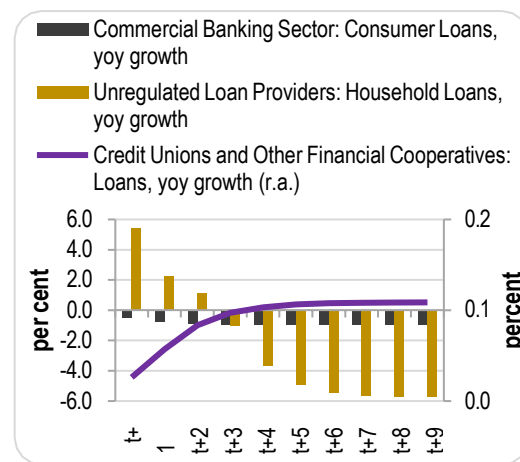
**Household**



**Fiscal\***



**Financial Sector**



Source: Authors

Note: \* The result is the IRF that focuses solely on a shock to household transfers and subsidies.

Given that SPPs would not have a uniform impact on the total population, investigating the IRFs for Urban GNI per Capita and Rural GNI per Capita may help determine the drivers behind some of the adverse developments in **Figure 7**. In this respect, it was observed that a reduction in household transfers and subsidies had a generally positive effect on urban households but a significant negative impact on rural families’ financial positions (**Figure 8**). These results

<sup>23</sup> For instance “in France, Norway, Switzerland and the United Kingdom, 60% or more of growth in GDP is generated by those who have attained a tertiary education” (OECD 2012).

support the findings in Breisinger, Mukashov, et al. (2018). Namely, that eliminating certain subsidies (specifically those related to food) will significantly affect lower income households. The key reason for this may be that at its core, SPPs are meant to secure minimum standards of living for the vulnerable in society (ADB 2003). Therefore, the sudden removal of these programs could have a significant impact on households especially if efforts were not being made to improve self-sufficiency during the program – a commonly expressed concern<sup>24</sup>. A further investigation of transfers and subsidies revealed that the fuel subsidy had a similarly negative impact on rural GNI per capita. This may be because rural areas tend to be far more dispersed and/or have amenities spread out over vast distances – requiring regular use of motor vehicles to carry out day-to-day activities. However, as urban areas are small zones designed to serve the needs of hundreds of thousands of individuals, residents may not face as much transportation overheads as their rural counterparts. Despite this, urban households still experienced a decrease (though significantly smaller) in their financial positions following a decrease in fuel subsidies. This finding supports findings that fuel subsidies: (i) incentivise overconsumption; and (ii) divert funds from essential public goods (for example health and education). For instance, according to data collected by the World Bank, as at 2018, Trinidad and Tobago has the highest CO<sub>2</sub> emissions per capita in Latin America and the Caribbean despite being the 27<sup>th</sup> largest country (by land area, square kilometres) in the regional bloc. Overconsumption of social benefits was also reflected in utilities as urban households appeared to lose more than their rural counterparts if transfers and subsidies to these providers fell. Specifically, the Trinidad and Tobago Energy Chamber (2017) found that 43 per cent of the population (in 2015) used 2,142 (on average bi-monthly) kilowatt hours (kwh) of electricity while 38 per cent and 19 per cent of households consumed only 682 and 221 kwh of electricity (on average bi-monthly), respectively.<sup>25</sup> As such, it is assumed that the average bi-monthly bill of the rural community ranges between \$57.46 and \$218.24, while the average bi-monthly bill of urban households is \$792.54.<sup>26</sup> The only key transfer and subsidy that did not have a significant impact on urban households was education. This may be because education is “*progressively pursued among those in the higher income quartiles*” (GORTT 2017). Due to their financial standing, these families would be better able to absorb increased education costs. However, “*education has been and is a way out of poverty*” (Montecel 2013). As such, rural communities were negatively impacted by a reduction in transfers and subsidies to educational institutions. This finding mirrors recent developments at the University of the West Indies, St. Augustine Campus (UWI) which experienced a 7.1 per cent (on average) yearly decline in new student admissions following the GORTT’s announcement to reform GATE in their Budget Statement for 2016/17.<sup>27</sup> Notwithstanding, higher unbudgeted expenses are cause for concern from a financial stability perspective as it may trigger debt-servicing difficulties. From **Figure 8** it appears that commercial banks are acutely aware of these kind of risks as they demonstrate an unwillingness, *ceteris paribus*, to extend credit to both urban and rural families following a decrease in transfers and subsidies to households. To make-up for the lost loan access, households may lean on credit unions as well as unregulated loan providers. Still, it should be noted that rural households used these credit channels more frequently than their urban counterparts. This finding suggests that these institutions may face stability risks given that the vulnerable were the only group that displayed a significant negative reaction (that is, a fall in their financial position) to a decrease in transfers and subsidies to households.

---

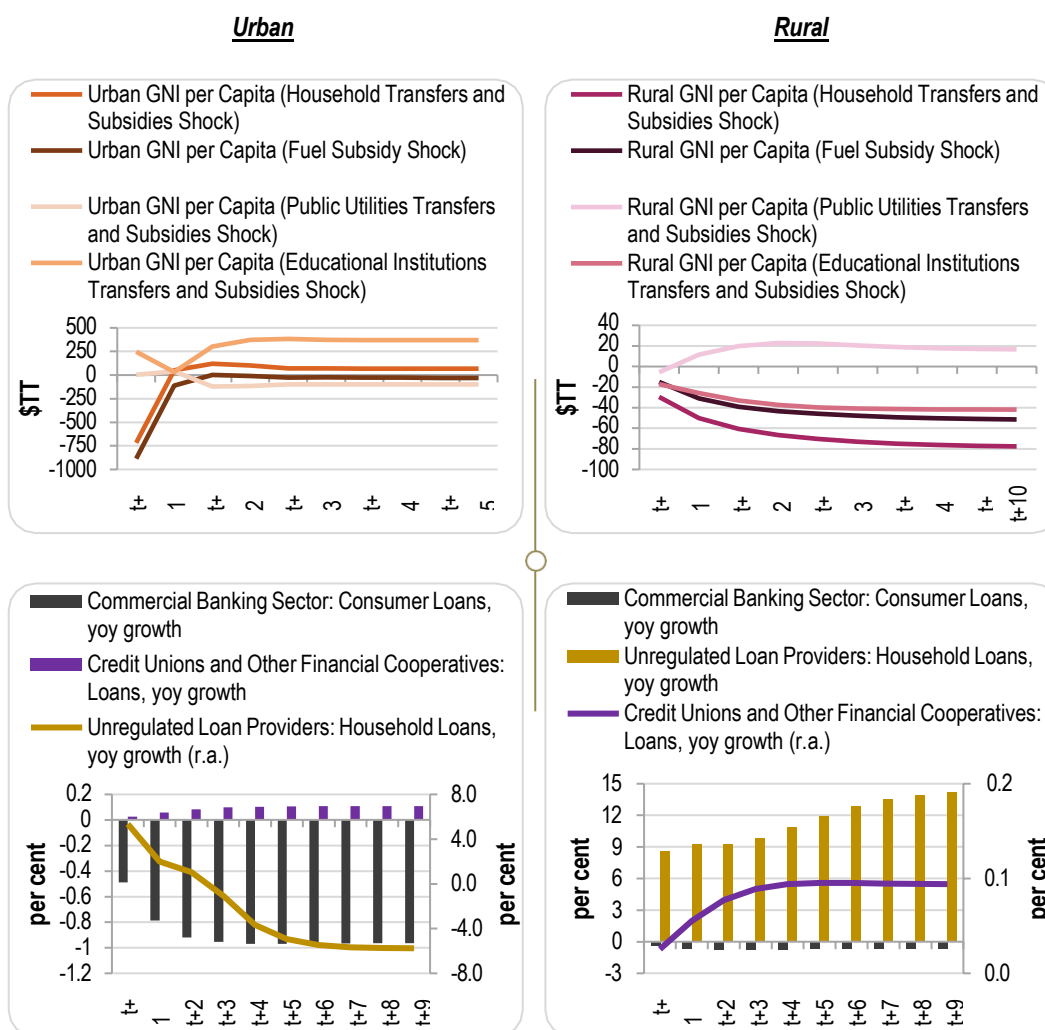
<sup>24</sup> GORTT (2017, 2019) opined that the vulnerable have become dependent on the state and lack proper incentives to develop the skills needed to find suitable employment.

<sup>25</sup> In Trinidad and Tobago, electricity usage is broken down into three brackets: (i) 1 – 400 kwh; (ii) 401 – 1,000 kwh; and (iii) > 1000 kwh.

<sup>26</sup> Minister of Finance, Colm Imbert, noted that 210,000 households have electricity bills that are \$300 or lower (GORTT 2021).

<sup>27</sup> New student admissions data was sourced from UWI (2022).

**Figure 8: Urban and Rural GNI per Capita – Transfer and Subsidy Shocks**

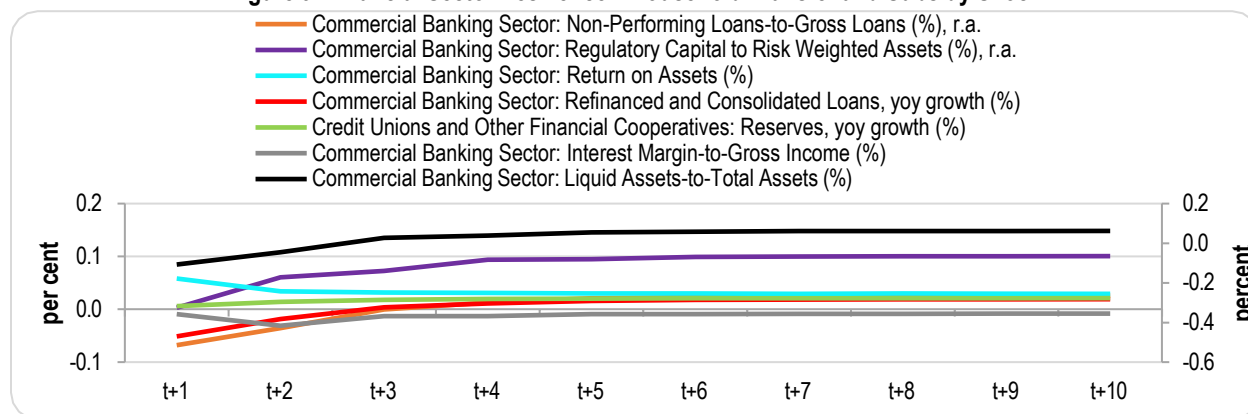


Source: Authors

Figure 9 showed the financial stability implications of the lending policy response following reduced transfers and subsidies to households. Commercial banks were able to preserve their capital adequacy, liquidity and asset return rates by mitigating their exposure to households (during a period of heightened transition risks). This stance however is not without its challenges as commercial banks also experienced a protracted contraction in their interest margin-to-gross income – which may be due to the unwillingness to extend credit. Further, increases in non-performing loans-to-gross loans were observed – however, this was addressed overtime by facilitating the restructuring of existing financial obligations. Regardless, given the favourable movements in several financial soundness indicators, a precautionary stance suggests commercial banks’ remain financially resilient during periods of heightened transition risks. The paper made similar attempts to evaluate the post-shock financial soundness of unregulated loan providers and credit unions, particularly as these institutions took a different lending approach compared to their commercial banking counterparts. However, due to data gaps, only an assessment of how credit unions’ reserves (facilities used to charge off delinquent loans) responded to a decrease in transfers and subsidies to households. On that note, it was observed that credit unions’ buffers grew at a significantly slower rate than the rise in loans. In other words, if reserves are the only measure

in place to mitigate against possible loan losses then, based on available data, credit unions may not have enough buffers to protect their operations from the negative implications of reduced SPPs.

**Figure 9: Financial Sector Resilience – Household Transfer and Subsidy Shock**



Source: Authors

## 6.0 Conclusion and Recommendations

The ultimate objective of SPPs is to secure minimum standards of protection for the population so that everyone has the chance to lead productive, healthy and dignified lives (ADB 2003). In budget statements, SPPs are often recorded under ‘transfers and subsidies’ – non-repayable grants/benefits paid out to private and public enterprises (World Bank 2021). In Trinidad and Tobago, the 2021 Review of the Economy (Review) noted that total transfers and subsidies for fiscal year (FY) 2020/21 was \$27.2 billion (53.6 per cent of total government expenditure). The largest share of expenditure under transfers and subsidies was attributable to ‘Transfers to Households’ (which stood at \$9.8 billion). While the Review does not decompose transfers to households into: (i) transportation; (ii) utilities; (iii) education and health care; and (iv) inter-island travel, we can anecdotally assume that every citizen benefits in some way from these subsidised services. However, many of these SPPs are procyclical, that is, they were either set up or expanded during periods of energy market buoyancy. As such, following the collapse of oil prices (by more than 50 per cent in 2014), in 2015 the GORTT announced that it will be scaling back SPPs (GORTT 2015). Though facing less fiscal revenue, the Government had delayed consolidation and instead temporarily amplified transfers and subsidies due to the financial impact of the COVID-19 pandemic. With the threat of COVID-19 on the retreat, a reversion to the policy stance of consolidation of transfer and subsidies has resumed.

Households may lean on debt financing to make-up for lost SPP benefits. However, recall that overleveraging was central to the 2008/09 global financial crisis. As financial instability can have knock-on effects for macroeconomic stability, it is important to understand the possible externalities from reducing transfers and subsidies. To accomplish this, the paper first assessed the level of vulnerability of Trinidad and Tobago’s households. This was then complemented with an assessment of commercial banks’ and credit unions’ financial positions following a reduction in transfers and subsidies to households.

The micro-analysis found that reductions in transfers and subsidies may significantly weaken already vulnerable households as SPPs may not be providing sufficient coverage (as they are based on outdated poverty statistics). Further, over 20 per cent of the population live below the poverty line (CF 2013) and there are high levels of income

inequality – 80.3 per cent of those surveyed in the CSSPs indicated that their gross income averaged between \$0 and \$5,000 while 3.3 per cent had a salary of \$10,000 or more. At the same time, while acknowledging that vulnerable households are not always the recipients of government financial assistance, there are concerns of a ‘welfare dependency syndrome’ in Trinidad and Tobago. There have been reported incidents of ‘double dipping’ and overqualified SPP recipients. These occurrences serve as another barrier in the fight against poverty by reducing the stock of financial assistance that can be directed to those in need of social support.

The macro-analysis was based on the IRFs of 13 individual VARs. Initially, the IRFs supported “redirecting expenditure away from subsidies and discretionary transfers and towards spending on essential economic infrastructure” (GORTT 2016) as GNI per capita increased alongside an improved fiscal balance. However, upon further investigation, it was observed that urban communities benefitted from this policy change as rural GNI per capita decreased throughout the forecast horizon. The literature suggests that this may be because SPPs are tailored to help vulnerable households – thus, the sudden removal of these programs could have a significant impact on these groups especially if not accompanied by efforts to improve self-sufficiency during the program. Further, there were instances (specifically the utilities subsidy and to some extent the fuel subsidy) where urban families showed that they made greater use of transfers and subsidies than their rural counterparts. As a large share of fiscal resources are being used on a section of society (urban households) that does not need this level of assistance, inequality arises through two channels – an unequal distribution of national resources and a crowding out of more progressive public spending.

Although it is necessary to correct benefit leakage, it should be noted that the decline in transfers and subsidies to households caused a decrease in commercial banks’ income as credit growth contracted – as these institutions adopted a ‘wait and see approach’. Their cautious approach allowed commercial banks to reinforce their financial positions. Credit unions and unregulated loan providers, on the other hand, took a different approach to their banking counterparts, as they continued to extend credit to households despite the negative implications of the fall in transfers and subsidies to their main customer base - vulnerable households. Although data on the financial soundness of credit unions and unregulated loan providers was sparse, the IRFs found that credit unions increase their reserves during this period of transition. However, it should be noted that reserves (the financial resources set aside to meet possible credit delinquencies) grew at a much slower pace than that of loans. As such, it is uncertain if other key loan providers possess sufficient buffers to mitigate possible transition risks associated with falling transfers and subsidies to households.

Based on the results of the micro- and macro-analysis, emphasis should be placed on restructuring social development programs and strengthening the supervision of credit unions. More specifically, social programs should be adjusted to better ensure that SPP recipients are getting skills training, referrals and the other necessary assistance needed to improve their self-sufficiency. This could be implemented alongside a database that tracks the ‘status’ (income, occupation, training received, assistance received, etc.) of SPP recipients to improve resource allocation by removing ‘double dippers’ and overqualified recipients.

In July 2005, the GORTT initially agreed that the supervision of the financial activities of all credit unions should be integrated, under the aegis of the CBTT. The GORTT also agreed that the Co-operative Societies Act, Chap. 81:03 (CSA) should be amended to remove the supervision of the financial activities of credit unions from the mandate of the Commissioner for Co-operative Development – the CBTT’s supervision mandate would be fulfilled under the establishment of a Credit Union Act (CUA). A policy proposal document for the CUA was published in 2009. Many of the macroprudential criteria outlined in the document would greatly improve the financial stability of credit unions as they are also in line with WOCCU recommendations. However, the responsibility of supervision and prudential regulation of credit unions may have been subject to a rethink. The Credit Union Bill was introduced on November 14

2014, but lapsed (on June 17, 2015) upon dissolution of the 5th Session of the 10th Republican Parliament. Following a commitment for successive rounds of consultation, to date the Bill has not been re-introduced. Therefore, as it stands, “the sector lacks an adequate regulatory and supervisory framework and reporting is weak” (IMF 2020). In this regard, there is a case for fiscal (reduction in transfer and subsidies) and financial stability (institutional resilience) measures to be considered collectively.

## References

- ADB. 2003. "Social Protection." *Asian Development Bank, Our Framework, Policies and Strategies*.
- Alobo, Sarah. 2012. "Determinants of Rural Household Income Diversification in Senegal and Kenya." *Agritrop*.
- Angori, Gabriele, David Arisetei, and Manuela Gallo. 2019. "Determinants of Banks' Net Interest Margin: Evidence from the Euro Area During the Crisis and Post-Crisis Period." *MDPI, Sustainability*.
- Baksa, Daniel, Zsuzsa Munkacsi, and Carolin Nerlich. 2020. "A Framework for Assessing the Costs of Pension Reform Reversals." *European Central Bank, Working Paper Series No 2396*.
- BCampus. 2017. "Poverty and Economic Inequality: Government Policies to Reduce Income Inequality." *Principles of Economics 2e*.
- Breisinger, Clemens, Askar Mukashov, Mariam Raouf, and Manfred Wiebelt. 2018. "Phasing Out Energy Subsidies as Part of Egypt's Economic Reform Program." *IFPRI, Regional Program Working Paper No. 7*.
- Breisinger, Clemens, Yumna Kassim, Sikandra Kurdi, Josée Randriamamonjy, and James Thurlow. 2021. "Food Subsidies and Cash Transfers in Egypt." *IFPRI, Regional Program Working Paper No. 34*.
- Caldwell, Miriam, and Khadija Khartit. 2021. "Advantages of Credit Unions." *The Balance*.
- CF. 2013. "National Report Trinidad and Tobago." *Commonwealth Foundation, A Civil Society Review of Progress Towards the Millennium Development Goals in Commonwealth Countries*.
- Chester, Marissa V. 2014. "The Economic Impact of Petroleum Subsidy and Subsidy Reform on Household Income Groups' Welfare in Trinidad and Tobago." *UWI St. Augustine Campus, Conference on the Economy*.
- Coady, Dave, and Rebecca Harris. 2001. "Evaluating Transfer Programs Within a General Equilibrium Framework." *IFPRI, Discussion Paper Briefs No. 110*.
- Cotton, J, D Cox, and D Ramrattan. 2013. "The Household Budget Impact of the Removal of the Petroleum Fuel Subsidy in Trinidad and Tobago." *Central Bank of Trinidad and Tobago*.
- Crook, Jonathan. 2003. "The Demand and Supply for Household Debt: A Cross Country Comparison." *CiteSeerX*.
- CRS. 2019. "Introduction to U.S. Economy: Fiscal Policy." *Congressional Research Service*.
- CSO. 2022. "2008/2009 Household Budget Survey." *Central Statistical Office*.
- CT. 2020. "Trinidad and Tobago Confirms First COVID-19 Case." *CARICOM Today*.
- ECLAC. 2019. "Targeted Conditional Cash Transfer Program (TCTTP)." *Economic Commission of Latin America and the Caribbean, Non-contributory Social Protection Programmes Database*.
- Elsennawy, Abeer. 2014. "The Implications of Phasing out Energy Subsidies in Egypt." *Journal of Policy Modelling, pgs 855-866*.
- Fang, Zhaoben, Junpeng Zhu, and Rongjie Deng. 2013. "Estimating Gini Coefficient Based on Hurun Report and Poverty Line." *Open Journal of Statistics, Vol.3, No.3*.
- Feng, Kuishuang, Klaus Hubacek, Yu Liu, Estefania Marchan, and Adrien Vogt-Schilb. 2018. "Managing the Distributional Effects of Energy Taxes and Subsidy Removal in Latin America and the Caribbean." *IDB Working Paper Series No. 00947*.
- FKJackie Consultancy. 2016. "Local Government Reform Consultations, Pt. Fortin." *Ministry of Rural Development and Local Government*.
- Gangopadhyay, Shubhashis, Bharat Ramaswami, and Wilima Wadhwa. 2005. "Reducing Subsidies on Household Fuels in India: How will it Affect the Poor?" *Elsevier, Energy Policy 33*.
- Gharibnavaz, Mohammad, and Robert Waschik. 2015. "Food and Energy Subsidy Reforms in Iran: A general Equilibrium Analysis." *Journal of Policy Modelling, pgs 726-741*.
- Gilliland, Michael. 2010. "The Business Forecasting Deal: Exposing Myths, Eliminating Bad Practices, Providing Practical Solutions." *Wiley Online Library, SAS Institute, Inc*.



- GORTT. 2015. "Budget Statement, 2016." *Government of the Republic of Trinidad and Tobago, Ministry of Finance*.
- . 2016. "Budget Statement, 2017." *Government of the Republic of Trinidad and Tobago, Ministry of Finance*.
- . 2017. "Excerpt of Verbatim Notes of the Seventeenth Meeting of the Joint Select Committee on Social Services and Public Administration." *Government of the Republic of Trinidad and Tobago, Joint Select Committee on Social Services and Public Administration*.
- . 2017. "House of Representatives." *Government of the Republic of Trinidad and Tobago, Trinidad and Tobago Parliament*.
- . 2017. "National Social Mitigation Plan, 2017 - 2022, "Building Resilience to Secure our Nation". " *Government of the Republic of Trinidad and Tobago, Ministry of Social Development and Family Services*.
- . 2019. "On an Inquiry into the Management of the Targeted Conditional Cash Transfer Programme." *Government of the Republic of Trinidad and Tobago, Joint Select Committee on Social Services and Public Administration*.
- . 2020. "Seventeenth Report of the Joint Select Committee on Human Rights, Equality and Diversity on an Inquiry into Persons Living in Poverty and Extreme Poverty in Trinidad and Tobago with Specific Focus on Vulnerable Groups." *Government of the Republic of Trinidad and Tobago, Fifth Session of the Eleventh Parliament (2019/2020)*.
- . 2021. "Budget Statement, 2022." *Government of the Republic of Trinidad and Tobago, Ministry of Finance*.
- Grossman, Valerie, and Adrienne Mack. 2014. "Database of Global Economic Indicators (DGEI): A Methodological Note." *Federal Reserve Bank of Dallas, Globalization and Monetary Policy Institute, Working Paper No. 166*.
- Hilaire, Alvin. 2021. "This is NOT a Drill!: Pandemic-Induced Stresses to Trinidad and Tobago's Financial System." *Central Bank of Trinidad and Tobago, Financial Stability Institute-Basel Committee on Banking Supervision-Central Bank of The Bahamas, Virtual High-Level Conference on Banking Regulation and Supervision in Smaller Jurisdictions*.
- HRCCU. 2021. "7 Main Factors that Determine Loan Amounts." *Hudson River Community Credit Union*.
- IADB. 2020. "Caribbean Quarterly Bulletin: A Pandemic Surge and Evolving Policy Responses." *Inter-American Development Bank*.
- IMF. 2016. Trinidad and Tobago: Selected Issues. IMF Country Report No: 16/205, *International Monetary Fund*.
- . 2020. "Trinidad and Tobago; Press Release; Financial System Stability Assessment; And Statement by the Executive Director for Trinidad and Tobago." *International Monetary Fund, IMF Country Report, No. 20/291*.
- Jiang, Zhujun, Xiaoling Ouyang, and Guangxiao Huang. 2015. "The Distributional Impacts of Removing Energy Subsidies in China." *China Economic Review, pgs 111-122*.
- John-Lall, Raphael. 2021. "Trade Union Membership Declining." *Trinidad and Tobago Guardian*.
- KCL. 2007. "Analysis of the Trinidad and Tobago Survey of Living Conditions." *Kairi Consultants Ltd., Central Statistical Office, Government of the Republic of Trinidad and Tobago*.
- Ludena, Carlos E, and Mark Horridge. 2015. "GTAP Regional Input-Output Data for Jamaica, Trinidad & Tobago, Puerto Rico and the Dominican Republic." *Inter-American Development Bank, Climate Change and Sustainability Division, Technical Note, N° 871*.
- Luebker, Malte. 2010. "Inequality, Income Shares and Poverty: The Practical Meaning of Gini-coefficients." *International Labour Office, TRAVAIL Policy Brief No. 3*.
- Lura, Andreas. 2013. "The Norwegian Stock Market: A Local Gaussian Perspective." *University of Bergen*.
- Lütkepohl, Helmut. 2007. "Econometric Analysis with Vector Autoregressive Models." *European University Institute, EUI Working Papers, ECO, 2007/1*.
- Malaki, Akhil. 2005. "Informal Finance and Microfinance in Jamaica, Trinidad and Tobago: An Institutional Study." *Stockholm University, Studies in Economic History*.
- Montecel, Maria. 2013. "Education as Pathway Out of Poverty." *Intercultural Development Research Association*.
- Nat Geo. 2022. "Rural Area." *National Geographic, Resource Library, Encyclopaedic Entry*.
- OBG. 2018. "Trinidad and Tobago Prioritises Agriculture, Crop Diversification and Food Security." *Oxford Business Group*.

- . 2020. "Skills Gap Creates a Need for Educational Diversification in Trinidad and Tobago." *Oxford Business Group, The Report, Trinidad & Tobago 2020: Health & Education*.
- OECD. 2012. "The Economic and Social Benefits of Education: How does Education Affect the Economy." *Organisation for Economic Co-operation and Development*.
- Ogarenko, Iuliia, and Klaus Hubacek. 2013. "Eliminating Indirect Energy Subsidies in Ukraine: Estimation of Environmental and Socioeconomic Effects Using Input–Output Modelling." *Journal of Economic Structures* 1-27.
- Rakovská, Zuzana, Dominika Ehrenbergerová, and Martin Hodula. 2020. "The Power of Sentiment: Irrational Beliefs of Households and Consumer Loan Dynamics." *Czech National Bank, Working Paper Series*.
- Ramdass, Anna. 2022. "Food Cards Abuse under Probe." *Trinidad and Tobago Express*.
- Ravn, Søren Hove. 2012. "Asymmetric Monetary Policy Towards the Stock Market." *Danmarks Nationalbank, Working Papers, 77*.
- Schaffitzel, Filip, Michael Jakob, Rafael Soria, Adrien Vogt-Schilb, and Hauke Ward. 2019. "Can Government Transfers Make Energy Subsidy Reform Socially Acceptable? A Case Study on Ecuador." *IDB Working Paper Series No. 01026*.
- Seemungal, Joshua. 2022. "CPO Starts Wage Talks with T&T's 11 Unions." *Trinidad and Tobago Guardian*.
- Sow, Nii. 2006. "The Role of Subsidies as a Means to Increase Welfare." *EDPRI, Accra*.
- Superville, Shane. 2022. "CEO Tells CEPEP Contractors Reduce Staff by Two-thirds." *Trinidad and Tobago Newsday*.
- Tack, Clint Chan. 2017. "PP Poverty Report Wrong." *Trinidad and Tobago Newsday*.
- Timilsina, Govinda R, Sheoli Pargal, Marinos Tsigas, and Sebnem Sahin. 2018. "How Much Would Bangladesh Gain from the Removal of Subsidies on Electricity and Natural Gas?" *World Bank Group, Policy Research Working Paper 8677*.
- TT Express. 2018. "No More Regular Gas: Pressure for Poor." *Trinidad and Tobago Express*.
- . 2021. "CEPEP Sends Home 10,000 Worker, to Pay Salaries." *Trinidad and Tobago Express*.
- UNICEF. 2018. "Consultation Report on Multidimensional Poverty, Trinidad." *United Nations Children's Fund, United Nations Development Programme*.
- UWI. 2022. "Student Statistical Digest, 2016/2017 to 2020/2021." *University of the West Indies, St. Augustine Campus*.
- WFP-CARICOM-CDEMA-FAO. 2021. "Caribbean COVID-19 Food Security & Livelihoods Impact Survey, Trinidad and Tobago Summary Report, June 2021." *World Food Programme, CARICOM Caribbean Community, Caribbean Disaster Emergency Management Agency, Food and Agriculture Organization of the United Nations*.
- Winters, Paul, Benjamin Davis, and Gero Carletto. 2009. "Assets, Activities and Rural Income Generation: Evidence from a Multicountry Analysis." IPC, Integrated Food Security Phase Classification.
- WOCCU. 2015. "Model Law for Credit Unions." *World Council of Credit Unions*.
- . 2021. "Statistical Report, 2020." *World Council of Credit Unions, The Global Network of Credit Unions and Financial Cooperatives*.
- World Bank. 2021. "DataBank, World Development Indicators." *The World Bank*.

## Appendix

### A1 VAR Statistical Adequacy Results

#### A1.1 Unit Root Tests

This paper incorporates stationary variables in all models. Stationarity evades the problem of spurious regression and enable hypothesis testing to be performed using the standard  $t$  and  $F$  distributions. All indicators, were *differenced* to the level that was recommended by at least two of the three traditional unit root tests.

**Table 4: Unit Root Test Results**

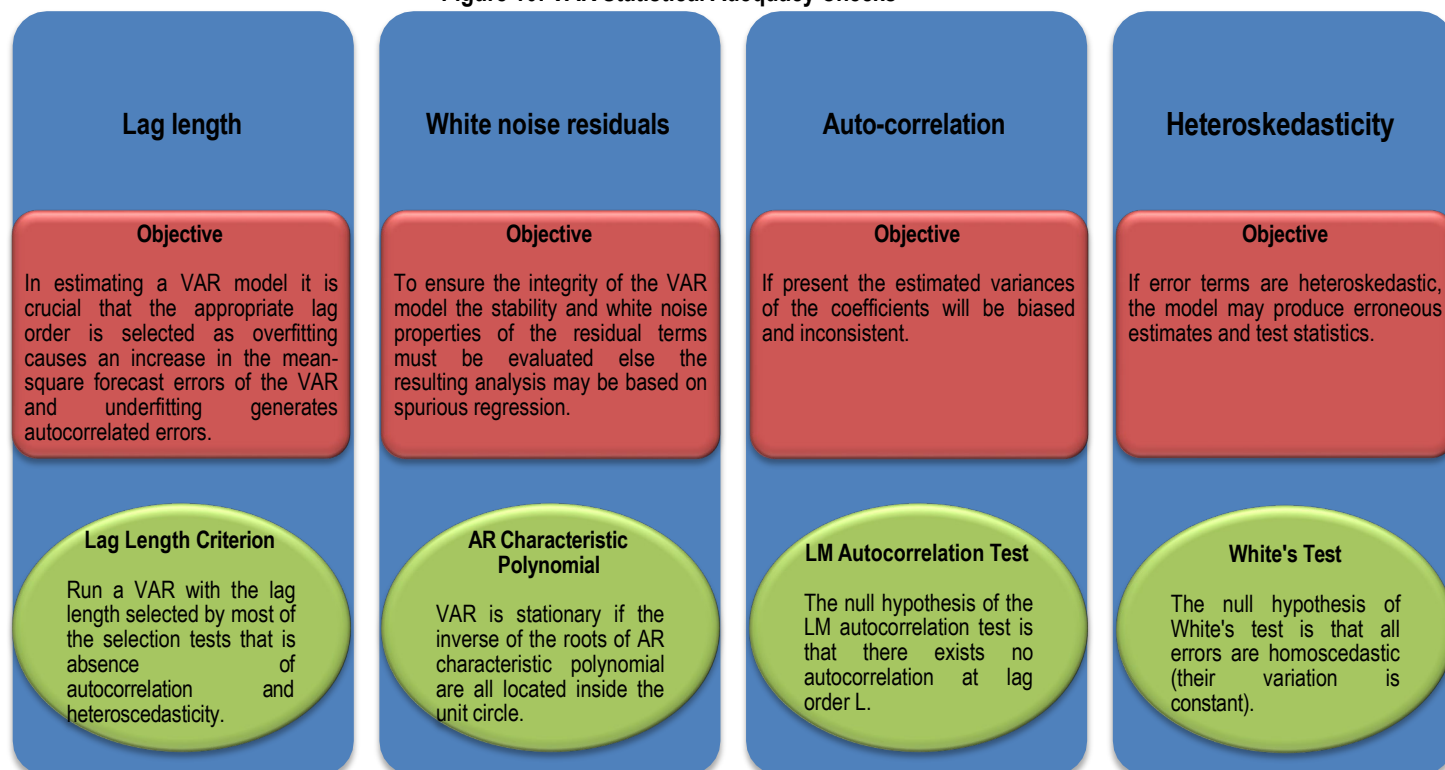
Variables	Augmented Dickey Fuller Unit Test		Phillips Perron Test		Kwiatkowski-Phillips-Schmidt-Shin Test	
	Test Statistic	Level	Test Statistic	Level	Test Statistic	Level
Central Government: Fuel Subsidy (yoy, % change)	-4.9	I(0)	-4.8	I(0)	0.2	I(1)
Central Government: Transfers and Subsidies to Educational Institutions (yoy, % change)	-5.3	I(0)	-5.3	I(0)	0.1	I(0)
Central Government: Transfers and Subsidies to Households (TT\$ Million)	-7.6	I(1)	-4.9	I(0)	0.3	I(0)
Central Government: Transfers and Subsidies to Public Utilities (yoy, % change)	-5.2	I(0)	-5.2	I(0)	0.2	I(0)
Commercial Banking Sector: Consumer Loans, yoy growth (%)	3.6	I(1)	-3.7	I(1)	0.2	I(1)
Commercial Banking Sector: Interest Margin-to-Gross Income (%)	-7.0	I(1)	-7.0	I(1)	0.2	I(0)
Commercial Banking Sector: Refinanced and Consolidated Loans, yoy growth (%)	-11.1	I(2)	-5.8	I(1)	0.3	I(1)
Credit Unions and Other Financial Cooperatives: Loans, yoy growth (%)	-4.3	I(2)	-4.0	I(1)	0.1	I(1)
Commercial Banking Sector: Return on Assets (%)	-6.8	I(1)	-6.8	I(1)	0.8	I(1)
Commercial Banking Sector: Regulatory Capital to Risk Weighted Assets (%)	-8.4	I(1)	-14.7	I(1)	0.3	I(1)
Commercial Banking Sector: Liquid Assets-to-Total Assets (%)	-6.2	I(1)	-6.3	I(1)	0.1	I(1)
Commercial Banking Sector: Non-Performing Loans-to-Gross Loans (%)	-7.8	I(1)	-8.0	I(1)	0.1	I(1)
Unregulated Loan Providers: Loans, yoy growth (%)	-4.2	I(1)	-5.5	I(1)	0.1	I(1)
Credit Unions and Other Financial Cooperatives: Reserves, yoy growth (%)	-4.3	I(2)	-4.0	I(1)	0.0	I(1)
GNI per Capita (\$TT)	-7.3	I(2)	-7.2	I(2)	0.3	I(1)
Overall Fiscal Balance (TT\$ Million)	-8.3	I(0)	-6.1	I(0)	0.1	I(1)
Rural GNI per Capita (\$TT)	-7.1	I(2)	-3.5	I(1)	0.4	I(1)
Urban GNI per Capita (\$TT)	-7.2	I(2)	-7.2	I(2)	0.3	I(1)

Source: EViews Output

Notes: All 'Test Statistics' were rejected at the 5 per cent level of significance.

## A1.2 VAR Specification Tests

Figure 10: VAR Statistical Adequacy Checks



Source: EViews Manuals and (Lütkepohl 2007)

Notes: Green rectangles discuss the objective of the specification test; Orange ovals describe the test statistic or index for the specification test.

Table 5: VAR Lag Length Selection Tests

Equation	Lag Length Used	LR Test Statistic	Final Prediction Error	Akaike Information Criterion	Schwarz Information Criterion	Hannan-Quinn Information Criterion
Equation 5	1	50.2	1100000000000000000.0	60.8	62.7	61.5
Equation 6	1	49.4	3930000000000000000.0	62.1	64.0	62.8
Equation 7	1	45.4	720000000000000000.0	55.8	57.7	56.5
Equation 8a	1	46.7	5200000000000000000.0	60.1	62.0	60.7
Equation 8b	1	44.5	7030000000000000000.0	67.3	69.2	67.9
Equation 8c	1	46.1	9510000000000000000.0	60.7	62.6	61.3
Equation 9a	1	46.2	18300000000000000000.0	61.3	63.2	62.0
Equation 9b	1	43.9	24900000000000000000.0	68.6	70.4	69.2
Equation 9c	1	46.0	32900000000000000000.0	61.9	63.8	62.6
Equation 10a	1	49.9	2550000000000000000.0	54.8	56.6	55.4
Equation 10b	1	41.5	45400000000000000000.0	62.3	64.1	62.9
Equation 10c	1	52.1	4250000000000000000.0	55.3	57.1	55.9
Equation 11	1	40.8	0.2	21.1	24.3	22.2

Source: EViews Output

Note: Bold cells note that the highlighted lag length was selected by the criterion. Given that the literature suggests different criteria for estimating the maximum lag lengths a common way to overcome this problem, is to run a VAR with the lag length (selected by most of the selections tests) that is absent of autocorrelation and heteroscedasticity (Lütkepohl, 2007).

**Table 6: VAR White Noise Residuals**

Equation	AR Roots Graph
Equation 5	
Equation 6	
Equation 7	
Equation 8a	
Equation 8b	
Equation 8c	
Equation 9a	
Equation 9b	
Equation 9c	
Equation 10a	
Equation 10b	
Equation 10c	
Equation 11	

Source: EViews Output

**Table 7: Auto-correlation VAR Results**

Equation	Statistics	Lag 1 Values	Lag 2 Values	Lag 3 Values	Lag 4 Values	Lag 5 Values	Lag 6 Values	Lag 7 Values	Lag 8 Values	Lag 9 Values	Lag 10 Values	Lag 11 Values	Lag 12 Values
Equation 5	LRE-stat	<b>40.49</b>	<b>31.14</b>	<b>30.67</b>	<b>47.01</b>	<b>30.24</b>	<b>31.69</b>	<b>41.64</b>	<b>27.08</b>	<b>26.11</b>	<b>33.15</b>	<b>24.56</b>	51.59
	P-value	<b>0.28</b>	<b>0.70</b>	<b>0.72</b>	<b>0.10</b>	<b>0.74</b>	<b>0.67</b>	<b>0.24</b>	<b>0.86</b>	<b>0.89</b>	<b>0.60</b>	<b>0.93</b>	0.04
Equation 6	LRE-stat	<b>40.53</b>	<b>31.13</b>	<b>30.62</b>	<b>47.78</b>	<b>30.23</b>	<b>31.49</b>	<b>40.98</b>	<b>27.32</b>	<b>25.65</b>	<b>33.28</b>	<b>24.81</b>	<b>51.11</b>
	P-value	<b>0.28</b>	<b>0.70</b>	<b>0.72</b>	<b>0.09</b>	<b>0.74</b>	<b>0.68</b>	<b>0.26</b>	<b>0.85</b>	<b>0.90</b>	<b>0.60</b>	<b>0.92</b>	<b>0.05</b>
Equation 7	LRE-stat	<b>49.09</b>	<b>44.60</b>	<b>28.89</b>	75.77	<b>27.76</b>	<b>40.01</b>	<b>31.84</b>	76.49	<b>21.03</b>	<b>44.02</b>	<b>26.52</b>	96.93
	P-value	<b>0.07</b>	<b>0.15</b>	<b>0.79</b>	0.00	<b>0.84</b>	<b>0.30</b>	<b>0.67</b>	0.00	<b>0.98</b>	<b>0.17</b>	<b>0.88</b>	0.00
Equation 8a	LRE-stat	<b>45.79</b>	<b>35.74</b>	<b>36.20</b>	55.81	<b>42.99</b>	<b>26.78</b>	<b>39.42</b>	<b>33.93</b>	<b>16.42</b>	<b>27.06</b>	<b>26.31</b>	<b>50.36</b>
	P-value	<b>0.13</b>	<b>0.48</b>	<b>0.46</b>	0.02	<b>0.20</b>	<b>0.87</b>	<b>0.32</b>	<b>0.57</b>	<b>1.00</b>	<b>0.86</b>	<b>0.88</b>	<b>0.06</b>
Equation 8b	LRE-stat	<b>40.32</b>	<b>37.54</b>	<b>26.95</b>	<b>49.58</b>	<b>26.84</b>	<b>21.05</b>	<b>26.67</b>	<b>27.67</b>	<b>20.64</b>	<b>30.22</b>	<b>24.16</b>	54.59
	P-value	<b>0.29</b>	<b>0.40</b>	<b>0.86</b>	<b>0.07</b>	<b>0.87</b>	<b>0.98</b>	<b>0.87</b>	<b>0.84</b>	<b>0.98</b>	<b>0.74</b>	<b>0.93</b>	0.02
Equation 8c	LRE-stat	<b>41.20</b>	<b>44.43</b>	<b>32.62</b>	<b>48.22</b>	<b>45.12</b>	<b>48.95</b>	<b>34.71</b>	<b>42.08</b>	<b>17.09</b>	<b>43.03</b>	<b>18.53</b>	<b>46.49</b>
	P-value	<b>0.25</b>	<b>0.16</b>	<b>0.63</b>	<b>0.08</b>	<b>0.14</b>	<b>0.07</b>	<b>0.53</b>	<b>0.22</b>	<b>1.00</b>	<b>0.20</b>	<b>0.99</b>	<b>0.11</b>
Equation 9a	LRE-stat	<b>45.24</b>	<b>35.00</b>	<b>35.86</b>	56.70	<b>42.90</b>	<b>27.01</b>	<b>39.31</b>	<b>34.37</b>	<b>16.32</b>	<b>27.41</b>	<b>26.37</b>	<b>50.18</b>
	P-value	<b>0.14</b>	<b>0.52</b>	<b>0.48</b>	0.02	<b>0.20</b>	<b>0.86</b>	<b>0.32</b>	<b>0.55</b>	<b>1.00</b>	<b>0.85</b>	<b>0.88</b>	<b>0.06</b>
Equation 9b	LRE-stat	<b>40.58</b>	<b>37.53</b>	<b>27.00</b>	<b>50.33</b>	<b>26.74</b>	<b>21.29</b>	<b>26.58</b>	<b>28.23</b>	<b>20.31</b>	<b>30.44</b>	<b>24.21</b>	53.66
	P-value	<b>0.28</b>	<b>0.40</b>	<b>0.86</b>	<b>0.06</b>	<b>0.87</b>	<b>0.98</b>	<b>0.87</b>	<b>0.82</b>	<b>0.98</b>	<b>0.73</b>	<b>0.93</b>	0.03
Equation 9c	LRE-stat	<b>41.45</b>	<b>44.73</b>	<b>32.61</b>	<b>49.02</b>	<b>45.07</b>	<b>48.99</b>	<b>33.81</b>	<b>42.96</b>	<b>16.59</b>	<b>43.28</b>	<b>18.49</b>	<b>45.85</b>
	P-value	<b>0.25</b>	<b>0.15</b>	<b>0.63</b>	<b>0.07</b>	<b>0.14</b>	<b>0.07</b>	<b>0.57</b>	<b>0.20</b>	<b>1.00</b>	<b>0.19</b>	<b>0.99</b>	<b>0.13</b>
Equation 10a	LRE-stat	<b>33.39</b>	<b>29.09</b>	<b>35.56</b>	69.72	<b>44.72</b>	<b>43.95</b>	<b>43.69</b>	69.70	<b>21.07</b>	<b>44.04</b>	<b>37.23</b>	79.37
	P-value	<b>0.59</b>	<b>0.79</b>	<b>0.49</b>	0.00	<b>0.15</b>	<b>0.17</b>	<b>0.18</b>	0.00	<b>0.98</b>	<b>0.17</b>	<b>0.41</b>	0.00
Equation 10b	LRE-stat	<b>25.79</b>	<b>31.22</b>	<b>26.69</b>	81.76	<b>32.83</b>	<b>22.35</b>	<b>24.71</b>	73.11	<b>25.36</b>	<b>31.70</b>	<b>28.91</b>	82.10
	P-value	<b>0.90</b>	<b>0.70</b>	<b>0.87</b>	0.00	<b>0.62</b>	<b>0.96</b>	<b>0.92</b>	0.00	<b>0.91</b>	<b>0.67</b>	<b>0.79</b>	0.00
Equation 10c	LRE-stat	<b>48.30</b>	<b>45.97</b>	<b>40.63</b>	61.62	<b>41.37</b>	53.11	<b>39.62</b>	62.51	<b>26.85</b>	<b>34.21</b>	<b>24.93</b>	74.00
	P-value	<b>0.08</b>	<b>0.12</b>	<b>0.27</b>	0.01	<b>0.25</b>	0.03	<b>0.31</b>	0.00	<b>0.87</b>	<b>0.55</b>	<b>0.92</b>	0.00
Equation 11	LRE-stat	<b>65.30</b>	<b>64.03</b>	<b>60.32</b>	103.31	<b>58.73</b>	<b>82.85</b>	<b>39.55</b>	104.61	<b>71.28</b>	<b>50.98</b>	<b>47.88</b>	113.43
	P-value	<b>0.43</b>	<b>0.48</b>	<b>0.61</b>	0.00	<b>0.66</b>	<b>0.06</b>	<b>0.99</b>	0.00	<b>0.25</b>	<b>0.88</b>	<b>0.93</b>	0.00

Source: EViews Output

Note: Bold cells refer to no autocorrelation for the associated probability of greater than 10 per cent.

**Table 8: Heteroskedasticity VAR Results**

Equation	Statistics	Value
Equation 5	Chi-sq	<b>227.80</b>
	P-value	<b>0.86</b>
Equation 6	Chi-sq	<b>224.77</b>
	P-value	<b>0.89</b>
Equation 7	Chi-sq	<b>218.87</b>
	P-value	<b>0.95</b>
Equation 8a	Chi-sq	<b>244.78</b>
	P-value	<b>0.62</b>
Equation 8b	Chi-sq	<b>238.34</b>
	P-value	<b>0.72</b>
Equation 8c	Chi-sq	<b>251.79</b>
	P-value	<b>0.49</b>
Equation 9a	Chi-sq	<b>248.06</b>
	P-value	<b>0.56</b>
Equation 9b	Chi-sq	<b>250.51</b>
	P-value	<b>0.51</b>
Equation 9c	Chi-sq	<b>266.87</b>
	P-value	<b>0.25</b>
Equation 10a	Chi-sq	<b>243.24</b>
	P-value	<b>0.64</b>
Equation 10b	Chi-sq	<b>237.18</b>
	P-value	<b>0.74</b>
Equation 10c	Chi-sq	<b>250.71</b>
	P-value	<b>0.51</b>
Equation 11	Chi-sq	<b>592.19</b>
	P-value	<b>0.31</b>

Source: EViews Output

Note: The p-value was greater than 10 per cent. Thus the null hypothesis of homoscedastic error terms was accepted.