

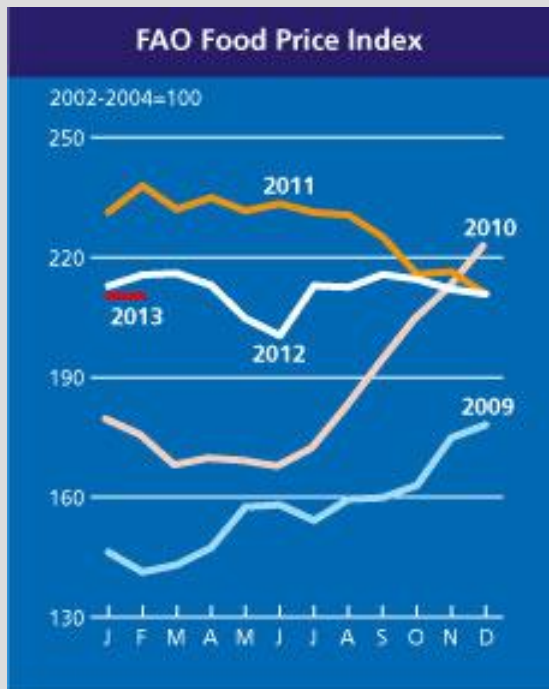
Rising Food Prices, Food Price Volatility, and Social Unrest



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Framing the Issue



- In the 23 years since the FAO has been recording food prices, the food price index has never been as high as it was at the end of 2010/beginning of 2011.
- The food price index currently stands at 210, i.e., lower than in early 2011, but still close to food price levels experienced during the food crisis of 2007-08.

Framing the Issue



- Food price volatility (i.e., unexpected departures from the food price level, holding the price level constant; the noise around the level) has also been on the rise (FAO, 2010).
- Episodes of extreme price volatility are rare, but there is always a certain amount of uncertainty over future prices.

(Note: I use the terms “price volatility,” “price uncertainty,” and “price risk” interchangeably.)

Framing the Issue



- The welfare impacts of rising food prices are clear but, the impacts of food price volatility on welfare are not understood all that well.
- In theory, producers should be price risk-averse (Sandmo, 1970). For consumers, it depends on the budget share of food, though it is possible that consumers are price risk-*loving* (Turnovsky et al., 1980).

Framing the Issue



- Moreover, the unit of analysis in development policy is often the household, which can both produce and consume staples, and whose position vis-à-vis the market – net seller, autarkic, or net buyer – isn't always the same. Food prices thus have heterogeneous effects.
- Finally, many people conflate the twin issues of rising food prices and food price volatility. “Price fluctuations” seem even more confusing concept.

Framing the Issue



- Brookings: “The crux of the food price challenge is about price volatility rather than high prices per se. It is the rapid and unpredictable changes in food prices that wreak havoc on markets, politics, and social stability.”

Framing the Issue



- So knowing where to best spend each aid dollar – toward curbing rising food prices or food price volatility – matters for policy.
- This is especially important in this era of budget austerity and of shrinking aid budgets.

Methodology: Data



- In order to study the impact of food prices – both rising food prices and food price volatility – on social unrest, one needs data on food prices and social unrest.
- Data on food prices are readily available from the FAO, which has recorded its monthly food price index – disaggregated in five categories – since January 1990, in both real and nominal terms.

(Note: I also conduct robustness checks using IMF nominal commodity price series for maize, rice, soybeans, and wheat.)

Methodology: Data



- I use LexisNexis to construct a monthly count of the number of news stories in the English media involving at least five occurrences of the terms “cereal,” “commodity,” “food,” “grain,” or “staple,” and their plural forms, and at least five occurrences of the terms “demonstration,” “mob,” “protest,” “riot,” “strike,” “unrest” or “violence” and their plural forms.

(Note: All empirical results are robust to several alternative definitions of the dependent variable.)

Methodology: Identification Strategy



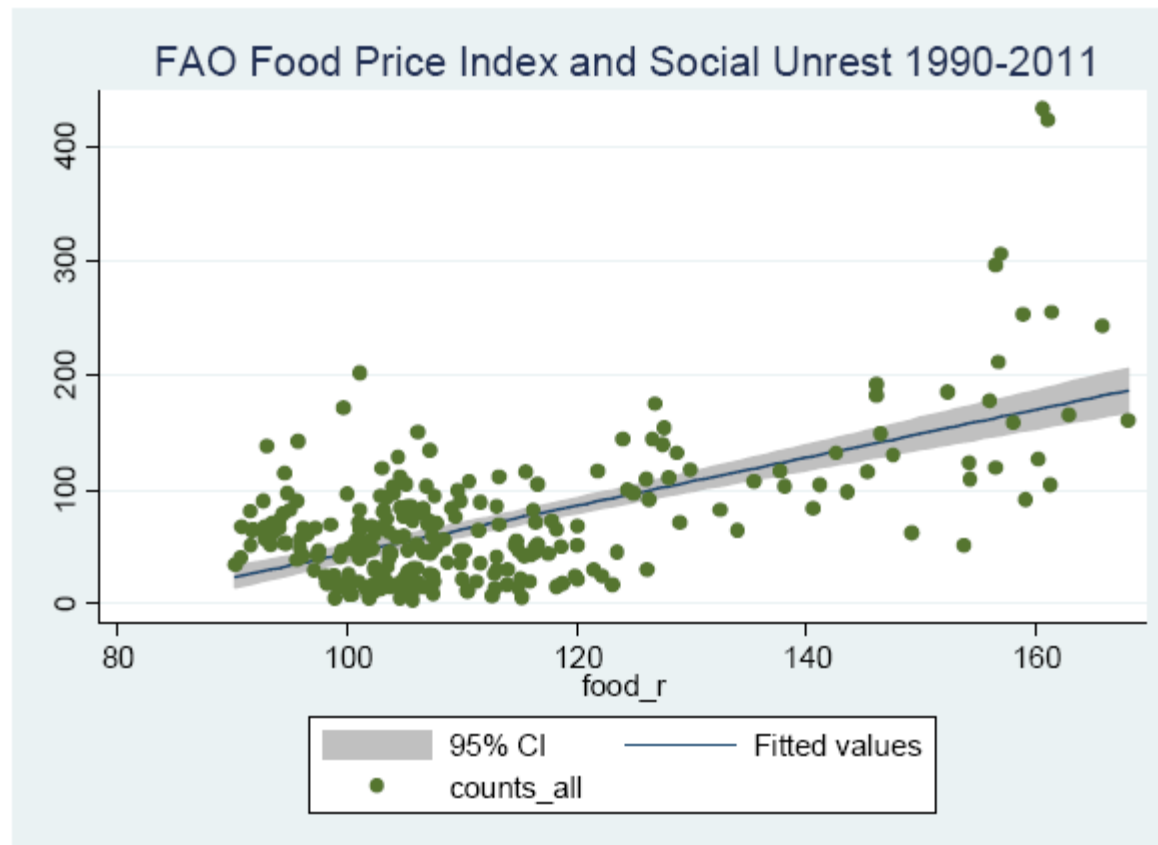
- Food prices are likely endogenous to food riots, so I condition food prices on natural disasters (drought, extreme temperature, floods, insect infestations, storms, volcanic eruptions, and wildfires).
- The full argument is in the paper, but in short: within a given month, natural disasters are unpredictable, and given the short time scale, they should only affect social unrest through food prices.

Methodology: Identification Strategy



- The identification strategy is helped by the geographical dispersion of the data – the data are worldwide.
- So what typically happens is that a natural disaster occurs in country A which has impacts on the price of food worldwide, which in turn affects social unrest in country B.
- Thus, food prices are essentially the only channel through which natural disasters affect social unrest, since the two are highly unlikely to occur in the same country in the same month.

(1) FAO Food Price Index



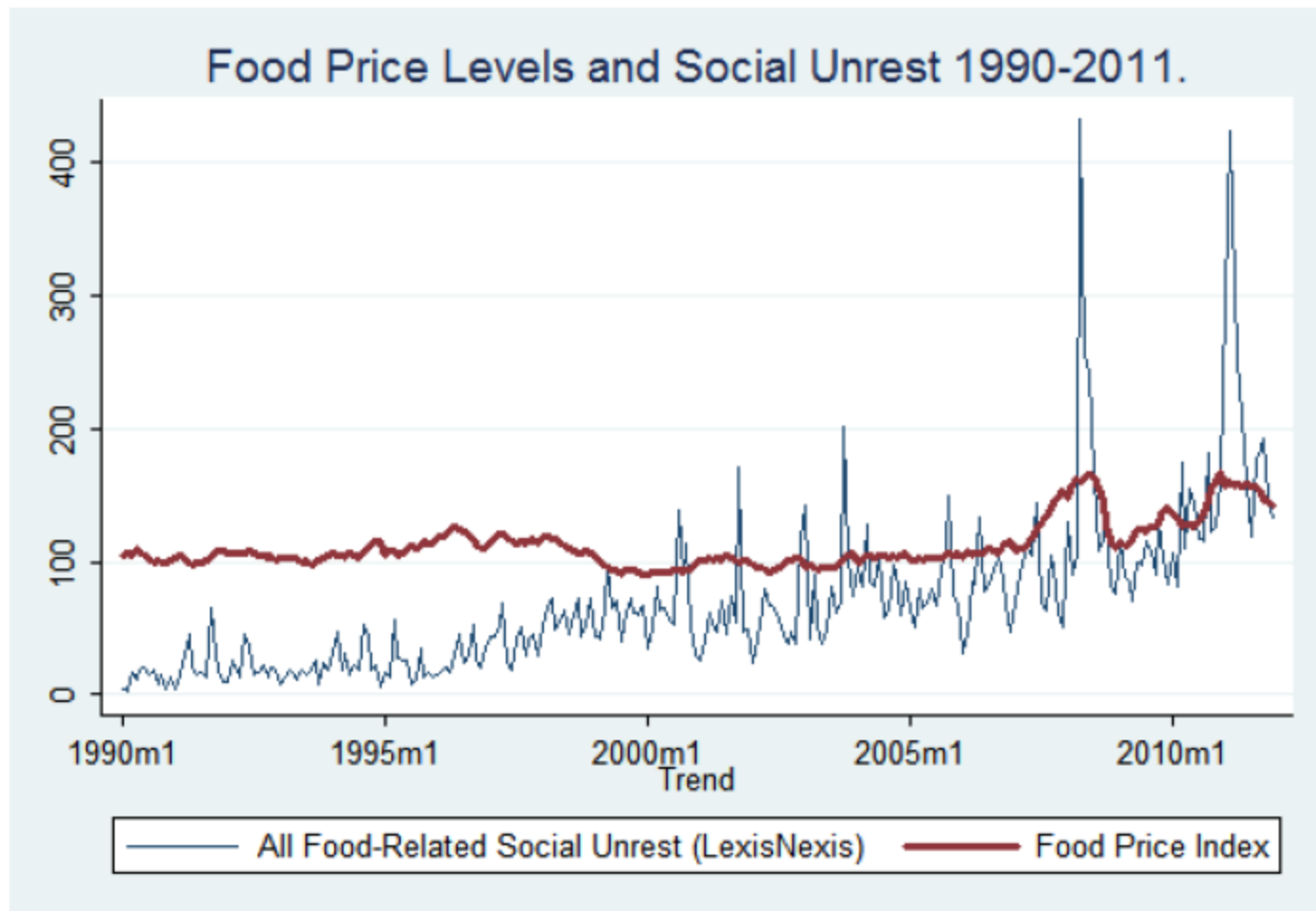


Figure 2. FAO Food Price Index and Social Unrest, January 1990 to December 2011.

Table 2. OLS Estimation Results for the Determinants of Social unrest, 1990-2011.

Variable	(1)	(2)
Dependent Variable: LexisNexis Stories about Food-Related Social Unrest.		
Food Price Index	0.686*** (0.160)	
Historical Volatility (Food, Three Months)	-368.382* (201.490)	
Cereal Price Index		0.516*** (0.111)
Historical Volatility (Cereals, Three Months)		-426.806*** (136.977)
News Stories in the Previous Month	0.442*** (0.057)	0.440*** (0.056)
Trend	0.248*** (0.042)	0.244*** (0.042)
Constant	-149.750*** (23.339)	-125.552*** (20.475)
Observations	262	262
Monthly Dummies	Yes	Yes
R-squared	0.702	0.708

Standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1

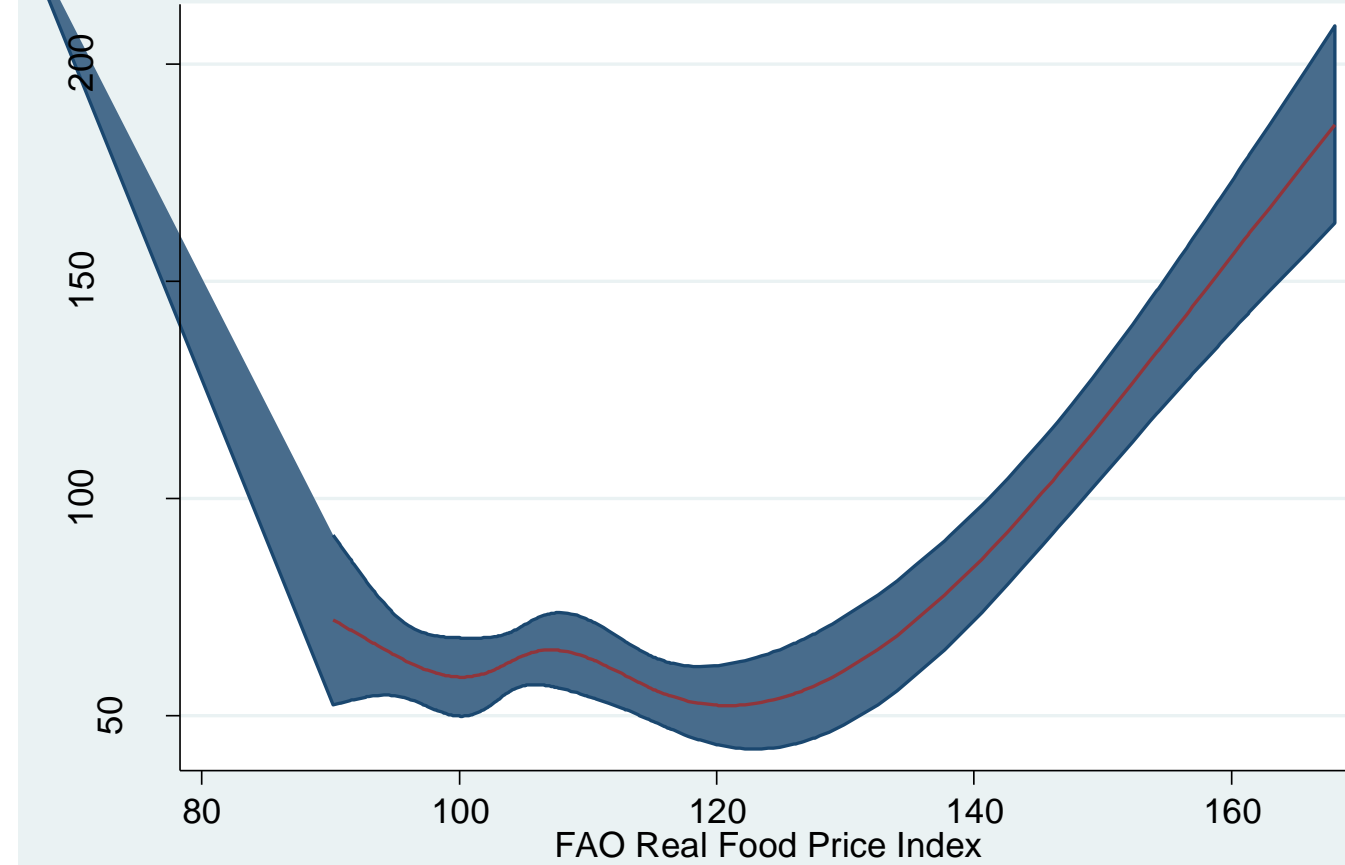
Table 3. IV Estimation Results for the Determinants of Social unrest, 1990-2011.

Variable	(1)	(2)
Dependent Variable: LexisNexis Stories about Food-Related Social Unrest.		
Food Price Index	0.990** (0.402)	
Historical Volatility (Food, Three Months)	-478.098* (242.834)	
Cereal Price Index		0.683** (0.272)
Historical Volatility (Cereals, Three Months)		-508.680*** (183.567)
News Stories in the Previous Month	0.398*** (0.078)	0.408*** (0.074)
Trend	0.238*** (0.044)	0.234*** (0.044)
Constant	-173.887*** (37.589)	-135.383*** (25.217)
Observations	262	262
Monthly Dummies	Yes	Yes
F-statistic (Weak Instrument Test)	46.79	50.13
R-squared	0.698	0.705

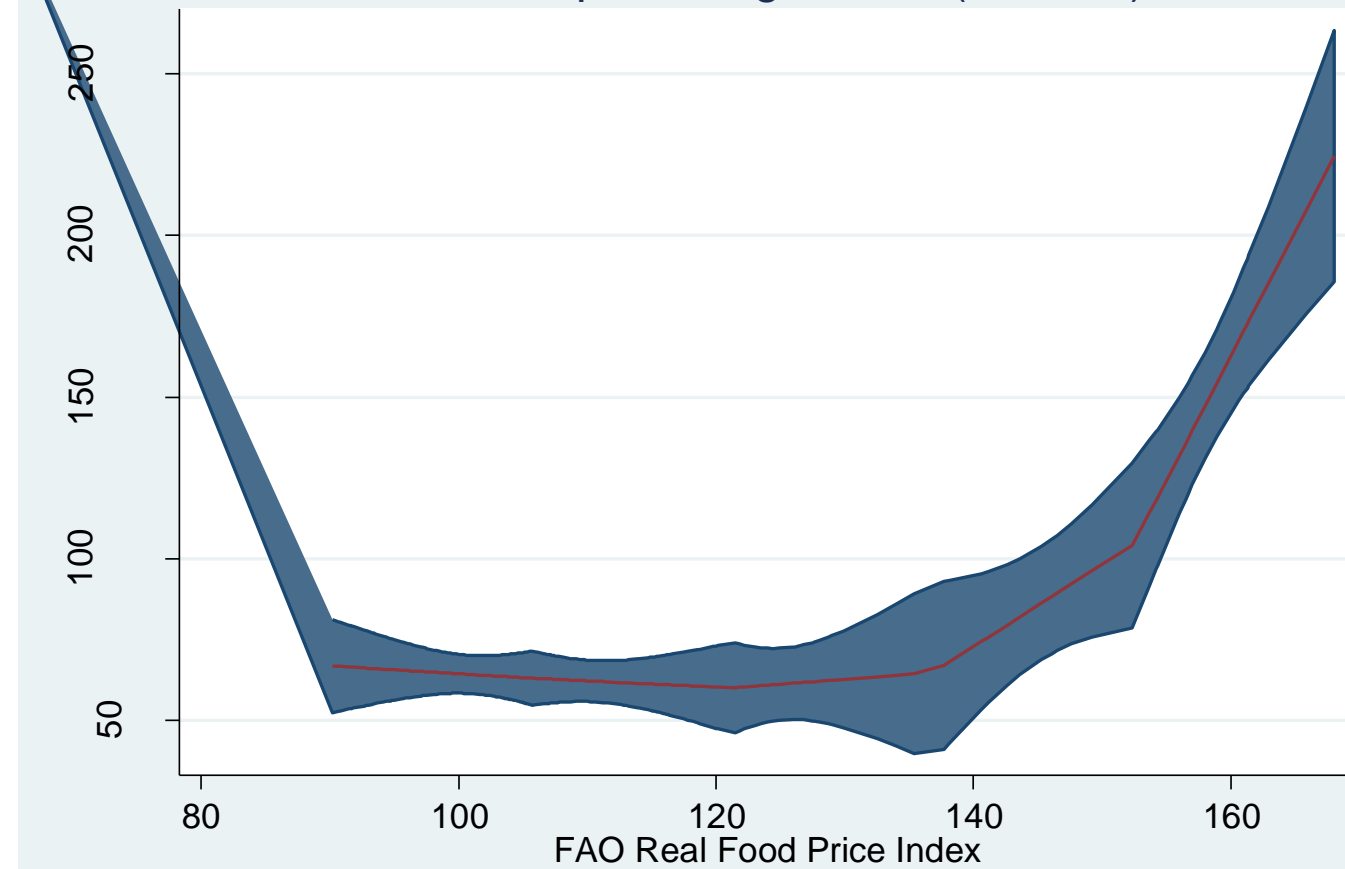
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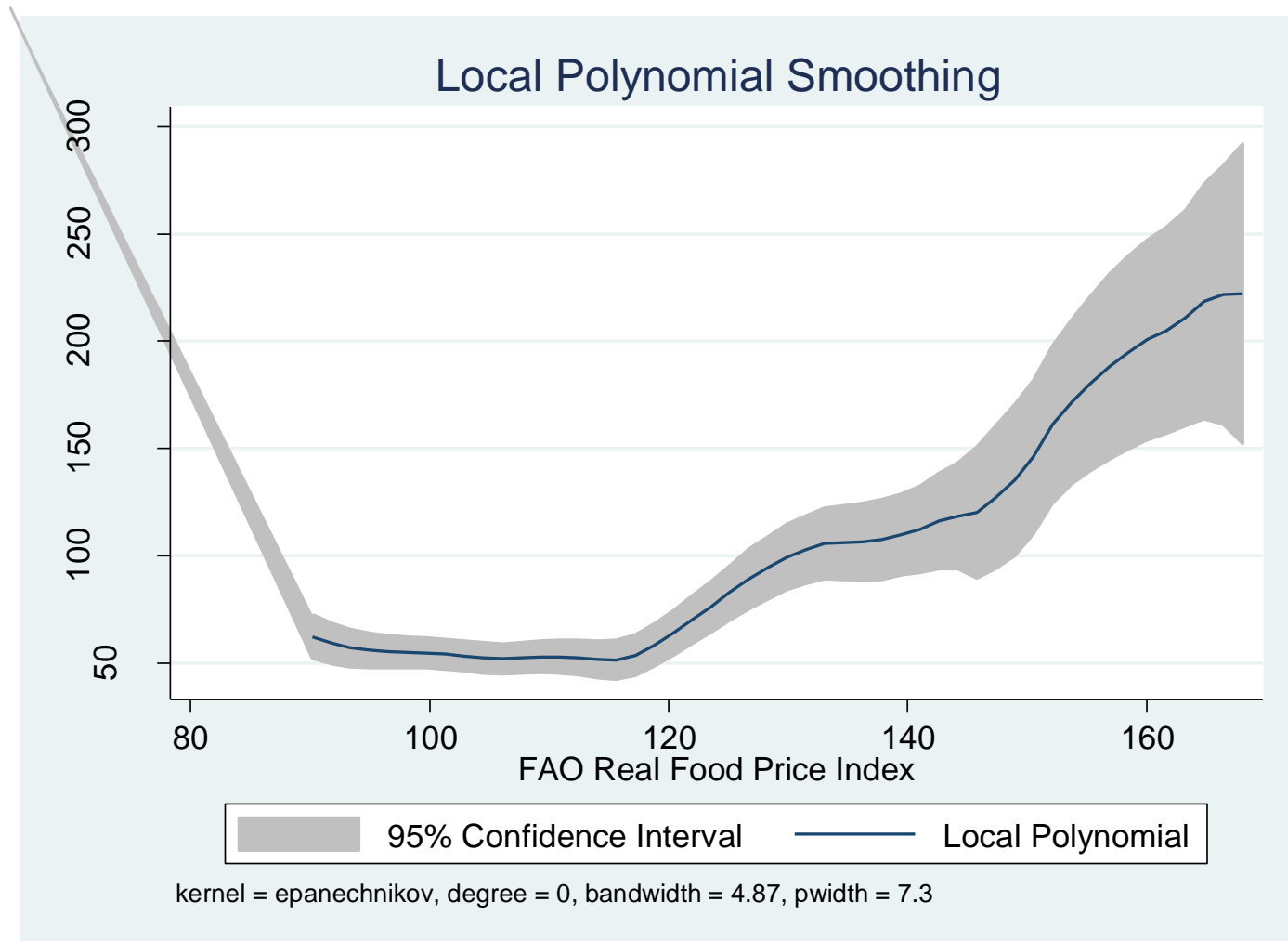
Restricted Cubic Spline Regression (5 Knots)



Linear Spline Regression (5 Knots)



Local Polynomial Smoothing



Key Findings



- This first suggests that rising food prices cause food riots.
- Consistent with this, Hsiang et al. (2011) recently found a correlation between El Niño Southern Oscillation cycles and conflict.

Key Findings



- Second, food price volatility is associated with decreases in social unrest.
- This cannot be argued to be causal, but it is consistent with the theory of consumer behavior in the face of price uncertainty (Waugh, 1944; Turnovsky et al., 1980).

Key Findings



- These findings are robust to:
 1. Controlling for food crises
 2. Omitting price volatility
 3. Alternative definitions of the instrumental variable
 4. Using 6 instead of 3-month volatility
 5. Using each IMF individual commodity prices
 6. Estimating Poisson specifications
 7. Using implied rather than historical volatility
 8. Looking at food riots in Africa (Cullen's SCAD).

Key Findings



- Third, this suggests that there are nonlinearities and threshold effects.
- In other words, food price increases have heterogeneous effects, and there are price levels beyond which social unrest becomes much more likely.