

# Disparities in Cost of Living Changes after a Large-Scale Devaluation: The Case of Egypt 2016

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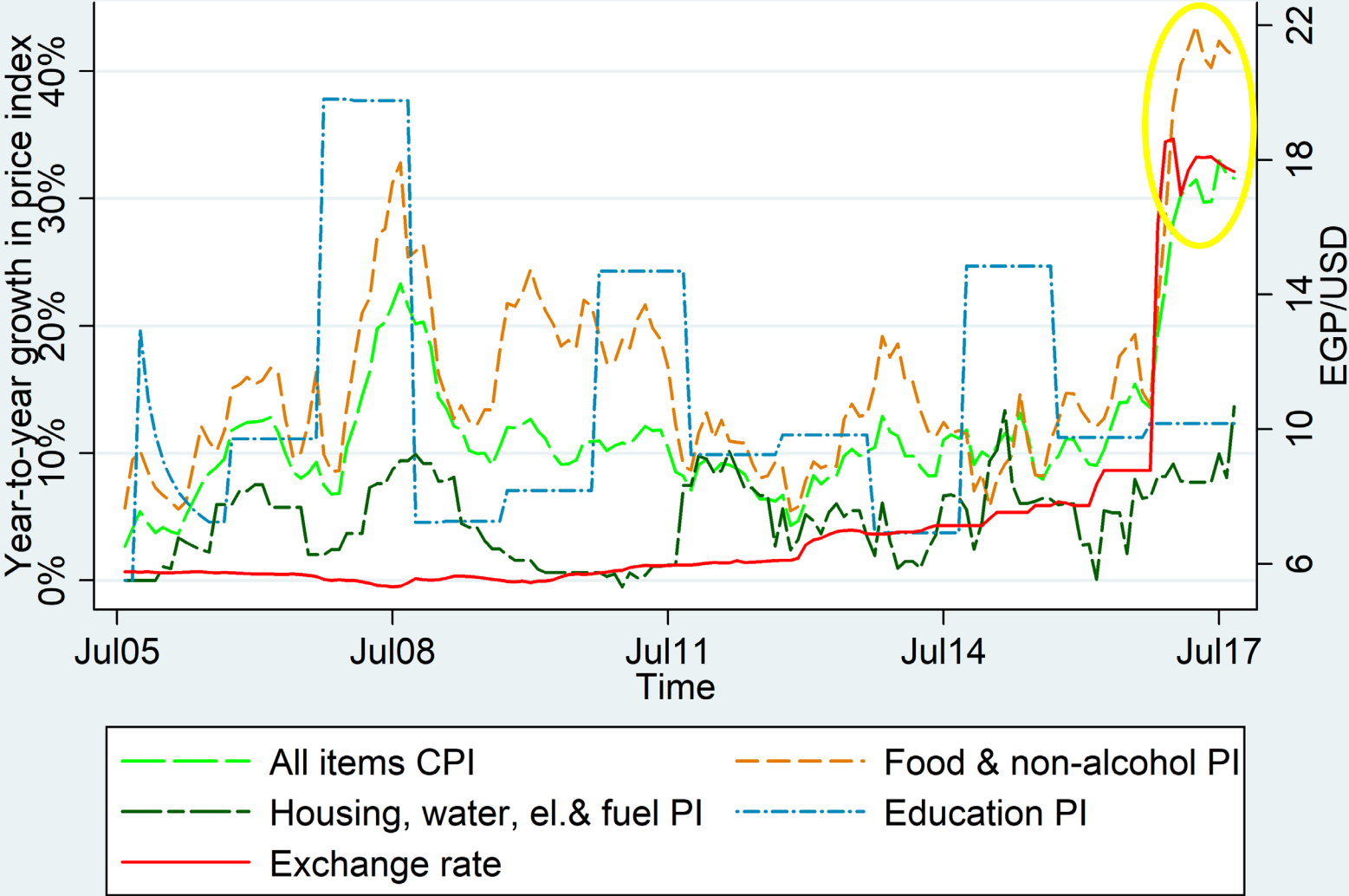
# Motivation: Regional & Income Disparities

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- In November 2016 Egypt went through a massive devaluation of its currency. The Egyptian pound lost more than half its value: from 8.80 to 17.60 EGP/USD
- Inflation rates soared above 30%, while food prices shot up by over 40%. Inflation rates continued above 30% until the fall of 2017 and remained well above their pre-2016 levels and regional averages through 2018.
- This inflation likely disproportionately hit the poor, since they spend over 50% of their incomes on food, the category that witnessed the highest price increases after the currency devaluation.
- It is important for policymakers to understand how this inflation affected particularly vulnerable groups and people in different geographical locations to be able to accurately mitigate its negative consequences on their welfare.

# EGP/USD Exchange Rate and Selected CPI Components 2005-2017

## EGP/USD exchange rate and selected price indexes



# Research Questions

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1. What share of the subsequent inflation was specifically due to the devaluation, commonly known as the exchange rate pass through?
2. What was the effect of exchange rate pass through on welfare?
3. Did these effects vary by region ? Did they vary by income level?

# Empirical Methodology Step 1: Calculating the Exchange Rate Pass-Through

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- A model loosely adopted from Kraay (2007) makes the price of a good  $i$  in region  $r$  and month  $t$ ,  $P_{irt}$ , have a non-tradable component  $P_{irt}^N$  and a tradable component  $P_{irt}^T$ .
- The tradable component is modeled as a weighted product of exchange rates  $E_t$  and a measure of production costs in Egypt's main trading-partner countries  $C_t$ .
- This yields an estimable reduced-form equation in percentage growth rates (indicated by  $\dot{\cdot}$ ):

$$\dot{P}_{irt} = \alpha_{ir}\dot{P}_{rt}^N + \beta_{ir}\dot{E}_t + \gamma_{ir}\dot{C}_t + u_{irt}$$

- We observe the actual price changes following the November 2016 devaluation and can decompose them into the part due to the devaluation, and the part due to other factors.

# Empirical Methodology Step 2: Measuring the Welfare Effect of the Devaluation

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- One way to gauge the welfare impact is to simply study the disparities in price increases faced by distinct regions and income groups as a result of the devaluation.
- However, simply examining rising prices as measured by the Consumer Price Index (CPI,  $P_{rt}$ ), does not accurately measure changes in households' cost of living or welfare.
- When inflation is high for some commodities, people resort to substitution to hedge themselves against a declining standard of living.
- Others may continue to consume higher price items in their baskets and reduce their consumption of others, due to changing preferences or due to habit formation.
- To accurately monitor changes in ***the cost of attaining a given utility level***, not a fixed basket of goods, we construct True Cost of Living Indices (TCLI) and use them to examine the regional and income disparities in cost of living changes due to the devaluation.

# Empirical Methodology of Estimating TCLI

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- We compute two versions of the TCLI as derived by Basmann et al. (1985a,b) based on the GFT utility functions:

- TCLI(0) is comparable to the CPI, assumes fixed preferences, but not a fixed bundle.

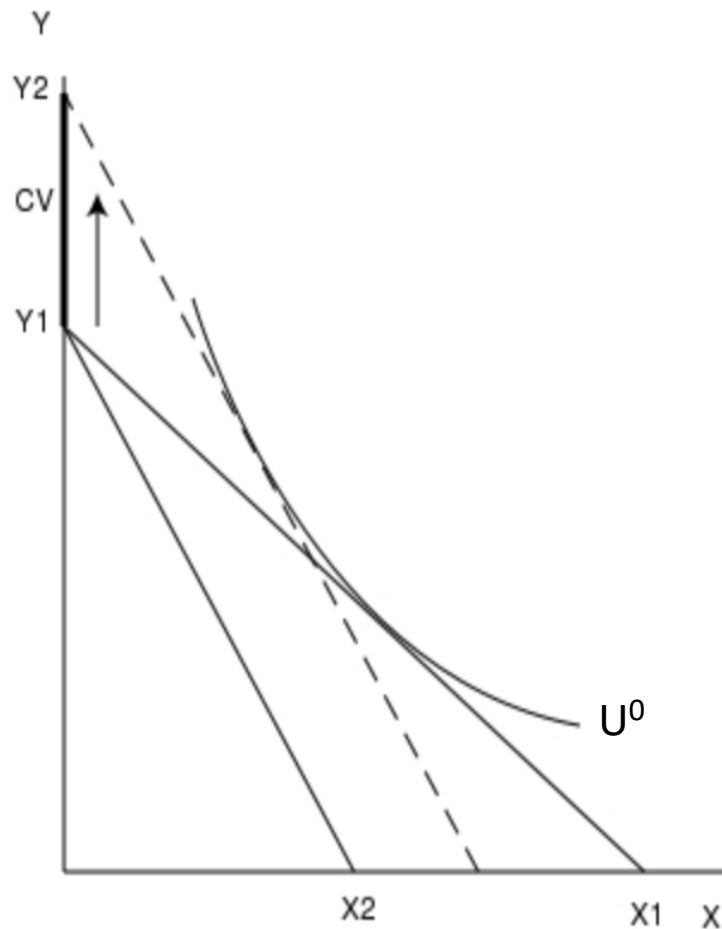
$$\text{GFT-TCLI (0)} = \prod_{i=1}^n (P_i^1 / P_i^0)^{M_i^0 / M^0}$$

- TCLI(1) allows preferences to change from the base to the current period

$$\text{GFT-TCLI (1)} = \prod_{i=1}^n (P_i^1 / P_i^0)^{M_i^1 / M^1}$$

- where P are prices in base (0) and current (1) periods; M are expenditure shares for good *i*

# TCLI as the *Compensating Variation*: Simple graphical exposition



- TCLI(0) is the compensating variation required to maintain the original level of utility given the base period parameter vector  $\theta^0$  as the price vector changes from the base period ( $P^0$ ) to the current period ( $P^1$ ), i.e. assuming preferences remain constant.
- Similarly, TCLI(1) is the compensating variation required to maintain the original level of utility given the current parameter vector  $\theta^1$  as the price vector changes from the base period ( $P^0$ ) to the current period ( $P^1$ ). (Basmann et al. 1988, p.88),



# Data

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- Exchange rate data are from the Central Bank of Egypt, and producer price indices in trading countries are from the FRB of St. Louis. Both are weighted by the partners' share in Egypt's imports, taken from the WB World Integrated Trade Solution database.
- Price data come from the CPI monthly series for the 12 main groups of commodities published by CAPMAS on a monthly basis for eight regions of Egypt: Cairo, Alexandria, Suez Canal cities, Urban and Rural Lower Egypt, Urban and Rural Upper Egypt, & Border region.
- Monthly, regional data at this level, with the same base year, available from July 2008 to December 2017.
- Commodity-group expenditure share data obtained from HIECS:2008/2009; 2010/2011; 2012/2013; and 2015.
  - Nationally representative household budget surveys that provide the best available information on consumption patterns of individuals across regions and income strata, and over time.

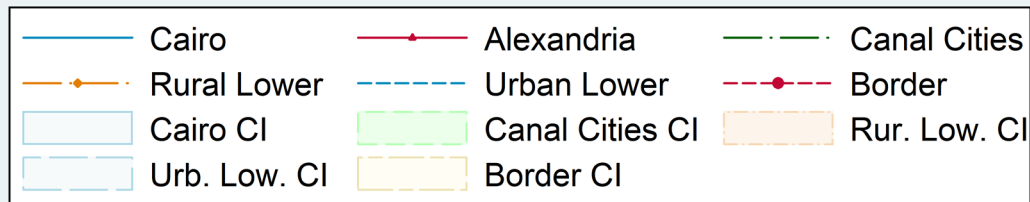
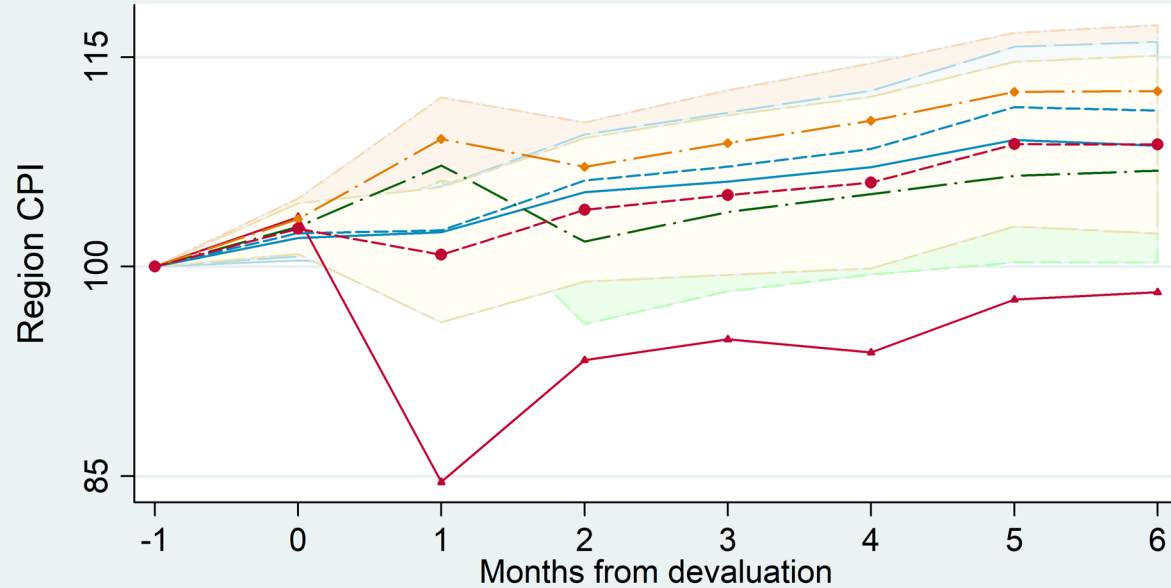
# Results 1: Exchange Rate Pass-Through

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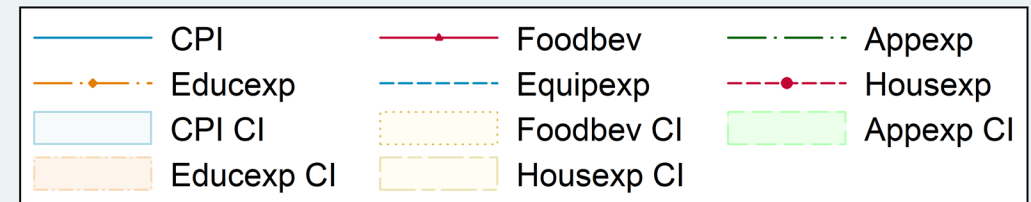
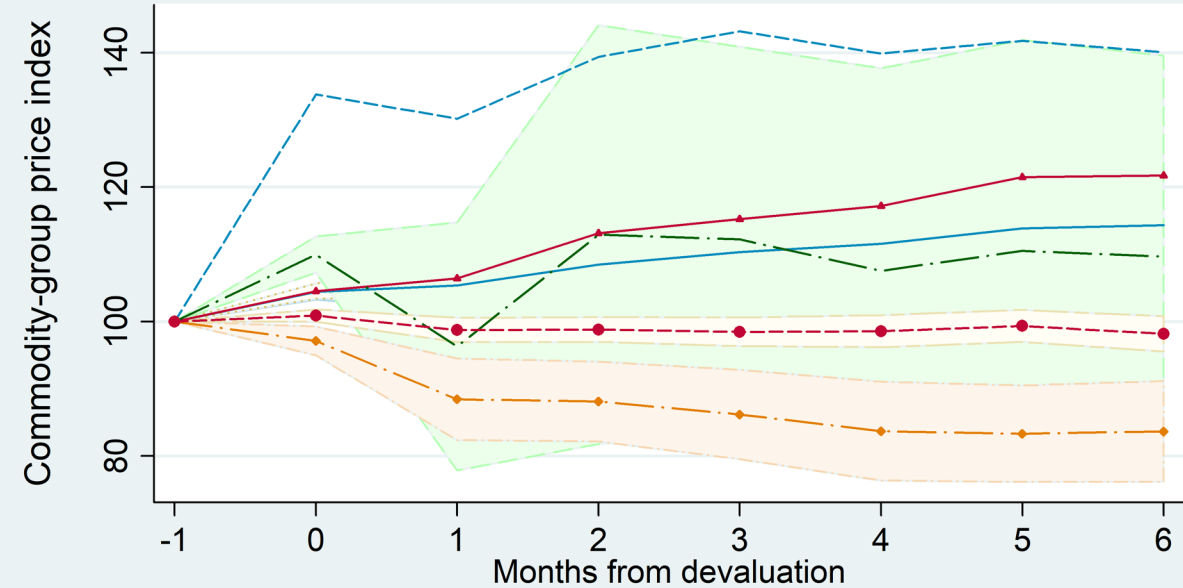
- Across all commodity groups and regions, the pass through of exchange rates is, on average, ***four percentage point within the first month***, and ***nine percentage points (p.pts.) over the six months after devaluation***.
- When the Egyptian pound was devalued from 8.80 to 17.60 EGP/USD as in November 2016, the direct impact of the devaluation on domestic prices was 4 p.pts. immediate increase, and a further 5 p.pts. increase over the following 6 months. The effects do not necessarily accumulate linearly or even monotonically.
- ***Pass through was highest and most significant for highly tradable goods such as food, alcohol, apparel and equipment***, and lowest or even negative and significant for domestically produced, non-tradable goods such as communication services, cultural services, medical services, education, utilities, and restaurants & hotels.

# Exchange Pass-Through by Region & by Commodity Group

Impact propensity of devaluation in months 0-6



Impact propensity of devaluation in months 0-6



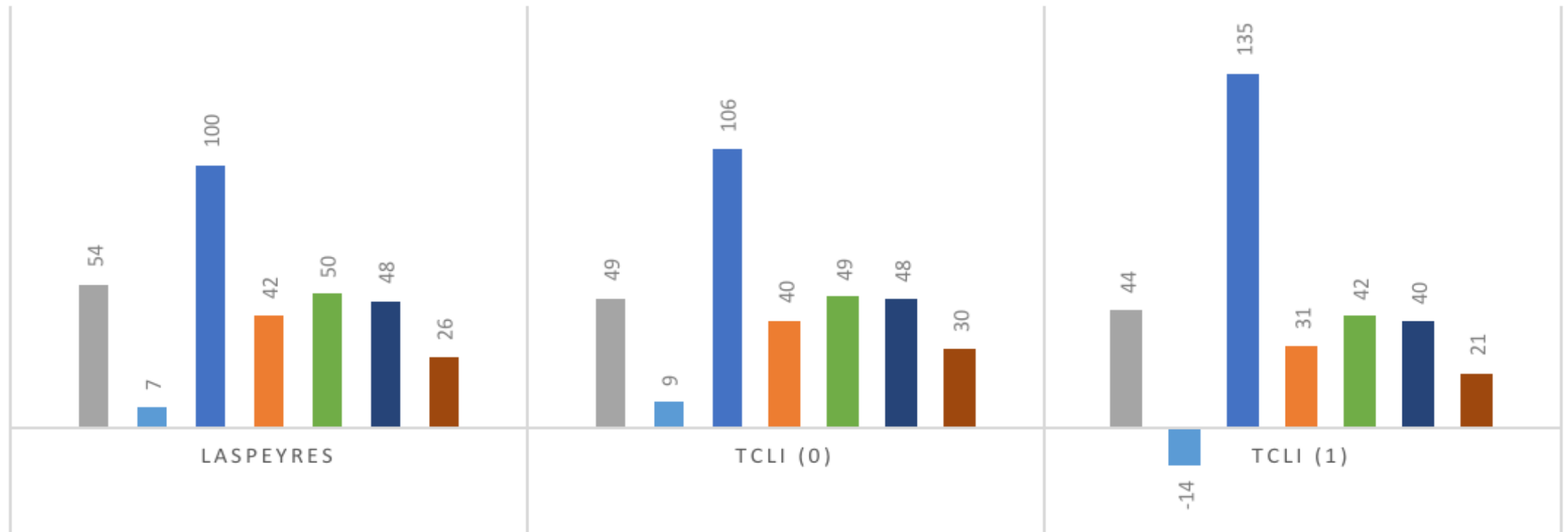
# Results 2: Cost of living Changes Due to Devaluation vs. Other Factors, by Region

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- Based on these exchange rate pass through estimates, combined with household expenditure patterns we find that some ***50% of the rise in the cost of living of the average household between November 2016 and May 2017 was due to the devaluation.***
- ***Wide disparities*** in price and cost of living changes as a result of the devaluation are apparent ***across regions***, using all cost-of-living indices: Cairo, Lower and Upper Egypt (both urban and rural), witnessed the highest increases in cost of living with the effect of the devaluation exceeding 50%.

## CHANGE IN COST OF LIVING DUE TO DEVALUATION AS SHARE OF TOTAL CHANGE FOR THE MEAN HOUSEHOLD, 11/2016 TO 5/2017

■ Cairo ■ Canal Cities ■ Urban Lower ■ Urban Upper ■ Rural Lower ■ Rural Upper ■ Frontier

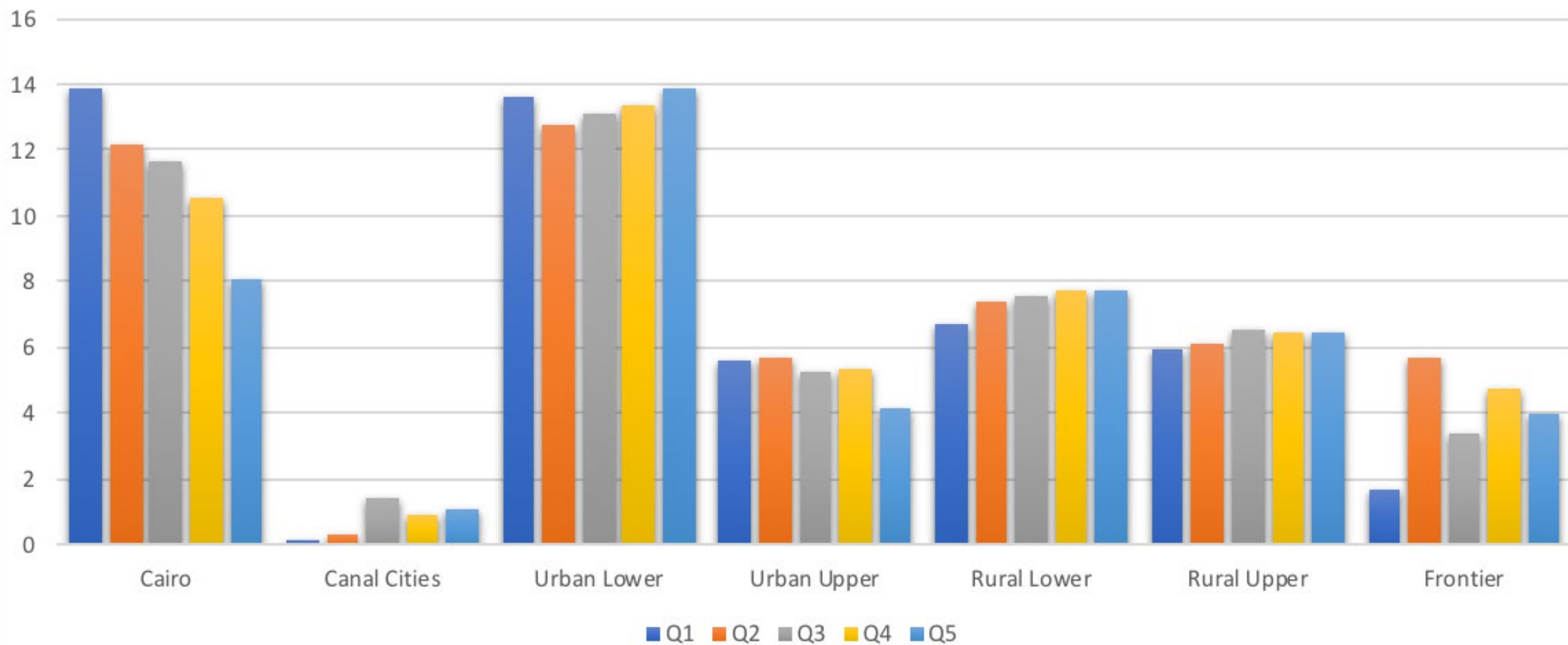


# Results 3: Income Disparities

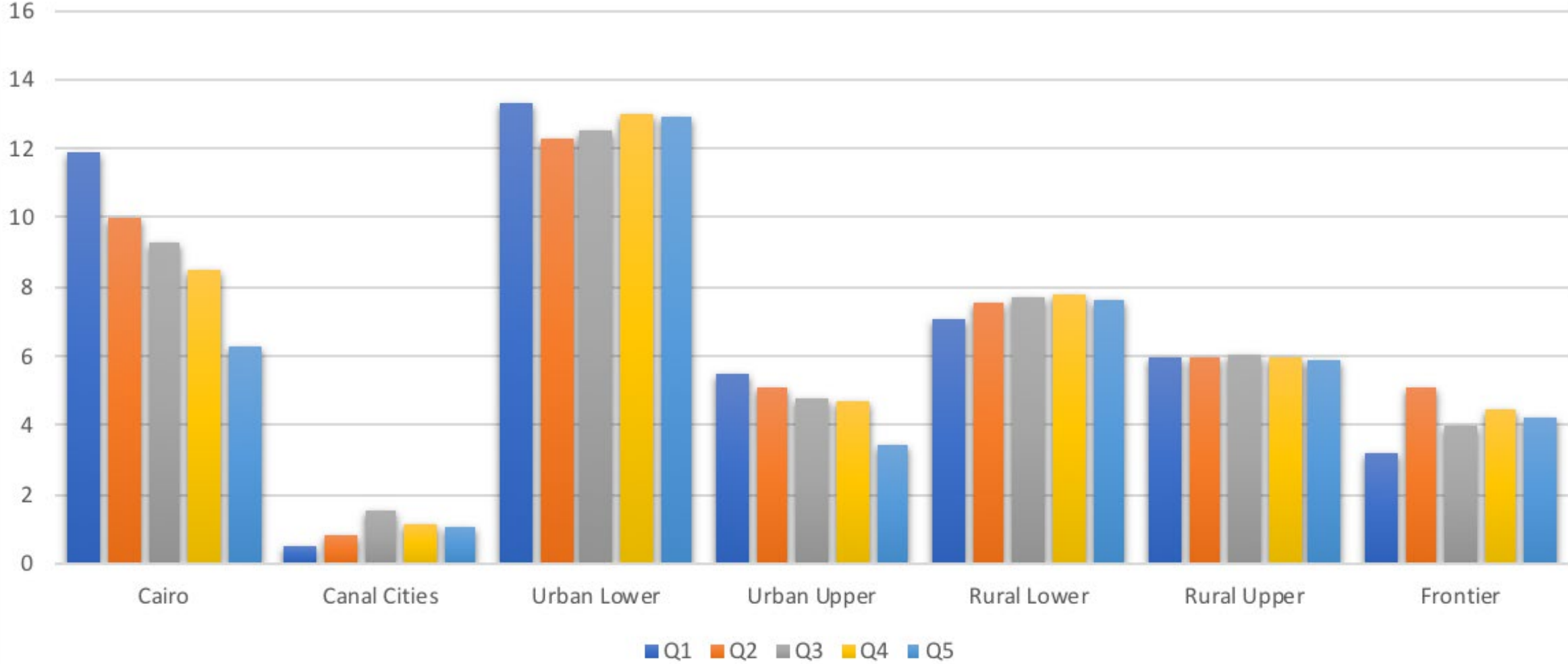
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- The effect of the evaluation on cost of living increases ***are also highest among households in the poorest income quintiles in Cairo, Urban Lower and Urban Upper Egypt by the Laspeyres PI and TCLI(0) and in all regions except Alexandria by TCLI(1).***
- They would have faced a far lower cost of living increase had the devaluation not taken place.

## Change in Laspeyres price index 11/2016 to 5/2017 by income quintile due to devaluation, %

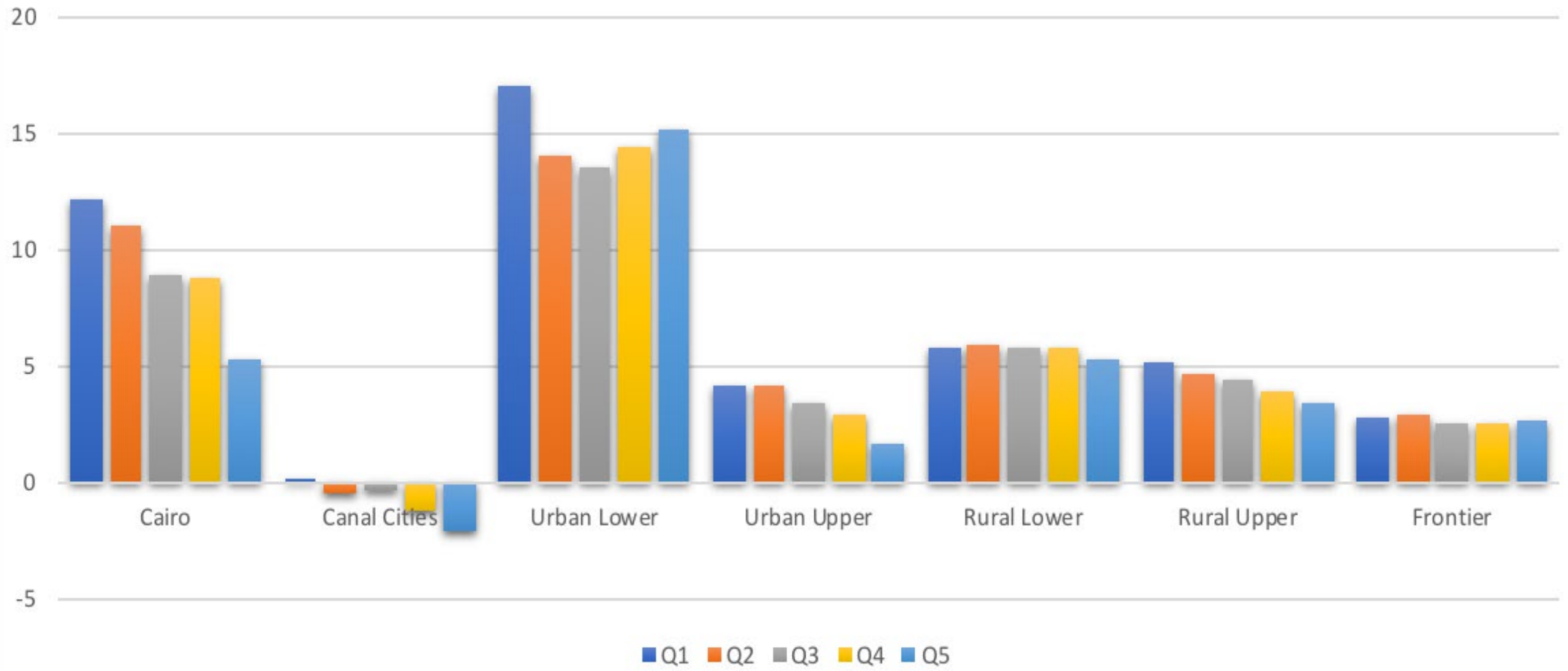


# Change in Cost of Living (TCLI(0)) 11/2016 to 5/2017 by income quintile due to devaluation, %





## Change in Cost of Living (TCLI(1)) 11/2016 to 5/2017 by income quintile due to devaluation, %



## Compensating Variation Counterfactual: How much would a Cairo household's nominal income have to rise in May 2017 to keep them at their 2015 real expenditure or income level?

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- ❑ The mean household would have needed about 9,500 EGP more in May 2017 to keep their 2015 expenditure based on overall inflation over this period.
- ❑ **Without devaluation**, the average HH would have needed less than 50% of that amount: only 4,300 EGP in expenditure.
- ❑ By income quintile, the bottom quintile would require the highest relative compensation to counteract the devaluation alone (60% of the total CV), than the top quintile (49% of the total CV).

Mean expenditure at 2015 prices						
	Q1	Q2	Q3	Q4	Q5	Mean
<b>TOTEXP</b>	<b>18,078</b>	<b>26,631</b>	<b>33,059</b>	<b>41,371</b>	<b>94,142</b>	<b>50,855</b>
Compensating Variation (CV) required						
<b>CV to stay at 2015 real expenditure level</b>	<b>4,195.36</b>	<b>5,545.24</b>	<b>6,651.85</b>	<b>7,934.09</b>	<b>15,423.23</b>	<b>9,483.13</b>
<b>CV component due to devaluation alone</b>	<b>2,508.54</b>	<b>3,250.00</b>	<b>3,850.11</b>	<b>4,376.41</b>	<b>7,577.16</b>	<b>5,159.19</b>
<b>As a % of 2015 TOTEXP</b>	<b>13.9%</b>	<b>12.2%</b>	<b>11.7%</b>	<b>10.6%</b>	<b>8.1%</b>	<b>10.1%</b>
<b>CV due to devaluation as % of total CV</b>	<b>60%</b>	<b>59%</b>	<b>58%</b>	<b>55%</b>	<b>49%</b>	<b>54%</b>

# Conclusion

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- The 2016 devaluation resulted in significant pass-through to domestic prices and overall inflation.
- This pass through varied depending on geographical region and income level.
- The compensating variation required to mitigate the impact of the exchange rate pass through represents a significant portion of households' income levels, and this share rises for households in lower income quintiles

# Policy Implications

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- Efforts to mitigate the effect of the exchange rate pass through need to carefully target lower income households as well as those in Cairo, Lower and Upper Egypt.
- Existing programs that provide direct cash transfers such as *Takafol and Karama* can be readily expanded and used for this purpose.
- Additionally, efforts to create alternative domestic production through industrial policy incentives can be concentrated in industries that are highly dependent on foreign trade such as food , apparel and equipment.
- This will not only lower foreign dependence and its potentially disastrous impact on the domestic economy in the event of global economic shocks, but will also provide employment and growth opportunities over the long run beyond the consumption gain.