An Attempt to Measure the Economy-Wide Impact of Recent Fiscal & Social Measures (A CGE Model):
The Case of Subsidies, VAT & Cash Transfers

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Outline

I. Introduction
   - Context of the study
   - Objectives
   - Contribution

II. Research Method
   - CGE Model: STAGE
   - Egypt SAM Data
   - Simulations

III. Selected Results and Discussion

IV. Concluding Remarks

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Key Pillars of Economic Reform Program
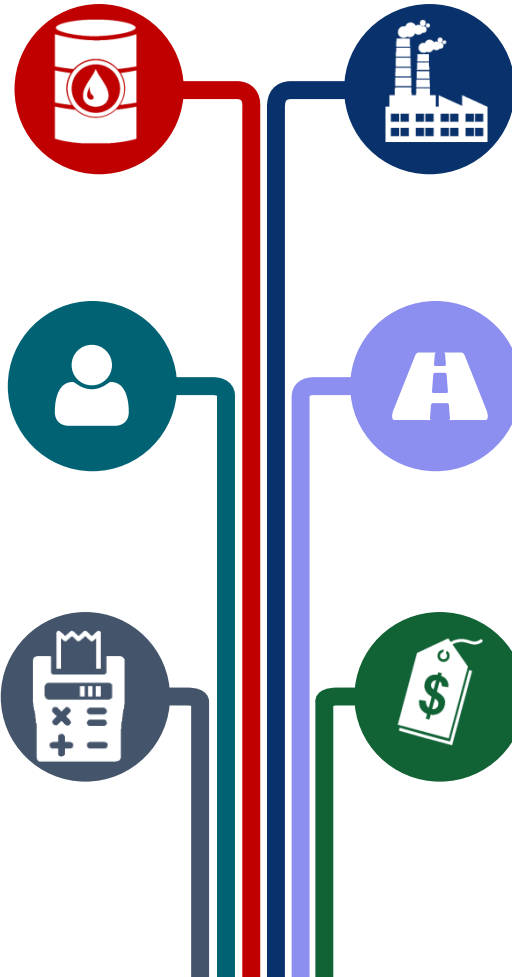
Fiscal Consolidation

Reforming Energy/Food Subsidies, Containing Wage Bill.

Social Protection

Cash Transfer, Social Pension Reform, Social Housing, Insurance

Tax Reforms

VAT, Property Tax and Excise Tax

Support Businesses

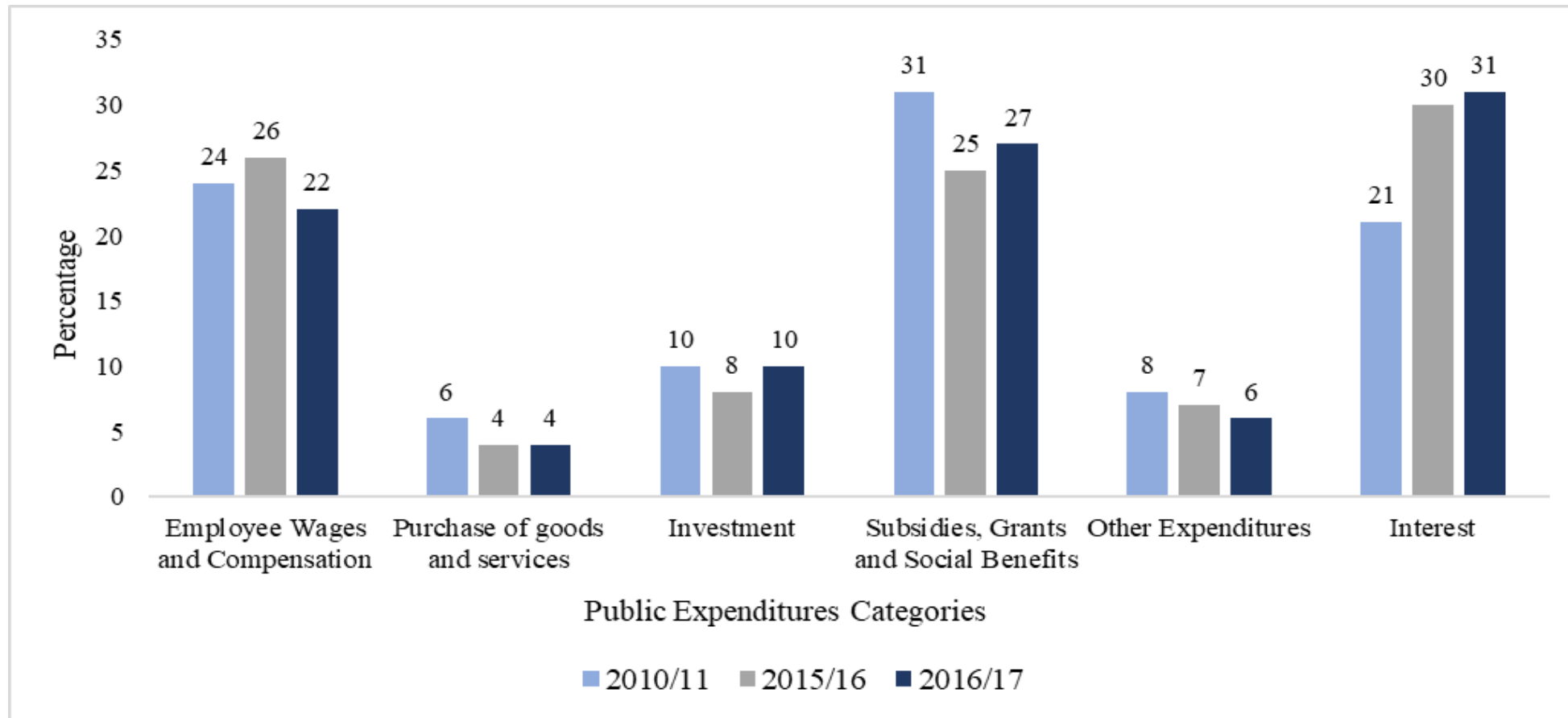New Investment Law, Improve Business Climate and Access to finance

Infrastructure

Sanitation, roads…etc

Flexible Exchange Rate

Currency Devaluation

# Breakdown of Public Expenditures

Source: Compiled by authors based on data from the Ministry of Finance (2010/11-2016/17).

Objectives

Attempt to Explore the economy-wide effect of selected fiscal policies and SSN measures undertaken by the GoE.

Attempt to Explore the impact of removing subsidies and allocating savings to: infrastructure, human capital (health and education), research and development, and SSN.
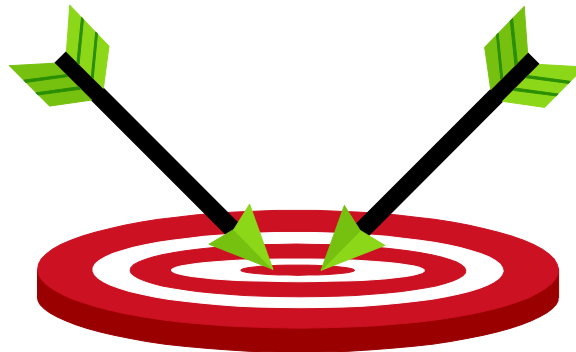
Contribution

- Building on previous studies like: Abouleinein, El-Laithy, and Kheir-El-Din (2009); Elshennawy (2014); Banerjee et al. (2017); Breisinger et al. (2019):

  ❖ **The introduction of differentiated VAT rates to the Egyptian economy**:
  a. The interlinkage of VAT and reforming subsidies is expected to affect demand and household welfare.
  b. Imposing multiple VAT rates for commodities and applying exemptions is required for an accurate examination of the impact of indirect taxes and welfare analysis.

  ❖ **Stimulating the combined effect of phasing out multiple types of subsidies.**

  ❖ **Attempting to explore the impact of alternative policy options:**
  a. Cash transfer is a transitional mitigation measure that needs to be complemented with other policies.

Outline

CGE Model: STAGE

- A single country CGE Model:
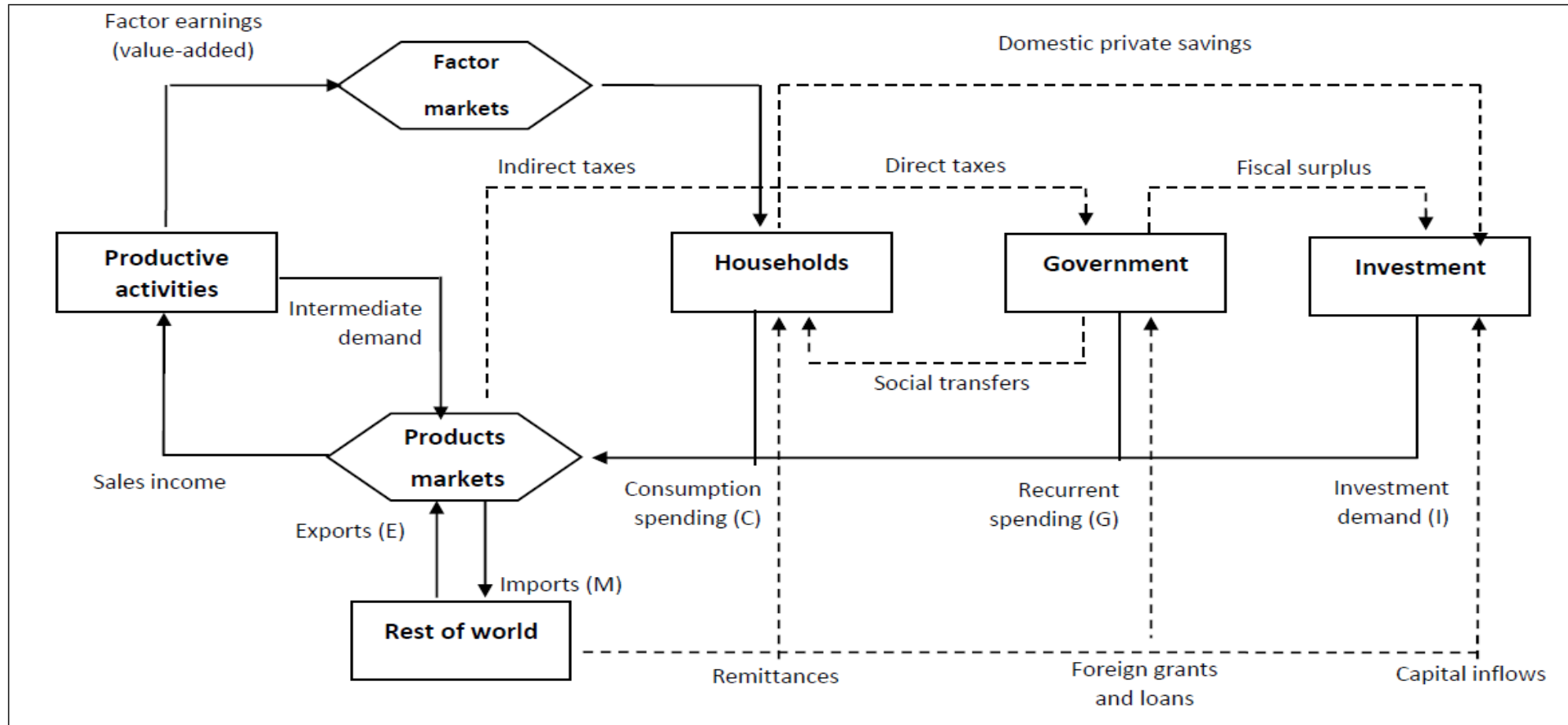
Why CGE?

- The analysis of the impact of economic policies entails an economywide framework.

- <u>CGE models are suitable for :</u>
  - ❖Linking households to the macroeconomy,
  - ❖Estimating the welfare impact of specific policies by comparing the pre- and post-policy analysis.
  - ❖Considers multi-sector linkages and interactions.

CGE Model: STAGE

- Total government expenditures:

$$EG = \left(\sum_c QGD_c * \text{PQD}_c\right) + (hogovconst_h * HGADJ * CPI) + (entgovconst_e * EGADJ * CPI)$$

- Government transfers are part of household income:

$$YH_h = \left(\sum_f hovash_{h,f} * YFDIST_f\right) + \left(\sum_{hp} HOHO_{h,hp}\right) + HOENT_h + (hogovconst_h * HGADJ * CPI) + (howor_h * ER)$$

- Price of Commodities: supply price plus ad valorem sales tax (TS_c) and excise taxes (TEX_c)
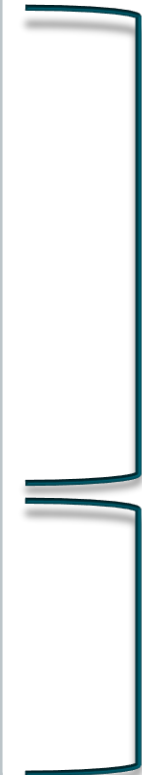
$$PQD_c = PQS_c * (1 + TS_c + TEX_c)$$

Egypt SAM Data 2012/13

Billion EGP- Source: CAPMAS (2016)

	Products	Activities	Production Factors	Households Sector	Enterprises Sector	Government	Saving/Gross Capital Formation	Rest of world	Margins	Total
Products		1211.9		1418.1		211.2	303.6	331.8	275.7	3752.2
Activities	3031.5									3031.5
Production Factors		1819.6								1819.6
Households Sector			760.8		888.8	4.9		117.6		1772
Enterprises Sector			975	20.5		167.6		1.4		1164.5
Government	-70.3			39.4	183.3	63.9		4.9		221.1
Saving/Gross Capital Formation			83.8	292.3	55.1	-230.6		103		303.6
Rest of the world	515.4			1.8	37.4	4				558.6
Margins	275.7									275.7
Total	3752.2	3031.5	1819.6	1772	1164.5	221.1	303.6	558.6	275.7	

Simulations

Baseline: Pre-Reform		
Reforms	Sim 1: Partial removal of energy subsidies and increasing cash transfers (2014-2015)	**Objective 1**
	Sim 2: Further removal of energy subsidies, cash transfers are expanded and VAT is introduced (2016)	
	Sim 3: Further removal of energy subsidies, cash transfers are expanded, food subsidies reform (2017)	
Potential Scenario	Sim 4: Full removal of food and energy subsidies and increased spending (infrastructure, human capital, research and development and social safety nets).	**Objective 2**

Incorporating VAT-Sim2

- In order to capture the economic and distributional impact of introducing VAT, **SAM disaggregation was required in addition to creating VAT account in STAGE:**

$$\text{TV}_c = \big((tvb_c + dabtv_c) * TVADJ\big) + (DTV * tv01_c)$$

$$VTAX = \sum_{c,h}\big(TV_c * PQD_c * \text{QCD}_{c,h}\big)$$

$$YG = \text{MTAX} + \text{ETAX} + \text{STAX} + \text{EXTAX} + \text{FTAX} + \text{ITAX} + \text{FYTAX} + \text{DTAX} + \text{VTAX} + \big(\sum_f govvash_{h,f} * YFDISP_f\big) + \text{GOVENT} + (govwor * ER)$$

$$PQCD_c = PQD_c * (1 + (TVADJ * tv_c))$$

$$\text{QCD}_{c,h} = \frac{\big((\text{PQCD}_c * \text{qcdconst}_{c,h}) + \text{beta}_{c,h} * \big(HEXP_h - (\sum_c \text{PQCD}_c * \text{qcdconst}_{c,h})\big)\big)}{PQCD_c}$$

Outline

Household Welfare

	U1	U2	U3	U4	U5	R1	R2	R3	R4	R5
Sim 1	5.10	-5.80	-1.10	-7.10	-7.30	12.30	6.90	-0.70	0.80	-5.10
Sim 2	-3.16	-4.35	-3.58	-3.76	-3.89	-2.21	-3.01	-3.83	-3.54	-2.93
Sim 3	-1.38	-2.49	-1.72	-2.15	-2.79	-2.30	-1.30	-2.26	-1.92	-1.85
Sim 4	-2.17	-3.79	-2.98	-3.46	-3.72	2.80	-2.10	-3.90	-3.40	-2.93

- Despite being the main recipients of SSN measures, **poor households are harmfully affected.**

- **Poor Urban Households** are not sufficiently protected against negative welfare effects.

- Reforms have the largest negative impact on the **welfare of the middle income** in rural areas (R3): These results differ from previous studies.

Consumption Expenditures-SIM 04
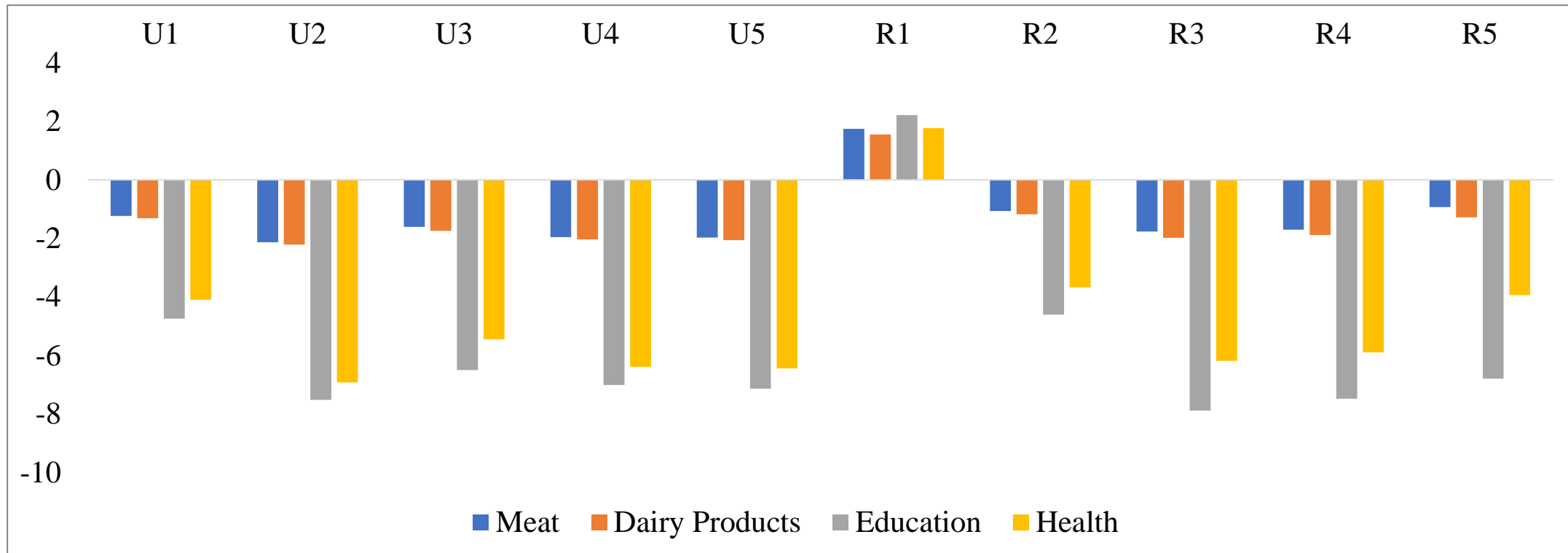
- Full removal of subsidies and expending pro-poor spending improves **consumption of rural poor households** on meat, fruits, vegetables, dairy products, education and health.

Household Income (percentage change from base)

	U1	U2	U3	U4	U5	R1	R2	R3	R4	R5
Sim 1	0.34	-0.13	-0.21	-0.44	-1.24	0.81	0.33	-0.19	-0.13	-0.75
Sim 2	-5.28	-5.58	-5.68	-5.68	-5.75	-4.42	-5.19	-5.60	-5.61	-5.71
Sim 3	-2.00	-2.30	-2.41	-2.42	-2.52	-1.15	-1.81	-2.30	-2.31	-2.44
Sim 4	-2.39	-3.31	-3.71	-3.74	-3.86	0.51	-2.23	-3.69	-3.70	-3.82

	Labor	Capital	Land
Sim 1	-7.15	-2.88	-1.99
Sim 2	-4.58	-6.54	-5.38
Sim 3	-1.28	-3.02	-1.55
Sim 4	-2.48	-4.45	-4.93

- Reduction **in returns to labor** (wages), which particularly constitute a large share of poor households' income.

- Lower reduction **in income to labor** when allocating savings to R&D, Education, Health (Semi-Skilled and Skilled labor) as well as infrastructure (unskilled labor).

Macroeconomic and Sectoral Effect (percentage change from base)

	Private Consumption	Total Investment	Real GDP
Sim 1	-0.94	2.48	-0.93
Sim 2	-4.26	15.11	-0.89
Sim 3	-3.53	11.4	-0.06
Sim 4	-3.82	16.35	-0.15

Production	Sim 1	Sim 2	Sim 3	Sim 4
Food production	-0.01	-4.78	0.08	-3.54
Beverages production	-0.50	-6.02	0.51	-3.04
Manufacturing	-2.74	-3.19	-2.07	-2.82
Computer and electronics	-2.41	-3.33	3.18	5.23
Machinery and equipment	-3.85	0.83	1.62	2.85
Motor vehicles	-2.84	-3.77	2.81	4.86
Utilities	-2.22	-2.60	-4.37	1.51
Construction	2.05	2.28	12.01	17.41
Services	-1.67	-3.37	-2.03	-3.50
R&D	-0.04	0.36	0.24	0.55
Education	-1.43	-2.41	-0.42	15.14
Health	-3.08	-4.54	-1.98	4.81

- Redistribution from **private consumption** to investment.

- Inflationary pressures had a detrimental effect on **production, demand for labor and private demand** leading to a reduction in GDP.

- There is no large-scale **reallocation of labor** from high to low productive industries.

- **Growing without structural transformation** might continue.

- Dynamics within the **manufacturing subsectors** start to change.

- **Sim 4:** labor demand will start to be directed to other sectors that employ mostly skilled/semi-skilled males and females.

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Concluding Remarks

- The current policy move in Egypt towards **cash transfers** for the poor might offers only **a limited solution** to the issues facing the country as they are more focused on short term consumption smoothing.

- It is not necessarily that cash transfer will boost private consumption and stimulate the economy to improve growth.

- It is argued that there is a need to develop comprehensive and integrated social policies which promote social cohesion and address the **Middle Class in Egypt**.

- Options might include improving business climate and the use of Active Labor Market Policies (ALMPs) for decent employment.

Concluding Remarks

- The planned full removal subsidies over the coming years needs to be backed up by substantial spending on human capital and R&D to maintain the reform momentum and avoid being locked in **a low productivity trap**.

- Reallocating government savings could also create **positive externalities** beyond the impact discussed in this study by inducing high social return, improving human capital, and reducing inequality and poverty in the long run.

Limitations

- Static vs. Dynamic CGE model:

❖ Static models are powerful in identifying the winners and losers from shocks, a drawback is not showing the adjustment path over time.

❖ Further work could focus on dynamic model.

- Microsimulation for in-depth analysis of poverty and inequality.

- Multiple interdependent events and policies could affect results.