Impact of India's Food Security Policy across Household Types

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Global Trade Analysis Project

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Outline

- **Introduction**
  - India’s National Food Security Act of 2013
  - Objective and approach
- **Data and Model**
  - Sources and development
- **Policy Scenarios**
  - Results
- **Conclusions**
  - Future work

Introduction: India's NFSA

- **In September 2013, the Government of India passed the National Food Security Act 2013 (NFSA) also called the Right to Food Act,**
  - The NFSA aims to provide subsidized food grains to nearly two thirds India's population
- **Covers 75% of the rural population and 50% of the urban population**
  - "Priority" Group (BPL) : 46% rural and 28% urban
  - "General" Group (APL) : 28% rural and 22% urban
- **NFSA is regarded as the biggest experiment in the world to achieve food and nutritional security (Gulati et al. 2012)**

Introduction: India's NFSA

- **The NFSA entitlement is 35 kg of food grains per "Priority" household per month at issue prices of:**
  - 4.5¢ per kg of rice
  - 3.0¢ per kg of wheat
  - 1.5¢ per kg of coarse grains (millets).
- **For "General" group, the NFSA entitlement is 20 kg of food grains per household per month at 50% of the minimum support price**
- **Full implementation of the NFSA is estimated cost $22 billion and with more than 60 million tons of food grains**

Introduction: India’s NFSA

- **NFSA entitles pregnant women, lactating mothers, and children from 6 months to 14 years to a FREE nutritious “take home ration” of 600 calories and $100 as maternity benefit for six months**
  - Not accounted for it here
- **Adoption of NFSA still ongoing by the states**

India’s Subsidy Costs

Subsidy	2014-2015 (USD billion)	2015-2016 (USD billion)
Food Subsidy (NFSA)	20.45 (14.75)	20.74 (10.83)
Fertilizer Subsidy	11.83	12.16
Petroleum Subsidy	10.05	5.00
Total Subsidy	42.33	37.90

Source: Budgets from Government of India (2015)

Objective

- To analyze the impact of NFSA, in an economy wide framework that accounts for multiple household types and multiple endowment factors

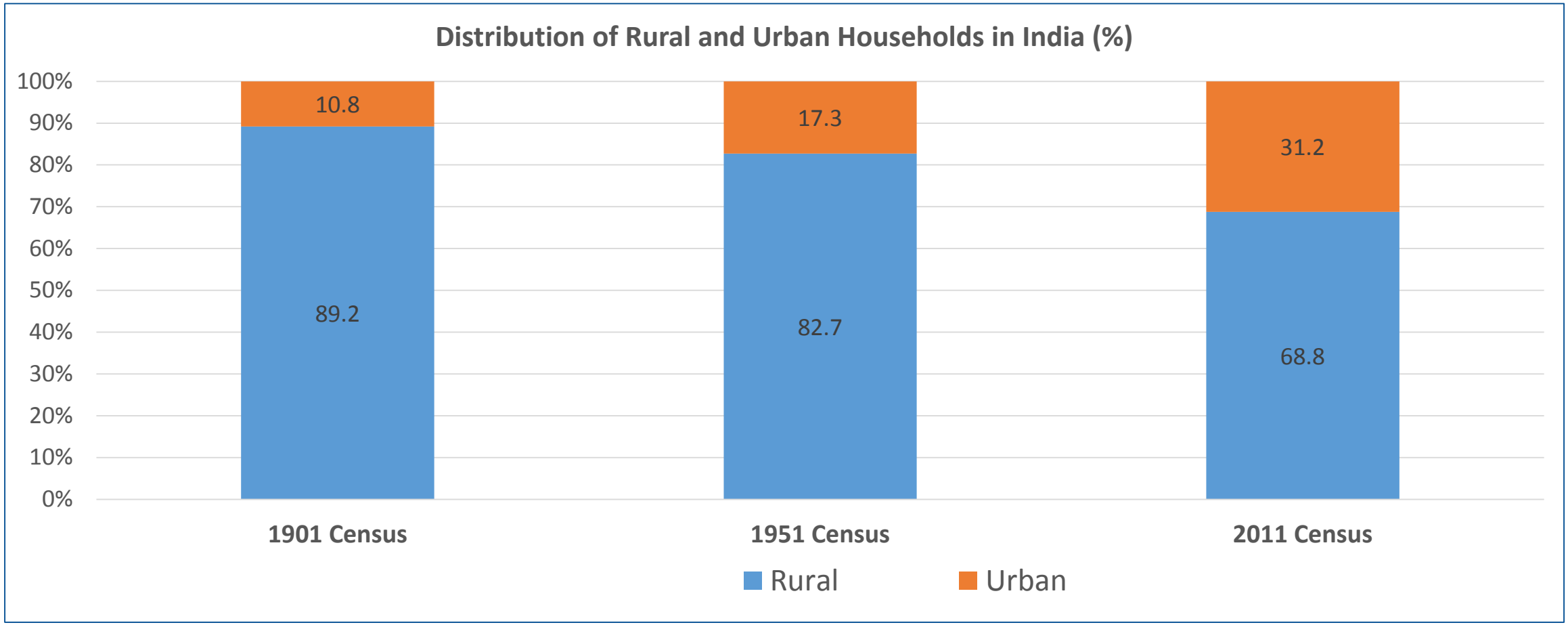
Data Sources

- **GTAP v8.1 data base**
  - 2007 ref. year, 134 regions and 57 sectors (Narayanan et al. (Ed.), 2012)
- **India's National Sample Survey**
  - data on income and expenditure, by quintiles
- **India's Census data**
  - For rural and urban households classification

Data work

- **GTAP data base for all countries except for India**
- **For India, we use the MyGTAP data program (Minor and Walmsley, 2013) to split the households and factors:**
  - Household consumption share across all sectors,
  - Factor ownership shares,
  - Shares on factor use, and
  - Households savings rate

Rural vs. Urban Households in India



Final Data Base

- The resulting data base from MyGTAP data program includes five categories of households each in rural and urban categories of India (hhr1 hhr2, hhr3, hhr4, hhr5; hhu1, hhu2, hhu3, hhu4, hhu5)
- The labor in India is classified as: unsk_rural, unsk_urban, skl_rural, skl_urban
- The capital in India is classified as agricultural and other capital: AgCapital and OCapital;
- The data base is aggregated to 10 regions and 28 sectors

Disaggregation of Sectors

	Sectors	Description		Sectors	Description
1.	PaddyRice	Paddy rice	15.	BeverTobac	Beverages & tobacco
2.	**Wheat**	Wheat	16.	**ProcRice**	Processed Rice
3.	CrGrains	Cereal grains	17.	VegOil	Other food products
4.	VegsFruits	Vegetables & fruits	18.	Sugar	Processed Sugar
5.	Oilseeds	Oilseeds	19.	ProcRum	Processed Ruminants
6.	Sugarcrops	Sugar crops	20.	ProcNRum	Processed Non Ruminants
7.	PlantFibres	Plant Fibers	21.	Coal	Coal
8.	OthAgri	Other Agri. Crops	22.	CrudeOil	Crude oil
9.	Ruminant	Ruminant Livestock	23.	Electricity	Electricity
10.	NonRumnt	Non Ruminants	24.	NGas	Natural Gas
11.	DairyPrdts	Dairy Farms & its products	25.	Oil_pcts	Petroleum & coal products
12.	Forestry	Forestry	26.	Water	Water sector
13.	Fishery	Fishing sector	27.	En_Int_Ind	Energy intensive industries
14.	FoodPrd	Food products	28.	Oth_Ind_Se	Other industry and services

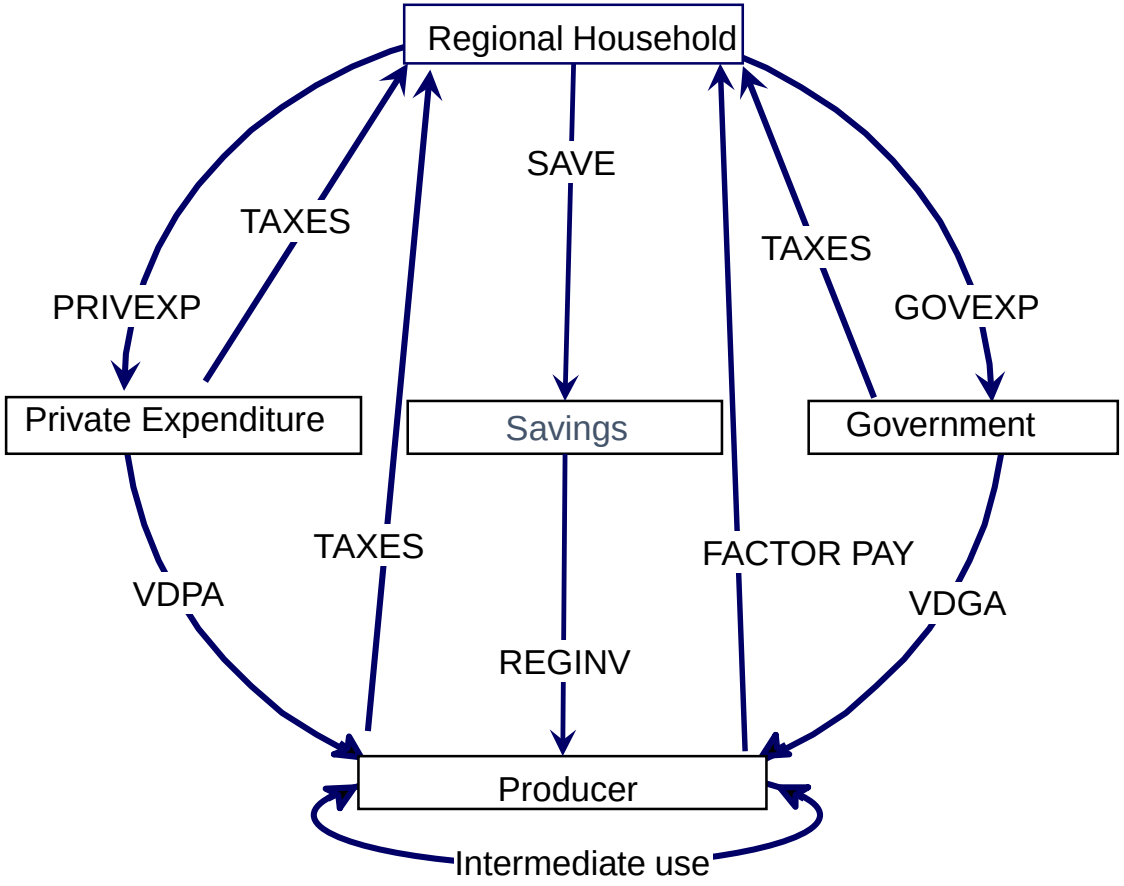
Disaggregation of Regions

	Regions	Comprising of:
1.	**India**	ind
2.	USA	usa
3.	EU27	aut bel cyp cze dnk est fin fra deu grc hun irl ita lva ltu lux mlt nld pol prt svk svn esp swe gbr bgr rou
4.	China	chn hkg
5.	RoSEAsia	jpn kor mng twn xea khm idn lao mys phl sgp tha vnm xse bgd npl pak lka xsa
6.	MENA	bhr irn isr kwt omn qat sau tur are xws egy mar tun xnf
7.	SSAfrica	ben bfa cmr civ gha gin nga sen tgo xwf xcf xac eth ken mdg mwi mus moz rwa tza uga zmb zwe xec bwa nam zaf xsc
8.	Brazil	bra
9.	LatinAmerica	mex xna arg bol chl col ecu pry per ury ven xsm cri gtm hnd nic pan slv xca xcb
10.	RestofWorld	aus nzl xoc can che nor xef alb blr hrv rus ukr xee xer kaz kgz xsu arm aze geo xtw

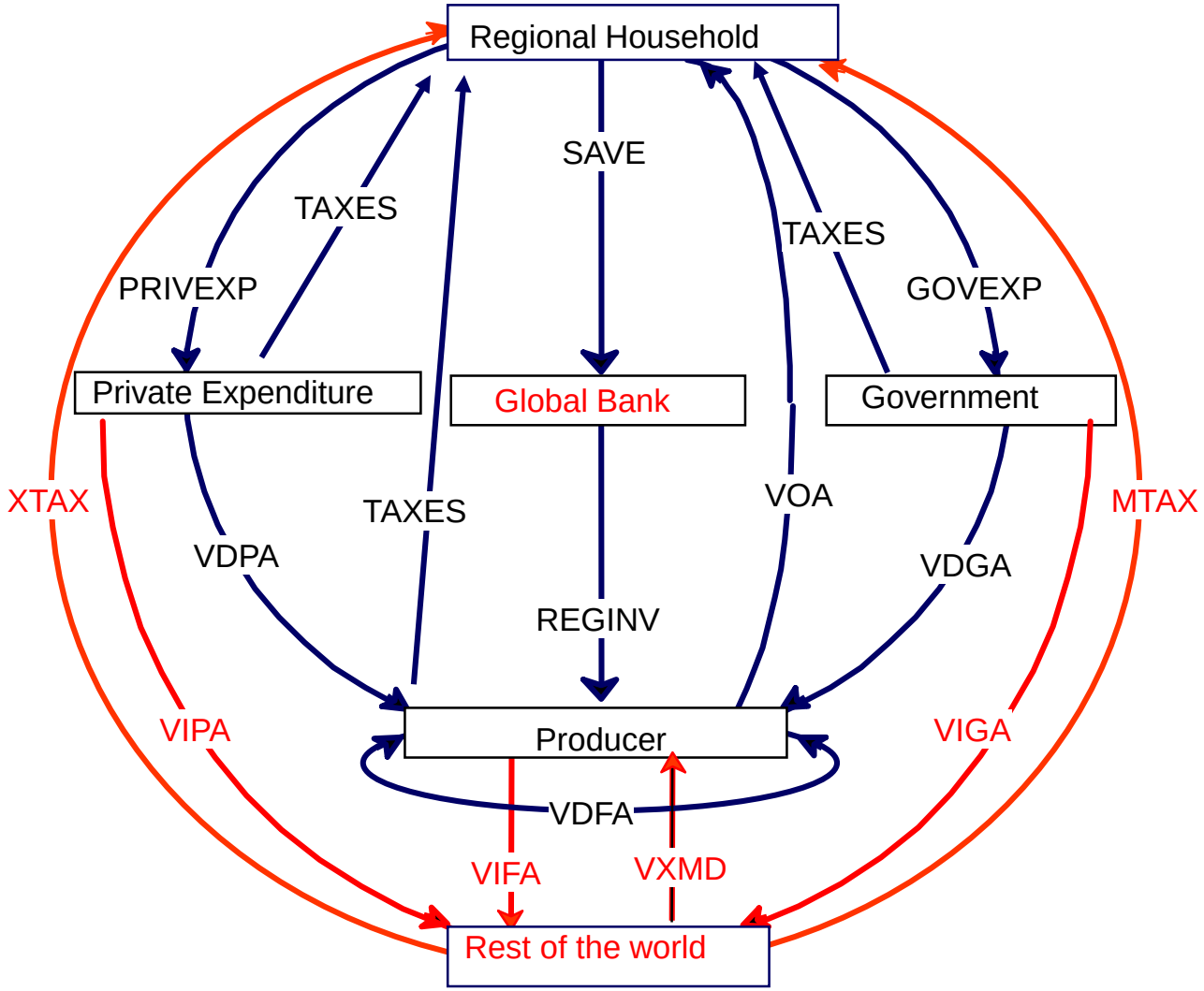
MyGTAP Model

- **Standard GTAP relationships, except for country of interest**
- **Government income**
  - Receives all tax revenues
  - Accounts for net foreign aid flows
- **Multiple regional households income**
  - Factor payments, allows for government transfers
  - Accounts for net remittances
- **Government and Private Savings determine country savings**

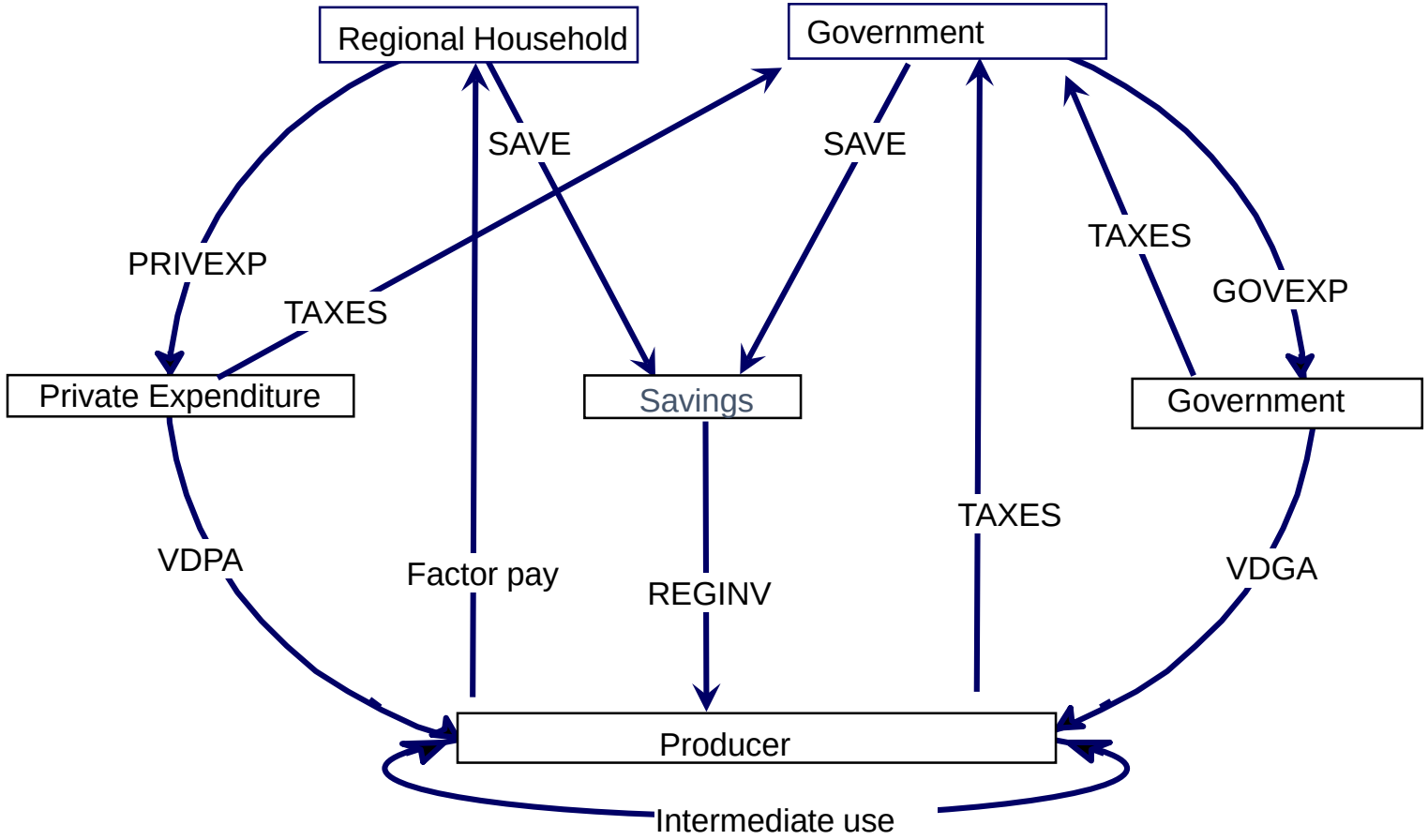
GTAP Model: One region



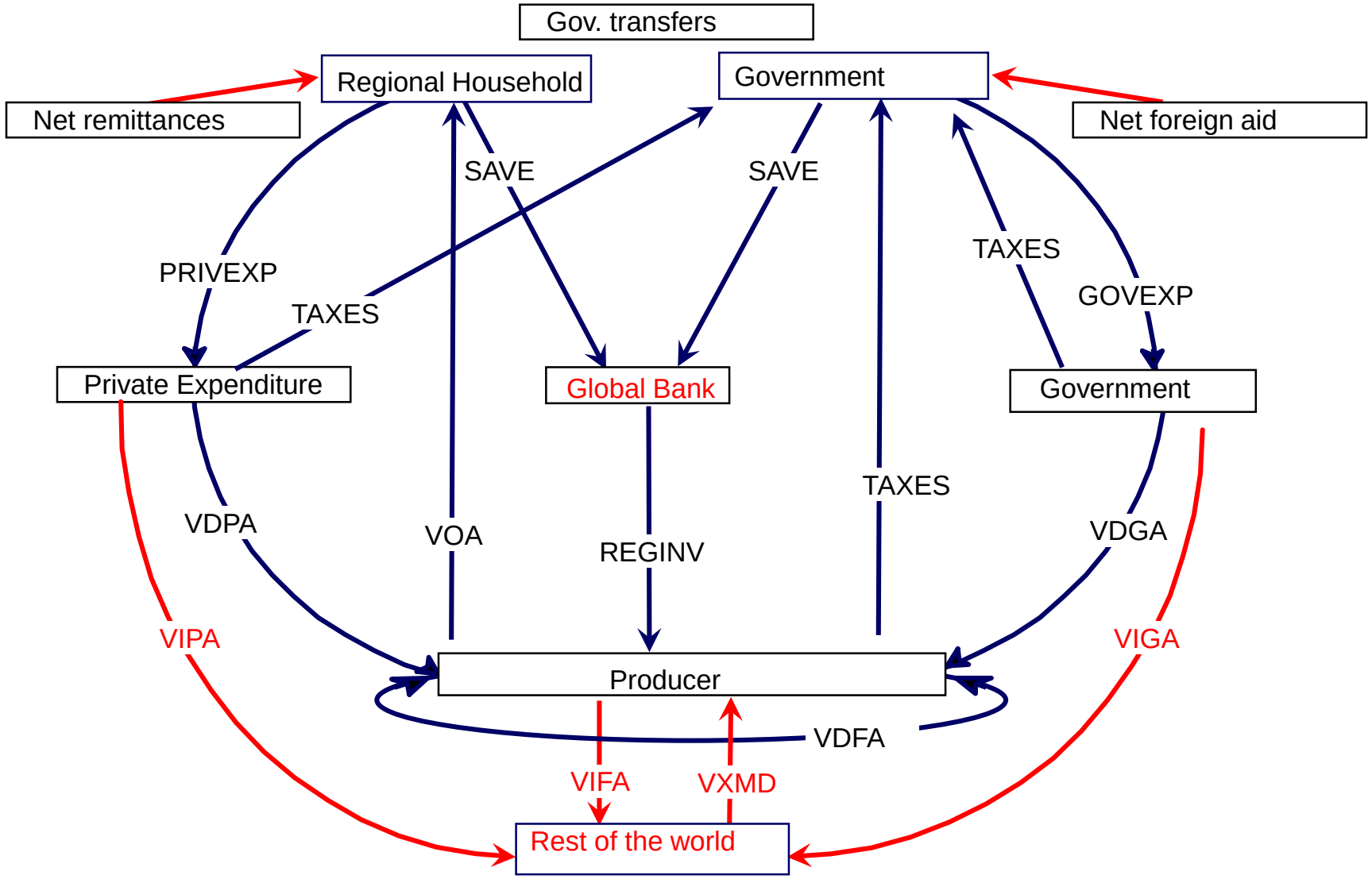
GTAP Model


Regional Household
SAVE
TAXES
TAXES
PRIVEXP
GOVEXP
Private Expenditure
Global Bank
Government
XTAX
TAXES
VOA
MTAX
VDPA
VDGA
REGINV
VIPA
VIGA
Producer
VDFA
VIFA
VXMD
Rest of the world

MyGTAP Model: One region



MyGTAP Model: Multi-region



Experimental Design

- **Scenario A. Implementing NFSA**
  - We compute the power of the *ad valorem* equivalent (ADV) subsidy provisions for Processed Rice and Wheat
  - Implement different magnitudes of subsidy shocks across the selected households: hhr1 hhr2, hhr3, hhr4; hhu1, hhu2
- **Scenario B. Removal of Food Consumption Subsidy**
  - Based on the policy distorted economy from (A), we fully remove food consumption subsidies (different magnitudes) across all the ten rural and urban household types (including pre-NFSA consumption subsidies)

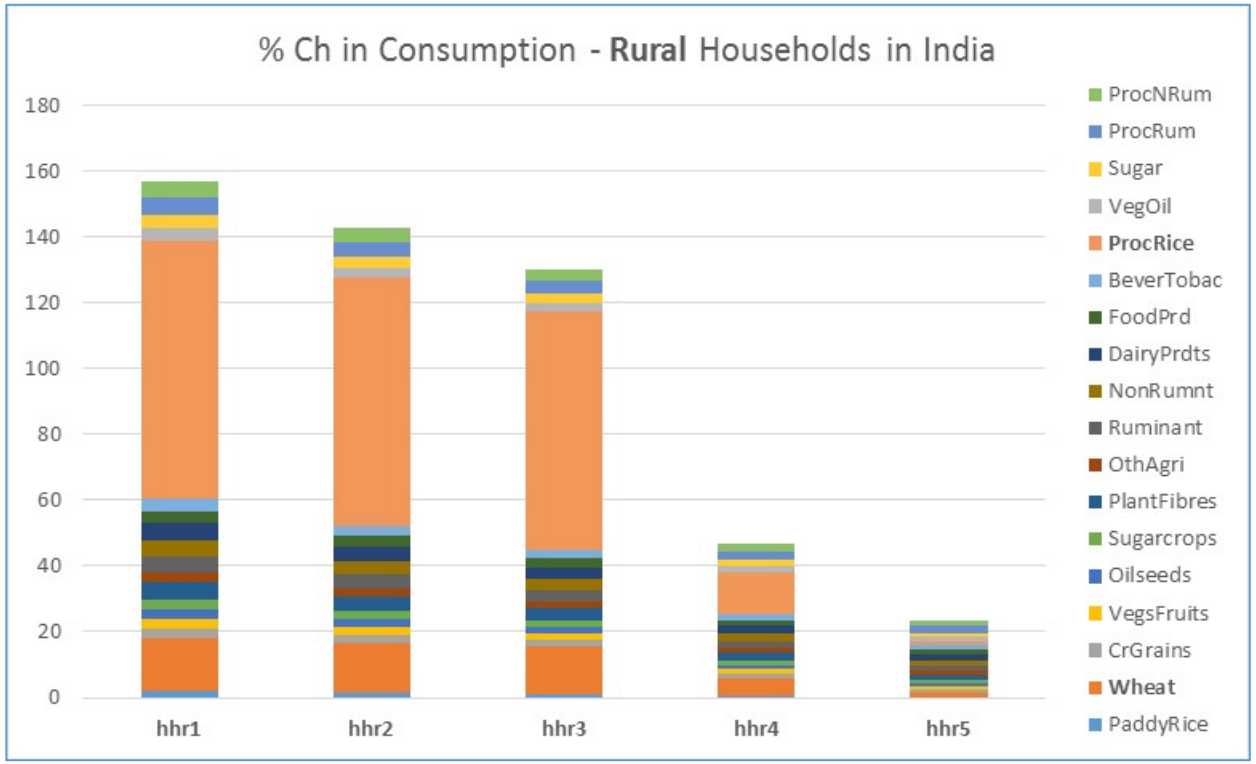
Experimental Design

- **Scenario C. Income Transfers**
  - Based on the population weights as well as the total subsidy cost implicit in NFSA (22 billion US$),
    - we simulate income transfers to 4 bottom quintiles of the rural and 2 bottom quintiles of the urban households.

Scenario A

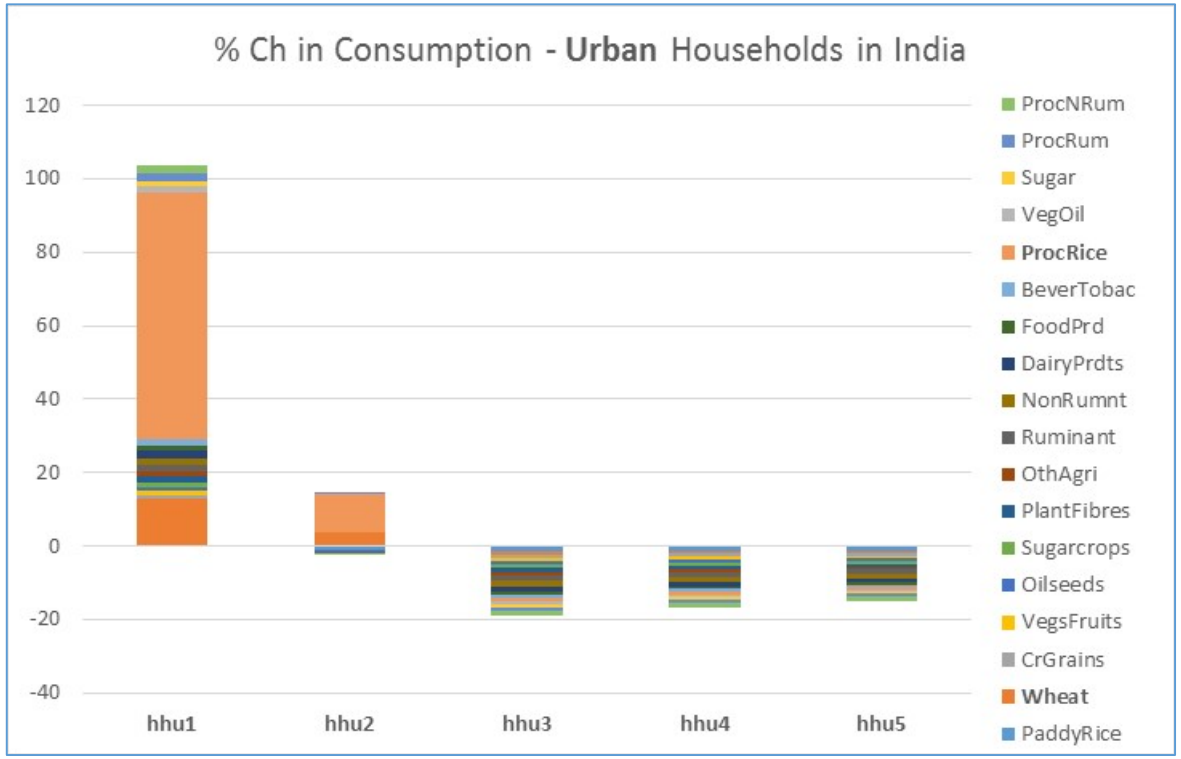
Implementing Food Subsidies

Results A: Change in Consumption across Rural HH (%)



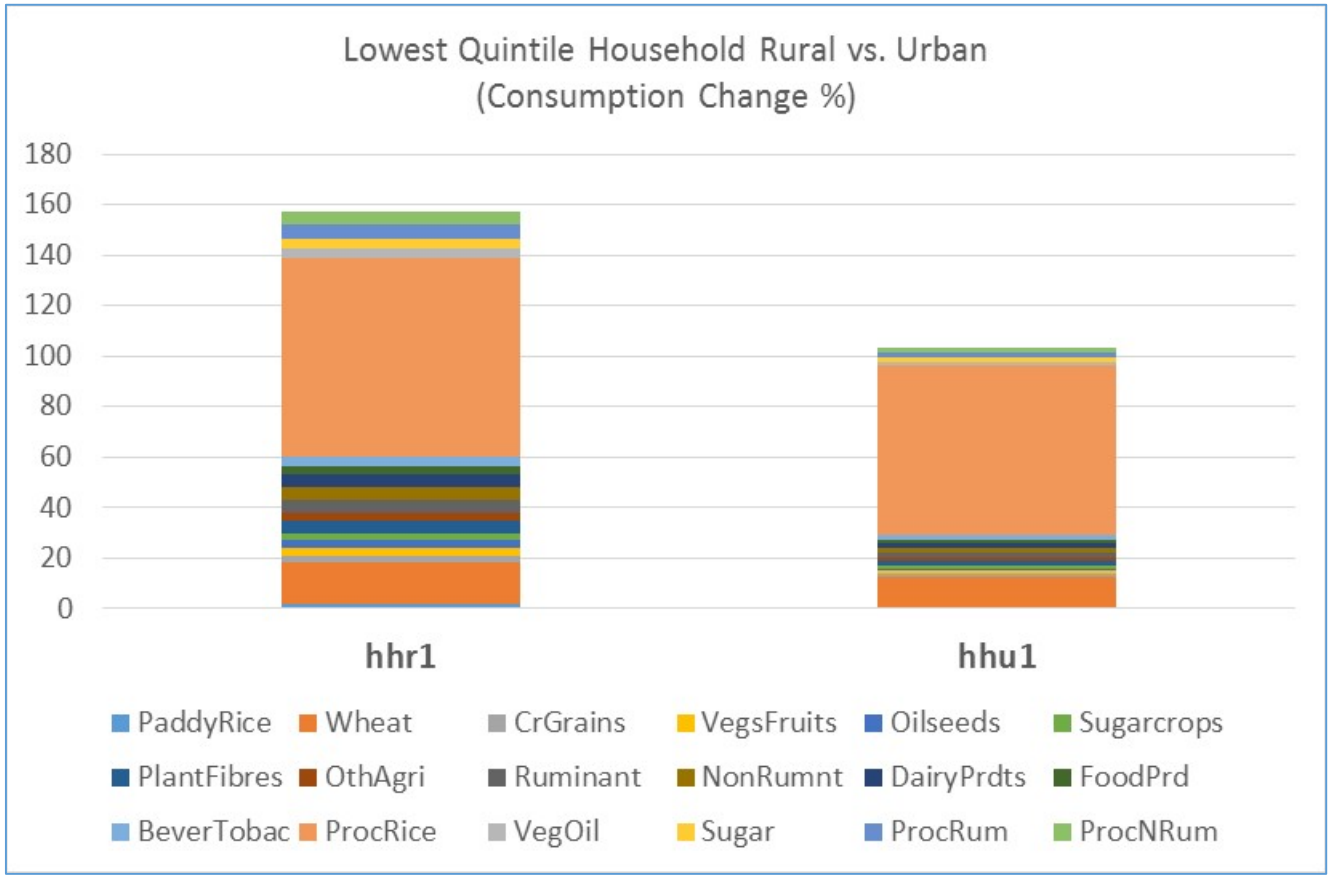
- Dramatic consumption changes in BPL households (hhr1, hhr2, hhr3)
- In the lowest quintile rural household, consumption of processed rice increase by >78% and that of wheat increased by >16%.
- Slight increase in consumption of other commodities (meat, other food categories).

Results A: Change in Consumption across Urban HH (%)



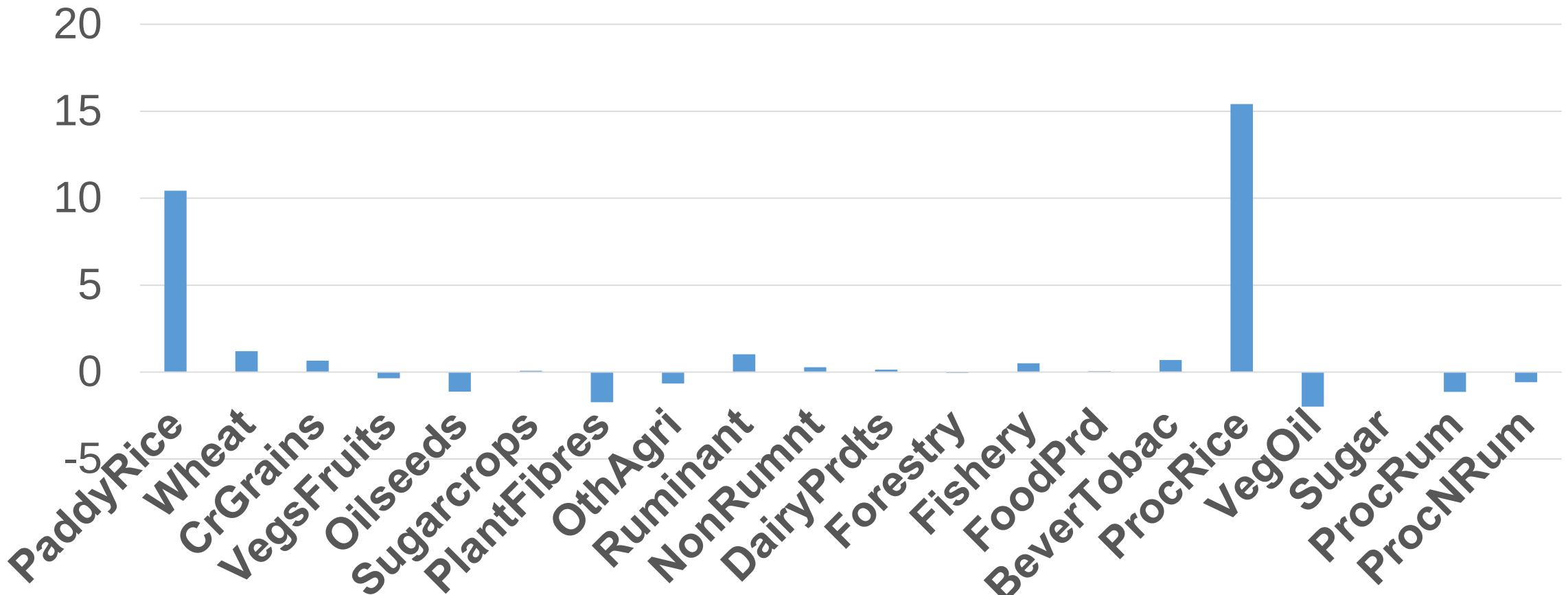
- Only the lowest quintile urban household showed significant increase in consumption of processed rice (>67%) and that of wheat (>12%)
- Slight increase in consumption of other commodities (meat, other food categories).

Results A: Urban vs. Rural - Lowest Quintile HH Consumption (%)

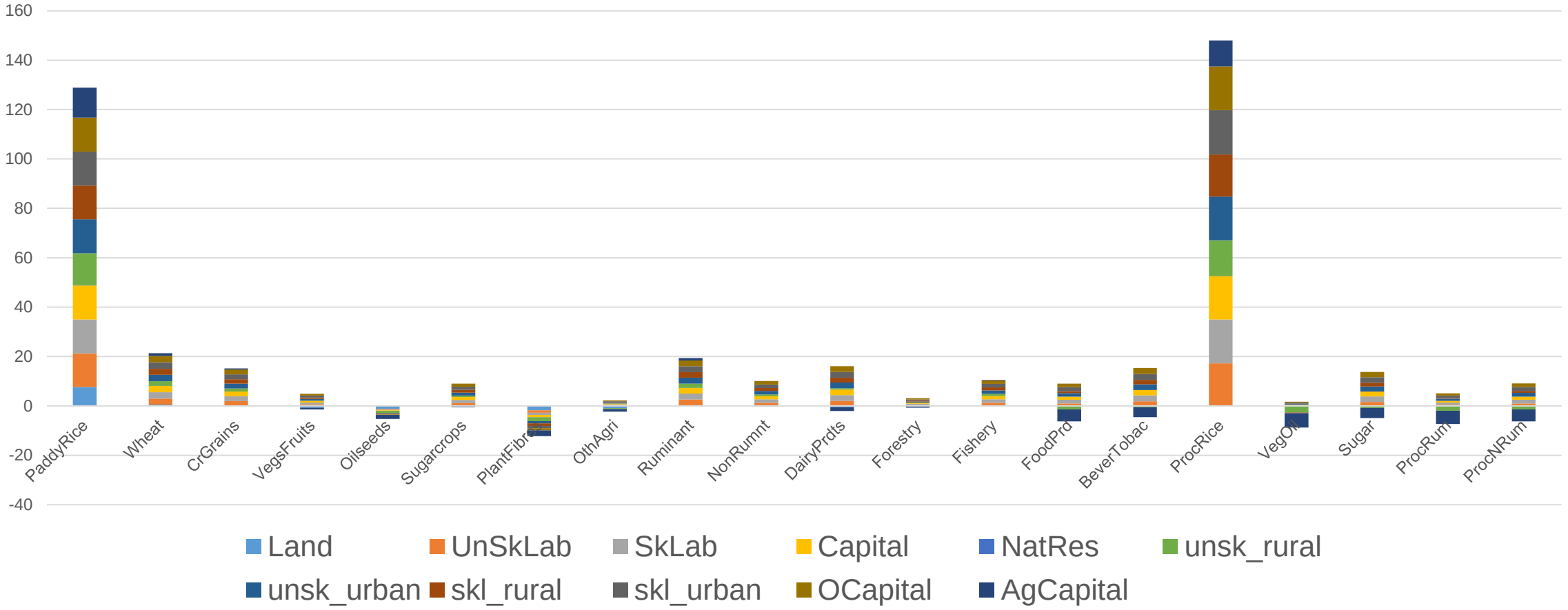


- Though magnitude of the subsidy shock was same across the rural and urban lowest quintile households, impact on change in consumption of food differ considerably,

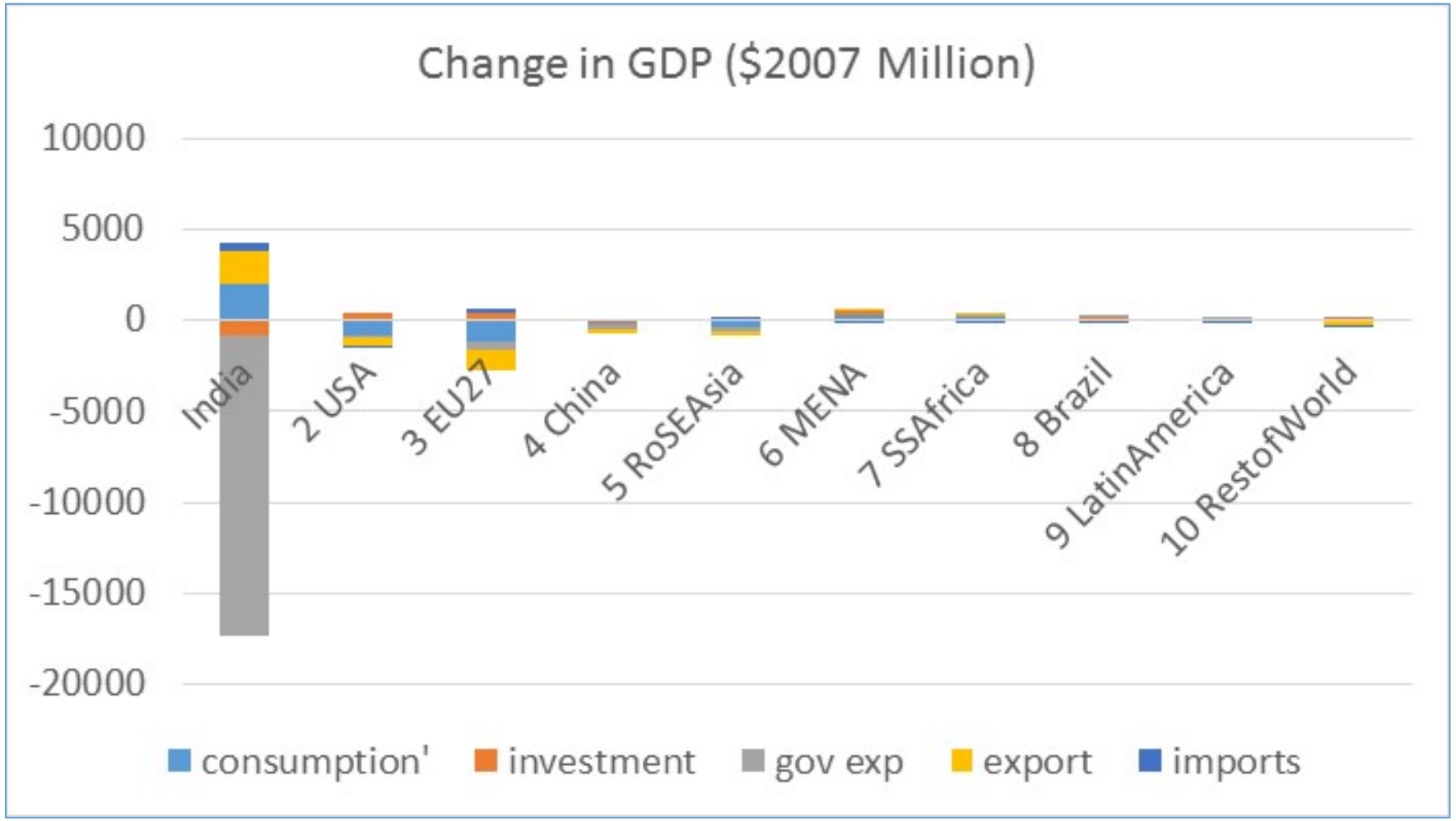
Results A: % Change in output



% change in the demand for value added



Results A: Ch. in GDP ($2007 Million)

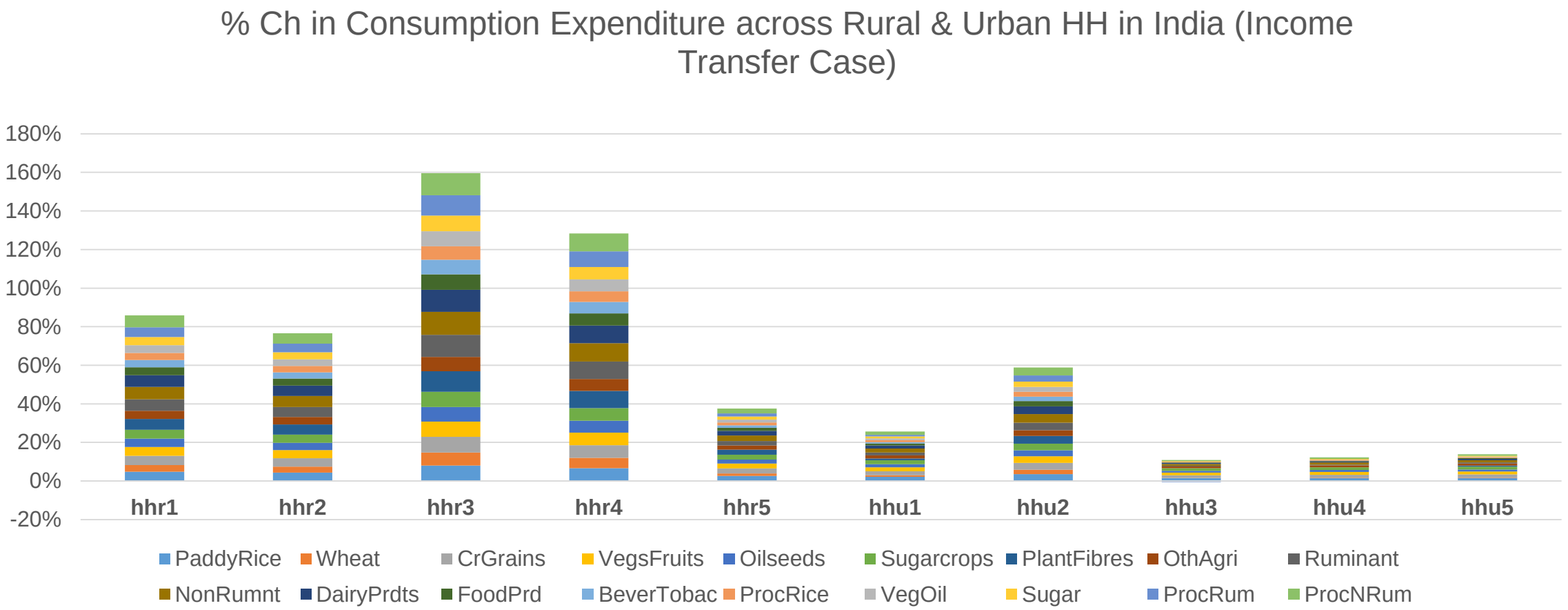


GDP in India dropped by about USD13 billion, mainly due to drop in government expenditure.

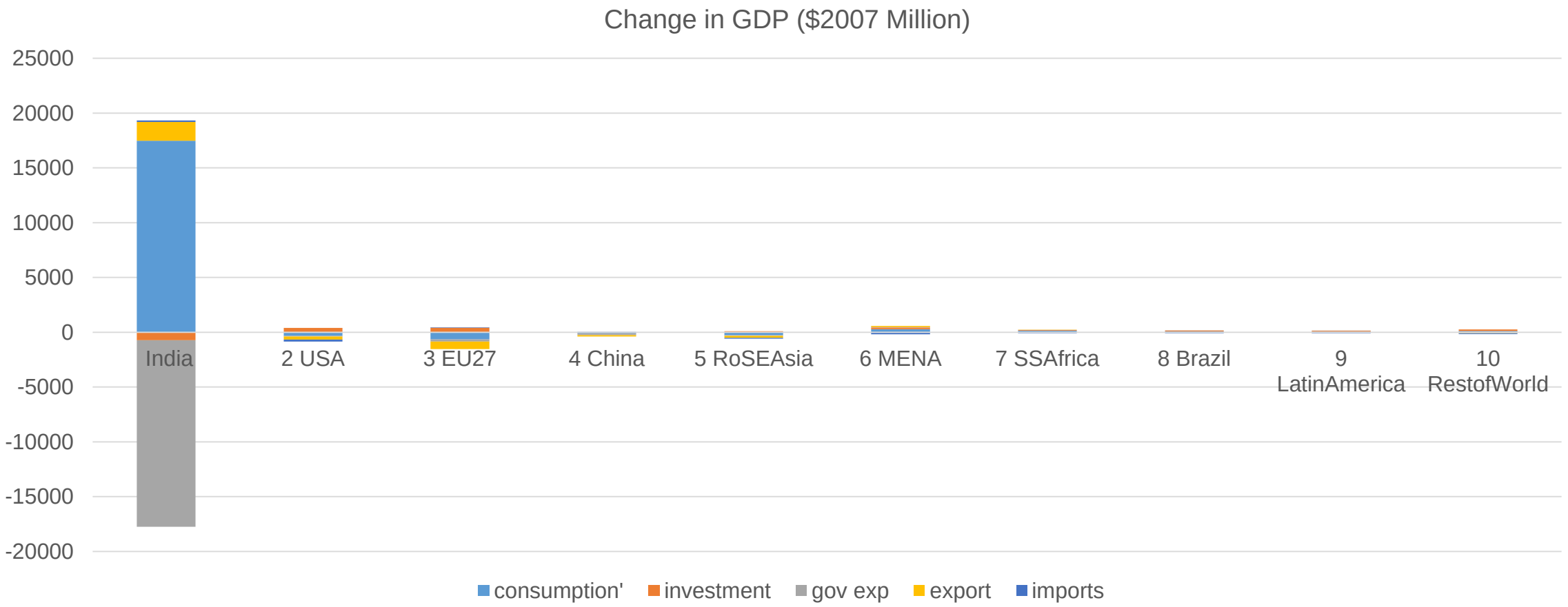
Scenario C

Income Transfers Alternative

Results C: Consumption



Results C: Change in GDP



Effects on output

qo	Scenario A	Scenario C
PaddyRice	10.43	0.71
Wheat	1.2	0.26
VegsFruits	-0.36	0.39
Oilseeds	-1.13	-0.11
PlantFibres	-1.73	-0.93
ProcRice	15.41	0.99

Conclusions

- NFSA policy in India showed significant change in consumption pattern of food grains, but not much impact was observed in consumption of other commodities such as livestock products
- Impact of subsidy on lowest quintile rural household was significantly high compared to lowest quintile urban households, for the same amount of subsidy
- Income Transfers: have secular impact on consumption of all food commodities

Extensions for the future

- Further work is on incorporating nutrition module to track impacts across vulnerable households.
- Other scenarios of income transfer and subsidy inclusion/exclusion: e.g. the role of realistic/limited changes in total government expenditure.
- Calibrate/validate consumption response to price changes, using empirical literature.

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Questions or comments?

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