Low Exchange Rate Pass-Through in the United States, Economy-Wide and in Agriculture

Will Johnson and Wendy Zeng

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Will Johnson[1]   Wendy Zeng[1]

[1]Economic Research Service, USDA

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Disclaimer & Acknowledgment

Overview

Motivation:

- ▶ In the U.S., inflation has recently hit a historic 40-year high
- ▶ U.S. Dollar continues to appreciate

Our paper:

- ▶ Exchange rate pass-through (XRPT): extent to which change in exchange rates translates into change in domestic prices
- ▶ We find low to zero XRPT in the U.S., 1970-present, in agriculture and economy-wide
- ▶ Dollar appreciation unlikely to have any significant disinflationary impact

Related Literature

- Low exchange rate pass-through in developed countries, especially the U.S.:
  - Feinberg (1986, 1989), Goldberg and Knetter (1997), Gopinath, Itskhoki and Rigobon (2010), Parsley and Popper (1998), Woo (1984)
- Changes over time in exchange rate pass-through:
  - Bailliu, Dong and Murray (2010), Campa and Goldberg (2005, 2006), Jašová, Moessner and Takáts (2016), Marazzi et al (2005), McCarthy (2007)
- Exchange rate fluctuations and agricultural trade:
  - Baquedano and Liefert (2014), Gervais and Khraief (2007), Luckstead (2018), Nakamura and Zerom (2010), Wiseman, Luckstead and Durand-Morat (2021), Xu and Orden (2002), Yeboah, Shaik and Allen (2009)

# Data

- Agricultural Exchange Rate Data Set (USDA ERS)
  - Monthly commodity real exchange rates
  - Importer-weighted index for agricultural goods
  - Competitor-weighted index for all goods
- BLS: general CPI, food CPI, general PPI
- BEA: economy-wide wages
  - Compensation of Employees, Received: Wage and Salary Disbursements
- NASS: agricultural PPI (prices received), agricultural wages

A first look at the data
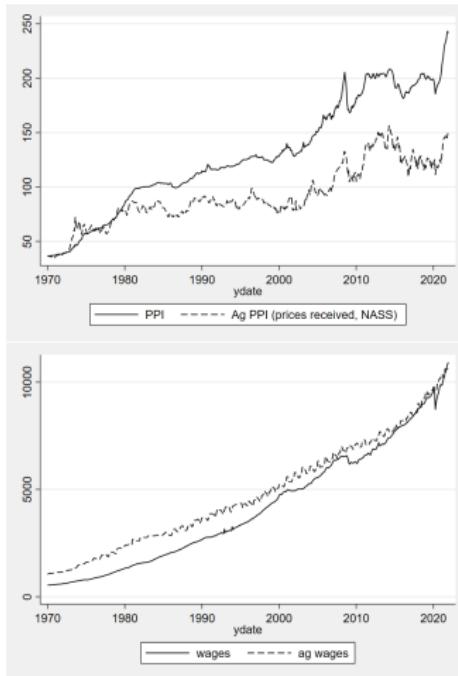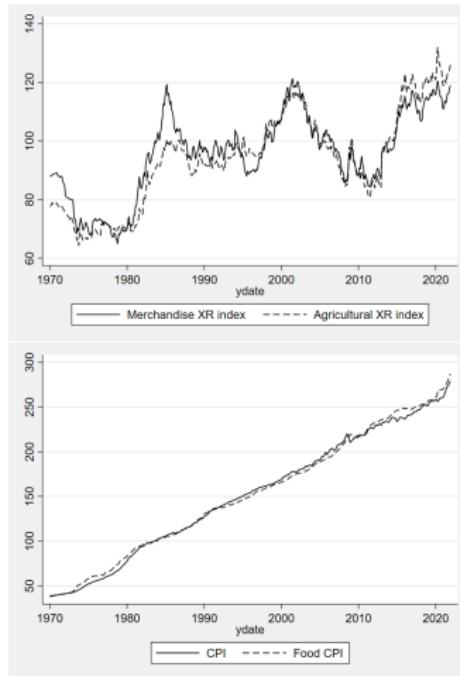
Empirical Methodology

Rolling regressions, rolling window of ten years, monthly time series data, following Burstein and Gopinath (2014):

$$\Delta p_t = \alpha + \sum_{k=0}^{T} \beta_k \Delta e_{t-k} + \gamma \Delta X_t + \epsilon_t$$

- ▶ Δp_t: log changes in a US domestic price index
- ▶ Δe_{t-k}: log changes in a US real exchange rate index
- ▶ ΔX_t: log changes in control variables (wages, producer prices)
- ▶ Baseline lag specification: $T = 11$ (months)
- ▶ $\hat{\beta}_0$: estimate of short-run (contemporaneous) pass-through
- ▶ $\sum_{k=0}^{T} \hat{\beta}_k$: estimate of long-run pass-through

Robustness: separate time bins

Unit root tests

Results: short-run (contemporaneous)
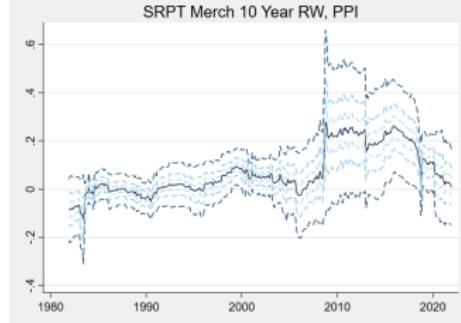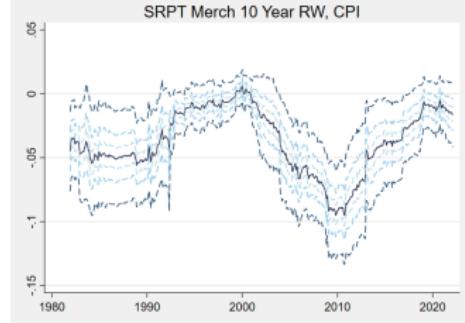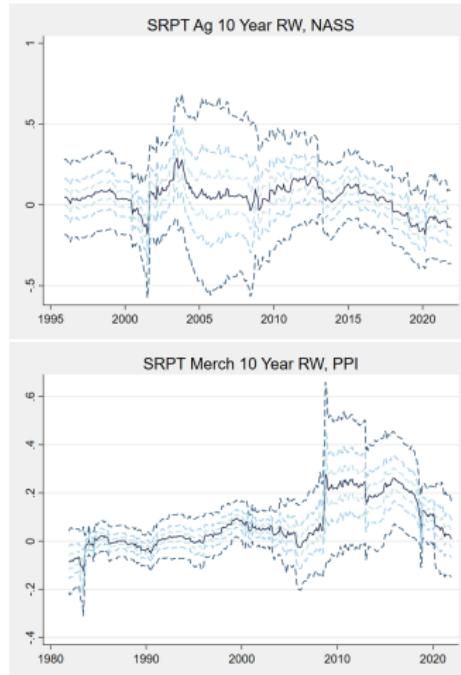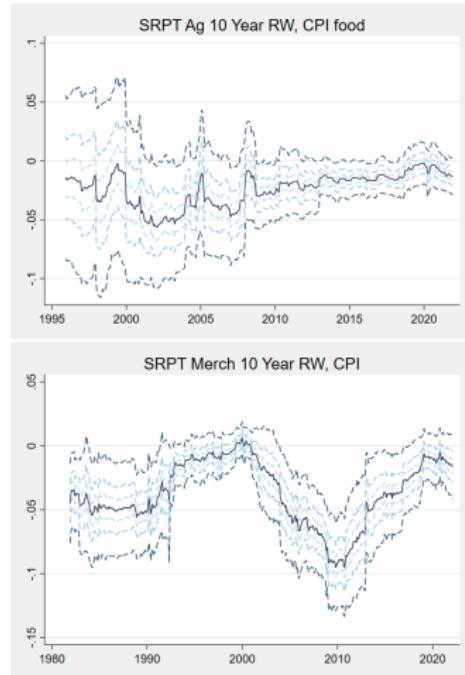
Robustness: separate time bins

Results: longer-run (1 year)
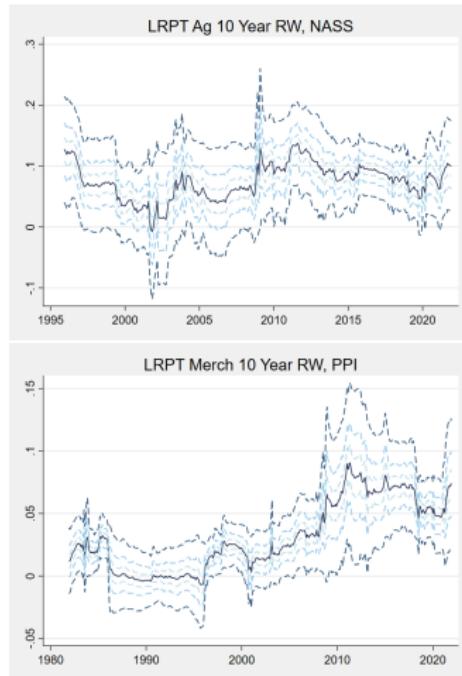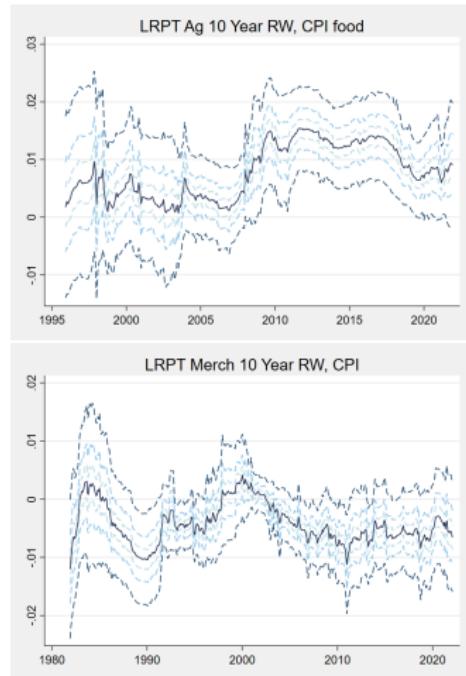
Robustness: separate time bins

Conclusion

- ▶ We find low to zero pass-through from exchange rates into both agricultural and general prices in the U.S.
- ▶ Even as the U.S. dollar continues to appreciate, there will likely be limited to no disinflationary effects through an exchange rate mechanism
- ▶ Further research: systematic product-level analysis within agriculture

Results from unit root tests

Specification	Dickey–Fuller test statistic	Phillips–Peron test statistic
CPI, residual	-14.962	-15.166
CPI, predicted	-17.077	-17.535
PPI, residual	-17.482	-17.793
PPI, predicted	-14.862	-16.113
NASS, residual	-19.187	-19.043
NASS, predicted	-14.761	-15.869
Food CPI, residual	-18.264	-18.621
Food CPI, predicted	-17.491	-18.671

Table: Test statistics from Dickey-Fuller & Phillips-Peron tests on baseline regression specifications. For both tests, null hypothesis is that there is a unit root; critical values: 1%, -3.43; 5%, -2.86; 10%, -2.57. Results robust to various lag structures and to running these tests on each of the (first-differenced) variables individually.

Back to empirical method

Binned regression specification

Time span of the data divided into H equal-sized bins, with the set τ_h denoting the hth bin in chronological order:

$$\Delta p_t = \sum_{h=1}^{H} \mathbb{1}\{t \in \tau_h\}[\alpha_h + \sum_{k=0}^{T} \beta_{hk}\Delta e_{t-k} + \gamma_h \Delta X_t] + \epsilon_t$$

For each span of time captured by bin h:

▶ $\hat{\beta}_{h0}$: estimate of short-run (contemporaneous) pass-through
▶ $\sum_{k=0}^{T} \hat{\beta}_{hk}$: estimate of long-run pass-through

Results from binned regressions: short-run
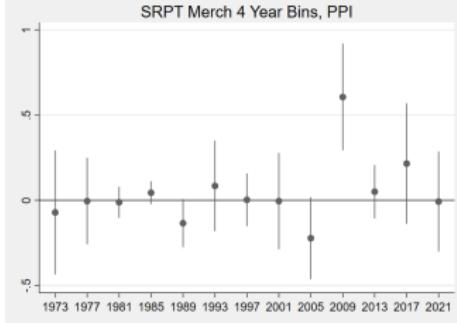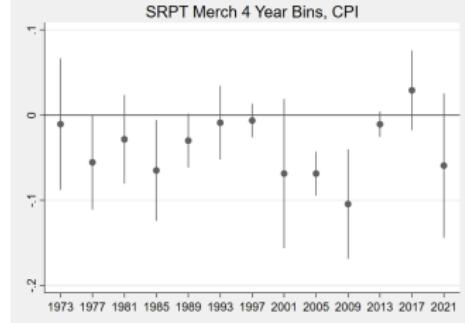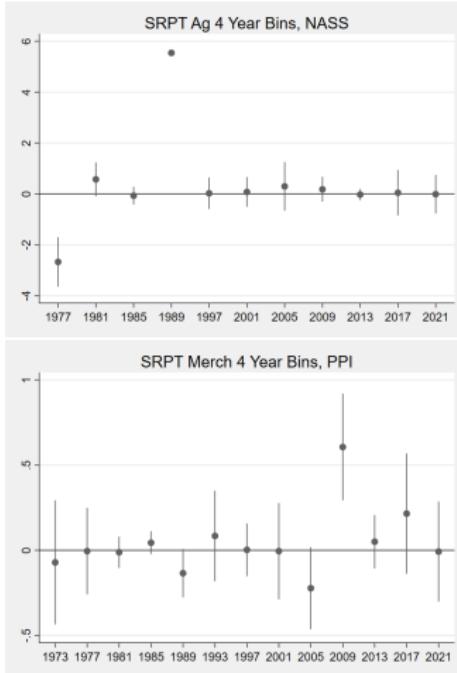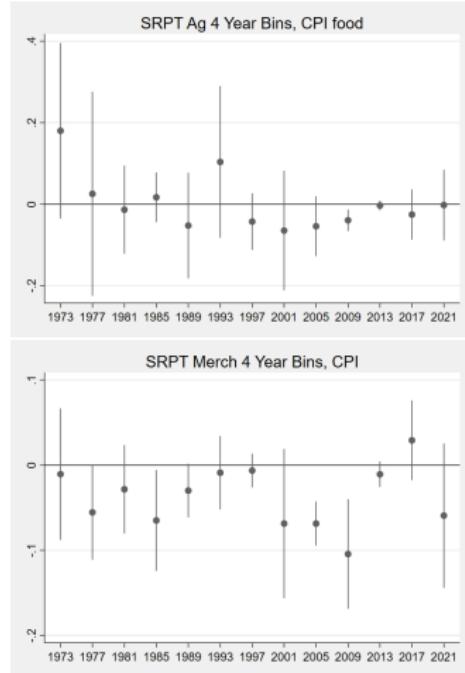
Back to rolling regression results

Results from binned regressions: long-run