

Impacts of the Russia-Ukraine War Price Shocks on the Bangladesh Economy: A General Equilibrium Analysis

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BIDS Research Almanac 2023

17 – 18 May 2023

Presentation Outline

- ❖ Research Background
- ❖ Global Price Data Trend and Government Subsidy
- ❖ Methodology and Simulation Design
- ❖ Simulation Results
- ❖ Conclusion and Policy Implication

Research Background

- The spike in global commodity prices caused by the Russia-Ukraine war has created concern to many developing countries including Bangladesh that still heavily depends on several imported commodities.
- Despite having strong economic bounce after COVID-19 pandemic, this global trade shock still creates uncertainty on country's food security and its impacts on the poor who are vulnerable to any economic shocks.
- Global commodity price data indicated sharp increase for several Bangladesh key imported commodities
- Given the high dependency of Bangladesh economy on key imported commodities that are affected by Ukraine war, this study examines how global price shocks affect domestic economy, sectoral activities, income distribution and its implication on poverty.
- This study also explores the impact of policy responses by the Bangladesh government during the Russia-Ukraine war period.

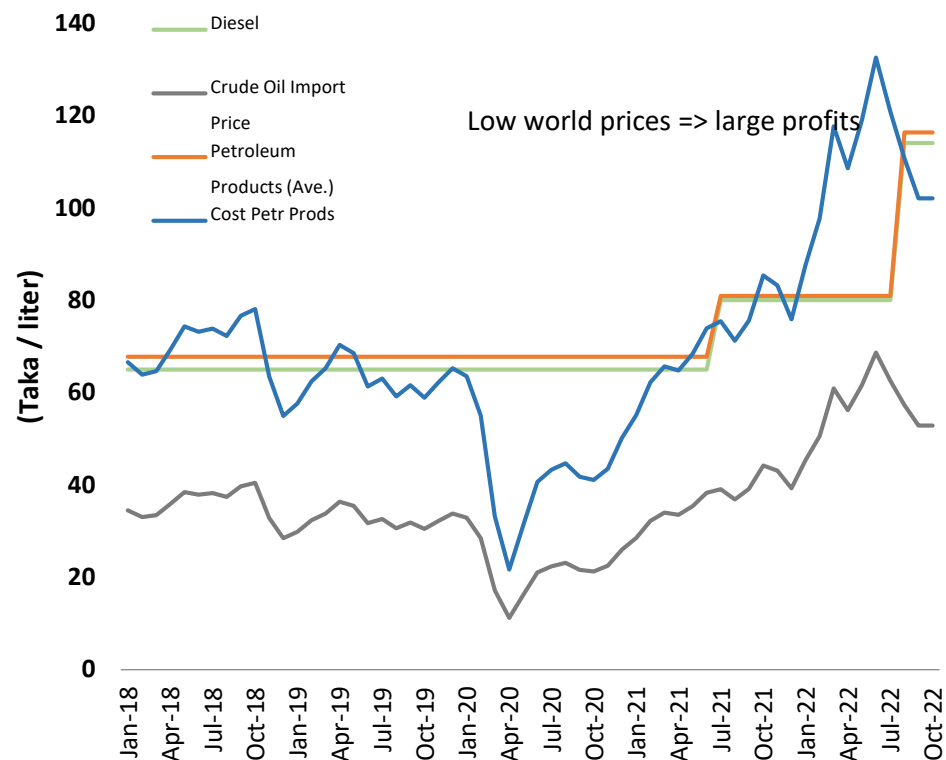
Domestic Price vs Global Price of Petroleum Products

- Domestic supply of petroleum products includes imported refined petroleum as well as domestically processed petroleum derived from crude oil.
- BPC is the institution to administer the domestic price of petroleum products .
- When international price of petroleum price increase; BPC tries to stabilize the domestic price to lessen the burden of petroleum users.
- Imports cost of crude oil and refined petroleum products per metric ton increased by 62.5% and 89% in 2022.
- However, retail price of refined petroleum products at domestic market, shows smaller increase (43.6%)[Diesel and Kerosene increased by 51 % & Octane and Petrol by 42.5 %].
- This gap between domestic & international price is due to BPC’s policy that helped cushion the increase in retail price from any large swing of international price.
- In the current simulation (Sim1), we ignore the role of BPC in stabilizing energy domestic price and only consider the increase in international price of crude oil and refined petroleum products to introduce the price shock in the model
- However, instead of referring to nominal price, Price Shock (% change in real price)” has been calculated using the formula of real price by using US CPI as deflator.

	Crude oil	Refined Petroleum Products.
Price in 2020-21 (USD/MT)	404.13	472.53
Price in 2021-22 (USD/MT)	656.51	893.69
Price change (%)	62.45	89.13
Price Shock (% change in real price)	47.69	71.95
Source: Authors’ calculation based on BPC (2022b)		

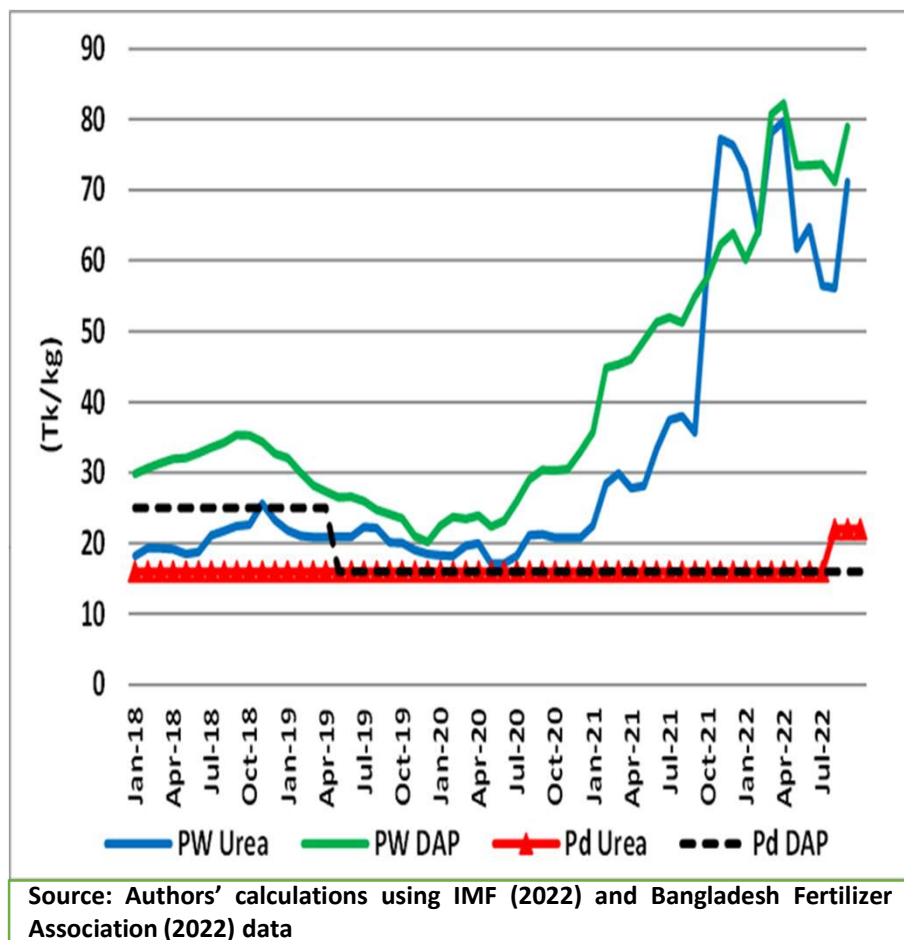
Global Petroleum Price Started to Increase in Early 2022

- Domestic price of petroleum products does not have much fluctuations (the flat lines)
- During 2018-2019: cost of petroleum products is pretty much moving along the fixed price line, which suggests the BPC did not incur any loss or gain profit.
- During 2020: the price of crude oil slumped, BPC was potentially reaping profit given the cost of producing petroleum is less than the sale price.
- Price of petroleum was only increased in July 2021; further increased in July 2022 a few months after the Russia-Ukraine war started.
- Despite the sharp rise in the import price, the domestic price was not increased immediately,
- In January-June 2022 : BPC incurred losses given the cost of producing petroleum is higher than the sales price.
- BPC used half of its profits (210 billion BDT) from the 2020 year to finance the losses (The Daily Star, 2022).
- However, BPC only had 190 billion BDT to pay import bills for the next two months of fuel consumption, price of petroleum products had to be increased. **Based on this information we estimate the amount of subsidy provided on petroleum sector during the 2022 period which is around Tk 110 billion.** This amount of subsidy is considered in our policy simulation analysis.



Source: International commodity prices are based on WB (2022); Domestic petroleum price is constructed based on BPC (2022) and cost of petroleum production is derived from crude oil input share to total petroleum output following 2019 Bangladesh SAM database (Dorosh, Pradesha, Raihan and Thurlow 2021)

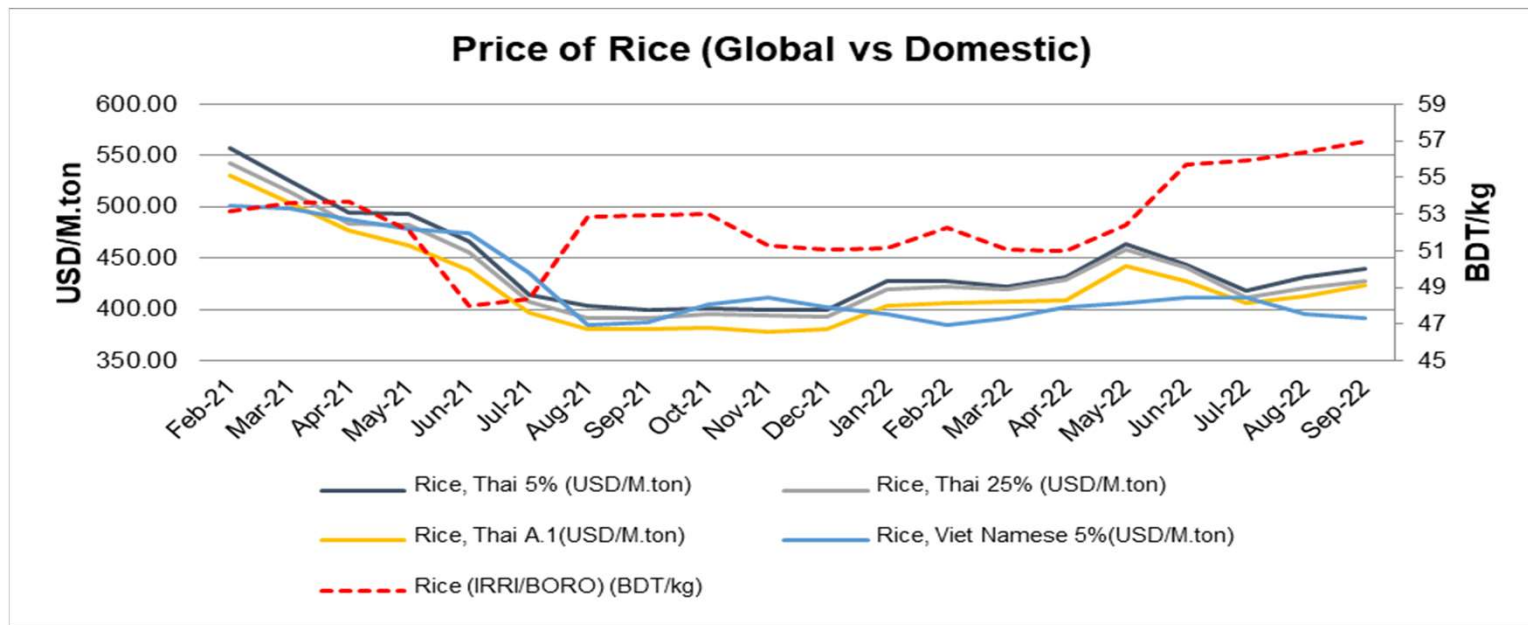
Global Fertilizer Price Started to Increase around end of 2021



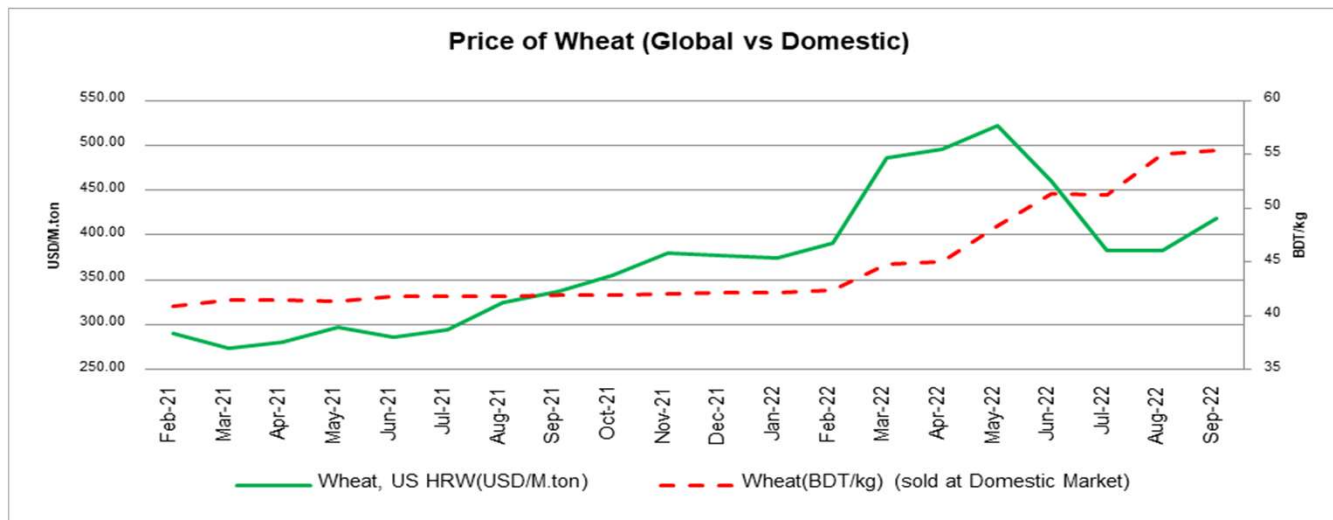
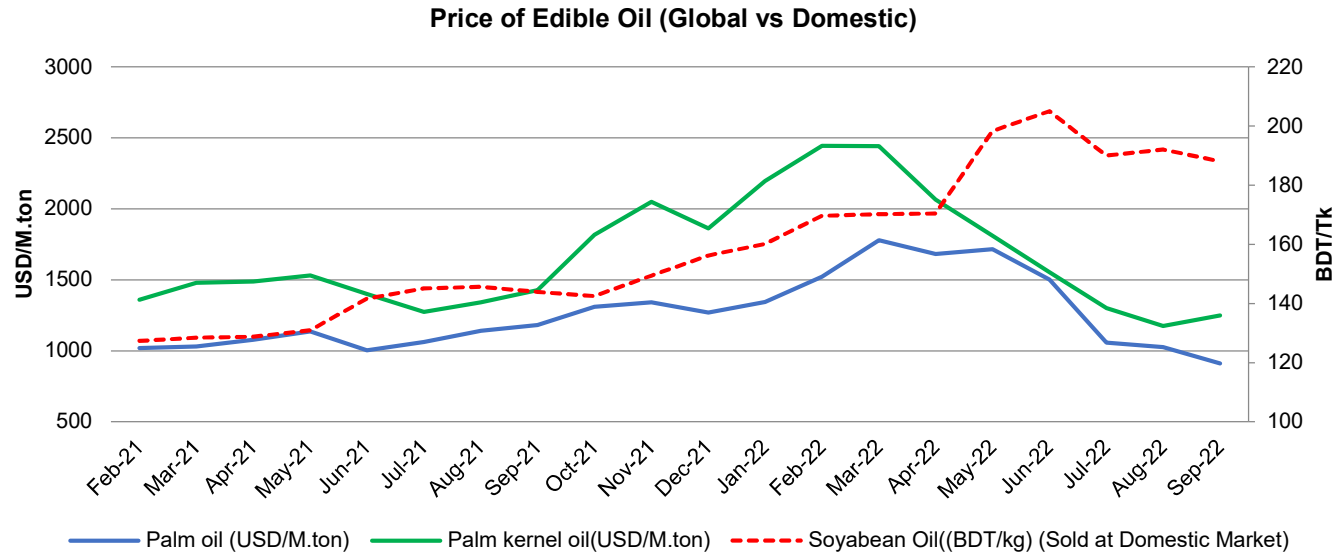
- Fertilizer price in Bangladesh is controlled by the government in order to maintain price stability.
- Despite the increased global price of urea and DAP in world markets in mid-2020; the domestic price was constant. This creates large gap between domestic and border prices and it keeps rising substantially until mid-2022.
- But, the price gap on urea started to reduce in July 2022 when the world price started heading down while government increased domestic price of urea.
- January 2021 to June 2022: the international price of urea rose from Tk 27.8 to Tk 73.7 per Kg while the domestic price was at Tk 16.0 per Kg [ratio of the domestic price to the border price fell sharply from 0.58 to 0.22].
- Over burden on government with larger subsidy to maintain domestic urea price over time.
- July 2022: the government raised the price of urea to Tk 20.5 to reduce the cost of subsidy. But, the border price of urea dropped to Tk 65.2 per Kg in this same period pushing the ratio of the domestic price to the international price to 0.27, which still indicates the large amount of subsidy provided by the government.
- Government provided Tk 40 billion of fertilizer subsidy in 2022 which was used in our policy simulation.

Food Price Gradually Increased from Middle of 2021

- Increased international price rice, wheat, maize, and edible oil increased import cost of Bangladesh up to April, 2022.
- But, domestic price of rice, maize, edible oil showed upward trend despite the fall in price of in international market starting from May 2022. And, domestic price of wheat followed a rising trend along with the persistent increase in price of wheat at international market.
- **We simulate a hypothetical price increase of all these commodities ignoring the actual fall in price in international market.** We set the world commodity price of wheat, maize and edible oils increase by 47.1 percent, 8.0 percent and 38.4 percent respectively. On the other hand, we set the world price of rice decrease by 15.6 percent

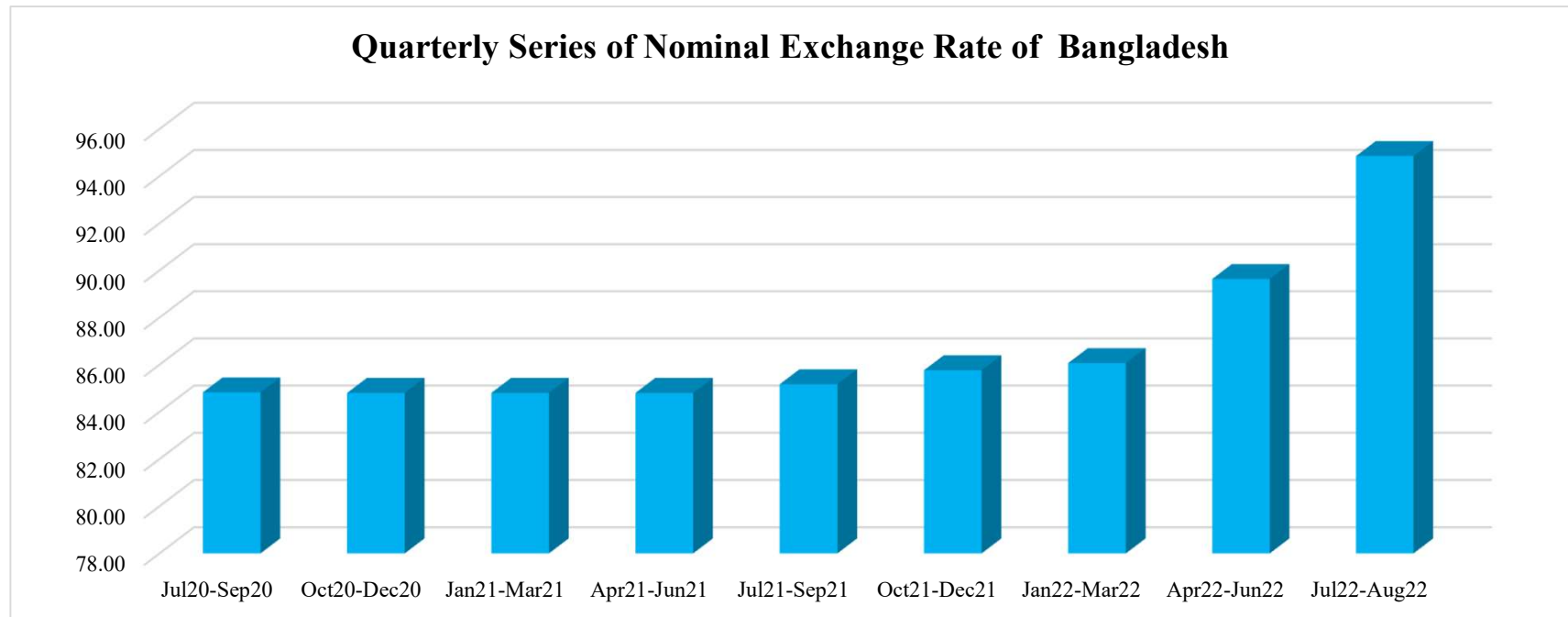


Food Price Shock (cont...)



- Source: Domestic price data is based on **BBS (2021-2022)** while international price is derived from WB (2022)

Exchange rate Devaluation

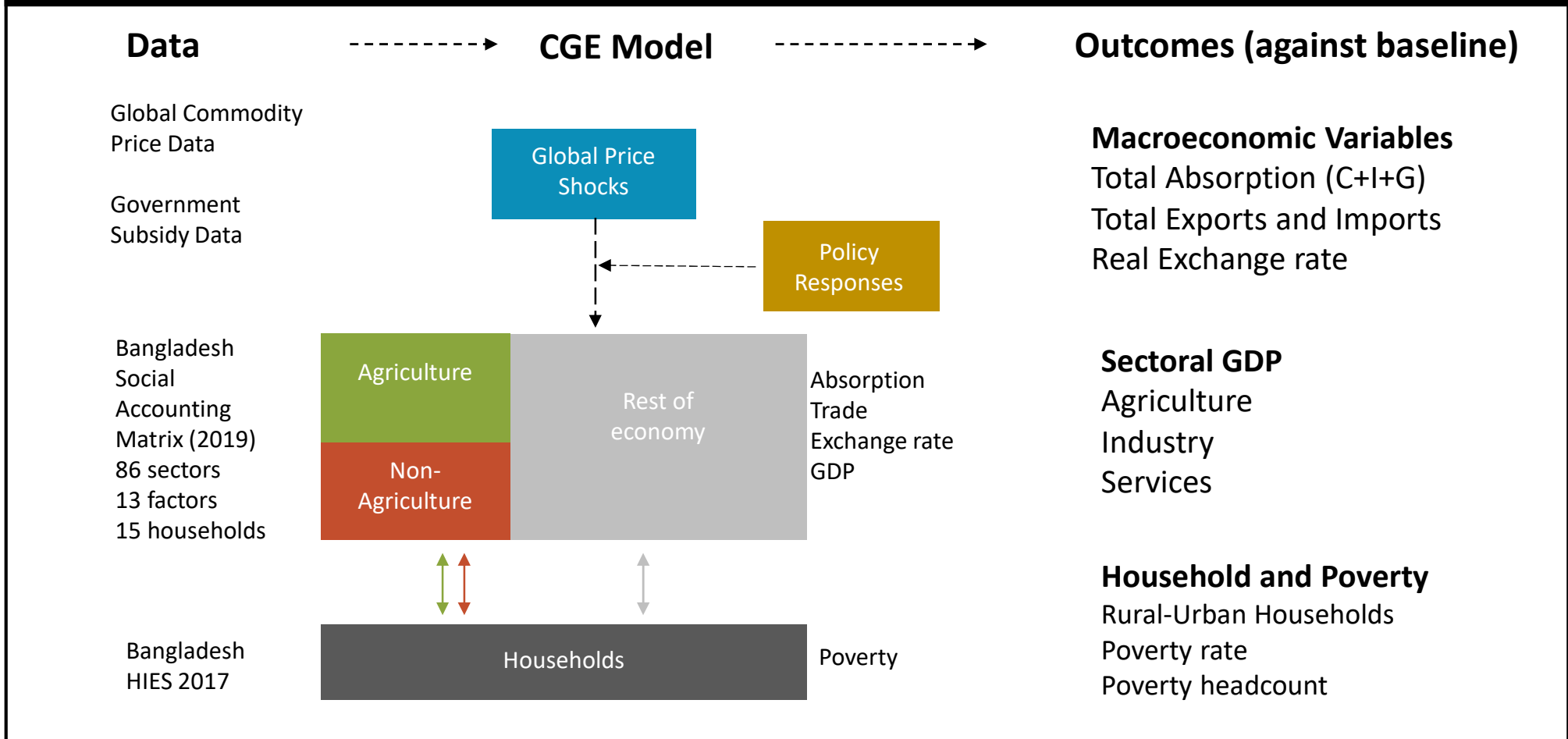


Source: Bangladesh Bank, 2022.

- We assume the country's currency is devaluated by 5 percent following the calculation based on exchange rate movement from April to August 2022.
- Average exchange rate was 89.63 Tk per USD during the period April-June 2022 and then increased up to 94.9 Tk per USD during July-August 2022.
- We assume the Ukraine war is considered as the plausible reason for the rise in the exchange rate as considered in Sim4.

Methodology

Simulation Analysis using Bangladesh RIAPA Model



Source: IFPRI RIAPA model

Simulation Design

Global Commodity Price Shocks

Simulation 1:

Increase in international price for **crude oil** and **petroleum products**

Simulation 2:

Increase in international price for **fertilizer** following and reduce **crops productivity**

Simulation 3:

Increase in international price on **food commodities** (i.e., rice, wheat, maize and edible oils)

Simulation 4:

International price shocks introduced in simulation 1, 2 and 3 with exchange rate devaluation.

Economic Policy Responses

Policy 1:

Simulation 1 plus **subsidy on petroleum products** amount for 110 billion Taka.

Policy 2:

Simulation 2 plus **subsidy on fertilizer products** amount for 40 billion Taka and **increase crops productivity**.

Policy 3:

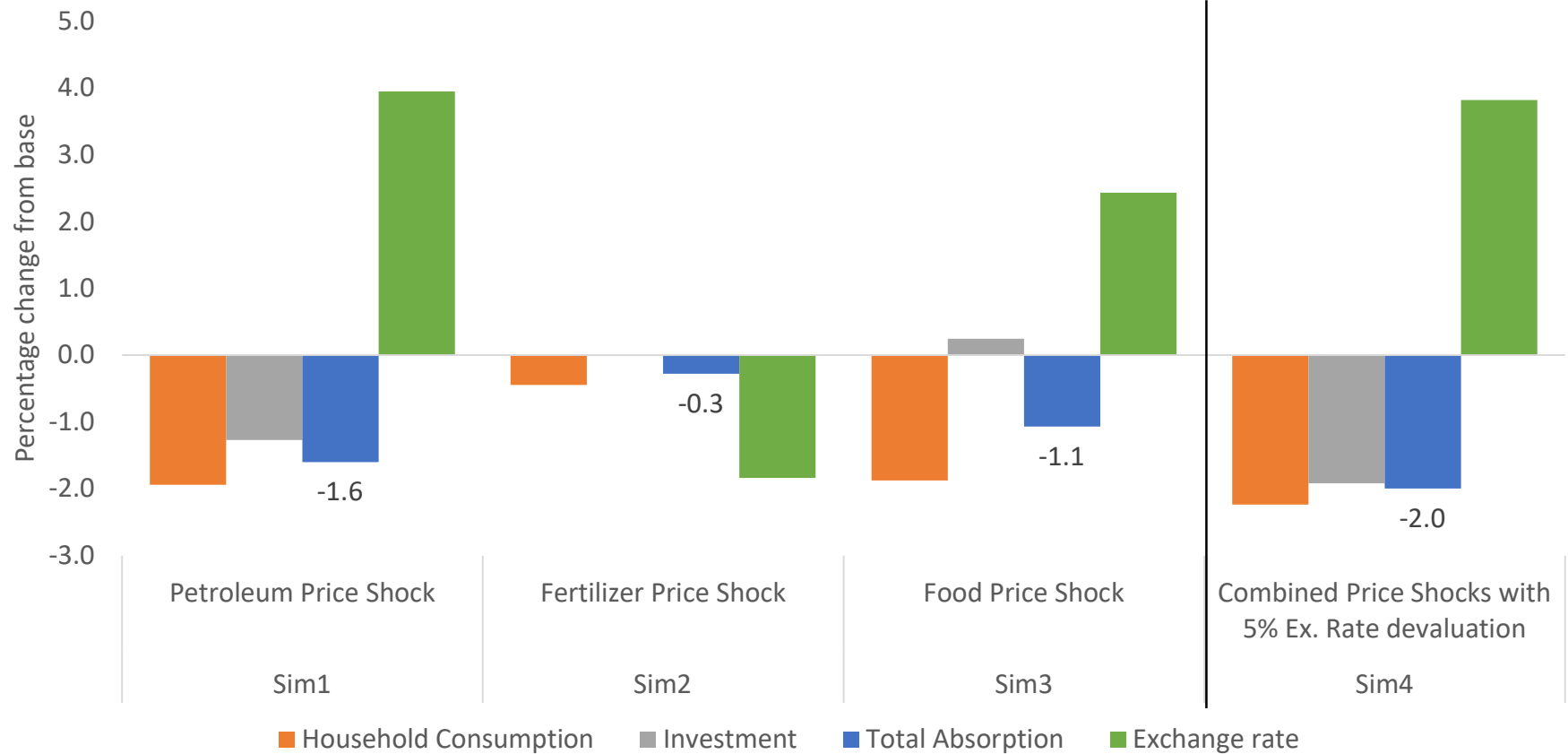
Simulation 3 plus **targeted cash transfer** to the bottom 20% of households amount for 26 billion.

Policy 4:

Simulation 4 plus all policy responses introduced in Policy 1, 2 and 3.

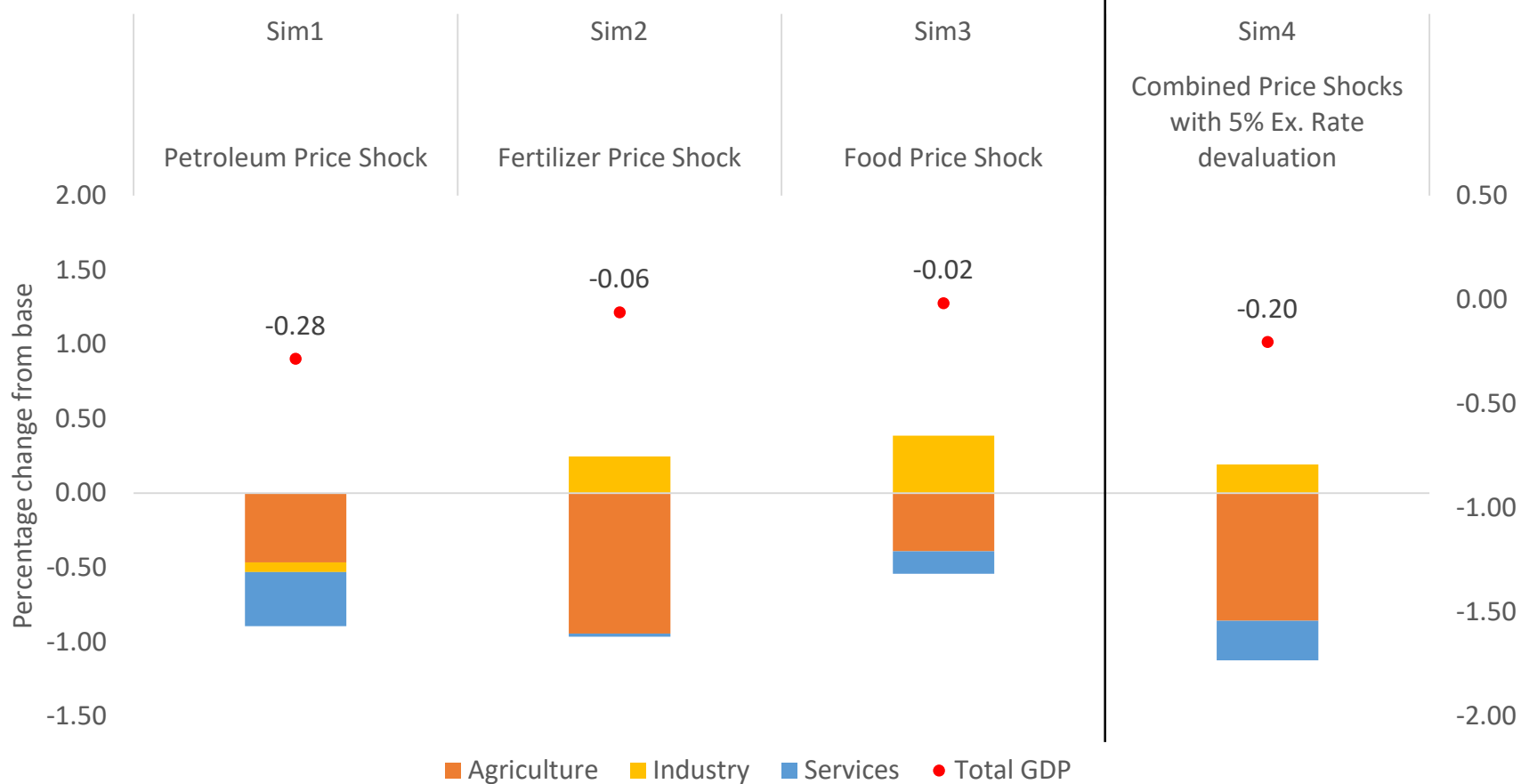
Global Price Shocks on Macroeconomic Variables

Reduction in national welfare (absorption) mainly driven by reduction in household cons.



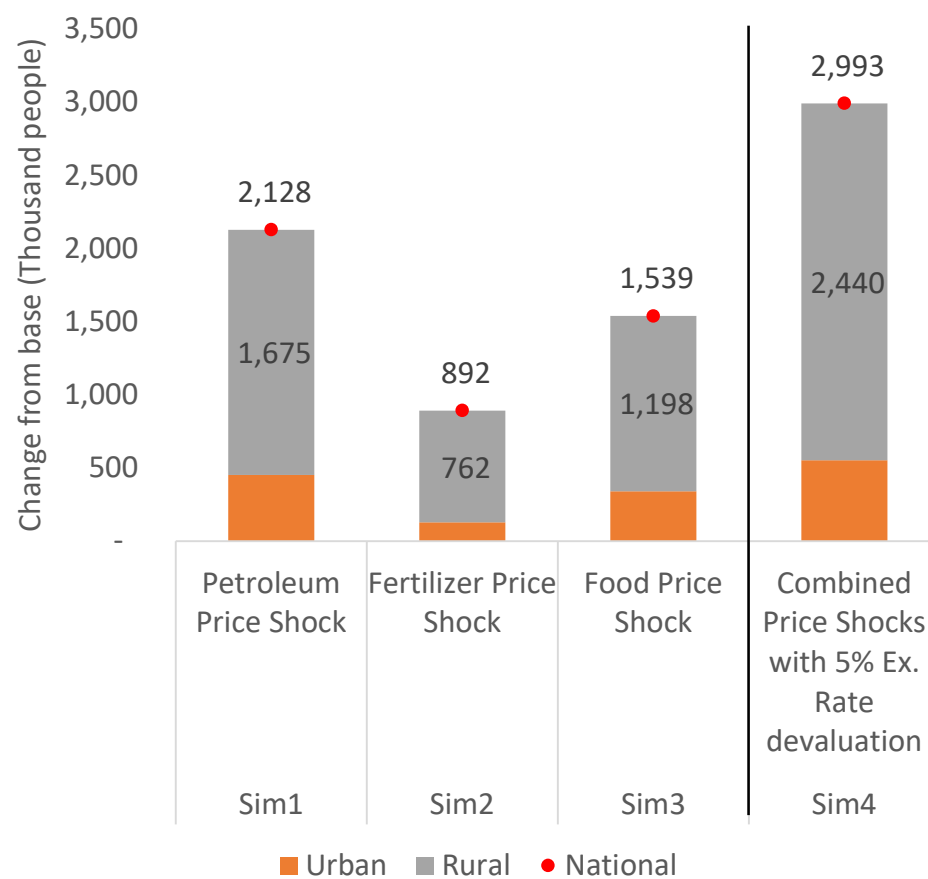
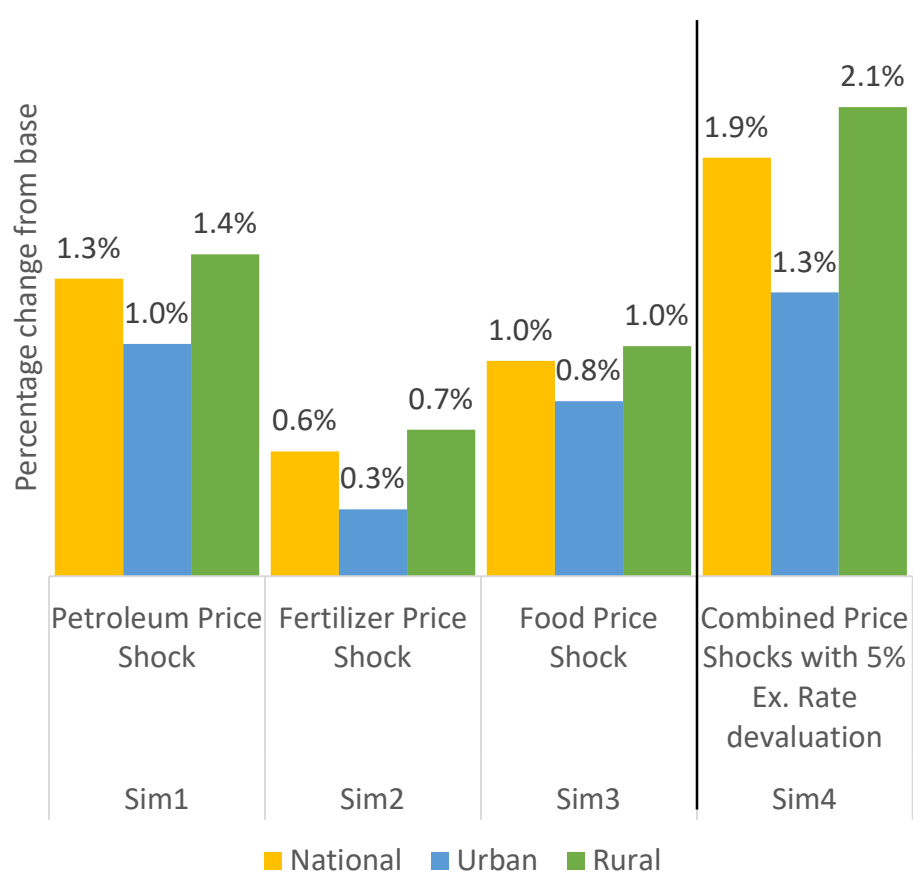
Global Price Shocks on Sectoral GDP

Agricultural GDP is the most affected sectors under all scenarios



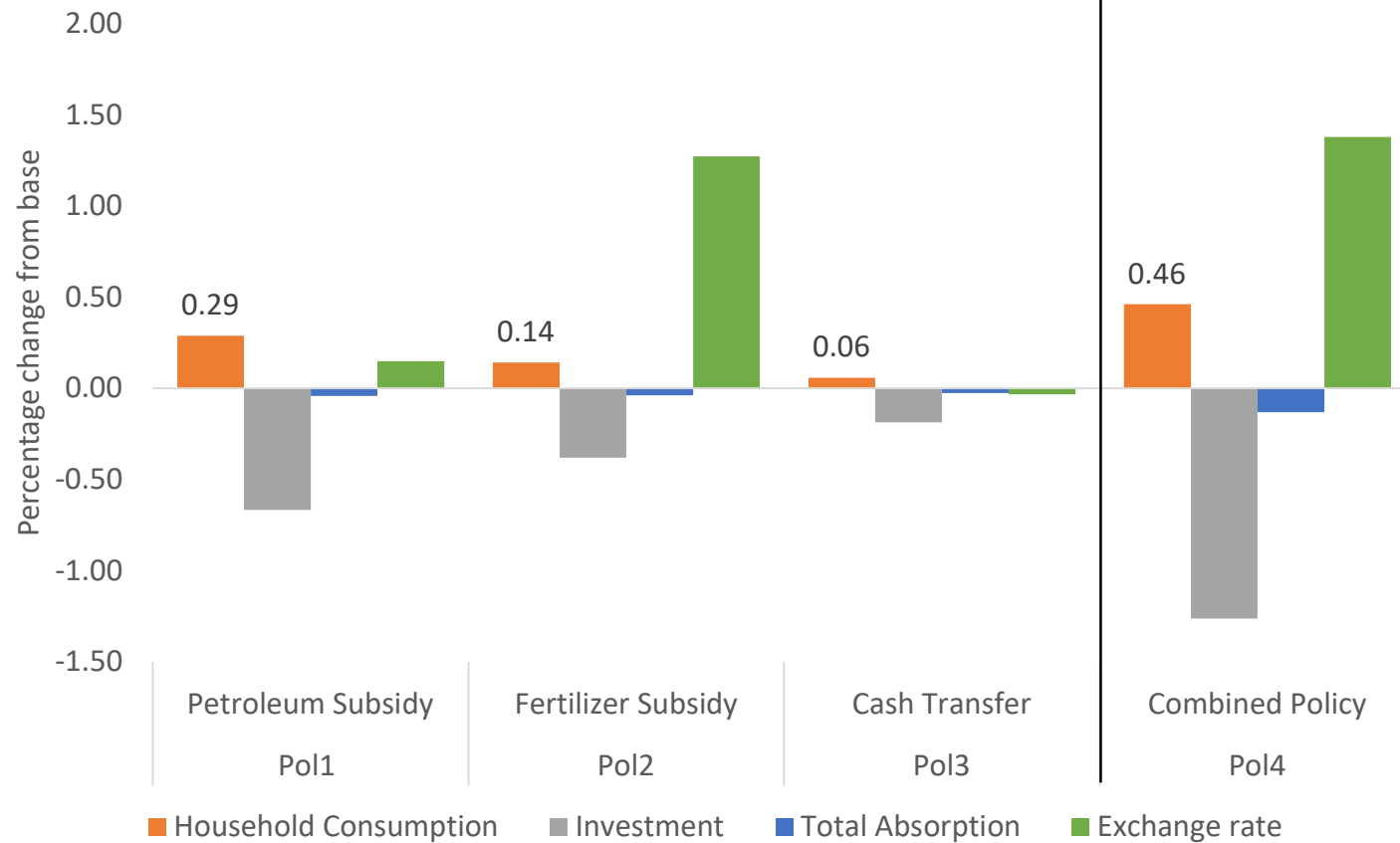
Global Price Shocks on Poverty

More people become poor especially in rural region



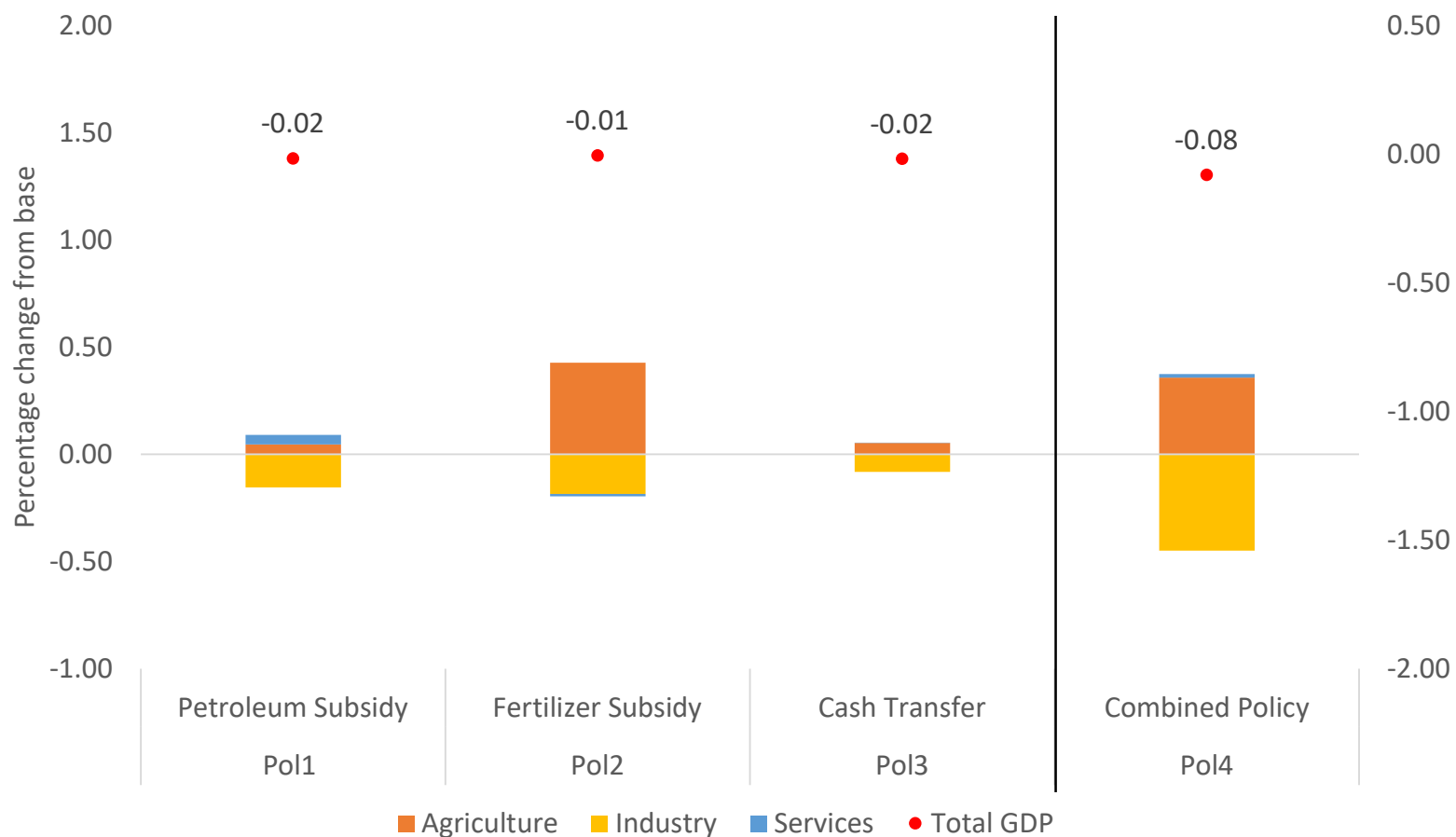
Policy Impacts on Macroeconomic Variables

Fuel subsidy increases consumption the most but with the expense of reduction in investment



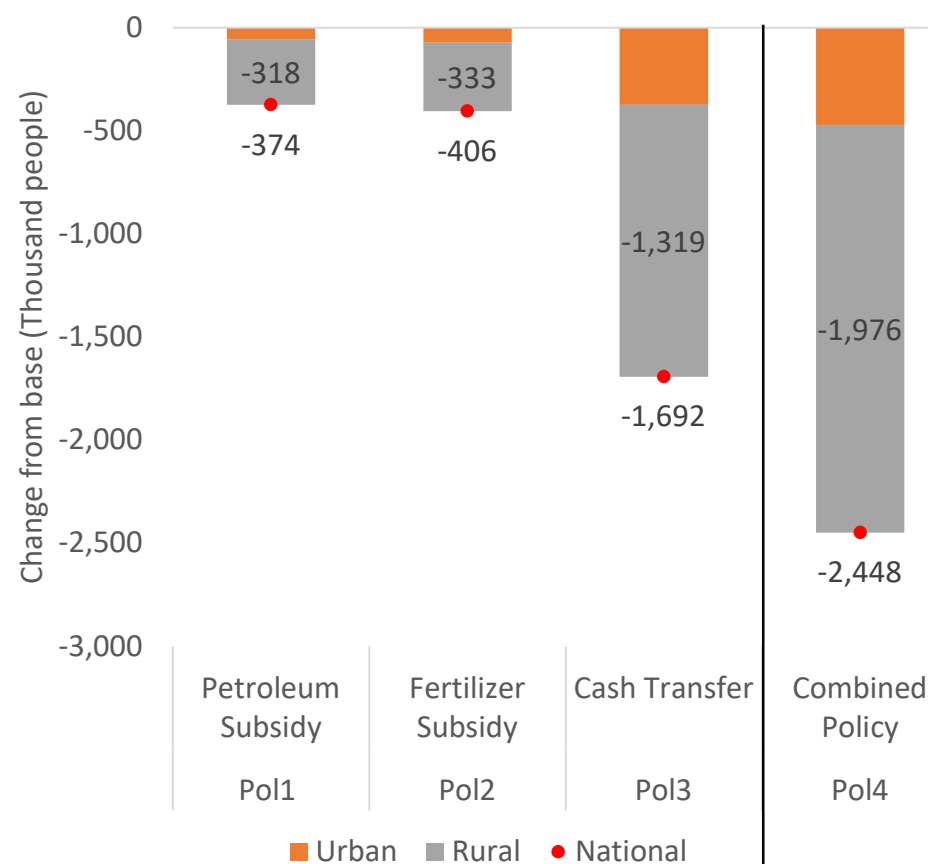
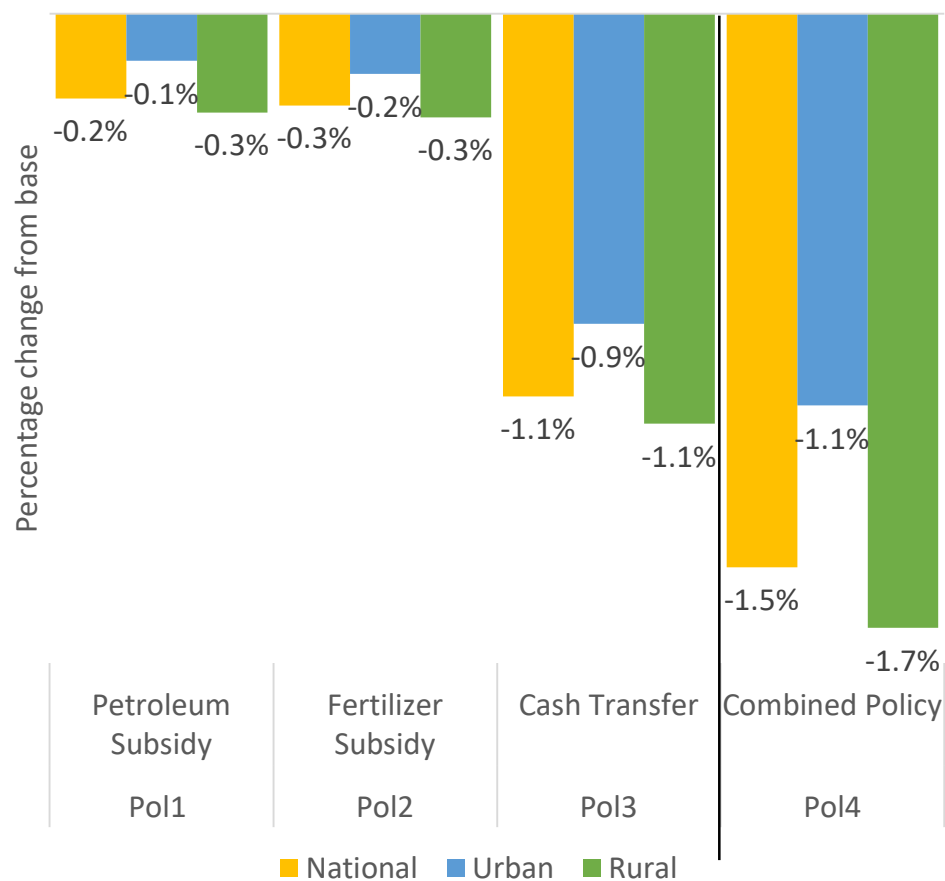
Policy Impacts on Sectoral GDP

Agricultural sector is benefited the most under fertilizer subsidy



Policy Impacts on Poverty

Targeted cash transfer program is more effective in reducing poverty



Conclusion and Policy Implications

- Spike in global commodity prices caused by Ukraine war negatively affected Bangladesh economy, reducing national welfare by 2 percent.
- Agriculture sector is the mostly affected sector given the strong interlinkages with the affected sectors.
- Rural household especially the vulnerable groups who earn most income from agriculture are worst affected, pushing around 3 million people into poverty.
- Increase in subsidy on fuel products help spur consumption, but with the cost of reduction in investment demand.
- Adding fertilizer subsidy helps increase agriculture production the most, while cash transfer is most effective in reducing poverty.
- Cash transfer program requires the least government budget than the subsidy programs but providing the highest impact in reducing poverty.
- Subsidy programs usually do not target certain population group and difficult to reverse once it is increased.

Thank you!