

The Effects of Rising Staple Prices on Food Insecurity:

The Case of Tortilla in Mexico

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Motivation

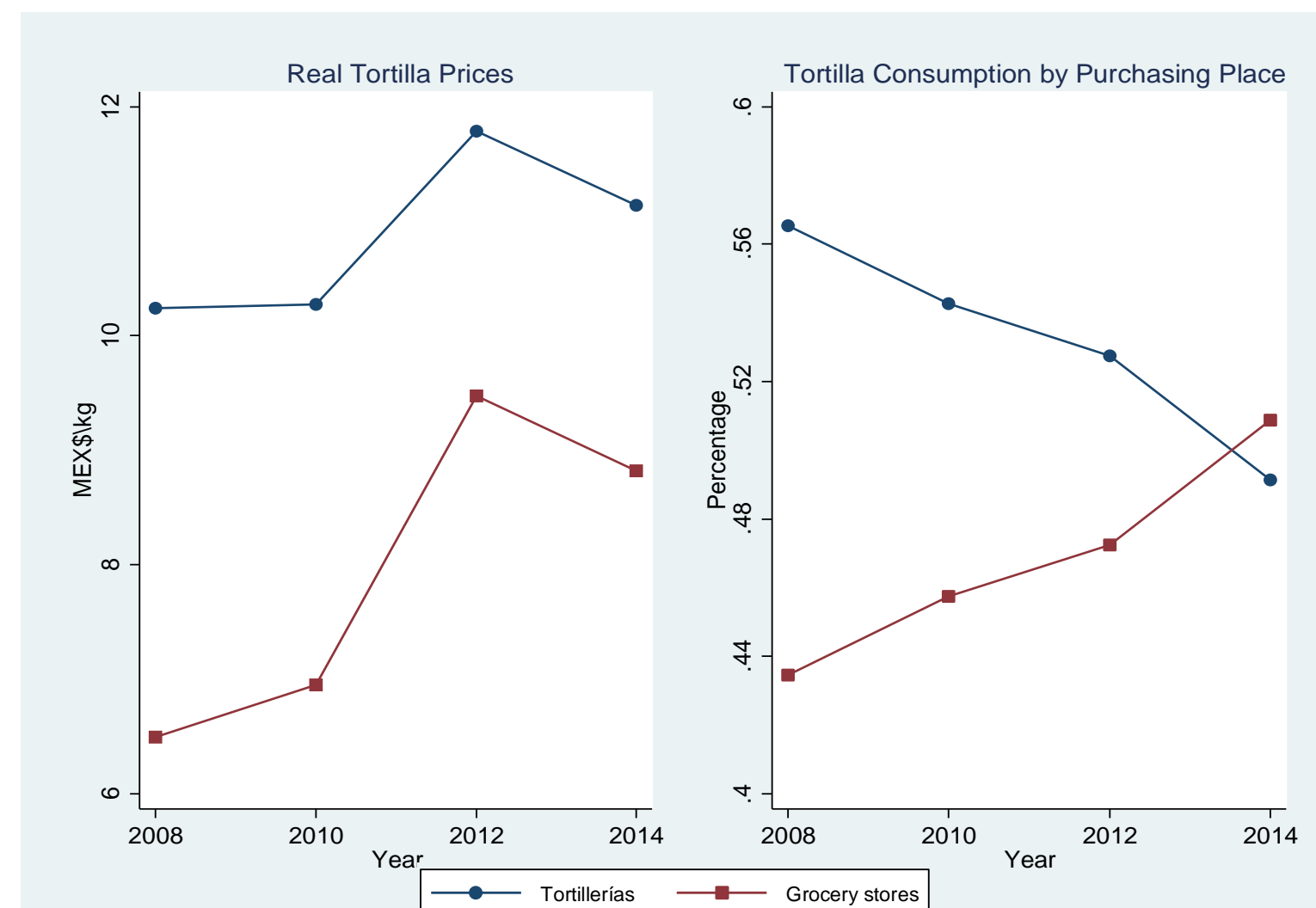
- **Research Question:** What are the effects of rising staple prices on food insecurity?
- **This paper** → What is the impact of tortilla prices on household food insecurity in Mexico?
- Since 2006, food prices have increased, reaching its peak between 2008 and 2011.
- Households might follow different coping strategies to mitigate the effects of rising food prices on their wellbeing:
 - Substitution between products; downgrading the quality;
 - relocating intra-household resources; buying fewer quantities.
- Most vulnerable households: urban poor households, rural landless, small-scale farmers.

Background

Tortilla is a thin, flat bread, made from maize or wheat. It is the Mexican staple.



Maize tortillas can be purchased from *tortillerías* or grocery stores. Consumer households prefer buying tortillas in *tortillerías* because of their quality. However, this tendency has changed in recent times.



Source: 2008-2014 Mexican ENIGH and own calculations.

Data and Descriptive Statistics

Mexican National Survey of Household Income and Expenditure (ENIGH):

- Conducted biannually by the National Institute of Statistics and Geography (INEGI).
- Representative at the national level.
- Captures detailed information regarding household income and expenses.
- Data Collection Process: 10 different schedules.
- Sample: 85,604 household-year observations.

Food Security Supplement (FSS):

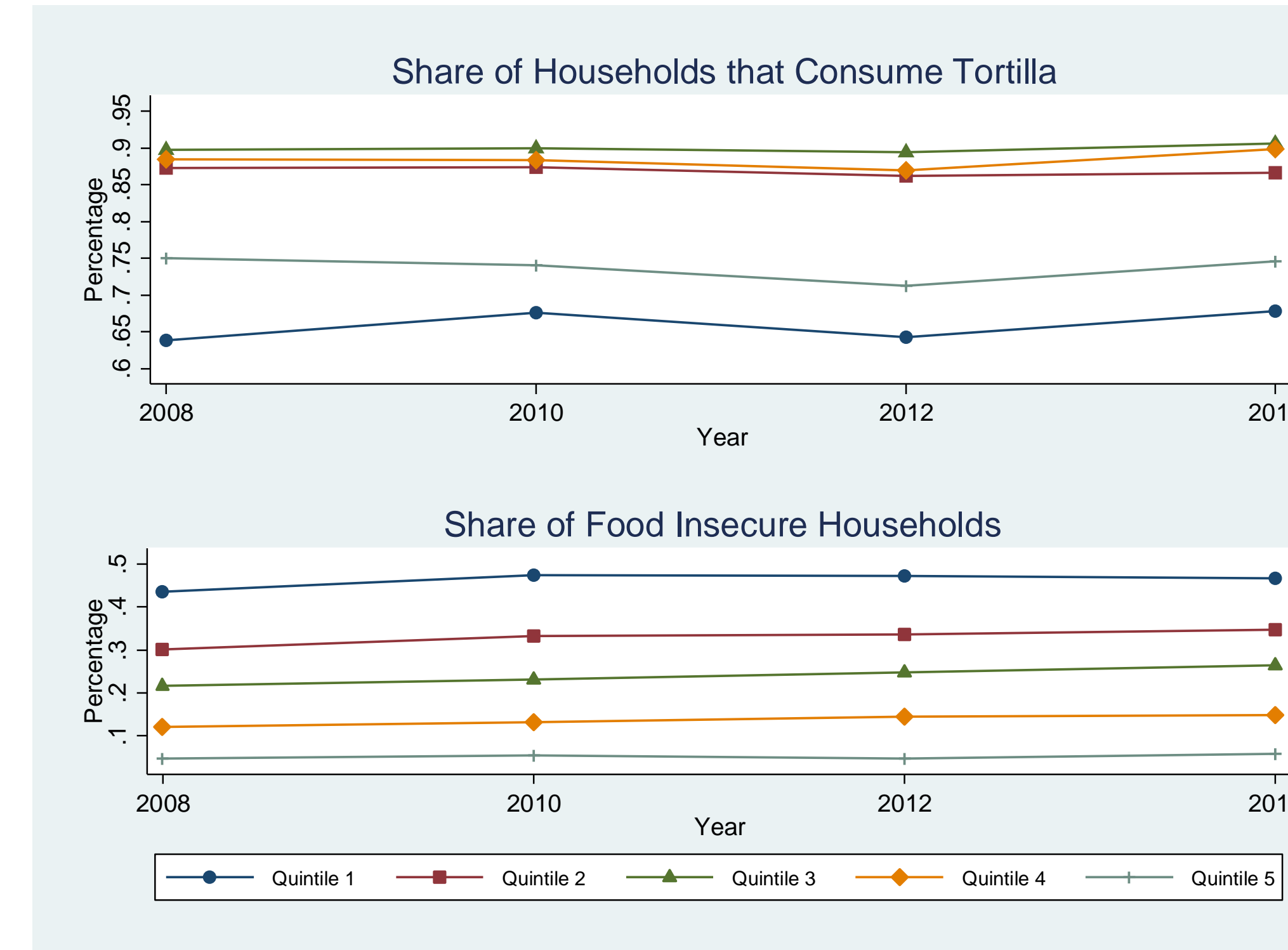
- 12 questions in 2008; from 2010 onwards it was extended to 16 questions.
- A household is food insecure if it answers “yes” to three or more questions.

National System of Market Information and Integration (SNIIM):

- Collects data from 384 *tortillerías* and 120 grocery stores in 53 cities located across all states, every Monday, Wednesday, and Friday.

Households were classified in quintiles, according to the national distribution of per capita income.

- Households in the first and fifth quintiles are the ones that consume the least tortilla.
- Poorer households are more food insecure.



Source: 2008-2014 Mexican ENIGH and own calculations.

Econometric Framework and Identification Strategy

The ENIGH does not track households across years, so it is not possible to estimate fixed effect models using the households as the unit of observation.

We construct a series of pseudo-panels, at the state and state-income quintile levels (Deaton (1985); Bellemare, Fajardo-Gonzalez, and Gitter (2016); Gundersen, Kreider, and Pepper (2011)) and estimate the following equation:

$$\overline{FI}_{it} = \beta_0 + \beta_1 \log(\overline{P}_{it}) + \gamma' \overline{X}_{it} + u_i + v_{it} \quad (1)$$

Where:

\overline{FI}_{it} → Food insecurity rate for unit i at time t

\overline{P}_{it} → Price measure (*tortillerías*, grocery stores)

\overline{X}_{it} → Unit-level covariates

u_i → Unit-level fixed effects

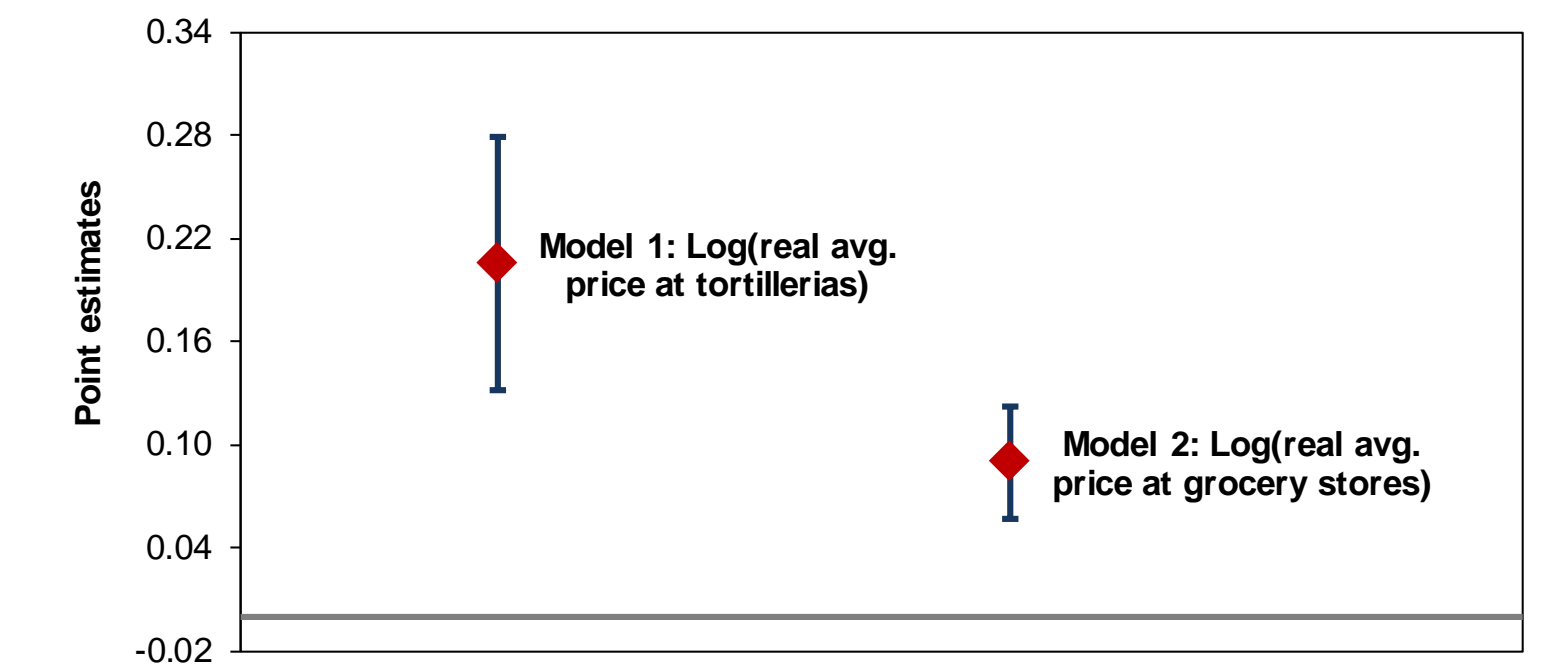
v_{it} → Zero-mean error term

We also estimate the equation (1) using the state pseudo-panel for each income quintile, and the state-pseudo panels for rural and urban areas, respectively.

Results and Conclusions

State-Income Quintile Pseudo Panel Estimates

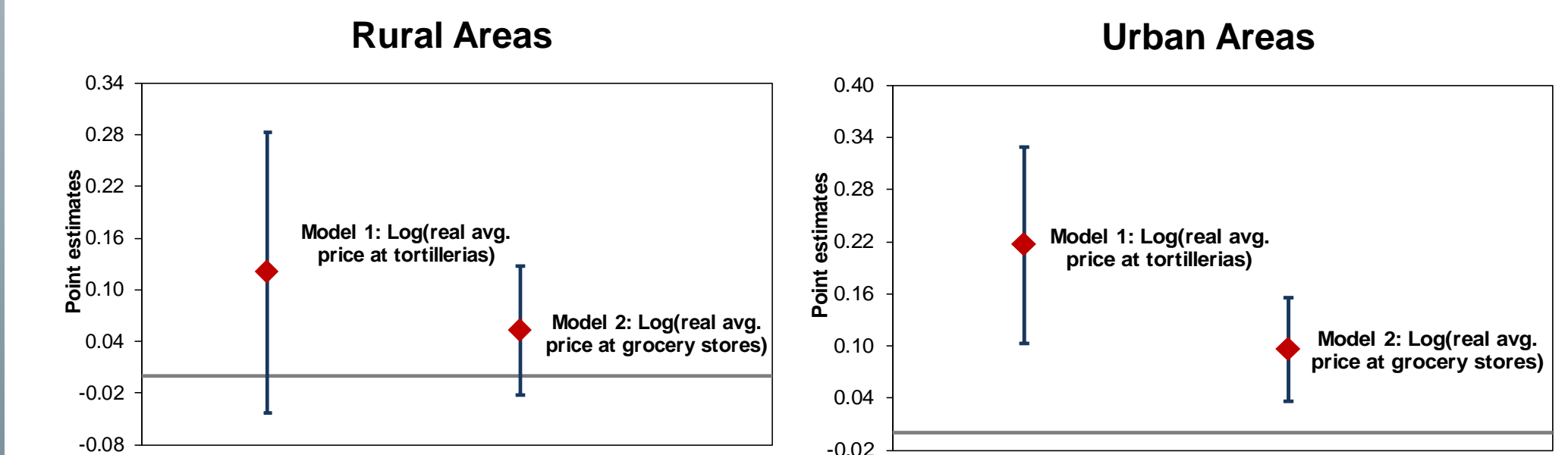
Dependent Variable: Food Insecurity



Controls: quintile fixed effects, and transfers and in-kind remunerations. Source: 2008-2014 Mexican ENIGH and own calculations. Blue line represent 95% confidence intervals.

State-Pseudo Panel Estimates for Rural and Urban Areas

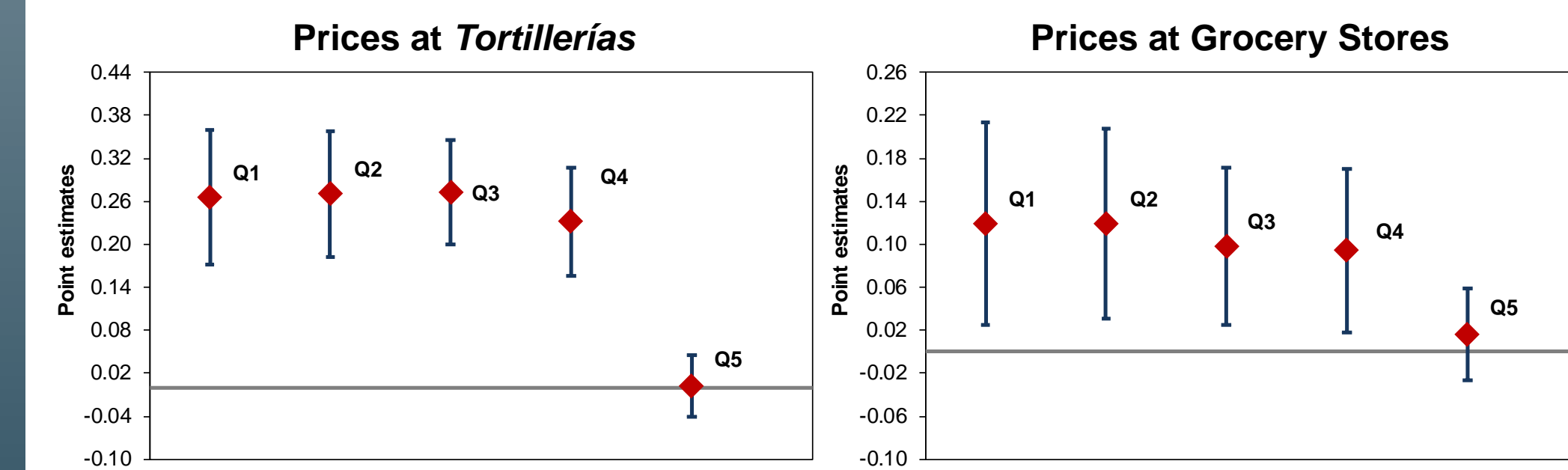
Dependent Variable: Food Insecurity



Controls: quintile fixed effects, and transfers and in-kind remunerations. Source: 2008-2014 Mexican ENIGH and own calculations. Blue line represent 95% confidence intervals.

State-Pseudo Panel Estimates by Income Quintiles

Dependent Variable: Food Insecurity



Controls: transfers and in-kind remunerations. Source: 2008-2014 Mexican ENIGH and own calculations. Blue line represent 95% confidence intervals.

- Rising prices of tortilla impact food insecurity rates. The greatest effect comes from prices at grocery stores.
- Households from lower income quintiles, as well as urban households, are the most sensitive to rising tortilla prices.