

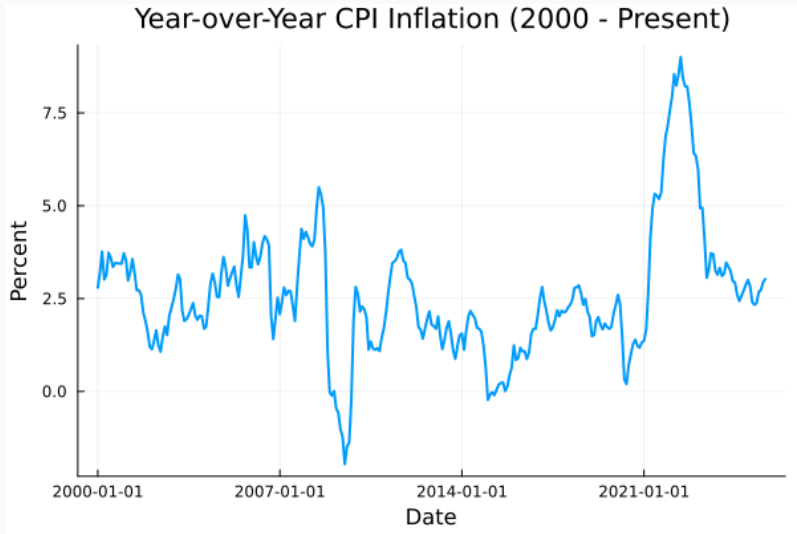
Energy Inflation Pass Through

Pranay Gundam

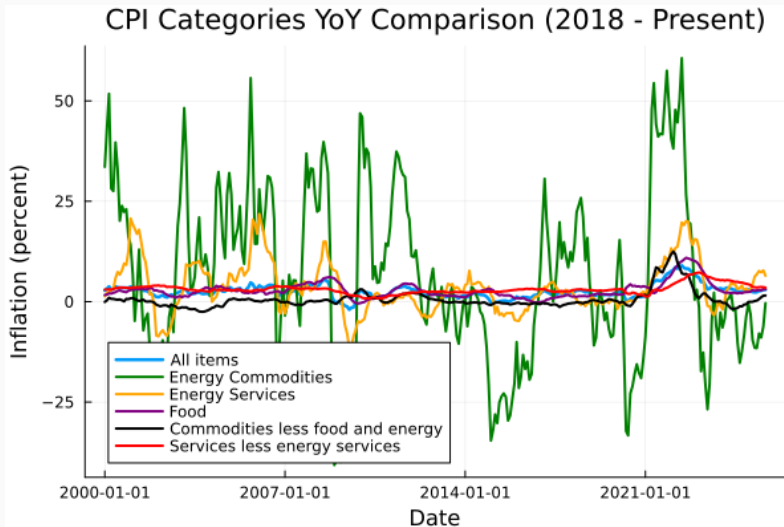
December 9, 2025

University of Minnesota

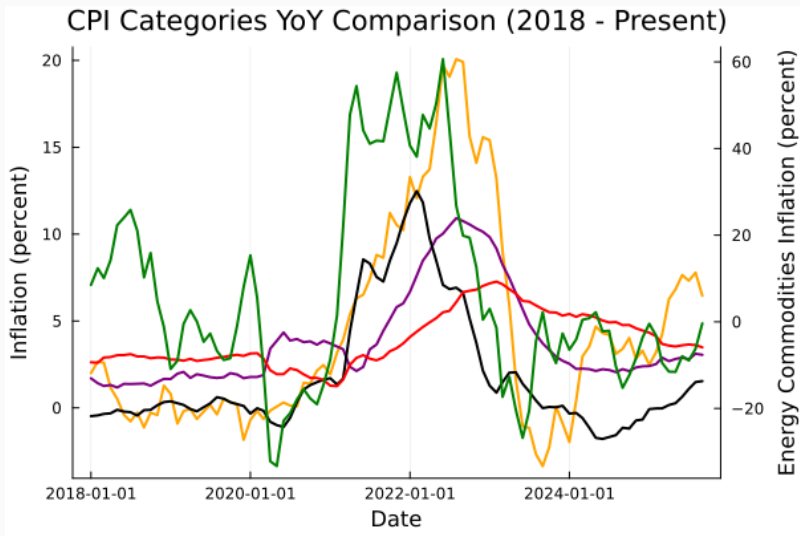
We typically report inflation across a bundle of goods / sectors.



Aggregate CPI series loses the nuance of each sector.



There does seem to be some qualitative co-movement.



More recent Macro work in interaction of prices amongst sectors.

- ◇ [Stock and Watson\(2016\)](#) examines if measurement of trend inflation can be improved by using disaggregated sectoral inflation data.
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- ◇ I personally feel Energy Commodities (gasoline, natural gas, etc.) is a fundamental sector that is an core input across most other sectors.

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 - ▶ What role do energy-commodity inflation shocks play in other industries' inflation?

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 - ▶ Estimate a VAR and identify structural shocks via Cholesky Decomposition.

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- ◇ What do I ask?
 - ▶ What role do energy-commodity inflation shocks play in other industries' inflation?
- ◇ How do I do it?
 - ▶ Estimate a VAR and identify structural shocks via Cholesky Decomposition.
- ◇ What do I find?
 - ▶ A 1pp shock to energy-commodities inflation leads to a lagged spike in other sectoral inflation.

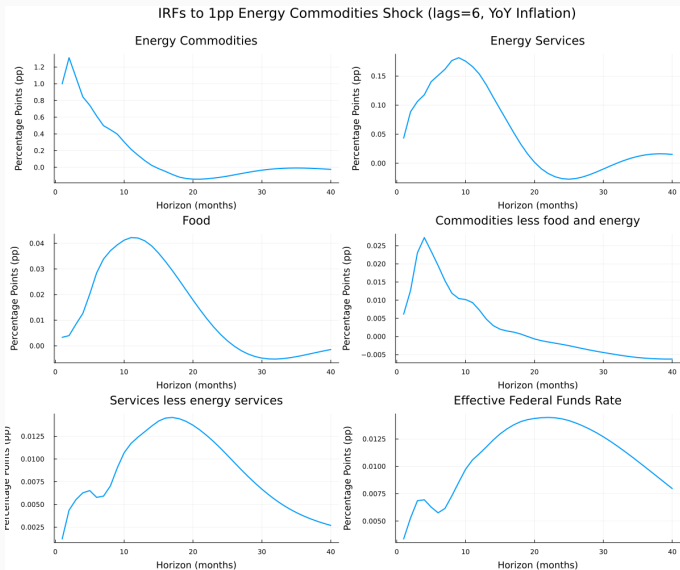
VAR Model Description

$$X_t = \sum_{j=1}^6 \beta_j' X_{t-j} + \epsilon_t$$

- ◇ X_t is a 6×1 vector of sectoral inflation and FFR, β_j is a matrix of coefficients, and ϵ_t is a 6×1 vector of errors
- ◇ 6 lags, following recent suggestion by [Olea et al. \(2025\)](#)
- ◇ Ordering for Cholesky Decomposition:

Energy Commodities → Energy Services → Food →
Commodities less → Services less → FFR

Primary Results



Variance table

Sector	Variance
Energy Commodities	445.809
Energy Services	29.9498
Effective Federal Funds Rate	12.5945
Food	9.65913
Commodities less food and energy	4.8576
Services less energy services	1.29883

Robustness Checks

What I have done:

- ◇ VAR with MoM inflation.
- ◇ Various lag lengths yield similar trend and magnitude results.

What still could be done:

- ◇ Extend the network analysis of inflation to include spatial sectors of inflation.
- ◇ Run model on pre-pandemic data and analyze post-pandemic shock.
- ◇ Choose lag length based on AIC.
- ◇ Compare magnitude of response between other sectoral inflation shocks.

Thank You!