

# Impact of the Russia-Ukraine War on two African economies – Egypt and Kenya: a gendered macro-micro modelling assessment



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# Impact of the Russia-Ukraine War on two African economies – Egypt and Kenya: a gendered macro-micro modelling assessment

## Abstract

The trade distortions caused by the Russia-Ukraine War have created a crisis that have impacted women more than men, particularly in countries in the Global South. This paper presents a macroeconomic model-based assessment of the economic impacts of the Russia-Ukraine War. Using gendered Computable General Equilibrium (CGE) models combined with micro-econometric models, we find that the war-induced price shocks are country-specific, and that women's economic situation drives the impacts of these shocks. Simulating different mitigation policies shows that these policies could help improve the situation of poverty during crises. However, the policies have different impacts on the economy. Given limited fiscal space to fund mitigation policies policymakers are challenged to carefully design mitigation policies that can protect the vulnerable and at the same time support the growth of the economy. The results provided in this macro-micro modelling assessment can support the discussion of policy decision-making by considering women as a vulnerable group.

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**Keywords:** Russia-Ukraine War, trade disruption, gender, food security, poverty

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## Executive summary

### Introduction

The trade distortions resulting from the Russia-Ukraine War (RUW) have triggered a crisis that disproportionately affects vulnerable populations in the Global South. Particularly, crises are rarely gender-neutral and often disadvantage women (Binci, 2014), with the RUW being no exception. Following the COVID-19 pandemic, it is of even more importance that the impact on vulnerable groups be carefully considered. In Africa, global trade shocks significantly impact women in their triple economic roles as workers, business owners, and consumers. Women generally earn less than men, occupy lower-skilled jobs, and hold more vulnerable positions (Korinek et al., 2021). Consequently, the war's effects on women differ markedly from those on men. The extent of economic development and gender inequality across African countries further shapes these impacts, influenced by urban and rural household vulnerabilities and gender-specific risks of poverty and hunger (Deng et al., 2022).

### Selection of case studies and methods

Recent research identifies Egypt and Kenya as particularly vulnerable to trade shocks induced by the RUW (Cororaton, 2024). While Egypt is food insecure and depends on wheat imports, Kenya depends on the import of oil and fertiliser. This study investigates the impacts of these trade disruptions and the effectiveness of mitigation policies on women in these two African countries, which differ significantly in economic conditions. Using gender-sensitive Computable General Equilibrium (CGE) models combined with micro-econometric models, we simulate the economic effects of the war as transmitted through energy, fertiliser, and food markets within a macro-micro modelling framework. The study examines macroeconomic gendered impacts using CGE models and assesses microeconomic effects on poverty and food security through a top-down linkage with a behavioural micro-econometric approach.

### Scenarios

The trade-shock scenario, simulated using the CGE model, reflects increases in global prices for crude oil (+41%), fertiliser (+27%), maize (+20%), wheat (+52%), and vegetable oil (+7%)

based on price changes observed from March 2022 to March 2023 (World Bank, 2023). Additionally, the study evaluates mitigation policies, both implemented by governments and hypothetical scenarios targeting women specifically.

In Egypt, which has been severely affected by rising food prices, the government implemented increased subsidies for food products (SubFood). In Kenya, a subsidy on petroleum products (SubOil) was introduced. Given Egypt's low female labour force participation and the heightened vulnerability of rural women, we also evaluate two targeted policies: a wage subsidy for unskilled women in the agricultural sector (SubSal) and a transfer policy for rural women in the lowest income quintile (Transmural). To ensure meaningful comparisons, the funding allocated to each policy scenario per country—food subsidies, wage subsidies, and rural women's transfers—is kept consistent.

## Simulation results

Simulations reveal that women's economic roles significantly shape the impacts of war-induced price shocks. Global price increases affect Egypt and Kenya through two main channels. First, higher import costs for essential goods—depending on a country's dependency—drive up consumer and input prices. For example, Egypt heavily relies on imported wheat and maize, while Kenya depends on petroleum and fertilisers, which are primarily used by industries and farms.

Second, higher global prices for exported goods can encourage local producers to prioritise external markets. Egypt stands to benefit from rising oil and fertiliser prices, while Kenya could gain from higher prices for agricultural commodities. Women's ability to benefit from these trends depends on their participation in these sectors. For instance, women in Kenya's agricultural sector may benefit from increased labour demand, whereas women in Egypt are more likely to face rising food costs as consumers.

Simulations of existing and gender-targeted policies reveal that general measures, such as Egypt's food subsidy or Kenya's fuel subsidy, are less effective at supporting women compared to targeted interventions. Direct transfers to vulnerable households and subsidies for hiring female workers are more impactful. Such targeted measures prove more effective in reducing women's poverty in both countries than non-targeted policies.

## Conclusions

Understanding the impacts of the RUW on women requires a country-specific approach to produce tailored insights. With limited fiscal resources for mitigation policies, policymakers must design measures that protect vulnerable populations while fostering economic growth. The findings from this macro-micro modelling assessment provide critical information for policymaking, highlighting the specific vulnerabilities faced by women.

Moreover, these results offer valuable insights beyond the RUW context, serving as a guide for policy decisions in similar scenarios. The study emphasizes the importance of assessing the relative effectiveness of commodity or production-factor subsidies versus cash transfers targeted specifically at poor households.

## I. Introduction

The Russia-Ukraine War (RUW)<sup>1</sup> caused a new economic shock by trade disruption for world food, fertiliser and energy markets (Arndt et al., 2022). Starting in early 2022, it followed the COVID-19 pandemic and the economic crisis from 2020 to 2021, which already hampered economic growth in many developing countries. Countries of the Global South and their inhabitants are expected to be most impacted by increasing prices and reduced supply of food, fertiliser and energy. Among people in developing countries, women are more sensitive to these impacts than men (UN Women, 2022a). Indeed, the impacts of crises are never gender-neutral and mostly to the disadvantage of women (Binci, 2014). While the problems are similar in different countries, the specific expression and, thus, the specific impact on women depend on their economic situation in these countries. Thus, comparing the impacts of the RUW on women in different countries can support understanding and designing specific counteractive policies.

In our study, we investigate the impacts of the RUW-caused trade shocks and of mitigation policies on women. With a macro and micro-economic analysis, we study impacts and mitigation in two African countries with different economic situations of women: Egypt and Kenya.

In many countries in the Global South, women have smaller resilience capacities to cope with the negative impacts of economic shocks of unequal access to productive resources such as land or other assets (Deressa and Hassan, 2009; Eastin, 2018; Mehar et al., 2016; Mersha and Van Laerhoven, 2016; Terry, 2009). Many women face significant gender gaps in salary (Doss et al., 2018, 2015; Doss, 2018; SOFA Team and Doss, 2011) and work in sectors sensitive to economic changes (e.g. agriculture, tourism). Furthermore, women are responsible actors for domestic work, which reduces the time they have available for economic opportunities (Elson, 1999; Fontana and Van Der Meulen Rodgers, 2005). The burdens of unpaid care and domestic work often force women to withdraw from the labour market (Azcona et al., 2020; OECD, 2020a).

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<sup>1</sup> In this study we use the term Russia-Ukraine War (RUW) to refer to Russian Invasion of Ukraine starting in February in 2022 and still ongoing. The Russian Invasion of Ukraine also is often referred to as Russian war on Ukraine (RWU) or Russian aggression on Ukraine (RAU).

While facing economic disadvantages compared to men, women are essential for the economic development in the Global South. Women work in key economic (e.g. tourism) or food supply (e.g. agriculture) (Awokuse and Xie, 2015; Khan et al., 2020; SOFA Team and Doss, 2011). Furthermore, women work in the care sectors (health, education, and other care), which contribute to human capacity development of both boys and girls, and thus to economic growth in the future. In Africa, the global trade shocks affect women in their triple economic roles as workers, business owners, and consumers (Korinek et al., 2021). The country-specific impacts of economic shocks on men and women depend on the vulnerabilities of urban and rural households and the gender-specific vulnerability to poverty and hunger (Deng et al., 2022). For example, women's vulnerability is determined by various factors: "women's intrahousehold bargaining power; agency in small-scale farming; and access to education, employment opportunities, and financial resources." (Papadavid, 2023).

Countries in the Global South in particular, suffer from the impacts of the polycrisis resulting from multiple global shocks (e.g., climate change, Covid-19 pandemic, RUW, global food and energy crisis). Facing limited fiscal space, governments' decision on how to allocate budget is challenged in different ways: (i) Funded policies should counteract increasing poverty and inequality and should be particularly effective in improving the situation for vulnerable groups (e.g., women); (ii) funded policies should not create negative economic impacts for any population group, government or industry; and (iii) the type of policy measure influences poverty and economic growth in different ways and channels. Different policy measures do not only vary in their specific objectives and targeted channels, but they also differ in temporal dimension: how they impact during time and over which time they need to be implemented to be effective. Thus, mitigation policies should protect the vulnerable and at the same time support economic growth, they create positive impacts briefly after their implementation and the impacts remain in the long-term.

In this research, we analyse the economic impacts of the RUW and of mitigation measures in Egypt and Kenya from a macro- and microeconomic perspective to provide information for policy decision-making. Firstly, we simulate the economic impacts of the RUW channelled by the markets of energy, fertiliser and food by using a macro-micro-modelling framework. Secondly, we analyse the impact of counteracting mitigation policies. Thirdly, by using a CGE model, we analyse the macroeconomic gendered impacts. Finally, by linking a

top-down behavioural micro-econometric model, we analyse the microeconomic impacts on poverty and food security.]

## II. Literature review

### 2.1 Survey-based assessments

Women's economic situation differs significantly between Egypt and Kenya from a macro-economic and socio-economic point of view and thus, the economic impacts resulting from the RUW also differ. Survey-based empirical research on the socio-economic impacts on women is ongoing, and the first results are only available for a few countries (e.g., UN Women, 2022b). Recent research has provided survey-based empirical evidence on the impacts of the RUW in Egypt and Kenya, as countries which have been identified as being particularly vulnerable to the RUW-induced shocks (Cororaton, 2024).

Zaki (2024) analysed the results of a recent phone survey in Egypt and found that not only the trade disruptions caused by RUW create food insecurity but also the domestic economic policies that were implemented increased this food insecurity. Larger households and rural households are more vulnerable to food insecurity than smaller and urban households. The highest costs for the crises are paid by female-headed households and women in female-headed households. Also, based on a phone survey, Onyango et al. (2024) analysed the gendered impact of the RUW with a focus on domestic energy usage for cooking. They found that households tend to stop using kerosene after the increase in fuel prices. Substituting kerosene by firewood creates higher costs for women than for men. Longer time for collecting firewood and bad cooking performance lead to women spending more time in domestic activities which lead to less time spent in economically productive activities.

Both studies<sup>2</sup> Zaki (2024) and Onyango et al. (2024) focus on surveyed microeconomic data on gender-specific impacts of the RUW in Egypt and Kenya. With our study, we extend

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<sup>2</sup> Both quoted studies are the research output of a partnered research project in which our study represents the complementary macro-micro-economic cross-country study complementing the two micro economic studies.

the scope of the analysis for Egypt and Kenya comparatively to the macroeconomic perspective. To consider distributional impacts, we link a micro-econometric analysis as a sequential top-down approach. We focus on the gendered impacts and analyse the impacts of different mitigation measures. Thus, we exploit two advantages of the modelling-based analysis: we create/provide empirical evidence based on secondary data, and we assess the impact of simulated scenarios as information before and after implementation. Using gender-sensitive CGE models in combination with micro-simulations can provide early information to support economic assessment and policy decision-making.

## **2.2 Model-based assessments**

Since the Russian invasion of Ukraine in February 2022, several model-based studies have estimated the economic impacts of the conflict. The methods applied cover graphical models and network analysis (Braun et al., 2023; Estrada and Koutronas, 2022), econometric and gravity models (Liadze et al., 2023; Sedrakyan, 2022), vulnerability analysis (Abay et al., 2023), trade flow analysis (Aitken and Ersoy, 2022), input-output model analysis (Deng et al., 2022) and CGE modelling analysis (Mahlstein et al., 2022; Rose et al., 2023; Schropp and Tsigas, 2023). Most of these studies analyse the impacts of the trade sanctions and disruption for the countries and regions impacted directly or indirectly by the conflict: the allies, the non-allies and important trade partners (Evenett and Muendler, 2022; Schropp and Tsigas, 2023). Most of the CGE model-based studies are multi-country studies with a focus on the impacts on economic growth and trade (Evenett and Muendler, 2022; Rose et al., 2023).

Only a few studies analyse the economic impacts of the RUW on specific developing African countries (Chepeliev et al., 2022; WTO, 2022) which are vulnerable to changes in energy and food markets. For instance, an analysis of the impact of the RUW on different African economies found particular welfare losses in Sudan, Kenya and Ethiopia (Cororaton, 2024). Also, few studies focus on the socio-economic impacts that the crisis will have in developing countries on vulnerable groups (Arndt et al., 2023; Chepeliev et al., 2022; Deng

et al., 2022). Arndt et al., (2023) use single-country CGE models<sup>3</sup> to estimate the near-term impacts in 19 developing countries. Ayaz et al (2023) investigated the impacts of the RUW on poverty and food security for Pakistan's households and Ayaz et al. (2024) analysed the impact of the RUW on South African women.

Changes in prices of energy, fertiliser and food differently impact poverty, hunger and diet quality. While increasing prices for energy and fertiliser drive more poverty, increased food prices drive more hunger and impact diet quality. The impacts vary across countries depending on their trade situation. The impacts also vary across rural and urban populations, which are differently vulnerable to increases in prices of energy, fertiliser, and food. Rural households are more vulnerable in terms of poverty due to the increase of fertiliser prices affecting agricultural productivity and reducing agricultural income. Urban populations are more vulnerable in terms of consumption to increased energy prices (Arndt et al., 2023).

Our study extends the scope of analysis on economic impacts and vulnerability of rural and urban populations as provided by Arndt et al. (2023) and Ayas et al. (2023, 2024) by analysing the gendered vulnerability and the impact of mitigation policies on women. For this in-depth analysis, we select two African countries where previous studies let us expect significant effects: Egypt in North Africa and Kenya in Eastern Africa (Cororaton, 2024). We develop two macro-micro simulation models to assess the gendered impacts in both countries. Although both countries are expected to face negative impacts, the channels and vulnerabilities are different. By the comparative model-based analysis of the RUW impacts and mitigation measure, we obtain country specific information and a comparable view on the gendered impacts of RUW in different countries.

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<sup>3</sup> Using CGE models to 'estimate impacts' has limitations: Results are based on strong assumptions regarding how people will behave, and markets will respond. The development observed in reality can differ from the results obtained in CGE model simulations. Therefore, empirical results based ex-post analysis are more accurate. However, often data for compiling an ex-post analyse are available sometime after the economic shock, which is subject to the analysis. Therefore, the CGE models value is to provide simulated impact assessments before data for an ex-post analysis are available.

### **III. The gender analysis framework**

To appropriately consider the gender perspective in the study, we orient as much as possible to (Fontana, 2020).

#### **3.1 Women's macro-economic situation**

While both countries expect to face negative economic impacts caused by the RUW, the initial economic situation is different. Table 1 presents selected macroeconomic indicators for both countries. While both are ranked as lower-middle income countries, Egypt has – with 3020 USD/head – a significantly higher average GDP than Kenya - with 1817 USD/head. The economies in both countries have developed in recent years based on different economic sectors: mainly petrol in Egypt and agriculture in Kenya. In both countries policies to empower women have been set in place and women's economic empowerment is in both countries an important economic and social objective. In Egypt, the female labour force participation is less than 20%, which is extremely low; for Kenya, female labour force participation stands at nearly 50% of women of working age.

The share of women (and men) working in the agricultural sector in Kenya's agricultural-based economy is much higher than in Egypt. In Egypt, women work mainly in services (particularly in the public administration, education, and health system) and are often informal and unpaid family workers. In Kenya, more workers are employed in vulnerable jobs than in Egypt. Women with different education levels are less employed in Egypt than in Kenya. Particularly, women with only basic education are less employed in Egypt than in Kenya.

In Egypt, policy measures target the improvement of female education and involvement in political functions and decision-making. These measures have increased the education level of women. However, employers' recruitment, female employment preferences, mostly in the contracting public sector, result in less female employment than men, despite the high educational level of women, i.e., the MENA paradoxon (Assaad et al., 2020). In Egypt, the share of formally employed women is small, while the share of women working informally and often as unpaid family workers (e.g., in care work) is relatively high. In

Kenya, women work mainly in the agricultural sector, where they face different gender gaps in terms of time use and wage.

**Table 1: Macro-economic indicators for recent years (i.e., 2019 for most of the indicators)**

	EGY			KEN		
	male	female	both	male	female	both
GDP per head (UDS/head)	3020			1817		
Total unemployment rate (% of male/female labour force)	7.2	22.2		2.5	2.8	
Labour force participation rate (% of male/female population)	70.9	21.9		77.3	72.1	
Female workers of total labour force (% of total labour force)		18.6			49.4	
Workers in agriculture (% of total labour force)	16.9	6.6	23.5	24.6	29.9	54.5
Workers in industry (% of total labour force)	26.9	1.3	28.2	6.3	1.0	7.3
Workers in services (% of total labour force)	37.6	10.7	48.3	19.7	18.5	38.3
Family workers (% of total labour force)	3.1	4.5	7.6	3.0	4.4	7.4
Employed in vulnerable jobs (% of total labour force)	14.3	6.1	20.4	21.9	29.5	51.4
Workers in agriculture (% of labour force in sector)	71.9	28.1		45.1	54.9	
Workers in industry (% of labour force in sector)	95.4	4.6		86.4	13.6	
Workers in services (% of labour force in sector)	77.9	22.1		51.6	48.4	
Family workers (% of family workers)	40.8	59.2		40.8	59.2	
Employed in vulnerable jobs (% of workers in vulnerable jobs)	70.1	29.9		42.6	57.4	
Workers in agriculture (% of male/female employment)	20.8	35.5		48.6	60.5	
Workers in industry (% of male/female employment)	33.0	7.0		12.4	2.0	
Workers in services (% of male/female employment)	46.2	57.5		39.0	37.5	
Family workers (% of male/female employment)	3.8	24.1		6.0	8.9	
Employed in vulnerable jobs (% of male/female employment)	17.6	32.9		43.2	59.7	

Female workers with advanced education (% of female working-age population with advanced education)	43.8			82.3	
Female workers with intermediate education (% of female working-age population with intermediate education)	14.4			64.8	
Female workers with basic education (% of female working-age population with basic education)	4.6			65.8	

Source: World Bank (2023): World Bank Indicators, selected years

### 3.2 Women's socio-economic situation

Social and masculine norms and perceptions determine how women are positioned in society. The norms and, thus women's position, are strongly determined by traditional religions. In Egypt, the Islamic religious norms define patriarchal gender roles. In Kenya, Christian religious norms allow a more emancipated role for women (KNBS, 2023a).

In Egypt, women prefer employed jobs in the public sector which offers good working conditions and formal employment. Many jobs are avoided because the working conditions are inadequate, and gendered differences are not considered. The not preferred jobs are associated with a higher risk of physical damage and sexual harassment. Employers often do not find women's skills match their demands and in hiring processes, women are still discriminated. Furthermore, after marriage and giving birth, working women or mothers are socially less accepted than women and mothers who are fully dedicated to home production or care work.

In Kenya, social norms allow women to work and female decision-making and empowerment are more established. However, women are mainly represented in vulnerable jobs in agriculture and in informal house and care services. Women's economic empowerment is limited because of relatively big gender gaps between men and women creating higher salaries for men and higher time poverty for women. According to the adjusted gender wage gap accounts male's salaries at nearly 10% higher for men than for women. The wage gaps depend on sectors, occupations and skills and reach from approximately 14% (in trade) to 38% (in education) (UN Women, 2023). In terms of time use,

on average women spend approximately 5 hours per day on unpaid work, while men spend only about 1 hour (KNBS, 2023a).

## **IV. Methodology**

### **4.1 Macro-economic (CGE) model**

#### **4.1.1 The macro-model**

Both macro models are based on the PEP 1-1 standard model (Decaluwé et al., 2013). However, to represent the specificities of each country, we changed many hypotheses from the standard model. Each model is consistent with the SAM of its country. We will present the main characteristics of the models. For a description of the SAM refer to the Appendix, Section 8.3.

For each country, production is defined by a multi-level nested structure. In consistency with the SAMs, in Egypt, there are 10 activities while in Kenya we have 42. At the top level, output is a Leontief type of function between value added and intermediate consumption. At the second level, value added is defined in terms of a CES function between composite labour and composite capital. In Egypt, at the third level, composite labour is disaggregated between rural and urban labour. At the fourth labour, each type of labour is further disaggregated between skilled labour and unskilled labour. Skilled labour is further disaggregated by skill into low- and skilled labour. Low skilled workers is a CES type of function between workers illiterate and workers who have not finished the primary level of education. Each type of education category is then split into male and female. Skilled workers are split between workers who have finished the tertiary level of education and workers who have finished the secondary level of education. Here as well, each type of worker category is further split by gender.

In Kenya, following the SAM and the structure of the economy (see Appendix Section 8.3), we assume that the composition of the value added is different whether we refer to agricultural activities or non-agricultural activities. For agricultural activities, the composite labour demand is a CES function between wage-workers and self-employed. Each type of

workers is then further disaggregated into male and female workers. For non-agricultural activities, the composite labour demand is a CES function between the three broad types of workers: skilled, semi-skilled and unskilled, each one is then further disaggregated into male and female workers. The composition of labour in each sector is very different, showing sectors which are labour-intensive such as the rice sector in Kenya and education in Egypt. As well, sectors such as health and education are particularly female-intensive in Egypt, while in Kenya, women are as well present in the trade sector. Since, we represent only formally employed workers in the CGE model, it is important to also keep in mind that in Egypt, most of the women are working informally and as family workers, while in Kenya the share of formally working women is much higher.

In each country, there are ten types of households: households are split according to their quintile of income and location, either rural or urban. Their income is derived from three sources: male and female labour, capital and transfers from other institutions (remittances, dividends, government transfers). The structure of income for the different households is very different. All households use their income to consume, pay direct taxes, pay transfers to other institutions and save. Household behaviour on the consumption side is modelled as a Linear Expenditure System.

Firm's<sup>4</sup> income comes from capital income and transfers from the government and the rest of the world. All firms pay dividends to other agents, pay direct taxes and save. Government income is composed of transfers income, and direct and indirect taxes. It spends most of its income on consumption (administration, education...), transfers to other institutions and saves the rest. To represent the links between each country and the rest of the world, we follow the traditional hypothesis assuming that both countries are small countries and consequently world prices are exogenous. However, to export more, each country producers must be more competitive on the international market.

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<sup>4</sup> In the CGE-model we represent firms as aggregated agent. We do not represent home-based small businesses, which is are firms types typical for women in African countries. For Kenya we represent self-employment in agriculture as a labour type.

### 4.1.2 Closure rules

In terms of closure rules, we assume that the nominal exchange rate is the numeraire of the model. Then, as mentioned above, both countries are considered small open economies and therefore world prices are taken as given. The current account balance is assumed to be exogenous. This assumption is important to keep in mind when analysing the results: indeed, it is not possible to borrow from the rest of the world, and any reduction in imports necessarily leads to a reduction in exports. Having an endogenous current account balance would not make much sense in our modelling. In fact, this would allow the country to have its policy financed by the rest of the world without ever having to repay it. For the two countries studied, this is not credible.

Government's savings is endogenous while government spending in goods and services is fixed. In this version of the model, there is no mechanism which would force this or that agent to have a certain level of savings to maintain a constant level of investment (closure like Kaldor for example). Thus, in our model, if the government's income decreases, *ceteris paribus*, this will lead to a decrease in its savings, which will have an impact on the total investment budget. Capital and land are sector specific while labour is mobile across sectors. In Kenya, agricultural labour is mobile across agricultural sectors only.

Given the specificities of the country, we cannot keep the full employment capacity. Indeed, in Egypt, the labour force participation is very low, especially for women. Consequently, labour supply cannot be fixed. In Egypt, we assume that households devote their time between marketed activities and other activities. By doing so, it allows households to increase their labour supply if job opportunities were to be created. However, in certain circumstances Egyptian women might not be able to apply for job opportunities because of domestic burdens (e.g., childcare). This, situation we cannot represent in the CGE model. Likewise, in the event of a reduction in economic activity, the paid work time perceived by households would decrease.

In Kenya, the situation on the labour market is different. Participation in the labour market is much higher than in Egypt. In addition, there is unemployment among skilled workers, particularly women. Consequently, we decided to model the labour market differently from the modelling used for Egypt. For non-agricultural sectors, we assume that there is unemployment for skilled and middle-skilled workers. Medium-skilled workers who

would not find employment as medium-skilled workers will fall back onto the market for unskilled workers. The idea behind this modelling is to represent the fact that workers are primarily looking to find a job and that they are ready to find a job less qualified than their initial qualification level. To model unemployment, we follow the Blanchflower and Oswald (1995) specification. According to these authors, there is an empirical relation between the unemployment rate and wage rates. Specifically, they found that a 10% increase in the unemployment rate leads to a 1% decrease in wages.

### 4.1.3 The scenarios

To simulate the trade shocks caused by the RUW, we simulate the increase in world prices for crude oil (+ 41%), fertiliser (+ 27%), maize (+20%), wheat (+52%), and vegetable oil (+7%). These price increases are observed between March 2023 and March 2022 (World Bank, 2023). Once the model is run, the new prices and volumes are transmitted to the micro module (top-down) to estimate changes in poverty, income distribution and food security.

## 4.2 Micro-economic model

### 4.2.1 Context and data

Kenya's labour market is marked by significant gender disparities, particularly in labour force participation and wage inequality. Women are underrepresented in formal employment and are predominantly found in the informal sector - in secondary activities - where they face low wages and limited opportunities for advancement. Occupational segregation is a persistent issue, with women concentrated in lower-paying jobs. Cultural norms and limited access to education further exacerbate these disparities (Kabubo-Mariara, 2006; Wanjala & Were, 2009).

In Egypt, female labour force participation is even lower, constrained by deep-rooted cultural norms that prioritise women's roles at home. Gender wage gaps are substantial, particularly in the private sector, and occupational segregation further limits women's career progression. The challenges in Egypt are compounded by societal expectations that reinforce the male breadwinner model, limiting women's access to quality jobs (Miyata & Yamada, 2016; Biltagy, 2019; Omran & Bilan, 2022).

#### 4.2.2 Data on Egypt

The microsimulation builds on two data sources: the 2018 Labour Force survey, which also includes a module addressing food insecurity questions (OAMDI, 2021), and 2018's Household Survey (OAMDI, 2023). While the first was informative of the labour market outcomes at the individual level, the second one provided information on household welfare indicators. Most importantly, the 2018 household survey provided a disaggregation of various sources of income (not available at the LFS) other than labour (self-employment, rental, property, transfers, etc) at the household level. However, given that both surveys do not sample the same households and that the bulk of our variables of interest were in the LFS, we took the latter as our main source and brought complementary variables from the household survey. To do so, we employed a matching algorithm that identified comparable households across surveys<sup>5</sup>. To assess the reliability of the matching procedure, we calculated the poverty rate for 2018 based on the official average poverty line of 736 Egyptian pounds per month using the matched database. We find minor differences when comparing poverty and inequality indicators. Specifically, the matched data showed a poverty rate of 30%, whereas the official one reported 32.5%. Similarly, the matched data Gini coefficient was 0.307, while the official one reported 0.315.

#### 4.2.3 Data on Kenya

We employed the Kenya Integrated Household Budget Survey (KIHBS) 2015-2016 (Kenya National Bureau of Statistics, 2018). It was designed to collect detailed data on household income, expenditure, and consumption patterns across the country. Most importantly, it includes a labour force module with information that we combine with the household level data in order to model the relationship between individual labour market outcomes and household welfare. The survey offers critical insights into the socioeconomic conditions of households, covering a wide range of variables including demographic

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<sup>5</sup> We employ a nearest neighborhood hot deck approach available in R (library StatMatch). The matching was performed at the household level, based on a variety of demographic indicators including the distribution of characteristics within the household.

characteristics, housing conditions, education, health, labour force participation, and access to services.

#### 4.2.4 Micro model

##### 4.2.4.1 Price Channel in Egypt

The macro model offers highly disaggregated price shocks on about 70 goods and services that need to be mapped into the available household expenditure data. We map the price shocks into four categories as defined in the household survey: food items, energy, non-food manufacture, and services. Each household has a unique expenditure share across these four categories, meaning that price shocks will impact households differently, depending on their individual consumption basket diversification.<sup>6</sup> The  $i$ -th household specific consumer price index is defined from the price shocks over the  $j$ -items noted  $P_j^0$  (before) and  $P_j^1$  (after the shock). The  $i$ -th household expenditure share on the  $j$ -th item is noted  $s_{ji}$ :

$$CPI_i^1 = \prod_j \left( \frac{P_j^1}{P_j^0} \right)^{s_{ji}}$$

##### 4.2.4.2 Labour market channel in Egypt

We assume that wage workers mobility is restricted to movements between ten economic sectors and unemployment. Beyond this sector-based mobility, labour markets are characterized by segmentation, suggesting limited to no mobility across specific cells or clusters. This segmentation is delineated by barriers such as workers' location (urban versus rural), skill levels required for the job (across four distinct tiers), and gender. In line with Cockburn et al. (2017), we recognize significant heterogeneity among wage earners, employers, and the self-employed, and posit that there is no mobility between these groups.

Mobility between sectors is modelled based on a comprehensive set of human capital and demographic indicators that pertain to household characteristics and cultural norms. The latter is particularly relevant for the female labour force, who are mainly employed in agriculture, education, and public administration. The literature has documented extensively

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<sup>6</sup> Because of their highly regulated price system, price variation is limited, which discourages the estimation of expenditure lineal system that endogenize the expenditure shares as a function of commodity prices.

the particularities of female labour market participation which seem to constraint the labour supply and the demand for qualified women (Krafft and Assaad, 2022). In Egypt, women labour market participation seems to be fundamentally determined by cultural norms that correlate to their civil status, ethnic origin, among others (e.g., children, available caregivers, parents' level of education, age at marriage, educational gap between spouses their empowerment) (Miyata and Yamada, 2016; Biltagy, 2019; Omran and Bilan, 2022). Hence, we introduce a general enough set of regressors that are informative of male and females' sectoral transition and participation decision.

Wages at a specific sector are censored and are modelled by a Heckman specification where the  $i$ -th worker wage at sector  $j$ -th is defined by:

$$\ln w_{ij} = x_i' \beta_j^g + u_{ij}$$

Where  $x_i'$  represents a set of controls which includes, age, age squared, years of education, a regional indicator (urban or rural) and the household's head level of education. This is a gender specific equation so  $\beta_j^g$  is a gender specific vector parameter. The probability of observing such wage is defined by a selection (probit) equation that includes a set of exclusion restrictions ( $z_i'$ ) i.e. variables other than  $x_i'$ :

$$\Pr[J = j]_i = \Phi(x_i' \gamma_j^g + z_i' \theta_j^g)$$

Among the exclusion restrictions set within  $z$ , we have number of children, number of members older than 65 years, share of female members, as they may relate to the availability and necessity of potential caregivers within the household, which in turn may ease labour market participation. The female specific  $\theta_j^g$  is crucial, to capture the nuances behind female's labour participation vis-à-vis males in our simulation.

The macroeconomic model introduces shocks that alter the demand for labour at every  $j$ -th sector, which in turn leads to hirings or dismissals across various sectors. The behavioural microsimulation model is then used to determine which individuals are likely to be hired or dismissed, based on their estimated probability of labour force participation. Specifically, if the simulated demand for labour in a given sector ( $j$ -th sector) exceeds the employment levels in the baseline scenario, the microsimulation identifies the workers most likely to be hired by selecting those with the highest participation probabilities  $\Pr[J = j]_i$ . Conversely, if the demand decreases, the model identifies those who are most likely to be

dismissed. Similarly, the counterfactual labour income is simulated from the estimated wage equations at every  $j$ -th sector and the unobservables' ( $u_{ij}$ ) normality assumption (Bourguignon and Spadaro, 2006).

The macro model also provides a simulation of alternative income sources, such as transfers to households. This type of shock is simulated by increasing the income of the vulnerable population group of women. The proportion of the increase is defined according to the women's residency (in rural or urban regions) and quintile of household income. Once the simulated labour income at the individual level and the household simulated transfers, a total simulated household income is calculated and deflated by the household specific  $CPI_t^1$  after the shock.

#### 4.2.4.3 Food security in Egypt

We build an agricultural food security indicator from a specific section of the 2018 labour force survey (LFS) titled "shocks and coping". The module tracks a broad range of responses to a variety of shocks, among them, food insecurity. After implementing a multiple correspondence analysis on an initial set of 10 indicators, we chose a subset that show less overlap or redundancy. Each indicator has a binary response that informs if an individual faced a food security negative experience or not, hence our indicator is simply defined as the number of food secure responses. Responses in the LFS are given at the individual level, so our food security indicator is also defined at that level. The indicator builds upon the binary responses to questions on the following six aspects:

- Worrying about food security
- Limited access to preferred food types
- Limited food variety available due to resource constraints
- Eating undesired types of food due to lack of resources
- Borrowing food or relying on others for help.
- Purchasing food on credit.

The indicator  $s_h$ , counts the positive – food secure - answers. As a count variable, it can be modelled as a Poisson, or binomial process among others. We set a food security threshold at 3 i.e., individuals with a higher score are not considered under a food insecurity status. The choice builds on two reasons. First, when analysing households at the local (expenditure) poverty line, they show a mode of 3 in our food insecurity indicator. Secondly,

under the assumption that each dimension is equally important, it makes sense to classify an individual as food secure if he has a single majority in the counting index.

$$s_h = F(x_h'\beta_h + y_h\beta_y) \quad ; s_h = 0,1, \dots,6$$

Where the indicator  $s_h$  follows a binomial distribution and  $F()$  is a logit transformation, while  $x_h$  is a vector of household controls. Shocks to food security are channelled through  $y_h$ , household's per capita available income, which in turn, is determined by the microsimulation exercise. Specifically,  $y_h$  includes wage work income, self-employment income, property income, rental income and transfers.

#### 4.2.4.4 Price channel in Kenya

As with Egypt, the macro model offers highly disaggregated price shocks on more than 45 goods and services that need to be mapped into the available household expenditure data. We map the price shocks into the four categories reported in the household survey: food items, energy, non-food manufacture, and services. Each household has a unique expenditure share across these four categories, meaning that price shocks will impact households differently, depending on their individual consumption basket diversification. The household-specific IPC follows the same definition as Egypt's.

#### 4.2.4.5 Labour market channel in Kenya

As discussed earlier, women are underrepresented in the formal labour market, with many employed in informal sectors like agriculture and low-skilled services. Agriculture plays a crucial role in this dynamic, as many women in rural areas rely on agricultural work as their primary job while taking on secondary jobs, also in agriculture, to supplement their income (Wanjala & Were, 2009). Hence, our microsimulation model's main challenge represents its most salient feature: the prevalence of secondary jobs in agriculture, where the most vulnerable women lie. While the specification of an ideal econometric model of the labour market would be straightforward, its probabilistic simulation would require a sophisticated procedure beyond the scope of our exercise. The ideal reference model is a two-levels nested one. In the first level the individual decides to engage in a main activity, which will lead to labour income  $w_1$  with probability  $p_1$ . In the second level, the individual may consider engaging in a secondary activity with income  $w_2$  with probability  $p_2$ , given it is already engaged in a primary job. This may be implemented through a nested logit or an equivalent

multinomial probit that does not impose the independence of irrelevant alternatives assumption (IIA) (Wen, 2009). As argued by the literature, the estimation of these models rapidly becomes challenging as the number of alternatives increase (Liesenfeld and Richard, 2010; Natarajan et al. 2000). In our case, we should estimate a choice model with too many alternative segments even under a simple specification that considers 5 alternative occupational choices:

1. Non-agriculture employment

Agriculture:

2. Employed in small-scale agriculture
3. Self-employed in small-scale agriculture
4. Employed in pastoralist activities
5. Self-employed in pastoralist activities

Given the 5 alternatives above, for either a main or potential secondary job<sup>7</sup>, the equivalent multinomial probit should consider all the mutually exclusive combinations of such activities resulting in 25 theoretical alternatives. Empirically, this could eventually be reduced to 10 alternatives, that is: 5 alternatives for those working on a main job only, plus 5 alternatives for those having a main non-agricultural job and any of the potential 5 alternatives as secondary employment. Unfortunately, this would ignore vulnerable workers with both (main and secondary) agricultural jobs (16 alternatives). Hence, we opt for a parsimonious approach. We specify a Heckman model for the labour earnings at the different occupational choices (for  $j = 0, 1, \dots, 5$ ), while including unemployment as an additional status ( $j = 0$ ). This is applied to estimate main and secondary job earnings denoted  $w_{ij}$  and  $\tilde{w}_{ij}$  respectively:

$$\text{Main job:} \quad \ln w_{ij} = x_i' \beta_j + e_{ij} \quad \text{with probability } P_{ij}$$

$$\text{Secondary job:} \quad \ln \tilde{w}_{ij} = x_i' \tilde{\beta}_j + \tilde{e}_{ij} \quad \text{with probability } \tilde{P}_{ij}$$

The probabilities  $P_{ij}$  and  $\tilde{P}_{ij}$  are standard selection probabilities based on a Heckman specification, incorporating their respective exclusion restrictions. In our case, we chose the

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<sup>7</sup> Engaging in a secondary activity suggests that a woman receives a very low salary in her primary job and therefore seeks additional paid employment. Following a primary and secondary activity can have negative implications for a woman's time poverty and health.

civil status, which, in contrast to the number of children in the household, did not exhibit frequent missing values that would lead to a loss in observations among the most vulnerable subpopulations (rural, low-skilled, women) that we aim to model. The set of control variables includes the gender, level of skill, age, age-squared a rural location dummy and the level of skill of household head or its couple, in case it's missing.

The microsimulation algorithm is implemented in two steps:

- i. The macro model labour demand shocks at specific labour market segments are applied to the main jobs first. Workers are simulated to be dismissed or hired based on their selection probabilities ranking within the labour market segment. Their counterfactual simulated wages are obtained following the normality assumption on  $e_{ij}$ .
- ii. Once the microsimulation has fulfilled the macro model specification on the main jobs, a similar procedure is applied on the secondary jobs. This only applies to workers conditionally having a main job in (i).

Similarly to Egypt, transfers to households from the macro model are applied as a flat rate within the ten segments defined by wealth quintiles for urban (5) and rural (5) households. After simulating individual labour earnings and transfers, a per capita total income at the household level noted  $\hat{y}_h$ , is calculated.

#### 4.2.4.6 Food security in Kenya

Our food security proxy at the household level is the total per capita expenditure on food items. Although this is clearly not a direct measure of food security, it may be considered to correlate positively with it as motivated by Melgar-Quinones et al., (2006), who studied this relationship in three countries. We model food security as a function of the household per capita total income and other controls such as the level of skill of the household head (or its partner), the location (rural or urban), the female shares in the household and the household size:

$$\ln s_h = x'_h \beta + \theta y_h + \epsilon_h$$

Once estimated, the simulated food security is obtained by replacing the simulated income  $\hat{y}_h$  and the estimated residuals  $\hat{\epsilon}_h$ . We chose the food security line as the magnitude that matches the average food expenditure for households in the neighbourhood of the household expenditure poverty line.

## V. Simulations and results

### 5.1 Trade shock impact scenario

#### 5.1.1 Macro-results trade shock scenarios: Egypt and Kenya

Using the CGE model, we simulate the increase in world prices for crude oil (+ 41%), fertiliser (+ 27%), maize (+20%), wheat (+52%), and vegetable oil (+7%). These price increases are observed between March 2023 and March 2022 (World Bank, 2023). Once the model is run, the new prices and volumes are transmitted to the micro module (top-down) to estimate changes in poverty, income distribution and food security.

The increase in world prices impacts the economy of the two countries through two main channels. On the one hand, imports of these products become more expensive and, depending on the significant internal dependency, lead to higher prices for consumers and industries that use them as input. For instance, as pointed out previously, in Egypt, a high proportion of wheat and maize are imported, while in Kenya, petrol and fertilisers represent a high share of imports, and they are mainly bought as input by industries and farms. On the other hand, if the country exports any of these products, then an increase in the world price will tend to induce local producers to turn their production to the external market. In our cases here, Egypt could benefit from the increase in prices of oil and fertilisers, while Kenya could benefit from the increase in agricultural commodities.

**Table 2: Macroeconomic impacts (in %)**

	<b>EGY</b>	<b>KEN</b>
Imports	0.62	-5.88
GDP real	-0.01	-0.13
Total labour demand	-0.01	-0.33
Total labour demand male	-0.02	-0.41
Total labour demand female	0.02	0.02
Consumer price index	3.39	-5.92
Total investment (nominal)	3.56	-10.82
Export demand	0.05	2.81
Nominal household income	3.00	-8.18
Total real household consumption	-0.37	-2.41

The large increase in the world price of the five commodities has a dramatic impact on the Kenyan economy and, to a lesser extent, on the Egyptian economy (Table 2). First, given the high dependency of Kenya on imported oil, there is an increase in production costs for all the different activities, as well as for households. Firms and businesses reduce their

production and lay off workers. The labour demand decreases more in Kenya than in Egypt, and in Kenya, the overall labour demand is decreasing much more for men than for women. Since the proportion of women in the Egyptian labour force is very small, the absolute changes in female labour in Egypt are very small. For both countries, there is a decrease in household's real consumption, with Kenyan households being hit harder. Overall, real GDP decreases for both countries.

The sectoral analysis will help us understand why the results are so different among the two countries. As mentioned earlier, for both countries, the rise in oil prices is increasing the costs of production for the different activities. The increase in production costs is particularly important for the transport sector and the other industries in Egypt. Consequently, these sectors face a decrease in their production. On the other side, Egypt, as it is a net oil and fertiliser exporter, is benefitting from the rise in world prices, leading to an increase in all the prices in the economy. In the sectors involved in the production of fertilisers and petroleum, we observe an increase in production. For these specific sectors, the rental rate of capital increases.

These impacts on the production of the sectors have impacts on the labour demand in the specific sectors. At the macro level, for both countries, there is a decrease in the total labour demand. The decrease depends on how capital-intensive the sectors are in the corresponding countries.

If we have a look at the results per type of worker, we can see that the labour demand for unskilled women would slightly increase, but the demand for skilled women would decrease (Table 3). Skilled women in Egypt mainly work in the administrative sector. Given the rise in prices and the fixed government budget, the public sector needs to reduce its production; hence, its labour demand and skilled women are the most affected, while male workers are less or not affected.

**Table 3: Impact on the labour demand per activity in Egypt and Kenya (in %)**

	EGY	KEN
aggr_agrforfis	0.44	
aggr_amaiz		-1.35
aggr_aocer		9.60
aggr_apuls		-2.50
aggr_aoils		-0.56
aggr_avero		-3.02
aggr_afrui		-1.50
aggr_aocrp		3.04
aggr_acatt		2.67
aggr_aoliv		2.15
aggr_afore		-7.21
aggr_afish		-8.33
aggr_afood		-6.26
aggr_amanuf	5.19	1.48
aggr_otherindu	-0.61	-1.83
aggr_acons	0.81	-8.67
aggr_atrad	0.87	-3.21
aggr_atran	-2.80	0.26
aggr_apadm	-1.05	4.80
aggr_aeduc	0.19	4.85
aggr_aheal	-0.01	2.58
aggr_aserv	-0.99	-1.93

**Notes:** aggr\_ = aggregated industries including ... , agrforfis = agriculture & forestry & fishery, amaiz = maize production, aocer = other cereals incl. rice and wheat, apuls = pulses, aoils = oilseeds, avero = vegetable & root crops, afrui = fruit, aocrp = other crops, acatt = cattle, aolive = other livestock, afore = forestry, fish = fishery, afood = food industry, amanuf = manufacturing, otherindu = other industries, acons = construction, atrad = trade, atran = transport, apadm = public services, aeduc = education, aheal = health services, aserv = other services

In Kenya, skilled and semi-skilled workers face a drop in the labour demand (Table 4). The semi-skilled workers who cannot find a job as semi-skilled try to find a job as unskilled workers, creating great downward pressure on the unskilled wage rate. Given the massive reduction of the wage rate, activities are hiring such types of workers, which suggests an increase in vulnerable (not good quality) employment.

**Table 4: Impact on the labour demand per type of labour in Egypt and Kenya (in %)**

	EGY	KEN
male_rura_unsk	0.00	
fema_rura_unsk	0.12	
male_rura_prim	-0.01	
fema_rura_prim	0.15	
male_rura_seco	-0.02	
fema_rura_seco	0.06	
male_rura_tert	-0.05	
fema_rura_tert	-0.01	
male_urba_unsk	0.00	
fema_urba_unsk	0.09	
male_urba_prim	0.00	
fema_urba_prim	0.12	
male_urba_seco	0.00	
fema_urba_seco	-0.03	
male_urba_tert	-0.05	
fema_urba_tert	-0.05	
flab-n		50.02
flab-nf		53.22
flab-p		-2.79
flab-pf		-2.59
flab-s		-0.75
flab-sf		0.03

**Notes:** male\_rura\_unsk = male workers in rural regions without scholar education, fema\_rura\_unsk = female workers in rural regions without scholar education, male\_rura\_prim = male workers in rural regions with primary education, fema\_rura\_prim = female workers in rural regions with primary education, male\_rura\_seco = male workers in rural regions with secondary education, fema\_rura\_seco = female workers in rural regions with secondary education, male\_rura\_tert = male workers in rural regions with tertiary education, fema\_rura\_tert = female workers in rural regions with tertiary education, male\_urba\_unsk = male workers in urban regions without scholar education, fema\_urba\_unsk = female workers in urban regions without scholar education, male\_urba\_prim = male workers in urban regions with primary education, fema\_urba\_prim = female workers in urban regions with primary education, male\_urba\_seco = male workers in urban regions with secondary education, fema\_urba\_seco = female workers in urban regions with secondary education, male\_urba\_tert = male workers in urban regions with tertiary education, fema\_urba\_tert = female workers in urban regions with tertiary education.

Households' income is derived from wages, capital and land income and transfers they receive from other institutions. In Egypt, there is a rise in nominal wages and a slight decrease in the total labour demand, while capital income is increasing, as well as nominal transfers. In Kenya, there is a sharp decrease in wages, especially for unskilled workers, and a drop in the total labour demand. At the macro level, the impacts on households' real consumption are negligible for rural households in Egypt, where the decrease in labour demand in rural areas is less expressed than in urban regions (Table 5). In Kenya, the decrease is general and a bit greater for rural households at the bottom of the distribution because their income is mainly based on agricultural production, for which production costs for fertiliser and energy have increased drastically.

**Table 5: Impact on households' real consumption (in %)**

	EGY	KEN
hhd-r1	-0.11	-2.62
hhd-r2	-0.20	-2.53
hhd-r3	-0.23	-2.49
hhd-r4	-0.25	-2.37
hhd-r5	-0.27	-2.34
hhd-u1	-0.29	-2.19
hhd-u2	-0.40	-2.39
hhd-u3	-0.45	-2.33
hhd-u4	-0.47	-2.22
hhd-u5	-0.59	-2.40

**Notes:** hhd- = household income decile, r1= rural first decile, ..., r5 = rural fifth decile, -u1= urban first decile, ..., u5 = urban fifth decile

## 5.1.2 Micro-results trade shock scenario

### 5.1.2.1 Poverty and consumption in Egypt

Table 6 shows our Foster-Greer-Thorbecke (FGT) estimates using Egypt's average official poverty line in 2018 (3.8 \$US per day or 736 Egyptian pounds). We notice a worsening of all measured aspects of poverty from the baseline to the RUW simulation scenario. The increase across all three FGT indices indicates not only an increase in the number of poor people, but also in how far below the poverty line the average poor person is, as well as the severity of their poverty. The poverty gap increases from 0.295 to 0.33, implying a rise in poor individuals of about 11%. This resembles Ayaz et al. (2023) microsimulation of the RUW effect on Pakistan. The authors found an 11% increase of the poverty headcount at the poverty line of 1.9 \$us per day and 5.3% at a line of 3.2 \$us per day. In terms of inequality, the authors found that it raised only slightly (in 0.001).

**Table 6: Poverty headcount, gap and severity at baseline and RUW simulation**

	FGT (0)	FGT (1)	FGT (2)	Gini
Baseline	0.295	0.229	0.076	0.307
Simulation	0.33	0.274	0.116	0.323

Note: FGT (0) Headcount ratio. FGT (1) Average normalised poverty gap. FGT (2) Average squared normalised poverty gap. The poverty line is 3.8\$us per day (average official).

Deepening the analysis reveals distinct patterns in how total household expenditure (representing the income growth rates) changes by gender, location, and skill level (Table 7). Overall, the decrease in total household expenditure in mean, median, and percentile mean consistently indicates negative growth rates, confirming a contraction in economic activity or

income for the observed groups. The growth rates highlight more severe reduced expenditures at the lower percentiles, particularly for the unskilled and rural populations. This suggests that the poorest segments are experiencing the most significant decreases in income. Urban areas and skilled individuals, while also facing negative growth, show relatively less severe declines, indicating a slightly more resilient economic status.

**Table 7: Relative change in total household expenditure (per capita)**

		10th	15th	20th	25th	30th	Mean	Median
<b>Overall</b>		-18.409	-14.895	-12.903	-11.388	-10.351	-3.255	-3.476
Gender	Male	-19.1	-15.551	-13.517	-11.959	-10.868	-3.453	-3.481
	Female	-17.895	-14.366	-12.392	-10.925	-9.909	-3.066	-2.885
Location	Urban	-17.662	-14.323	-12.245	-10.865	-9.821	-3.131	-2.371
	Rural	-18.909	-15.103	-13.179	-11.721	-10.629	-3.348	-2.954
Skill	Unskilled	-19.473	-15.736	-13.788	-12.403	-11.291	-3.428	-3.407
	Skilled	-16.512	-13.267	-11.363	-10.012	-9.051	-3.121	-2.807

Note: Author's calculations

#### 5.1.2.2 Food security in Egypt

To implement the FGT analysis over our food security indicator, we assume that scoring less than half of the best possible score proxies a food insecurity status, equivalent to food security poverty. The simulation results in Table 8 indicate that while the proportion of the Egyptian population classified as food insecure (22%) remains unchanged following the simulated RUW scenario, the depth and severity of food insecurity have notably worsened. The food insecurity gap index increased from 0.40 to 0.46, suggesting that those who remain food insecure are, on average, further below the food security threshold than before. Similarly, the food insecurity severity index rose from 0.26 to 0.3, highlighting growing disparities within the food-insecure population, with more severe cases becoming increasingly prevalent. Additionally, the slight increase in the Gini coefficient from 0.099 to 0.11 suggests that the overall inequality in food security has marginally worsened, indicating that the adverse impacts of the war have been unevenly distributed across the population.

**Table 8: Food Security headcount, gap and severity at baseline and RUW simulation**

	FGT (0)	FGT (1)	FGT (2)	Gini
Baseline	0.22	0.402	0.265	0.099
Simulation	0.22	0.465	0.3	0.11

Note: FGT (0) Headcount ratio. FGT (1) Average normalised food poverty gap. FGT (2) Average squared normalised poverty gap. The food security line is at 3 out of 6 dimensions.

The incidence curve analysis (Table 9) indicates that food security has declined across all demographics, with women being particularly hard-hit by the RUW compared to men. Females have experienced more significant reductions in food security at every percentile, with a decline of 18.67% at the 10th percentile compared to 17.51% for male-headed households. This trend continues across the 20th and 30th percentiles, as well as the mean, highlighting that women are disproportionately affected by the adverse changes in food security. This vulnerability is supported by ElKhorazaty and Zaky (2023), who argue that women are more vulnerable to shocks than men due to their heavier involvement in unpaid subsistence farming, limited access to resources like land and credit, and the higher likelihood of leading food-insecure households. This lack of resources and overburdening of unpaid labour makes it harder for women to recover from economic or environmental shocks. Additionally, while both rural and urban populations have seen declines, urban areas and skilled workers have also been more severely impacted, though to a slightly lesser extent than the gender disparity observed.

**Table 9: Relative change in food security indicator**

		10th	20th	30th	Mean	Median
<b>Overall</b>		-18.01	-12.48	-9.91	-2.85	-3.02
Gender	Female	-18.67	-13.07	-10.41	-3.05	-2.99
	Male	-17.51	-11.96	-9.47	-2.66	-2.43
Location	Rural	-17.22	-11.81	-9.38	-2.76	-1.93
	Urban	-18.48	-12.72	-10.16	-2.92	-2.47
Skill	Skilled	-19.05	-13.33	-10.82	-3.01	-2.98
	Unskilled	-16.09	-10.92	-8.61	-2.74	-2.34

Note: Author's calculations

### 5.1.3 Poverty and consumption in Kenya

Table 10 shows our Foster-Greer-Thorbecke (FGT) estimates using Kenya's average official poverty line in 2015-16. The overall poverty lines for rural and urban areas are calculated in monthly adult equivalent terms by Kenya's statistical office for the rural and urban areas. We notice a worsening of all measured aspects of poverty from the baseline to

the RUW simulation scenario. The increase across all three FGT indices resembles Egypt’s simulation and is also in line with the RUW simulation effects on Ayaz et al. (2023). The poverty gap increases from 0.33 to 0.38, so a rise of more than 10% in poor individuals. Inequality increases significantly from 0.39 to 0.43

**Table 10: Poverty headcount, gap and severity at baseline and RUW simulation**

	FGT (0)	FGT (1)	FGT (2)	Gini
Baseline	0.36	0.103	0.046	0.39
Simulation	0.38	0.12	0.061	0.43

Note: FGT (0) Headcount ratio. FGT (1) Average normalised poverty gap. FGT (2) Average squared normalised poverty gap. The poverty line is 3.8\$us per day (average official).

A deeper analysis reveals distinct patterns in how income growth rates vary by gender, location, and skill level. (Table 11). Overall, the growth rates in the mean, median, and percentiles consistently indicate negative growth, confirming a contraction in economic activity. The pro-poor growth rates highlight more severe contractions in the lower percentiles, particularly for the urban and skilled populations. Women continue to show vulnerability compared to men.

**Table 11: Relative change in total household expenditure (per capita)**

		10th	20th	30th	Mean	Median
<b>Overall</b>		-17.49	-11.90	-9.31	-4.55	-4.476
Gender	Female	-18.1	-12.57	-9.86	-4.43	-4.481
	Male	-16.85	-12.92	-8.09	-4.06	-3.885
Location	Rural	-16.62	-11.45	-9.21	-4.31	-3.371
	Urban	-17.90	-12.17	-9.69	-4.34	-3.954
Skill	Skilled	-18.47	-12.78	-10.91	-4.28	-4.407
	Unskilled	-15.12	-10.63	-8.05	-4.11	-3.807

Note: Author’s calculations

#### 5.1.4 Food security in Kenya

The simulation results in Table 12 indicate that the Kenyan population classified as food insecure (31%) increased by three percentage points following the simulated RUW scenario. Similarly, the gap and severity of food insecurity worsened more than in Egypt’s simulation. The food insecurity gap index increased from 0.095 to 0.11. The food insecurity severity index also rose from 0.043 to 0.05. Additionally, the increase in the Gini coefficient

from 0.34 to 0.36 suggests that overall inequality in food security has worsened, indicating that the adverse impacts of the war have been unevenly distributed across the population.

**Table 12: Food Security headcount, gap and severity at baseline and RUW simulation**

	FGT (0)	FGT (1)	FGT (2)	Gini
Baseline	0.31	0.095	0.043	0.34
Simulation	0.33	0.11	0.05	0.36

Note: FGT (0) Headcount ratio. FGT (1) Average normalised food poverty gap. FGT (2) Average squared normalised poverty gap. The food security line is at 3 out of 6 dimensions.

The incidence curve analysis (Table 13) indicates that food security has declined across all demographics, confirming that women are particularly hard-hit by the RUW compared to men. Females have experienced more significant reductions in food security at every percentile, including the mean. Additionally, while both rural and urban populations have seen declines, urban areas and skilled workers have also been more severely impacted.

**Table 13: Relative change in food security indicator**

		10th	20th	30th	Mean	Median
<b>Overall</b>		-19.29	-13.66	-8.41	-5.65	-4.12
Gender	Female	-19.33	-14.56	-9.16	-6.03	-3.39
	Male	-17.59	-12.23	-8.27	-5.56	-3.23
Location	Rural	-18.38	-10.67	-8.35	-2.78	-2.63
	Urban	-19.76	-11.34	-9.11	-3.12	-3.77
Skill	Skilled	-20.45	-12.34	-9.32	-5.08	-3.93
	Unskilled	-17.94	-11.32	-7.61	-5.74	-3.53

Note: Author's calculations

## 5.2 Mitigation policy scenarios

To help their populations cope with this shock, both countries have implemented policies to support their economies. In Egypt, severely affected by rising food prices, the government has increased subsidies for food products (SubFood). In Kenya, the government has implemented a subsidy on petroleum products (SubOil).

In the following series of scenarios, we first implement the policy put in place in each country to help the economy. Next, we evaluate the impacts of two policies per country that are in favour of women. To the policies, we implement both: for all policy mitigation

scenarios, we implement the shocks resulting from the RUW. In addition, we implement the country-specific policy measure. In this way, we simulate at the same time the impacts of RUW and the policies to counteract these impacts.

In Egypt, female labour force participation is particularly low, and women in rural areas are particularly vulnerable. First, we evaluate the effects of a wage subsidy policy for unskilled women in the agricultural sector (SubSal). Secondly, we evaluate the impact of a transfer policy for women living in rural areas, specifically women belonging to the first quintile (TransRur).

The amount allocated for each of the three policy scenarios is the same (food subsidy, wage subsidy and transfer to rural women) so that results can be compared.

In Kenya, in the first simulation, we evaluate the implementation of a subsidy for petroleum products as implemented by the government. Then, in order to reduce poverty for the greatest number of women in rural areas, we evaluate the effects of a transfer to rural households belonging to the first quintile to the extent that 99% of women belonging to this quintile are poor. In a second scenario, we evaluate the implementation of a transfer for women living in townships, which represents a new form of vulnerability for women in urban areas. In this scenario, the monetary transfer will be directed towards urban households belonging to the first quintile (i.e., the bottom quintile). As for Egypt, the amount allocated for the three policies is the same, allowing the results to be compared. Table 14 presents an overview of the simulated scenarios for Egypt and Kenya. The results presented in the following tables are compared to a simulation without any shock.

We anticipate different economic mechanisms behind these three scenarios. In the first scenario, the price of subsidised food products will decrease, which should increase household consumption of these products. An increase in the consumption of these products could have a positive effect on the production of these products, and therefore improve employment in these branches, all other things being equal. In the second scenario, it is the employment of unskilled women in agriculture that will be encouraged. Consequently, the agricultural sector should increase its production, and the income of mainly rural households should increase. This increase will have an impact on consumption, which could boost production. In the third scenario, rural households in the first two quintiles will receive a

transfer, which will increase their disposable income and consumption. This increase will have an impact on the sectors producing the different products.

On the other hand, for the three scenarios, the government incurs additional expenditure of the same amount, which further increases the deficit. The investment budget will therefore be impacted, which will have an impact on sectors producing capital goods, such as the construction sector for example.

**Table 14: Overview on the mitigation scenario assumptions**

Scenario	Assumptions	
	EGY	KEN
RUW	in world prices for crude oil (+ 41%), fertiliser (+ 27%), maize (+20%), wheat (+52%),	
SubFood	increased subsidies for food products	
SubSal	a wage subsidy policy for unskilled women in the agricultural sector	
TransRur	a transfer to rural households belonging to the first quintile	
SubOil		subsidy for petroleum products
TransRur		a transfer to rural households
TransUrb	transfer will be directed towards urban households belonging to the first quintile	

## 5.2.1 Mitigation and gender scenarios in Egypt

### 5.2.1.1 Macro-results mitigation and gender scenarios in Egypt

Table 15 shows the impacts on macroeconomic variables for the three mitigation policies compared to the situation with the RUW shocks. The three policies implemented have a negligible effect on real GDP. On the other hand, each lead to an improvement in real household consumption. Compared to other scenarios, the SubSal scenario offers a better effect on total labour with a slight decrease. The impact is particularly positive for female labour with an increase of 0.28%.

**Table 15: Difference in percentage points between the RUW scenario and the mitigation scenario (change in ScenShock - change in ScenXX)**

	SubFood	SubSal	TransRur
	-0.08	-0.05	-0.06
Imports	-0.01	-0.01	-0.08
GDP real	-0.02	-0.01	-0.16
Total labour demand	-0.02	-0.08	-0.17
Total labour demand male	-0.02	0.28	-0.15
Total labour demand female	-0.43	0.05	0.19
Consumer price index	-0.97	-0.79	-1.76
Total investment (nominal)	0.04	-0.04	-0.03
Export demand	-0.07	0.46	0.99
Nominal household income	0.35	0.40	0.82

**Notes:** SubFood = subsidies on food commodities, SubSal = subsidies on sallies for rural workers, TransRur = transfers to rural households, SubOil = subsidies for petrol, TransRur = transfers to rural households, TransUrb = Transfers to urban households

In terms of production, the different policies have interesting results (Table 16). As expected, the impact on the construction sector is negative as this sector is directly impacted by the drop of the budget for total investment due to the increase of government deficit. In the first two scenarios, the agricultural sector benefits from the policies, especially in the SubSal scenario. The changes in production lead to changes in the labour demand.

**Table 16: Difference of change in percentage points production (change in policy scenario - change in RUW scen)**

	SubFood	SubSal	TransRur
all sectors	0.03	-0.01	-0.05
aggr_agrforfis	0.02	0.43	-0.07
aggr_amanuf	0.31	0.02	0.18
aggr_otherindu	0.04	-0.09	0.07
aggr_acons	-0.58	-0.55	-1.12
aggr_atrad	-0.05	-0.10	-0.17
aggr_atran	-0.04	-0.03	0.01
aggr_apadm	-0.10	-0.18	-0.33
aggr_aeduc	-0.15	-0.18	-0.30
aggr_aheal	0.01	0.11	0.24
aggr_aserv	-0.07	-0.04	0.01

**Notes:** aggr\_ = aggregated industries including ... , agrforfis = agriculture & forestry & fishery, amaiz = maize production, aocer = other cereals incl. rice and wheat, apuls = pulses, aoils = oilseeds, avero = vegetable & root crops, afrui = fruit, aocrp = other crops, acatt = cattle, aolive = other livestock, afore = forestry, fish = fishery, afood = food industry, amanuf = manufacturing, otherindu = other industries, acons = construction, atrad = trade, atran = transport, apadm = public services, aeduc = education, aheal = health services, aserv = other services, SubFood = subsidies on food commodities, SubSal = subsidies on sallies for rural workers, TransRur = transfers to rural households, SubOil = subsidies for petrol, TransRur = transfers to rural households, TransUrb = Transfers to urban households

In the same way as for production, the demand for work (Table 17) evolves according to the scenarios. In agriculture and the manufacturing sector, labour demands are increasing, while for the construction and trade sectors, they are decreasing.

**Table 17: Difference of change in percentage points in labour demand per sector (change in ScenShock - change in ScenXX)**

	SubFood	SubSal	TransRur
aggr_agrforfis	0.05	1.02	-0.16
aggr_amanuf	1.10	0.08	0.64
aggr_otherindu	0.17	-0.39	0.27
aggr_acons	-1.11	-1.05	-2.15
aggr_atrad	-0.14	-0.26	-0.47
aggr_atran	-0.06	-0.04	0.01
aggr_apadm	-0.11	-0.20	-0.38
aggr_aeduc	-0.18	-0.21	-0.34
aggr_aheal	0.03	0.21	0.45
aggr_aserv	-0.13	-0.08	0.02

**Notes:** aggr\_ = aggregated industries including ... , agrforfis = agriculture & forestry & fishery, amaiz = maize production, aocer = other cereals incl. rice and wheat, apuls = pulses, aoils = oilseeds, avero = vegetable & root crops, afrui = fruit, aocrp = other crops, acatt = cattle, aolive = other livestock, afore = forestry, fish = fishery, afood = food industry, amanuf = manufacturing, otherindu = other industries, acons = construction, atrad = trade, atran = transport, apadm = public services, aeduc = education, aheal = health services, aserv = other services, SubFood = subsidies on food commodities, SubSal = subsidies on salaries for rural workers, TransRur = transfers to rural households, SubOil = subsidies for petrol, TransRur = transfers to rural households, TransUrb = Transfers to urban households

Given the distribution of workers across sectors, not all workers are affected in the same way. The impact on the different categories of workers will depend on the intensity of the sectors in skilled versus unskilled workers, men and women. For example, male workers can be expected to be more impacted than female workers as they are over-represented compared to women in sectors with declining production. On the other hand, given the polarisation of the labour market for women in Egypt, the implementation of policies favourable to the agricultural sector has a beneficial effect on unskilled female workers (Table 18).

**Table 18: Difference of change in percentage points in the different type of demand (change in Policy Scenario - change in RUW)**

	<b>SubFood</b>	<b>SubSal</b>	<b>TransRur</b>
male_rura_unsk	-0.03	-0.19	-0.42
fema_rura_unsk	0.00	1.37	-0.37
male_rura_prim	-0.03	-0.18	-0.42
fema_rura_prim	0.00	1.39	-0.37
male_rura_seco	-0.03	-0.19	-0.37
fema_rura_seco	-0.01	-0.17	-0.25
male_rura_tert	-0.03	-0.18	-0.22
fema_rura_tert	-0.04	-0.18	-0.16
male_urba_unsk	-0.02	0.01	0.00
fema_urba_unsk	-0.01	0.02	0.03
male_urba_prim	-0.02	0.01	0.00
fema_urba_prim	0.00	0.02	0.04
male_urba_seco	-0.01	0.01	0.01
fema_urba_seco	-0.03	0.01	0.00
male_urba_tert	-0.02	0.01	0.00
fema_urba_tert	-0.04	0.00	-0.01

**Notes:** male\_rura\_unsk = male workers in rural regions without scholar education, fema\_rura\_unsk = female workers in rural regions without scholar education, male\_rura\_prim = male workers in rural regions with primary education, fema\_rura\_prim = female workers in rural regions with primary education, male\_rura\_seco = male workers in rural regions with secondary education, fema\_rura\_seco = female workers in rural regions with secondary education, male\_rura\_tert = male workers in rural regions with tertiary education, fema\_rura\_tert = female workers in rural regions with tertiary education, male\_urba\_unsk = male workers in urban regions without scholar education, fema\_urba\_unsk = female workers in urban regions without scholar education, male\_urba\_prim = male workers in urban regions with primary education, fema\_urba\_prim = female workers in urban regions with primary education, male\_urba\_seco = male workers in urban regions with secondary education, fema\_urba\_seco = female workers in urban regions with secondary education, male\_urba\_tert = male workers in urban regions with tertiary education, fema\_urba\_tert = female workers in urban regions with tertiary education

Regarding households' real consumption (Table 19), the food subsidy scenario improves the situation for all the different households, especially the poorest, who spend a higher share of their income on food commodities. In the wage subsidy scenario, all rural households increase their real consumption while urban households see their situation getting worse. In the transfer scenario, only households that are receiving the transfer see their situation improving.<sup>8</sup>

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<sup>8</sup> The empirical literature suggests that when women's wages increase relative to men's wages (even when keeping total household income constant) women gain greater decision-making power. There is also evidence that women's earnings are more likely to be spent on children, food, health education. Thus, the gender composition of household income matters for well-being, not only the level. In this work we do not consider this aspect, since we do not consider intra-household decision making processes.

**Table 19: Difference of change in percentage points in for households' real consumption (in %)**

	SubFood	SubSal	TransRur
hhd-r1	0.36	1.11	8.81
hhd-r2	0.34	1.03	4.79
hhd-r3	0.34	0.96	-0.01
hhd-r4	0.33	0.96	-0.02
hhd-r5	0.33	0.75	-0.04
hhd-u1	0.39	-0.08	-0.23
hhd-u2	0.38	-0.10	-0.25
hhd-u3	0.37	-0.10	-0.25
hhd-u4	0.36	-0.10	-0.25
hhd-u5	0.34	-0.13	-0.26

hhd- = household income decile, -n1= (non-rural = urban) first decile, ..., n5 = (non-rural = urban) fifth decile, -r1= rural first decile, ..., r5 = rural fifth decile, -u1= urban first decile, ..., u5 = urban fifth decile

### 5.2.2 Micro-results mitigation and gender scenarios: Egypt

Table 20 compares the effectiveness of different mitigation scenarios—food subsidies, wage subsidies, and direct transfers—on poverty and income inequality, as measured by the FGT indices and the Gini coefficient. The results show that direct transfers are the most effective in reducing poverty, with the poverty headcount (FGT (0)) decreasing from 0.330 in the baseline RUW scenario to 0.306, and the severity of poverty (FGT(2)) also seeing a significant reduction. In contrast, food and wage subsidies offer only marginal improvements, barely affecting the poverty gap (FGT (1)) and severity while leaving the overall income inequality between households unchanged, as indicated by a stable Gini coefficient of 0.323. The Gini coefficient under the transfer scenario decreases slightly to 0.319, indicating a modest reduction in income inequality between households. Overall, the findings suggest that direct transfers are a more effective tool for reducing both poverty and inequality compared to subsidies.

**Table 20: Poverty headcount, gap and severity at RUW simulation and mitigation scenarios**

	FGT (0)	FGT (1)	FGT (2)	Gini
RUW	0.330	0.274	0.116	0.323
Food	0.325	0.273	0.115	0.323
Wage	0.327	0.273	0.115	0.323
Transfers	0.306	0.264	0.109	0.319

Note: FGT (0) Headcount ratio. FGT (1) Average normalised poverty gap. FGT (2) Average squared normalised poverty gap. The poverty line is 3.8\$us per day (average official).

An in-depth analysis of the distributional effects of the mitigation scenarios is provided in Table 21. Food subsidies provide relatively stable welfare outcomes with minor gender and urban-rural differences. Wage subsidies lead to lower overall welfare less reducing for rural than for urban households. Direct transfers increase the welfare levels particularly in rural areas and among unskilled workers but create a higher increase in rural than in urban households. The magnitude of the increase in welfare for men and women is modest between food subsidies and wage subsidies and slightly lower for women. The direct transfers, however, create a significant increase in wealth, with slightly higher for women than for men.

**Table 21: Relative change in household expenditure (per capita) at mitigation scenarios (across percentiles)**

Food	10	15	20	25	30	mean	median
<b>Overall</b>	0.72	0.72	0.73	0.73	0.72	0.55	0.67
<b>Male</b>	<b>0.75</b>	<b>0.74</b>	<b>0.74</b>	<b>0.74</b>	<b>0.74</b>	<b>0.56</b>	<b>0.67</b>
<b>Female</b>	<b>0.68</b>	<b>0.71</b>	<b>0.72</b>	<b>0.72</b>	<b>0.71</b>	<b>0.55</b>	<b>0.63</b>
<b>Urban</b>	0.75	0.74	0.74	0.73	0.71	0.51	0.53
<b>Rural</b>	0.78	0.76	0.76	0.75	0.75	0.59	0.80
<b>Unskilled</b>	0.72	0.74	0.74	0.75	0.74	0.57	0.67
<b>Skilled</b>	0.70	0.70	0.71	0.70	0.69	0.51	0.70
Wage	10	15	20	25	30	mean	median
<b>Overall</b>	0.49	0.48	0.51	0.52	0.51	0.31	0.45
<b>Male</b>	<b>0.67</b>	<b>0.61</b>	<b>0.59</b>	<b>0.58</b>	<b>0.56</b>	<b>0.32</b>	<b>0.38</b>
<b>Female</b>	<b>0.49</b>	<b>0.52</b>	<b>0.53</b>	<b>0.52</b>	<b>0.51</b>	<b>0.30</b>	<b>0.40</b>
<b>Urban</b>	0.42	0.41	0.41	0.40	0.39	0.22	0.24
<b>Rural</b>	0.66	0.60	0.60	0.60	0.59	0.38	0.63
<b>Unskilled</b>	0.49	0.51	0.52	0.54	0.54	0.33	0.45
<b>Skilled</b>	0.45	0.46	0.47	0.46	0.46	0.26	0.39
Transfers	10	15	20	25	30	mean	median
<b>Overall</b>	4.86	5.10	4.96	4.62	4.43	2.20	2.42
<b>Male</b>	<b>4.88</b>	<b>5.09</b>	<b>4.96</b>	<b>4.62</b>	<b>4.41</b>	<b>2.00</b>	<b>2.00</b>
<b>Female</b>	<b>5.12</b>	<b>5.26</b>	<b>5.08</b>	<b>4.74</b>	<b>4.56</b>	<b>2.38</b>	<b>2.10</b>
<b>Urban</b>	0.20	0.18	0.17	0.17	0.15	0.04	0.08
<b>Rural</b>	7.32	7.36	7.28	6.80	6.47	3.81	3.78
<b>Unskilled</b>	5.30	5.40	5.51	5.29	5.05	3.59	3.63
<b>Skilled</b>	3.33	3.13	2.95	2.71	2.51	0.84	1.01

Moving to the food security scenarios, Table 22 presents the impact of different policy scenarios—food subsidies, wage subsidies, and direct transfers. The FGT (0) index, representing the proportion of the population experiencing food insecurity, shows that all scenarios offer some improvement over the baseline RUW scenario, where 20% of the population is food insecure. Wage subsidies appear to have the most significant impact,

reducing the FGT (0) to 17%, indicating a more substantial decrease in the proportion of food-insecure households. However, both the FGT (1) and FGT(2) indices, which measure the depth and severity of food insecurity, respectively, increase under the food and wage subsidy scenarios, suggesting that while fewer households are food insecure, those who remain food insecure are experiencing more severe levels of insecurity. This is particularly evident in the wage subsidy scenario, where the FGT (2) index increases to 0.34, the highest among all scenarios. The Gini coefficient, which measures inequality in food security, increases slightly under both subsidy scenarios, suggesting a modest increase in inequality. In contrast, the transfers scenario, while less effective in reducing the food insecurity headcount (FGT (0) to 18%), maintains a stable Gini coefficient and shows less pronounced increases in the severity of food insecurity. This suggests that direct transfers may offer a more balanced approach, reducing food insecurity without exacerbating inequalities as much as the subsidy-based interventions.

**Table 22: Food Security, gap and severity at RUW simulation and mitigation scenarios**

	FGT (0)	FGT (1)	FGT (2)	Gini
RUW	0.20	0.46	0.30	0.11
Food	0.19	0.48	0.32	0.12
Wage	0.17	0.51	0.34	0.12
Transfers	0.18	0.48	0.32	0.11

Note: FGT (0) Headcount ratio. FGT (1) Average normalized food poverty gap. FGT (2) Average squared normalised poverty gap. The food security line is at 3 out of 6 dimensions.

### 5.2.3 Results mitigation and gender scenarios in Kenya

To mitigate the negative effects induced by the RUW, we evaluate the effects of three policies. The first scenario (SubOil) evaluates the effects of establishing a subsidy for petroleum products. The second (TransRur) evaluates the effects of a monetary transfer to poor rural women. The third (TransUrb) evaluates the effects of a monetary transfer to women living in informal settlements in urban and in peri-urban regions (e.g., in townships).

#### 5.2.3.1 Macro-results mitigation and gender scenarios in Kenya

The results of the three policies are interesting because they show different effects (Table 23). Indeed, the establishment of a subsidy for petroleum products affects the entire economy (households and businesses). The economy as a whole will benefit from this subsidy and pay less for the purchase of petroleum products. *Ceteris paribus*, the price of intermediate consumption for the branches will decrease, reducing the producer price. For

households, the subsidy allows them to purchase more petroleum products, but also more other products. Consequently, we are witnessing an overall improvement for most sectors, for which production decreases less than in the crisis scenario. Likewise, sectors are reducing their workers less and this benefits women in particular. Real GDP is slightly improved.

For the other two scenarios, we have results that point in the same direction. To the extent that the transfer affects a restricted group of people (and not the entire economy as in the SUBOIL scenario), the results will be greater in terms of total household consumption.

**Table 23: Difference in percentage points between the RUW scenario and the mitigation scenario (change in ScenShock - change in ScenXX)**

	SubOil	TransRur	TransUrb
	-0.06	-0.02	-0.04
Imports	0.02	-0.14	-0.19
GDP real	0.04	-0.36	-0.50
Total labour demand	0.04	-0.34	-0.47
Total labour demand male	0.05	-0.29	-0.41
Total labour demand female	0.29	1.29	1.81
Consumer price index	-1.07	-1.12	-1.57
Total investment (nominal)	0.05	-0.44	-0.62
Export demand	0.53	1.55	2.24
Nominal household income	0.26	0.40	0.57

**Notes:** SubFood = subsidies on food commodities, SubSal = subsidies on salaries for rural workers, TransRur = transfers to rural households, SubOil = subsidies for petrol, TransRur = transfers to rural households, TransUrb = Transfers to urban households

The transfer policy will benefit certain sectors, notably those consumed by poor rural households (mainly food products) and products consumed by poor urban households, whereas, in the first simulation, most sectors see their situation improve. Poor rural households spend mainly their income on food commodities, pulses and maize while rich urban households spend the highest share of their income on food commodities, pulses and vegetables. We can expect an increase in the production of these commodities.

As in the previous table, an improvement in the situation means that sector production decreases less than in the crisis scenario (Table 24).

**Table 24: Change of production between the RUW scenario and the mitigation scenario (in percentage points)**

	SubOil	TransRur	TransUrb
all sectors	0.02	-0.15	-0.20
aggr_amaiz	0.06	0.35	0.45
aggr_aocer	0.02	0.05	-0.06
aggr_apuls	0.05	0.35	0.48
aggr_aoils	0.07	-0.09	-0.22
aggr_aver0	0.08	0.17	0.37
aggr_afru1	-0.03	-0.36	-0.42
aggr_aocrp	-0.11	-0.54	-0.94
aggr_acatt	0.03	0.08	0.09
aggr_aoliv	0.04	0.06	0.16
aggr_afore	-0.16	-0.29	-0.44
aggr_afish	0.15	0.14	0.30
aggr_afood	0.20	0.29	0.49
aggr_amanuf	0.15	-0.19	-0.25
aggr_otherindu	0.03	-0.22	-0.32
aggr_acons	-0.57	-0.94	-1.31
aggr_atrad	0.08	0.13	0.23
aggr_atran	0.03	-0.19	-0.26
aggr_apadm	0.17	-0.64	-0.90
aggr_aeduc	-0.06	-0.60	-0.90
aggr_aheal	0.26	-0.57	-0.84
aggr_aserv	0.08	-0.08	-0.14

**Notes:** aggr\_ = aggregated industries including ... , agrforfis = agriculture & forestry & fishery, amaiz = maize production, aocer = other cereals incl. rice and wheat, apuls = pulses, aoils = oilseeds, avero = vegetable & root crops, afrui = fruit, aocrp = other crops, acatt = cattle, aolive = other livestock, afore = forestry, fish = fishery, afood = food industry, amanuf = manufacturing, otherindu = other industries, acons = construction, atrad = trade, atran = transport, apadm = public services, aeduc = education, aheal = health services, aserv = other services, SubFood = subsidies on food commodities, SubSal = subsidies on salaries for rural workers, TransRur = transfers to rural households, SubOil = subsidies for petrol, TransRur = transfers to rural households, TransUrb = Transfers to urban households

These impacts on production have effects on labour demands in the sectors, with a marked improvement for the SubOil scenario. The construction sector, as well as sectors producing investment goods, are seeing their production decline given the worsening budget deficit following the implementation of support policies. These sectors are particularly intensive in medium-skilled labour (Table 25).

**Table 25: Difference of change in percentage points in labour demand per sector (change in ScenShock - change in ScenXX)**

	SubOil	TransRur	TransUrb
aggr_amaiz	0.16	0.99	1.26
aggr_aocer	0.05	0.12	-0.13
aggr_apuls	0.12	0.82	1.12
aggr_aoils	0.15	-0.20	-0.50
aggr_avero	0.19	0.38	0.80
aggr_afrui	-0.05	-0.60	-0.71
aggr_aocrp	-0.25	-1.10	-1.94
aggr_acatt	0.41	1.08	1.25
aggr_aoliv	0.75	1.09	2.39
aggr_afore	-2.62	-4.73	-7.13
aggr_afish	3.56	3.29	7.03
aggr_afood	0.72	0.86	1.49
aggr_amanuf	0.90	-0.68	-0.88
aggr_otherindu	0.06	-0.73	-1.05
aggr_acons	-1.37	-2.26	-3.14
aggr_atrad	0.16	0.26	0.46
aggr_atran	0.11	-0.63	-0.86
aggr_apadm	0.22	-0.86	-1.22
aggr_aeduc	-0.08	-0.76	-1.15
aggr_aheal	0.39	-0.85	-1.26
aggr_aserv	0.30	-0.14	-0.29

**Notes:** aggr\_ = aggregated industries including ... , agrforfis = agriculture & forestry & fishery, amaiz = maize production, aocer = other cereals incl. rice and wheat, apuls = pulses, aoils = oilseeds, avero = vegetable & root crops, afrui = fruit, aocrp = other crops, acatt = cattle, aolive = other livestock, afore = forestry, fish = fishery, afood = food industry, amanuf = manufacturing, otherindu = other industries, acons = construction, atrad = trade, atran = transport, apadm = public services, aeduc = education, aheal = health services, aserv = other services, SubFood = subsidies on food commodities, SubSal = subsidies on sallies for rural workers, TransRur = transfers to rural households, SubOil = subsidies for petrol, TransRur = transfers to rural households, TransUrb = Transfers to urban households

The highest share of unskilled male workers can be found in the food sector (3.5%), the trade sector (1.7%) and the construction sector (1.1%), for women the highest share of unskilled workers can be found in the food sector (0.8%), the trade sector (0.5%) and the construction sector (0.3%) and public services (0.3%) (see Appendix Section 8.3). These two sectors see their production improve for each of the sectors, and in the last two scenarios (Table 26).

**Table 26: Impact on the labour demand per type of labour in Kenya (in %)**

	SubOil	TransRur	TransUrb
male_empl_crop	0.00	0.00	0.00
fema_empl_crop	0.00	0.00	0.00
male_self_crop	0.00	0.00	0.00
fema_self_crop	0.00	0.00	0.00
male_empl_past	0.00	0.00	0.00
fema_empl_past	0.00	0.00	0.00
male_self_past	0.00	0.00	0.00
flab-n	1.10	14.63	19.74
flab-nf	0.44	15.22	20.54
flab-p	-0.06	-0.82	-1.10
flab-pf	-0.02	-0.74	-1.00
flab-s	0.08	-0.62	-0.86
flab-sf	0.10	-0.60	-0.85

**Notes:** male\_rura\_unsk = male workers in rural regions without scholar education, fema\_rura\_unsk = female workers in rural regions without scholar education, male\_rura\_prim = male workers in rural regions with primary education, fema\_rura\_prim = female workers in rural regions with primary education, male\_rura\_seco = male workers in rural regions with secondary education, fema\_rura\_seco = female workers in rural regions with secondary education, male\_rura\_tert = male workers in rural regions with tertiary education, fema\_rura\_tert = female workers in rural regions with tertiary education, male\_urba\_unsk = male workers in urban regions without scholar education, fema\_urba\_unsk = female workers in urban regions without scholar education, male\_urba\_prim = male workers in urban regions with primary education, fema\_urba\_prim = female workers in urban regions with primary education, male\_urba\_seco = male workers in urban regions with secondary education, fema\_urba\_seco = female workers in urban regions with secondary education, male\_urba\_tert = male workers in urban regions with tertiary education, fema\_urba\_tert = female workers in urban regions with tertiary education

The implementation of the subsidy for petroleum products makes it possible to improve the real consumption of all households while for the two other scenarios, it is mainly rural households who see their situation improve, and for the third simulation, the urban poor (Table 27).

**Table 27: Difference of change in percentage points in for households' real consumption (in %)**

	SubOil	TransRur	TransUrb
hhd-r1	0.33	9.09	0.39
hhd-r2	0.34	0.30	0.39
hhd-r3	0.33	0.23	0.30
hhd-r4	0.31	0.13	0.16
hhd-r5	0.29	0.03	0.02
hhd-u1	0.21	-0.16	117.83
hhd-u2	0.22	-0.27	-0.37
hhd-u3	0.21	-0.35	-0.49
hhd-u4	0.20	-0.50	-0.68
hhd-u5	0.21	-0.49	-0.67

hhd- = household income decile, -n1= (non-rural = urban) first decile, ..., n5 = (non-rural = urban) fifth decile, -r1= rural first decile, ..., r5 = rural fifth decile, -u1= urban first decile, ..., u5 = urban fifth decile

### 5.2.3.2 Micro-results mitigation and gender scenarios: Kenya

Table 28 compares the effectiveness of different mitigation scenarios—fuel subsidies, urban subsidies, and rural transfers—on poverty and income inequality, as measured by the FGT indices and the Gini coefficient. The results show that rural transfers are the most effective in reducing poverty, with the poverty headcount (FGT (0)) decreasing from 0.38 in the baseline RUW scenario to 0.34. Similarly, urban transfers show the second-best improvement as the headcount ratio drops to 0.34. Inequality also reduces in these scenarios from 0.43 to 0.40 and 0.41 for rural and urban transfers, respectively. In contrast, fuel subsidies offer slight improvements. Overall, the findings suggest that direct transfers are a more effective tool for reducing poverty and inequality than subsidies.

**Table 28: Poverty headcount, gap and severity at RUW simulation and mitigation scenarios**

	FGT (0)	FGT (1)	FGT (2)	Gini
RUW	0.38	0.12	0.061	0.43
Fuel subsidy	0.36	0.10	0.058	0.42
Rural transfers	0.34	0.08	0.05	0.40
Urban transfers	0.35	0.09	0.05	0.41

Note: FGT (0) Headcount ratio. FGT (1) Average normalized poverty gap. FGT (2) Average squared normalized poverty gap.

Table 29 shows that Fuel Price Subsidy moderately increases household expenditure, particularly benefiting urban areas and males due to their reliance on fuel and other byproducts. Rural Transfers have the most significant impact, especially boosting expenditure in rural areas and among unskilled workers, with notable benefits for women in these regions. Urban Transfers primarily benefit urban poor households, particularly unskilled workers in informal settlements. Overall, targeted cash transfers in rural and urban areas are more effective at increasing household expenditure and reducing poverty than the broad fuel subsidy

**Table 29: Relative change in total household expenditure at mitigation scenarios (across percentiles)**

Food	10	20	30	mean	median
Overall	0.30	0.32	0.34	0.32	0.32
<b>Male</b>	<b>0.32</b>	<b>0.34</b>	<b>0.36</b>	<b>0.34</b>	<b>0.34</b>
<b>Female</b>	<b>0.38</b>	<b>0.30</b>	<b>0.32</b>	<b>0.30</b>	<b>0.30</b>
Urban	0.31	0.33	0.35	0.33	0.34
Rural	0.29	0.31	0.33	0.31	0.31
Unskilled	0.30	0.32	0.34	0.32	0.32

<b>Skilled</b>	0.29	0.31	0.33	0.31	0.32
<b>Rural</b>	10	20	30	mean	median
Overall	4.5	4.55	4.6	4.58	4.6
<b>Male</b>	<b>4.48</b>	<b>4.50</b>	<b>4.55</b>	<b>4.52</b>	<b>4.55</b>
<b>Female</b>	<b>4.6</b>	<b>4.70</b>	<b>4.76</b>	<b>4.72</b>	<b>4.75</b>
Urban	0.20	0.20	0.25	0.22	0.20
Rural	7.30	7.25	7.35	7.33	7.35
Unskilled	5.40	5.45	5.50	5.48	5.50
Skilled	3.30	3.15	3.20	3.20	3.18
<b>Urban</b>	10	20	30	mean	median
Overall	2.99	3.05	3.10	3.08	3.10
<b>Male</b>	<b>2.95</b>	<b>3.00</b>	<b>3.05</b>	<b>3.03</b>	<b>3.05</b>
<b>Female</b>	<b>3.05</b>	<b>3.10</b>	<b>3.13</b>	<b>3.18</b>	<b>3.15</b>
Urban	4.01	4.03	4.03	4.04	4.05
Rural	0.15	0.20	0.25	0.19	0.20
Unskilled	2.85	2.95	2.95	2.93	2.95
Skilled	3.25	3.30	3.35	3.33	3.35

Moving to the food security scenarios, Table 30 reflects the adjusted FGT indices for Kenya under various food security scenarios following the RUW simulation, which set the baseline at 31% for the poverty headcount (FGT0), 11% for the poverty gap (FGT1), and 5% for poverty severity (FGT2). The fuel price subsidy scenario offers slight improvements, reducing the headcount to 29% and moderately decreasing the poverty gap and severity. Rural transfers are the most effective, significantly lowering the poverty headcount to 25% and substantially reducing both the poverty gap (8%) and severity (3%), indicating a strong impact on the most vulnerable populations. Urban Transfers also improve upon the baseline, lowering the poverty headcount to 27%, with moderate reductions in the gap and severity, but they are slightly less effective than rural transfers in addressing overall poverty.

**Table 30: Food Security, gap and severity at RUW simulation and mitigation scenarios**

	FGT (0)	FGT (1)	FGT (2)	Gini
RUW	0.31	0.11	0.05	0.36
Fuel Subsidy	0.29	0.10	0.045	0.35
Rural Transfers	0.25	0.08	0.03	0.34
Urban Transfers	0.27	0.09	0.04	0.35

Note: FGT (0) Headcount ratio. FGT (1) Average normalized food poverty gap. FGT (2) Average squared normalized poverty gap.

## VI. Conclusions

The analysis of the economic impacts and mitigation policies of the Russia-Ukraine War on women in Egypt and Kenya illustrates that the impacts on the vulnerable population of women are different and depend on the general economic situation within the countries and on women's economic and socio-economic situation in the countries. Thus, impacts of the RUW on women require a country specific analysis to provide country specific information. The mitigation policies can help to improve the consumption of rural poor households, while GDP is only marginally decreased compared to the impact resulting from the RUW caused trade shock.

Table 31 presents the impacts of the trade shock compared to the reference and the impacts of the policy measures compared to the trade shock scenario for both countries. Because of different dependency on oil imports and the capabilities to export oil, the Egyptian economy is less impacted than the Kenyan economy. Economic growth and poverty are more impacted in Kenya than in Egypt. From the macro-economic aggregated result, the negative impacts on female labour are not obvious. However, more detailed analysis shows that educated female workers are suffering the shock on the labour markets and benefitting from the simulated gendered policies.

The microeconomic analysis shows that women are being particularly hard-hit by the RUW compared to men. Females have experienced more significant reductions in food security at every percentile and are disproportionately affected by the adverse changes in food security. The direct transfers are the most effective in reducing poverty in terms of poverty headcount and poverty severity. Thus, results from the micro econometric analysis indicate that a cash transfer to poor households is more effective in counteracting poverty than the policies of food and wage subsidies.

**Table 31: Impact on macroeconomic indicators in trad shock and mitigation scenario in Egypt and Kenya**

	EGY				KEN			
	Shock	Policy scenarios			Shock	Policy scenarios		
		SubFood	SubSal	TransRur		SubOil	TransUrb	TransRur
%	%points			%	%points			
Imports	0.62	-0.08	-0.05	-0.06	-5.88	-0.06	-0.04	-0.02
GDP real	-0.01	-0.01	-0.01	-0.08	-0.13	0.02	-0.19	-0.14
Total labour demand	-0.01	-0.02	-0.01	-0.16	-0.33	0.04	-0.50	-0.36
Total labour demand	-0.02	-0.02	-0.08	-0.17	-0.41	0.04	-0.47	-0.34
Total labour demand	0.02	-0.02	0.28	-0.15	0.02	0.05	-0.41	-0.29
Consumer price index	3.39	-0.43	0.05	0.19	-5.92	0.29	1.81	1.29
Total investment	3.56	-0.97	-0.79	-1.76	-10.82	-1.07	-1.57	-1.12
Export demand	0.05	0.04	-0.04	-0.03	2.81	0.05	-0.62	-0.44
Nominal household	3.00	-0.07	0.46	0.99	-8.18	0.53	2.24	1.55
Real consumption	-0.37	0.35	0.40	0.82	-2.41	0.26	0.57	0.40

**Notes:** SubFood = subsidies on food commodities, SubSal = subsidies on sallies for rural workers, TransRur = transfers to rural households, SubOil = subsidies for petrol, TransRur = transfers to rural households, TransUrb = Transfers to urban households, % = percentage change in the shock scenario compared to the reference, % points = percentage points difference between the impacts in the policy scenario and the shock scenario compared to the reference.

The results suggest that alternative mitigation policies could represent valuable options to counteract poverty in the countries, compared to the implemented ones (food and oil subsidy).<sup>9</sup> This study is motivated by analysing the impacts of the RUW induced trade distortions on women in Egypt and Kenya. However, the results can be informative also outside the context of the RUW for policy decision making. The results raise the question of the advantages of subsidies targeting commodities or production factors versus cash transfers targeting specifically poor households.

As economic model-based assessment the analysis is limited to the methodological framework of the models. The limits of the CGE model framework results from the aggregated nature of the data, which cannot consider individual decision making or specific business types. However, by applying micro econometric techniques as a complementary analysis tool, we overcome some of the limits of the CGE model. Reducing the limits further

<sup>9</sup> Leakages and inefficiencies resulting from poor implementation of the policies caused by corruption, bad targeting etc. is not represented in the CGE model and thus not considered in this study.

of the macro-micro model compound depends mainly on the availability of data and can be objective of further research.

The modelling exercise presented in this paper illustrates that a macro-micro model assessment framework in combination with an expert guided co-modelling approach can be a fruitful approach to provide detailed and insightful results. In this study we focussed the analysis on short-term economic impacts. Further modelling research can consider broader and longer-term impacts resulting from economic shocks or mitigation policies. For example, considering the long-term environmental impacts of fuel subsidies could provide a broader view to assess the favourability of this policy option in countries where of relevance. Further research can also analyse scenarios which compare different options to fund mitigation policies. Since Southern countries found themselves in the challenge to cope with polycrisis and limited fiscal space, the evaluation of potential funding options could be of significant policy interest.

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## Appendix

### Gender analysis and co-modelling approach

We used the macroeconomic (CGE) and microeconomic (econometric) modelling as quantitative tools to assess the RUW impacts in both countries. In addition, we apply two further methodological approaches support the results analysis and the CGE model building and scenario design.

### Gender analysis framework (cont.)

To appropriately consider the gender perspective in the study, we orient as much as possible to (Fontana, 2020). Table presents in brief how we address the general principles for economic data analysis on gender topics (Fontana, 2020): 5-7). We follow the general principles by (Fontana, 2020:5-7)

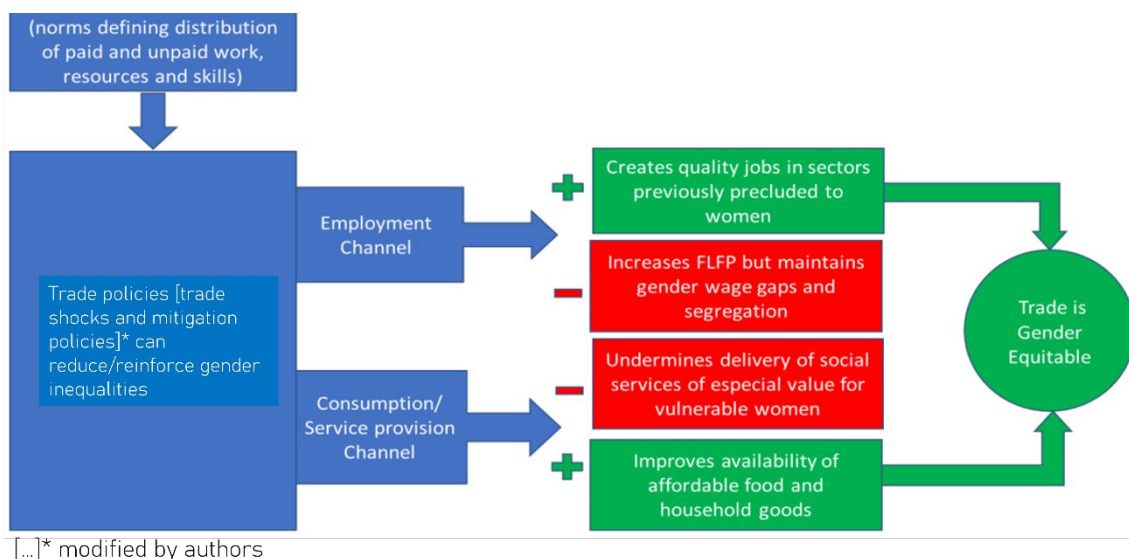
**Table 32: Consideration of general principles for economic data analysis on gender topics**

Principle	How considered in this study
<b>(a) Choose statistics that capture terms of inclusion and indicate women's capacity to achieve goals rather than merely counting their numbers</b>	We analyse gender in the CGE framework by considering their labour force in terms of wage bills.
<b>(b) Look at differences between groups of women and men, focusing on the disadvantaged, and taking a life cycle approach wherever possible</b>	We differentiate the groups of women and men as workers with different skills, in urban and rural regions, in contract forms and in households of different income.
<b>(c) Be aware of the difference between equalizing up and equalizing down</b>	We consider during the analysis both men and women to compare the impacts resulting from shocks and policies for both.
<b>(d) Look at impact on households as well as individuals, and take account of effects on unpaid domestic work and care</b>	In the microeconomic analysis we consider individuals.
<b>(e) Select appropriate indicators depending on economic structure</b>	In the macroeconomic modelling, we select the indicators of labour markets and households consumption to detect the channels of impacts and analyse the transmission within the economy. For the microeconomic analysis we compute different indicators for poverty and inequality.
<b>(f) Accept that data gaps are likely to be significant, particularly in low-income economies in the global South, but strive to be creative with existing data</b>	We base our analysis for the macroeconomic analysis on two social accounting matrixes as consistent macroeconomic data set. The microeconomic analysis is based on official household surveys. Data gaps are filled with complementary reports and statistics.
<b>(g) Quantify gender differences in impact whenever the data allow it, but do not assume no gender impact if it is not possible to quantify</b>	We are conscious about the limitations of the quantitative modelling tools in use and their capability to indicate and quantify gendered impacts.

Source: adapted from Fontana (2020: 5-7)

To understand the gendered impacts within the economy we orient to the general scheme for gender analysis presented by (Fontana, 2020): 12) presented in Figure 1 in slightly modified form. While (Fontana, 2020) presents the transmission channels with focus on trade policies, we extend the scheme to the trade shocks and counteractive mitigation policies.

**Figure 1: Gender distributional effects of trade.** Notes: FLFP = female labour force participation rate. Source: Fontana (2020: 12)



For the analysis the results we consider the sectoral structure of the economy as presented by (Fontana, 2020). Table 33 compiles the data presented in Section 3.12. Further labour market segregation is possible into labour types (skills), regions (rural and urban) and employment form (employed and self-employed), based on data presented in Section 8.3.

**Table 33: Sectoral structure of Egypt and Kenya, presentation oriented to a (2020:17), in percentage**

	EGY							KEN						
	VAshtar	IMpene	EXinte	LDmaleOfTot	LDfemaOfTot	LDfemalnten	LDfemaOfVA	VAshtar	IMpene	EXinte	LDmaleOfTot	LDfemaOfTot	LDfemalnten	LDfemaOfVA
aggr_agrforfis	15.8	9.4	4.8	6.6	7.4	53.0	3.5	36.4						
aggr_amaiz								7.8	1.6	0.1	4.0	3.3	45.2	1.3
aggr_aocer								2.3	7.5	1.1	1.4	1.1	44.1	0.4
aggr_apuls								5.6	1.7	0.7	3.3	2.7	45.1	1.1
aggr_aoils								0.6	1.8	1.8	0.4	0.3	47.2	0.1
aggr_avero								6.3	0.1	2.0	3.7	3.0	44.7	1.2
aggr_afrui								4.9			4.1	3.4	45.0	1.3
aggr_aocrp								2.1	4.1	1.8	1.5	1.2	45.0	0.5
aggr_acatt								3.5			0.5	0.2	29.4	0.1
aggr_aoliv								1.2	0.6	0.3	0.1	0.0	23.7	0
aggr_afore								1.6			0.2	0.1	26.6	0
aggr_afish								0.6			0.0	0.0	27.9	0
aggr_afood								3.6	9.9	4.9	2.2	0.7	24.7	0.3
aggr_amanuf	15.4	23.5	12.5	8.4	0.8	8.9	0.4	5.0	57.8	18.0	2.1	0.7	25.3	0.3
aggr_otherindu	10.1	6.7	10.4	4.7	0.5	9.1	0.2	2.7			1.7	0.5	21.4	0.2
aggr_acons	5.3	1.0	1.7	5.8	0.1	1.5	0	6.4	3.5		4.8	1.7	26.3	0.7
aggr_atrad	11.4			7.9	0.8	8.9	0.4	8.6	0.5	0.2	7.3	3.4	31.6	1.3
aggr_atran	8.2	24.0	30.5	11.9	0.3	2.5	0.1	9.6	4.1	21.3	6.1	1.3	17.6	0.5
aggr_apadm	4.5	3.8	6.4	6.7	1.6	19.2	0.8	4.1	4.6	15.5	4.7	3.2	40.2	1.2
aggr_aeduc	5.5			5.3	4.9	47.9	2.3	5.0			5.7	4.4	43.9	1.7
aggr_aheal	2.2			1.2	1.3	52.2	0.6	1.7			1.2	1.7	58.7	0.7
aggr_asev	21.5	10.1	14.5	20.3	3.5	14.7	1.7	17.1	6.9	5.4	7.4	4.5	37.7	1.7

**Notes:** VAshtar = share of industry of total value added, IMpene = import penetration, EXinte = export intensity, LDmaleOfTot = share male labour demand of total labour demand (total of all industries), LDfemaOfTot = share femal labour demand of total labour demand (total of all industries), LDfemalnten = Female labour demand intensity (share of female labour of total sectoral labor), LDfemaOfVA = share of female labour of total value added

### Co-modelling approach

To monitor the modelling work and to ensure a scenario design resulting into policy relevant scenarios we follow a co-modelling approach (Mabugu et al., 2023b). We coordinating the modelling efforts closely with Country-Experts for Kenya and Egypt and Gender-Experts. We consulted with the experts on modelling and scenario assumptions. Table 34 the iterative co-modelling process with the main meetings and communications and results in key-word. We exchanged (via email or viseo-conference) in some of the meetings we exchanged with both gender and country experts. In total, we exchange about 18 times within the project duration of 11 months with the gender (11 times) and country experts (10 times).

**Table 34: Communications with Country and Gender-Experts**

Date	Communication	Communication with	Counting number of comm
2023-10-26	Comments on concept note	Gender-Expert(s)	1
Discussion/outcome: <ul style="list-style-type: none"> <li>Statistical picture of the gendered structure of the economies in EGY and KEN</li> <li>Labour types should be represented</li> </ul>			
2023-11-14	Zoom (incentive and gender workshop)	Country-Experts, Gender-Experts, ODI	2
Discussion/outcome: <ul style="list-style-type: none"> <li>Synchronized scenarios for the KEN case study fuel subsidies, investigated by the AERC-research team</li> <li>The CGE model needs to consider the gender situation in the most representative way possible</li> </ul>			
2024-02-02	Comments on revised concept note	Gender-Expert	3
Discussion/outcome: <ul style="list-style-type: none"> <li>the modelling work needs to follow a gender analysis approach by considering as many information as possible</li> <li>assumptions and structure the macro-model need to be decided</li> </ul>			
2023-12-01	Zoom	KEN-Country-Experts	4
Discussion/outcome: <ul style="list-style-type: none"> <li>Fuel subsidies on consumption on production are of research for the KEN-Country-Experts</li> <li>Subsidies on production could be also of interest.</li> <li>AERC-Team suggests a macro-impact scenario</li> <li>KEN-Country-Experts provide macro-scenario for CGE model</li> </ul>			
2024-04-19	Email	KEN-Country-Experts	5
Discussion/outcome: <ul style="list-style-type: none"> <li>AERC-research team is investigating how fuel subsidies impacted gendered poverty and income distributions.</li> </ul>			
2024-04-26	Zoom	Gender-Expert	6
Discussion/outcome: <ul style="list-style-type: none"> <li>Increasing female workers productivity is not an option, because -1- it is ad-hoc estimation on TFP -2- it will increase production but demand for labour and wages of agricultural workers</li> <li>Subsidies for female agricultural labour force to increase agricultural production (food security) and provide work for rural women</li> </ul>			
2024-04-27	Email	EGY-Country-Expert	7
Discussion/outcome: <ul style="list-style-type: none"> <li>Suggestion simulation scenarios:</li> <li>Government support for women working in the informal sector (if you model that).</li> <li>Government support for unskilled women, especially those in rural areas or in the agriculture sector to help them face high inflation rates.</li> <li>Government support for the food sector (higher subsidies or lower taxes).</li> <li>4) We also had a strong currency devaluation (that went up from 15 EGP to 47 EGP per dollar, leading to a high pass-through).</li> </ul>			

2024-04-30	Zoom	EGY-Country-Expert	8
Discussion/outcome: <ul style="list-style-type: none"> <li>Of high interest for Country-Expert and Gender-Expert: Scenario 3 (Food subsidies as in reality applied scenario), Scenario 2 (support of rural women, by labour subsidies)</li> </ul>			
2024-05-01	Email	Gender-Expert	9
Discussion/outcome: <ul style="list-style-type: none"> <li>Importance on describing the closure rules, which will affect the gender and macro story</li> <li>Emphasize for need for clarification, on the expected impact on the scenarios</li> <li>Emphasize need for anticipating the gendered impacts of scenarios 2 and 3</li> <li>Labelling the scenarios as 'women targeting' scenarios instead of "gender sensitive scenarios"</li> <li>Emphasize need for differentiation of labour market segregation/differentiations for gender analysis</li> <li>Emphasize need for consideration of "unpaid carework" if not possible in the CGE model emphasizing it as an important dimension in the Egypt labour market</li> </ul>			
2024-05-02	Email	Gender-Expert	10
Discussion/outcome: <ul style="list-style-type: none"> <li>Clear communication of closure rules: Egypt: the current account balance is fixed, while government savings is endogenous. Government spending is fixed. Labour supply is endogenous while capital supply is fixed, since these influence the results</li> <li>Suggestion of "women targeting" scenarios:</li> <li>Scenario 1 (via the production / labour market channel): increase the employment of women in the agricultural sector, increase of agricultural output and food supply decrease in food prices.</li> <li>No change of labour productivity simulated since without an econometric estimation ad-hoc and increase in productivity reducing employment, thus counterproductive for the policy objective.</li> <li>Scenario 2 (consumption channel): transfers to households with rural unskilled women consumption channel. Positive spill-over effects to the rest of the economy expected.</li> <li>Using employment of the different categories of women as indicators, to draw a more accurate picture with the micro-economic analysis</li> </ul>			
2024-05-13	Preliminary finding workshop (zoom)	Gender-Expert and country expert KEN	11
Comments from reviewer review comments on the draft report presented by the gender and country experts detailed comments later received via email in written format			
2024-05-21 and 2024-05-21	Email	Gender-Expert and country expert KEN	12
Written reviewers' comments on the draft report provided by gender and country experts answered in detail in the document (Revision01_AnswersToReviewersComments_.docx)			
2024-05-29	Zoom	Gender-Expert	13
Discussing policy scenario for EGY: <ul style="list-style-type: none"> <li>First simulation scenario: wage subsidies for agricultural female labour</li> <li>Second scenario: cash transfer to rural households (i.e., the households where women are most impacted)</li> </ul>			
2024-06-21	Zoom	Gender-Expert	14
Discussion of scenario results with improved SAM <ul style="list-style-type: none"> <li>The results with the corrected SAM are more plausible</li> </ul>			

Discussing the requirements for revisions to address the country expert's comments in line with the gender expert's comments

- Need for clarification of differences and complementarities between the CGE model study on Kenya provided by the PEP-Research-Team and by the AERC-Research-Team
- AERC-Research-Team presented a CGE model for Kenya in the aggregation of the PEP-1-1 standard model (i.e., 4 activities and 5 commodities). The fact that the CGE model presented by the AERC-Research-Team is of significantly different aggregation than the CGE model presented by PEP-Research-Team (i.e., more than 10 activities and commodities) let expect different results between the models used in the study on the same country.

Discussing policy scenario for KEN:

- Sim1: Fuel subsidies for households and activities in the magnitude according to country experts (this scenario would be comparable to the scenario analysed by the Kenyan team)
- Sim2: instead of a fuel subsidies a cash transfer for rural household where women suffer most. This scenario would be comparable to the EGY scenario 2

2024-07-02	Email	Country-Experts-KEN (AERC)	15
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Contacting KEN-country experts (AERC-research team) for advising on the definition of scenarios for KEN

2024-07-16/17	Email	Country-Experts-KEN (PEP)	16
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Contacting additional KEN-country expert Prof Jane Mariara (JM) from PEP for advising on the definition of scenarios for KEN

Answer 2024-07-24

The KEN-Country expert (PEP)

- supports the Scenario of fuel subsidy
- considers scenario of cash transfer to the rural poor households, which we identified as the households where many women suffer as interesting

However, the country expert (PEP) notes that:

- in reality such a policy might be difficult to achieve reduction of poverty for all, since strong poverty does not appear in rural but also in urban areas (informal settlements)
- in reality such a policy might be to be implemented because of limited fiscal space
- the country expert suggests an simulation oriented to cash transfer/social protection to the elderly (>65).

2024-07-27/28	Email	Country-Experts-KEN (AERC)	17
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Asking KEN-country expert (AERC-Team) for advice for suggested scenarios for KEN

Country experts-KEN (AERC) provides

- provides information on the magnitude of fuel subsidy for scenario 1
- confirms the interest of scenario 2 ( cash transfer to poor households) and suggests to apply the cash transfer only to households of the first income quintile to respect the budgetary constraints. Households of the first quintile suffer from distributional and environmental concerns as is the case with fuel subsidies.

2024-07-31/1500-1600	Zoom	Gender-Expert MF	18
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Presenting the scenario design for the simulation scenarios for EGY and KEN to Gender-Expert

Outcomes the meeting:

Case study Egypt:

- the gender expert and the research team agreed on following scenarios:

- Scenario 0: impact scenario (comparable with KEN)
- Scenario 1: food price subsidy (in reality implemented scenario)
- Scenario 2: wage subsidy for rural female labour in agricultural sector
- Scenario 3: transfers to poor household in rural areas (comparable to KEN)

Case study Kenya:

For the KEN study case the gender expert and the research team agreed on following scenarios:

- Scenario 0: impact scenario (comparable with EGY)
- Scenario 1: fuel price subsidy. (in reality implemented scenario)

The scenarios 2 and 3 still require a decision. Two options A and B were discussed with pros and cons:

Option A:

**Scenario 2:** transfers to rural poor households to mitigate poverty in the rural regions where most of the poor women are living (10% of the women) (oriented to the suggestion of the country experts to mitigate most of the poverty) (**comparable to EGY**), funding by a part of the fuel subsidy to consider the problem of fiscal space.

- **Contra:** the poverty in rural regions is not in focus of policy making and requires high financial means (contra pointed out by the country expert)
- **Pro:** Fighting poverty for most of the women should be the policy objective to reduce poverty, which is existing in rural regions with 10% of the women

**Scenario 3:** transfers to urban poor households to mitigate poverty in the urban informal settlement (oriented to the suggestion of the country experts), also where food poverty is considered as very critical, funding by a part of the fuel subsidy to consider the problem of fiscal space.

- **Contra:** the operational problem might be how the transfer can reach the women, if they are not officially registered in the informal settlements (contra pointed out by the gender expert)
- **Pro:** The informal settlements are a focus of interest for policy making (pro by the country experts)

**A Scenario with mixed transfers to rural and to urban households** at the same time was seen critical by the gender expert since in a mixed scenarios two policy options would be combined and conclusions on effects on poverty elevation and macroeconomic impacts will be difficult to identify ("mixed effects").

Option B:

**Scenario 2:** the same scenario and discussion as for Option A, Scenario 2 (: transfers to rural poor households to mitigate poverty in the rural regions where most of the poor women are living (10% of the women)

**Scenario 3:** simulating a funding scenario in which the gender instrument will be funded by an endogenous sources.

- **Pro by gender expert:** Such a scenario would be of high policy interest to address the problem of fiscal space.
- **Contra (by research team):** discussed internally after the zoom meeting internally within the research team): a funding scenario would extend the workload too much. Identifying justifiable funding mechanism would require a profound country expert validation, to guarantee a realistic funding mechanism. Given the project timeline simulating a funding scenario might not be feasible and might be better addressed in future works.

Conclusion drawn within the PEP research team post zoom meeting:

Option A might be the preferable option over Option B, to simulate scenarios. First with simulating the transfers to urban households, the simulation orients to the suggestions provided by the country expert, and at the same time simulating scenario 2 allows a

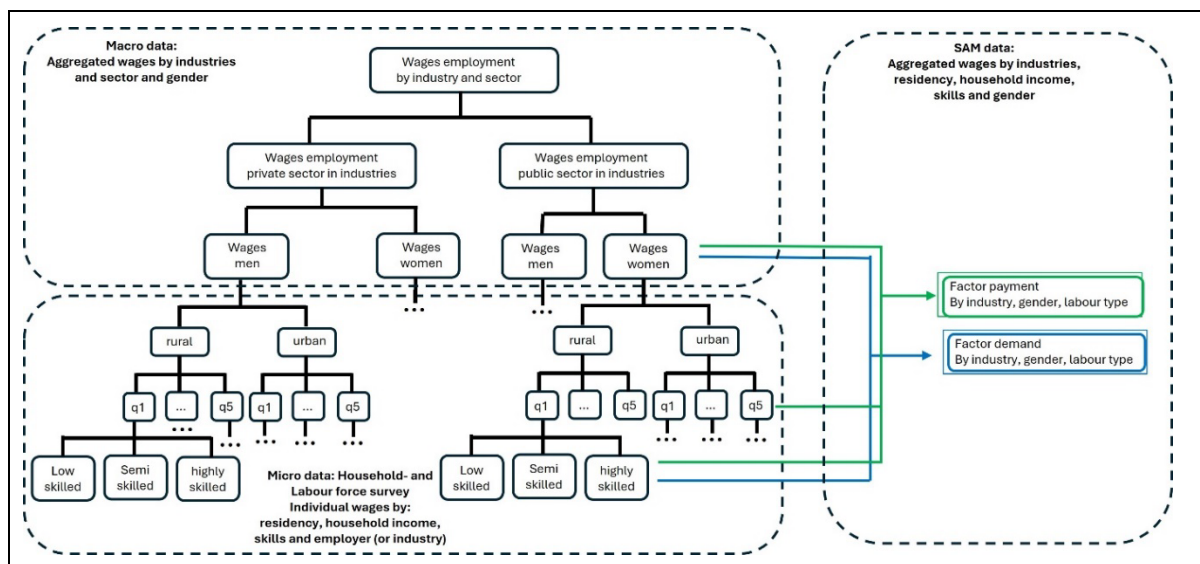
comparison with the EGY case (as suggested by the gender expert). Thus, with Option A both gender and country experts suggestions are considered.

### Splitting the Social Accounting Matrix (SAM)

Representing gender in the CGE models for Egypt and Kenya requires disaggregating the SAM without gender dimension into SAM with gender-dimensions, as “gendered” SAM. For splitting (disaggregating) the SAM we use microeconomic survey data and macroeconomic statistics presented in Table 35. Simple: we use the microeconomic data to compute shares of wage payments which we apply to the macroeconomic (aggregated) data in the SAM. For this study we disaggregate the labour market and the factor payments to the households (i.e., household income from labour) according to following socioeconomic and economic attributes: gender (male, female), labour type (e.g., unskilled, semi-skilled, low-skilled), industry (e.g., agriculture, manufacture) residency (e.g., rural, urban) and household income level (e.g., 1st income quintile, ..., 5th income quintile).

For splitting the SAM for Egypt, we used the Egypt Labour Market Panel Survey, ELMPS (2018) ((ERF and CAPMAS, 2019)), which provides all information requires. For splitting the SAM for Kenya we combine information from the Statistical report Economic Survey 2021 (KNBS, 2021) with the Kenya Integrated Household Budget Survey 2015-2016 (KNBS, 2018). From the Economic Survey 2021 we use the information on wage payments and number of male and female workers and in industries, from the Kenya Integrated Household Budget Survey 2015-2016 we use the information on labour type, residency and household income level. Figure 2 schematically presents the combination of macroeconomic data (KNBS, 2021) with microeconomic data (KNBS, 2018), to compute shares to derive in the SAM factor demands and factor payments.

**Figure 2: Combing information from macro and microeconomic data to derive shares to split the SAM data.**



## Sources and data considered in this study

Following “Guidance Note on Data Analysis for Gender and Trade Assessments ” (Fontana, 2020) we consider the information retrieved from various sources, to represent women’s situation as realistically as possible in the models. Table 35 presents the sources as reports, articles and data-sets used to consider the country specific gender situation adequately.

**Table 35: Sources and data considered**

	EGY		KEN	
	Source	Source type	Source	Source type
Conceptual framework	(Kabeer et al., 2013)	report	(Kabeer et al., 2013)	report
	(Fontana, 2024) (Fontana, 2020)	report	(Fontana, 2024)	report
Statistical framework statistics on the gender characteristics of the labour market	(Kabeer et al., 2013)	report	(KNBS, 2020)	
	(Fontana, 2024)	report	(KNBS, 2022)	
	(World Bank, 2018)	report	(KNBS, 2023a)	
	(Constant et al., 2020)	report	(KNBS, 2023b)	
	(Assaad et al., 2022a)	article	(UN Women, 2019)	
	(Assaad et al., 2022b)	article	(UN Women, 2020)	
	(Assaad and Arntz, 2005)	article	(UN Women, 2023)	
CGE-data base (SAM)	(Ehab, 2022)	article		
	(Assaad et al., 2017)	report		
	(World Bank, 2024)	data set	(World Bank, 2024)	data set
Disaggregation of SAM/CGE model	(Serag et al., 2021)	data set	(Thurlow, 2021)	data set
	(ERF and CAPMAS, 2019)	data set	(Ferrari et al., 2020)	data set
			(KNBS, 2018)	data set
			(KNBS, 2021)	report
			(UN Women, 2023)	report

### Describing the Social Accounting Matrix (SAM)

The studies are based on two CGE models which are calibrated on a Social Accounting Matrix. The one for Egypt is based on 2019 data (Serag et al., 2021). The one for Kenya was developed by and is based on 2019 data as well (Thurlow, 2021). For the purposes of our studies, both SAMs were gendered, and for Kenya, for agricultural sectors, the labour categories were modified. For Egypt, to be in line with the micro model, the sectors were aggregated into 10 sectors. For Kenya, so far we have kept the sectors in the original SAM but it is likely that when the micro work starts, to ensure consistency, we will need to aggregate sectors at the macro level as in the Egyptian case.

References for the SAMs:

International Food Policy Research Institute (IFPRI). 2021. 2019 Social Accounting Matrix for Kenya. Washington DC: IFPRI [dataset]. <https://doi.org/10.7910/DVN/ALUXSI>. [Harvard Dataverse. Version 1](#).

Serag et al. (2021) A 2019 Nexus Social Accounting Matrix for Egypt. MENA RP Working Paper 35. Washington, DC: International Food Policy Research Institute (IFPRI). <https://doi.org/10.2499/p15738coll2.134544>

Before presenting the hypotheses we took for the modelling, we will present some insights from both SAMs that will help us later understand the results.

First, we see the contribution of the value added of each sector to the total value added generated in the economy in 2019 (Table 36). In Egypt, the main contributors to GDP are the service sectors (trade, transport, other services...), followed by the manufacturing sector in which petrol is included. In Kenya, it is as well the services sectors that contribute mainly to GDP, followed by the agricultural sectors. Services can be heterogenous in terms of factor demand reaching from capital intensive service (e.g., transport) to labour intensive services demanding highly skilled labour (e.g., financial services) or lower skilled labour (e.g., social care).

**Table 36: Contribution of each sector to the total value added**

	EGY	KEN
aggr_agrforfis	15.8	
aggr_amaiz		7.5
aggr_aocer		2.2
aggr_apuls		5.4
aggr_aoils		0.6
aggr_avero		6.0
aggr_afrui		4.7
aggr_aocrp		2.1
aggr_acatt		3.4
aggr_aoliv		1.2
aggr_afore		1.6
aggr_afish		0.6
aggr_afood		3.5
aggr_amanuf	15.4	4.8
aggr_otherindu	10.1	2.6
aggr_acons	5.3	6.1
aggr_atrad	11.4	8.3
aggr_atran	8.2	9.3
aggr_apadm	4.5	3.9
aggr_aeduc	5.5	4.8

	EGY	KEN
aggr_aheal	2.2	1.6
aggr_aserv	21.5	16.5

**Notes:** aggr\_ = aggregated industries including ... , agrforfis = agriculture & forestry & fishery, amaiz = maize production, aocer = other cereals incl. rice and wheat, apuls = pulses, aoils = oilseeds, avero = vegetable & root crops, afrui = fruit, aocrp = other crops, acatt = cattle, aolive = other livestock, afore = forestry, fish = fishery, afood = food industry, amanuf = manufacturing, otherindu = other industries, acons = construction, atrad = trade, atran = transport, apadm = public services, aeduc = education, aheal = health services, aserv = other services

### *Structure of the different sectors*

In Table 37 we are interested in seeing whether the sector uses a lot of value added (labour<sup>10</sup> and capital) or mainly intermediate consumptions to produce. It is interesting to have this information for the simulations later because if a sector which uses a lot of intermediate consumption to produce is negatively affected by an economic shock, then we can expect negative effects on the other sectors of the economy.

**Table 37: Contribution of value added in each sector**

	EGY	KEN
aggr_agrforfis	81.4	
aggr_amaiz		92.6
aggr_aocer		87.4
aggr_apuls		80.3
aggr_aoils		87.7
aggr_avero		64.2
aggr_afrui		89.8
aggr_aocrp		83.2
aggr_acatt		37.2
aggr_aoliv		29.0
aggr_afore		95.2
aggr_afish		45.8
aggr_afood		19.4
aggr_amanuf	34.8	31.8
aggr_otherindu	71.3	75.8
aggr_acons	51.8	41.9
aggr_atrad	93.4	57.0
aggr_atran	80.3	59.8
aggr_apadm	84.2	54.9
aggr_aeduc	90.1	57.0
aggr_aheal	63.6	54.3
aggr_aserv	69.7	70.9

**Notes:** aggr\_ = aggregated industries including ... , agrforfis = agriculture & forestry & fishery, amaiz = maize production, aocer = other cereals incl. rice and wheat, apuls = pulses, aoils = oilseeds, avero =

<sup>10</sup> The SAM, which considers only formal employment. Therefore, thus in the CGE model and in this study, we do not consider informal employment.

vegetable & root crops, afrui = fruit, aocrp = other crops, acatt = cattle, aolive = other livestock, afore = forestry, fish = fishery, afood = food industry, amanuf = manufacturing, otherindu = other industries, acons = construction, atrad = trade, atran = transport, apadm = public services, aeduc = education, aheal = health services, aserv = other services

**Fehler! Ungültiger Eigenverweis auf Textmarke.** presents the shares of labour to the value added per sector. For most of the agricultural cropping sectors the contribution of labour accounts between 40 to 50percent, while the agricultural livestock sectors are more capital intensive (with less than 10% of labour contribution). Also, manufacturing and other industries are with 30% of labour contribution rather capital intensive, while public services, education and health demand for 70% to nearly 90% of labour.

**Table 38: Labour contribution to value added in each sector**

	EGY	KEN
aggr_agrforfis	42.4	
aggr_amaiz		35.8
aggr_aocer		43.3
aggr_apuls		42.0
aggr_aoils		44.0
aggr_aver0		41.5
aggr_afrui		59.5
aggr_aocrp		48.1
aggr_acatt		7.8
aggr_aoliv		5.7
aggr_afore		5.7
aggr_afish		4.1
aggr_afood		30.7
aggr_amanuf	28.6	22.1
aggr_otherindu	24.2	31.9
aggr_acons	52.3	39.5
aggr_atrad	36.2	48.2
aggr_atran	71.2	29.6
aggr_apadm	88.3	74.4
aggr_aeduc	88.2	78.4
aggr_aheal	52.9	67.4
aggr_aserv	52.5	26.7

**Notes:** aggr\_ = aggregated industries including ... , agrforfis = agriculture & forestry & fishery, amaiz = maize production, aocer = other cereals incl. rice and wheat, apuls = pulses, aoils = oilseeds, avero = vegetable & root crops, afrui = fruit, aocrp = other crops, acatt = cattle, aolive = other livestock, afore = forestry, fish = fishery, afood = food industry, amanuf = manufacturing, otherindu = other industries, acons = construction, atrad = trade, atran = transport, apadm = public services, aeduc = education, aheal = health services, aserv = other services

In the Table 39 to Table 41, we have the composition of the wage bill by sectors for each country. We can see that the agricultural sector in Egypt is mainly intensive in female rural unskilled workers.

**Table 39: Share of specific wage bill in the value added for agricultural sectors in KEN**

	Crop production	Pastoral and livestock farming
<b>male_empl_crop</b>	9.7	
<b>fema_empl_crop</b>	8.5	
<b>male_self_crop</b>	45.3	
<b>fema_self_crop</b>	36.5	
<b>male_empl_past</b>		37.0
<b>fema_empl_past</b>		14.7
<b>male_self_past</b>		35.1
<b>fema_self_past</b>		13.1

**Notes:** male\_empl\_crop = male workers employed in crop production, fema\_empl\_crop = female workers employed in crop production, male\_self\_crop = male workers self-employed in crop production, fema\_self\_crop = female workers self-employed in crop production, male\_empl\_past = male workers employed in pastoral and livestock farming, fema\_empl\_past = female workers employed in pastoral and livestock farming, male\_self\_past = male workers self-employed in pastoral and livestock farming, fema\_self\_past = female workers self-employed in pastoral and livestock farming,

Source: Sam for Kenya

**Table 40: Share of specific wage bill in the value added for non agricultural sectors in Kenya**

	aggr_ afood	aggr_ a manuf	aggr_ oth erindu	aggr_ acons	aggr_ atrad	aggr_ atran	aggr_ a padm	aggr_ a educ	aggr_ a heal	aggr_ a serv
flab	3.5			1.1	1.7	0.7	0.1	0.1		0.1
flab	0.8			0.3	0.5	0.1	0.3	0.2		0.1
flab	7.0	23.5	2.3	33.9	20.9	14.2	11.5	1.3	1.0	4.1
flab	2.5	8.4	0.5	12.8	10.3	3.2	6.4	0.8	1.0	2.6
flab	64.8	51.2	76.4	38.7	45.7	67.5	48.2	54.7	40.3	58.1
flab	21.4	16.9	20.8	13.2	20.8	14.3	33.6	42.9	57.7	35.0

**Notes:** aggr\_ = aggregated industries including ... afood = food industry, amanuf = manufacturing, otherindu = other industries, acons = construction, atrad = trade, atran = transport, apadm = public services, aeduc = education, aheal = health services, aserv = other services, flab-n = male workers without scholar education, flab-nf = female workers without scholar education, flab-p = male workers with primary education, flab-pf = female workers with primary education, flab-s = male workers with secondary or higher education, flab-sf = female workers with secondary or higher education

**Table 41: Share of specific wage bill in the value added per sector in Egypt**

	aggr_ agrforfis	aggr_ amanuf	aggr_ otherindu	aggr_ acons	aggr_ atrad	aggr_ atran	aggr_ apadm	aggr_ aeduc	aggr_ aheal	aggr_ aserv
male_rura_unsk	18.1	7.2	2.1	18.9	4.9	10.1	4.4	1.2	0.7	4.8
fema_rura_unsk	24.4	1.3	3.5	0.1	1.5	0.1	0.0	0.4	1.0	0.4
male_rura_prim	6.1	7.0	9.9	14.0	6.7	8.8	4.8	0.9	1.6	3.8
fema_rura_prim	5.7	0.5		0.0	0.6			0.3	0.6	0.2
male_rura_seco	14.1	19.2	22.3	26.4	15.0	18.4	21.1	8.0	5.9	12.0
fema_rura_seco	13.9	1.2	3.8	0.1	0.9	0.1	2.3	5.3	11.0	0.6
male_rura_tert	3.3	6.9	10.3	4.3	6.6	4.2	9.0	19.6	10.6	9.0
fema_rura_tert	4.1	0.4	0.7		0.4	0.1	1.7	13.6	7.4	0.5
male_urba_unsk	2.3	6.3	8.4	6.3	7.6	8.2	1.0	0.4	0.7	3.5
fema_urba_unsk	2.2	0.8		0.4	1.1			0.3	1.6	1.2
male_urba_prim	0.6	6.8	2.5	6.9	8.1	8.7	1.9	0.7	1.1	4.1
fema_urba_prim	0.5	0.5	0.0	0.1	0.5		0.1	0.1	0.8	0.6
male_urba_seco	1.0	20.3	20.0	10.8	21.2	22.0	9.4	3.5	6.4	11.1
fema_urba_seco	0.8	1.4	0.4	0.1	2.0	0.4	4.1	4.3	11.1	2.1
male_urba_tert	1.6	17.5	15.4	10.9	21.1	17.1	29.2	17.7	20.9	36.9
fema_urba_tert	1.4	2.8	0.6	0.7	2.0	1.8	11.0	23.6	18.6	9.2

**Notes:** aggr\_ = aggregated industries including ... , agrforfis = agriculture & forestry & fishery, amaiz = maize production, aocer = other cereals incl. rice and wheat, apuls = pulses, aoils = oilseeds, avero = vegetable & root crops, afrui = fruit, aocrp = other crops, acatt = cattle, aolive = other livestock, afore = forestry, fish = fishery, afood = food industry, amanuf = manufacturing, otherindu = other industries, acons = construction, atrad = trade, atran = transport, apadm = public services, aeduc = education, aheal = health services, aserv = other services, male\_rura\_unsk = male workers in rural regions without scholar education, fema\_rura\_unsk = female workers in rural regions without scholar education, male\_rura\_prim = male workers in rural regions with primary education, fema\_rura\_prim = female workers in rural regions with primary education, male\_rura\_seco = male workers in rural regions with secondary education, fema\_rura\_seco = female workers in rural regions with secondary education, male\_rura\_tert = male workers in rural regions with tertiary education, fema\_rura\_tert = female workers in rural regions with tertiary education, male\_urba\_unsk = male workers in urban regions without scholar education, fema\_urba\_unsk = female workers in urban regions without scholar education, male\_urba\_prim = male workers in urban regions with primary education, fema\_urba\_prim = female workers in urban regions with primary education, male\_urba\_seco = male workers in urban regions with secondary education, fema\_urba\_seco = female workers in urban regions with secondary education, male\_urba\_tert = male workers in urban regions with tertiary education, fema\_urba\_tert = female workers in urban regions with tertiary education.

## Households

### Households source of income in Egypt and Kenya

In each country, households<sup>11</sup> are disaggregated by quintile of income and location (rural, urban). Households receive three sources of income: labour income (YHL), capital income (YHK) and transfers income (YHTR). Table 42 shows the structure of total income for each type of households. We can see that the structure of income is very different in the two countries. For Egypt, all categories of households get the biggest share of their income from labour income. The second largest component is transfers income, either from firms, government or the rest of the world. In Kenya, the situation is different: rural households get most of their income from capital income (i.e., returning from land), while for urban, the main source of income is labour. For the highest urban quintile, the main source of income comes from dividends.

**Table 42: Households source of income**

	EGY			KEN		
	YHL	YHK	YHTR	YHL	YHK	YHTR
hhd-r1	55.3	13.6	31.1	41.3	48.5	10.2
hhd-r2	66.2	11.7	22.2	40.3	50.6	9.1
hhd-r3	69.6	10.4	20.1	36.1	51.1	12.8
hhd-r4	71.3	9.7	19.0	36.5	42.2	21.3
hhd-r5	72.0	10.6	17.4	37.4	34.8	27.8
hhd-u1	57.3	9.5	33.3	69.8	5.7	24.5
hhd-u2	66.9	9.7	23.4	61.1	7.9	31.0
hhd-u3	67.6	9.5	23.0	66.4	5.3	28.3
hhd-u4	67.7	10.7	21.6	58.0	4.1	37.9
hhd-u5	68.9	15.4	15.7	37.2	2.4	60.4

**Notes:** hhd- = household income decile, -r1= rural first decile, ..., r5 = rural fifth decile, -u1= urban first decile, ..., u5 = urban fifth decile, YHL = income from labour, YHK = income form capital, YHTR = income from transfers

In Egypt, rural households receive mainly labour income from male rural who have finished their secondary level (Table 43). For the richest rural households, it is mainly male secondary and male tertiary labour income that contributes to total wage earnings. Female labour earning are relatively low for each type of rural households. This observation is not surprising since only few women work in salaried employment.

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<sup>11</sup> In the SAM and CGE-model we represent the households as aggregated households differentiated into household types. We do not differentiate household members and cannot represent intra household gender dynamics.

**Table 43: Repartition of labour income in Egypt**

	hhd- r1	hhd- r2	hhd- r3	hhd- r4	hhd- r5	hhd- u1	hhd- u2	hhd- u3	hhd- u4	hhd- u5
male_rura_unsk	13.2	18.2	18.9	22.4	27.3					
fema_rura_unsk	14.4	18.8	20.7	24.9	21.2					
male_rura_prim	12.9	19.3	23.2	23.8	20.7					
fema_rura_prim	13.9	19.8	18.8	24.0	23.5					
male_rura_seco	9.9	18.6	21.3	24.9	25.3					
fema_rura_seco	7.6	14.0	21.1	26.4	30.9					
male_rura_tert	4.8	12.3	17.8	26.8	38.3					
fema_rura_tert	2.7	7.3	13.7	30.9	45.4					
male_urba_unsk						12.5	18.5	24.2	22.3	22.5
fema_urba_unsk						13.0	17.8	7.7	28.5	33.0
male_urba_prim						10.7	15.8	20.4	25.5	27.7
fema_urba_prim						11.4	17.5	18.0	20.2	32.8
male_urba_seco						5.9	12.8	18.9	25.6	36.7
fema_urba_seco						3.8	10.7	14.5	24.9	46.2
male_urba_tert						1.3	3.5	7.2	13.2	74.8
fema_urba_tert						1.3	2.8	6.2	12.0	77.7

**Notes:** hhd- = household income decile, -r1= rural first decile, ..., r5 = rural fifth decile, -u1= urban first decile, ..., u5 = urban fifth decile, male\_rura\_unsk = male workers in rural regions without scholar education, fema\_rura\_unsk = female workers in rural regions without scholar education, male\_rura\_prim = male workers in rural regions with primary education, fema\_rura\_prim = female workers in rural regions with primary education, male\_rura\_seco = male workers in rural regions with secondary education, fema\_rura\_seco = female workers in rural regions with secondary education, male\_rura\_tert = male workers in rural regions with tertiary education, fema\_rura\_tert = female workers in rural regions with tertiary education, male\_urba\_unsk = male workers in urban regions without scholar education, fema\_urba\_unsk = female workers in urban regions without scholar education, male\_urba\_prim = male workers in urban regions with primary education, fema\_urba\_prim = female workers in urban regions with primary education, male\_urba\_seco = male workers in urban regions with secondary education, fema\_urba\_seco = female workers in urban regions with secondary education, male\_urba\_tert = male workers in urban regions with tertiary education, fema\_urba\_tert = female workers in urban regions with tertiary education.

For urban households, the picture is a bit different. The richest households mainly get its labour income from workers who have finished their tertiary education, male and to a lesser extent female (Table 44). For urban households, the contribution to total income of low skilled women labour income is quite marginal.

**Table 44: Repartition of labour income in urban regions in Egypt**

	male_urba_unsk	fema_urba_unsk	male_urba_prim	fema_urba_prim	male_urba_seco	fema_urba_seco	male_urba_tert	fema_urba_tert	total
hhd-u1	23.6	4.9	19.7	1.6	31.3	3.4	11.6	4.0	100.0
hhd-u2	18.4	3.6	15.3	1.3	35.5	5.0	16.5	4.5	100.0
hhd-u3	16.0	1.0	13.2	0.9	35.0	4.5	22.8	6.5	100.0
hhd-u4	10.2	2.6	11.3	0.7	32.6	5.3	28.6	8.7	100.0
hhd-u5	3.4	1.0	4.1	0.4	15.5	3.3	53.8	18.6	100.0

In Kenya, the pattern is quite different (Table 45). For rural households, the main source of labour income comes from male and female working as self employed in the cropping activities. The wage activities in cropping or pastoral is quite marginal for the different types of households, especially for women. Labour income coming from workers who have finished their primary and secondary level are the other main components of labour income. For urban households in Kenya, the higher the household belongs to a quintile, the higher the share of income from secondary work in total income.

**Table 45: Repartition of labour income in Kenya**

	male_empl_crop	fema_empl_crop	male_self_crop	fema_self_crop	male_empl_past	fema_empl_past	male_self_past	fema_self_past	flab-n	flab-nf	flab-p	flab-pf	flab-s	flab-sf	total
hhd-r1	2.4	0.9	29.9	21.3	2.3	1.4	1.2	0.3	1.8	0.8	15.7	6.6	13.2	2.3	100.0
hhd-r2	2.6	1.3	29.6	21.3	1.5	0.6	1.5	0.5	1.5	0.4	13.4	5.7	15.9	4.2	100.0
hhd-r3	2.1	1.1	29.4	21.2	0.7	0.3	0.6	0.2	0.8	0.4	13.0	5.4	19.6	5.3	100.0
hhd-r4	3.0	2.1	25.0	19.3	0.4	0.1	0.5	0.2	0.7	0.2	7.1	3.8	27.1	10.5	100.0
hhd-r5	2.7	2.4	21.9	19.0	0.5	0.1	0.9	0.4	0.4	0.1	5.5	2.2	28.5	15.5	100.0
hhd-u1	3.6	3.1	19.3	17.0	0.1	0.0	0.2	0.1	0.5	0.2	19.5	7.6	20.1	8.7	100.0
hhd-u2	3.0	2.8	14.9	14.9	0.2	0.0	0.2	0.4	0.1	0.4	17.5	7.9	28.3	9.4	100.0
hhd-u3	3.7	3.0	13.8	12.3	0.1	0.0	0.1	0.1	0.3	0.1	15.6	7.0	30.8	13.4	100.0
hhd-u4	4.3	3.9	5.9	7.6	0.0	0.0	0.1	0.0	0.1	0.0	10.6	3.8	42.0	21.8	100.0
hhd-u5	4.1	4.2	5.9	5.0	0.0	0.0	0.0	0.0	0.0	0.0	3.0	1.3	47.1	29.5	100.0

**Notes:** hhd- = household income decile, -n1= (non-rural = urban) first decile, ..., n5 = (non-rural = urban) fifth decile, -r1= rural first decile, ..., r5 = rural fifth decile, -u1= urban first decile, ..., u5 = urban fifth decile, male\_rura\_unsk = male workers in rural regions without scholar education, fema\_rura\_unsk = female workers in rural regions without scholar education, male\_rura\_prim = male workers in rural regions with primary education, fema\_rura\_prim = female workers in rural regions with primary education, male\_rura\_seco = male workers in rural regions with secondary education, fema\_rura\_seco = female workers in rural regions with secondary education, male\_rura\_tert = male workers in rural regions with

tertiary education, fema\_rura\_tert = female workers in rural regions with tertiary education, male\_urba\_unsk = male workers in urban regions without scholar education, fema\_urba\_unsk = female workers in urban regions without scholar education, male\_urba\_prim = male workers in urban regions with primary education, fema\_urba\_prim = female workers in urban regions with primary education, male\_urba\_seco = male workers in urban regions with secondary education, fema\_urba\_seco = female workers in urban regions with secondary education, male\_urba\_tert = male workers in urban regions with tertiary education, fema\_urba\_tert = female workers in urban regions with tertiary education.

### *Households structure of spending*

For all households in both countries, they spend most of their income into consumption spending and this share is decreasing when the level of income increases (Table 46).

**Table 46: Spending of households in EGY and KEN**

	EGY				KEN			
	TDH	SH	C	TR	TDH	SH	C	TR
hhd-r1	1.1	5.7	68.2	25.0	0.2	0.5	88.0	11.3
hhd-r2	1.4	8.2	71.1	19.3	0.7	3.2	85.8	10.4
hhd-r3	1.5	8.7	72.1	17.8	1.3	4.1	80.7	14.0
hhd-r4	1.5	9.2	72.3	17.0	2.4	6.9	69.5	21.1
hhd-r5	1.5	9.4	73.3	15.8	3.5	11.4	59.4	25.7
hhd-u1	1.0	6.7	66.0	26.3	1.8	7.3	67.3	23.6
hhd-u2	1.5	10.2	68.2	20.1	0.7	2.2	69.0	28.1
hhd-u3	1.7	10.8	67.7	19.8	1.5	3.4	68.5	26.6
hhd-u4	1.9	10.8	68.6	18.8	2.7	7.9	56.8	32.6
hhd-u5	2.0	13.9	69.9	14.3	6.4	8.2	42.7	42.8

Notes: hhd- = household income decile, -n1= (non-rural = urban) first decile, ..., -r1= rural first decile, ..., r5 = rural fifth decile, -u1= urban first decile, ..., u5 = urban fifth decile, TDH = direct taxes, SH = savings, C = consumption, TR = transfers to other agents

### *Households consumption spending*

Table 47 and Table 48 present the household structure of consumption<sup>12</sup> spending in Egypt and Kenya. In both countries the share of consumption for food and energy is higher for the poorer households. While richer households spend a higher share of consumption budget on services (like health and education).

<sup>12</sup> In the SAM and CGE model we consider the aggregated consumption budget and do not represent the individual consumption by different household members (e.g., the usage of public transport).

**Table 47: Households structure of consumption spending in Egypt (in % of total consumption spending)**

	hhd-n1	hhd-n2	hhd-n3	hhd-n4	hhd-n5	hhd-u1	hhd-u2	hhd-u3	hhd-u4	hhd-u5
aggr_cmaiz	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
aggr_cocer	1.6	1.4	1.3	1.5	1.2	0.5	0.6	0.4	0.3	0.2
aggr_cpuls	0.7	0.5	0.4	0.3	0.2	0.6	0.4	0.3	0.3	0.1
aggr_croot	1.1	1.0	0.9	0.8	0.6	1.1	1.0	0.8	0.7	0.4
aggr_cvege	3.5	3.2	2.9	2.8	2.2	3.3	3.0	2.7	2.4	1.5
aggr_cfroi	2.0	2.3	2.3	2.4	2.2	1.7	1.9	2.0	2.0	1.7
aggr_ccatt	2.4	2.6	2.6	2.7	2.7	2.1	2.4	2.8	2.9	2.3
aggr_coliv	4.6	4.4	4.3	4.0	3.3	3.1	3.2	3.1	2.7	1.9
aggr_cfore	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
aggr_cfish	1.8	2.2	2.3	2.1	1.7	1.7	1.9	1.9	1.9	1.5
aggr_cfood	17.8	15.6	14.3	13.0	10.4	18.0	16.1	15.3	14.1	10.8
aggr_cbeve	1.4	1.7	1.7	1.6	1.5	1.7	1.8	1.9	1.7	1.3
aggr_cpetr	10.1	9.2	8.7	8.8	9.0	6.7	5.6	5.0	4.8	8.1
aggr_cchem	7.5	7.7	8.1	8.5	9.6	7.8	8.3	8.3	8.8	8.3
aggr_coman	13.5	14.0	14.1	13.9	13.4	14.1	14.0	13.9	13.8	12.1
aggr_ccons	0.1	0.1	0.2	0.3	0.5	0.1	0.1	0.1	0.1	0.3
aggr_ctrad	0.2	0.3	0.5	0.9	4.0	0.1	0.3	0.4	0.8	3.3
aggr_ctrans	7.2	7.2	8.0	8.0	7.3	9.7	10.0	10.2	10.5	8.2
aggr_chotl	5.0	5.3	5.1	4.8	4.3	6.8	6.4	6.4	6.5	6.8
aggr_creal	8.1	7.7	7.4	7.2	6.4	8.4	8.3	8.4	8.0	10.6
aggr_cpadm	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
aggr_ceduc	2.0	2.8	3.2	3.1	2.8	2.6	3.7	4.0	4.1	5.4
aggr_cheal	3.2	3.5	3.5	4.6	6.6	2.6	2.3	2.6	3.2	3.9
aggr_cosrv	6.1	7.2	7.9	8.6	9.8	7.3	8.5	9.5	10.2	11.1

**Notes:** aggr\_ = aggregated commodities including ... , cmaiz = maize commodity, cocer = other cereals incl. rice and wheat, cpuls = pulses, coils = oilseeds, croot = root crops, cvege = vegetable, cfroi = fruit, aocrp = other crops, ccatt = cattle, colive = other livestock, cfore = forestry, cfish = fishery, cfood = food industry, cbeve = beverages, cpetr = petrol, cchem = chemicals & pesticides, coman = other manufacturing, ccons = construction, ctrad = trade, ctrans = transport, chotl = hotel & restaurants, creal = real estate, cpadm = public services, ceduc = education, cheal = health services, cosrv = other services. hhd- = household income decile, -n1= (non-rural = urban) first decile, ..., n5 = (non-rural = urban) fifth decile, -r1= rural first decile, ..., r5 = rural fifth decile, -u1= urban first decile, ..., u5 = urban fifth decile

**Table 48: Households structure of consumption spending in Kenya (in % of total consumption spending)**

	hhd-r1	hhd-r2	hhd-r3	hhd-r4	hhd-r5	hhd-u1	hhd-u2	hhd-u3	hhd-u4	hhd-u5
aggr_cmaiz	11.1	8.6	6.0	5.2	3.5	9.7	7.5	4.5	2.9	1.3
aggr_cocer	3.4	2.2	1.1	1.4	1.0	1.8	0.7	0.4	0.4	0.3
aggr_cpuls	16.2	16.5	14.3	12.7	10.3	16.2	13.4	11.4	7.7	3.5
aggr_coils	0.2	0.4	0.4	0.5	0.4			0.5	0.4	0.3
aggr_croot	4.0	4.9	5.1	4.6	4.0	2.5	4.8	4.1	4.1	2.0
aggr_cvege	8.8	9.9	9.0	8.6	6.8	13.3	11.2	10.9	10.4	6.4
aggr_cocrp	1.4	1.9	1.7	1.2	0.9		0.9	0.9	0.4	0.4
aggr_ccatt	6.0	7.2	8.5	8.9	9.0	4.7	7.3	10.2	12.0	8.6
aggr_coliv	1.9	2.7	3.4	4.8	5.9	2.3	2.7	3.4	3.7	3.5
aggr_cfore	0.2	0.3	0.4	0.3	0.2		0.8	0.4	0.4	0.1

aggr_cfish	1.1	1.4	1.6	1.5	1.3	2.3	1.7	2.8	2.9	1.7
aggr_cfood	25.2	23.6	20.5	18.8	15.2	30.1	24.1	22.6	19.0	16.4
aggr_cbeve	1.5	2.0	2.6	3.1	6.8	1.8	1.4	1.9	2.9	6.1
aggr_cpetr	0.6	0.9	0.9	1.2	1.5		0.8	1.1	1.5	1.4
aggr_cchem	0.1	0.1	0.1	0.2	0.2			0.2	0.1	0.1
aggr_coman	4.3	5.3	6.7	8.2	9.7	4.3	4.9	6.5	8.8	12.8
aggr_ctrans	0.3	0.4	0.5	1.5	0.8			0.6	0.7	1.1
aggr_creal	10.4	8.2	11.7	10.4	10.3	10.8	13.6	11.6	13.7	14.6
aggr_ceduc	1.1	1.4	1.7	2.1	2.1		1.0	1.7	2.0	2.4
aggr_cheal	0.3	0.2	0.5	0.3	0.3			0.6	0.2	0.3
aggr_cosrv	1.8	2.0	3.5	4.6	9.7		3.0	3.7	5.8	16.6

**Notes:** aggr\_ = aggregated commodities including ... , cmaiz = maize commodity, cocer = other cereals incl. rice and wheat, cpuls = pulses, coils = oilseeds, croot = root crops, cvege = vegetable, cfui = fruit, aocrp = other crops, ccatt = cattle, colive = other livestock, cfore = forestry, cfish = fishery, cfood = food industry, cbeve = beverages, cpetr = petrol, cchem = chemicals & pesticides, coman = other manufacturing, ccons = construction, ctrad = trade, ctran = transport, chotel = hotel & restaurants, creal = real estate, cpadm = public services, ceduc = education, cheal = health services, cosrv = other services, hhd- = household income decile, -n1 = (non-rural = urban) first decile, ..., n5 = (non-rural = urban) fifth decile, -r1 = rural first decile, ..., r5 = rural fifth decile, -u1 = urban first decile, ..., u5 = urban fifth decile

Table 49 and Table 50 show the structure of income for government in Egypt and Kenya. In Egypt, we can see that the main sources of income for the government come from indirect taxes on commodities and direct taxes on households. It is important to note that subsidies on commodities, especially on agricultural commodities are paid by the government from of the government's income of which they represent a high share (more than 30%). In Kenya, the main sources of income come from direct taxes and indirect taxes, and for 10.98%, transfers from firms.

**Table 49: Government sources of income (in %)**

	EGY	KEN
Transfers from firms	31.1	11.0
Transfers from households	0.2	1.3
Direct taxes	44.3	40.8
Taxes on factors	0.8	
Import taxes	6.3	7.9
Value added taxes	48.1	37.4
Subsidies	-31.1	
Transfers from the Rest of the World	0.4	1.7
<b>Total</b>	<b>100.0</b>	<b>100.0</b>

In terms of spending, the structure is quite interesting. Both governments spend a large share of their income on public consumption on goods and services (education, administration...) and transfers. Both are running a deficit, especially the Egyptian government.

**Table 50: Government sources of spending (in %)**

	EGY	KEN
Public consumption	76.1	67.2

Transfers to firms	10.9	84.2
Transfers to households	5.1	11.5
Savings	-0.1	-68.4
Transfers to the Rest of the World	8.0	5.4
<b>Total</b>	100.0	100.0

### Trade relations

Table 51 will shed some light on the trade structure for each country. The first two columns refer to the import penetration rate. It indicates per commodity how much each country relies on its imports. For instance, for Egypt, we can see that the country relies heavily on imports for wheat, pulses, oils seeds, tobacco, cotton, while Kenya relies heavily on imported petrol (more than 90%), fertilisers, chemicals and machineries. Then, the table provides information on the structure of imports and exports for each country.

**Table 51: Trade relations for each country**

	Import Penetration Rate		Share of imports		Share of exports	
	EGY	KEN	EGY	KEN	EGY	KEN
aggr_cmaiz	31.7	1.6	1.9	0.6	0.0	0.1
aggr_cocer	21.1	7.5	1.1	0.6	0.0	0.3
aggr_cpuls	27.9	1.7	0.9	0.5	0.2	0.5
aggr_coils	56.4	1.8	1.9	0.1	0.1	0.1
aggr_croot	3.0		0.1		0.5	
aggr_cvege	0.0	0.2	0.0	0.1	0.6	2.0
aggr_cfrui	16.9		1.8		2.6	
aggr_cocrp	13.7	4.1	0.5	0.3	0.3	0.5
aggr_ccatt	0.9		0.2		0.3	
aggr_coliv	0.3	0.6	0.0	0.1	1.3	0.1
aggr_cfore	0.5		0.0		0.0	
aggr_cfish	0.4		0.0		0.0	
aggr_cfood	14.5	11.1	7.1	7.8	3.8	7.4
aggr_cbeve	5.5	3.6	0.3	0.5	0.2	1.8
aggr_cpetr	14.9	90.2	7.0	16.2	7.4	3.2
aggr_cfert	5.8	64.6	0.2	0.9	2.1	
aggr_cchem	23.3	75.6	11.7	12.7	6.8	8.6
aggr_coman	22.1	41.8	38.2	46.1	23.4	16.5
aggr_ccons	1.0	3.5	0.5	2.4	1.1	
aggr_ctrad		0.5		0.4		0.2
aggr_ctran	24.0	4.1	11.0	2.3	19.3	34.3
aggr_chotl	24.4		4.6		23.7	
aggr_cpadm	3.8	4.6	1.0	1.3	2.1	11.5
aggr_cosrv	12.5	10.9	10.0	7.3	4.2	12.9

Table 52 and Table 53 will give us insights on how the shock can be transferred to the countries. Indeed, for each commodity, it gives an idea of the structure of the market. For

instance, in Egypt, all the oil or fertiliser are used as an intermediate consumption, while most of the vegetables and all the milk are used as final consumption.

**Table 52: Structure of the demand in Egypt**

	C	CG	DIT	MRGN	INV	VSTK
aggr_cmaiz	0.3		98.0			1.7
aggr_cocer	43.4		52.9			3.6
aggr_cpuls	26.3		8.7		65.0	
aggr_coils			72.8		27.2	
aggr_croot	64.1		10.9		24.5	0.6
aggr_cvege	82.0		17.6		0.5	
aggr_cfrui	53.8		34.3		11.8	0.0
aggr_cocrp			76.7		21.7	1.6
aggr_ccatt	37.4		31.0		31.5	0.1
aggr_coliv	58.4		18.2		22.9	0.5
aggr_cfore	0.7		7.8		91.7	-0.2
aggr_cfish	73.9		4.2		21.9	0.0
aggr_cfood	74.2		15.6		9.7	0.5
aggr_cbeve	77.0		19.9		2.9	0.2
aggr_cpetr	46.6		52.1		0.9	0.4
aggr_cfert			95.0		5.0	
aggr_cchem	46.1		49.7		4.0	0.3
aggr_coman	21.2		58.0		20.4	0.4
aggr_ccons	1.3		6.0		88.8	3.9
aggr_ctrad	8.1		7.6	67.7	16.7	
aggr_ctran	50.4		16.7	11.5	21.4	
aggr_chotl	84.0		2.2		13.8	
aggr_creal	50.0		31.6		18.4	
aggr_cpadm	1.0	62.7	0.5		35.8	
aggr_ceduc	34.3	22.6	1.2		41.9	
aggr_cheal	62.4	18.3	1.8		17.5	
aggr_cosrv	31.9	6.1	40.6		21.5	0.0

**Notes:** aggr\_ = aggregated commodities including ... , cmaiz = maize commodity, cocer = other cereals incl. rice and wheat, cpuls = pulses, coils = oilseeds, croot = root crops, cvege = vegetable, cfrui = fruit, aocrp = other crops, ccatt = cattle, colive = other livestock, cfore = forestry, cfish = fishery, cfood = food industry, cbeve = beverages, cpetr = petrol, cchem = chemicals & pesticides, coman = other manufacturing, ccons = construction, ctrad = trade, ctran = transport, chotel = hotel & restaurants, creal = realestated, cpadm = public services, ceduc = education, cheal = health services, cosrv = other services, C = private consumption (by households), CG = public consumption by government, DIT = intermediate demand, MRGN = trade margins, INV = demand for investment purposes, VSTK = variation of stocks

**Table 53: Structure of the demand in Kenya**

	C	CG	DIT	MRGN	INV	VSTK
aggr_cmaiz	32.6		67.4			
aggr_cocer	34.4		67.1			-1.5
aggr_cpuls	89.2		10.8			
aggr_coils	36.4		60.6			3.0
aggr_croot	76.4		24.0			-0.3
aggr_cvege	82.4		17.8			-0.1
aggr_cfrui						
aggr_cocrp	41.7		59.0			-0.7
aggr_ccatt	61.3		33.7		1.7	3.4
aggr_coliv	57.9		41.6			0.5

aggr_cfore	9.6	91.0		-0.5
aggr_cfish	87.5	12.5		
aggr_cfood	76.8	23.2		
aggr_cbeve	86.6	13.4		
aggr_cpetr	19.6	80.4		
aggr_cfert		100.0		
aggr_cchem	1.8	92.2		6.0
aggr_coman	24.1	55.7	20.1	0.1
aggr_ccons		21.5	78.5	
aggr_ctrad		5.0	94.8	0.2
aggr_ctran	4.3	86.6	9.1	
aggr_chotl				
aggr_creal	89.7	10.3		
aggr_cpadm		100.0		
aggr_ceduc	15.1	79.6	5.3	
aggr_cheal	6.8	86.4	6.8	
aggr_cosrv	39.0	58.0	3.1	

**Notes:** aggr\_ = aggregated commodities including ... , cmaiz = maize commodity, cocer = other cereals incl. rice and wheat, cpuls = pulses, coils = oilseeds, croot = root crops, cvege = vegetable, cfri = fruit, aocrp = other crops, ccatt = cattle, colive = other livestock, cfore = forestry, cfish = fishery, cfood = food industry, cbeve = beverages, cpetr = petrol, cchem = chemicals & pesticides, coman = other manufacturing, ccons = construction, ctrad = trade, ctran = transport, chotel = hotel & restaurants, creal = real estate, cpadm = public services, ceduc = education, cheal = health services, cosrv = other services, C = private consumption (by households), CG = public consumption by government, DIT = intermediate demand, MRGN = trade margins, INV = demand for investment purposes, VSTK = variation of stocks