Discussion of "The Granular Origins of Inflation and Its International Comovement"

Saroj Bhattarai
UT Austin

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Paper Summary

- Very nice paper on determinants of retail inflation!
- Uses a rich, multi-country scanner level data
  - Both advanced and emerging economies
- Empirically disentangles the role of granularity
  - With a focus on granularity of firms
- Assesses implications for cross-country correlations in inflation
  - Multi-national firms selling in multiple countries

Discussion Outline

- Motivation and comparison with Neilsen–GS1 data
- Summarize and comment on empirical method and key results
- Possible model mechanisms and interpretation of results
  - Nominal/informational rigidities
  - Models with oligopoly
  - Open-economy dimensions

Motivation

Table 5: *Top 10 manufacturers and categories (US)*

	Manufacturer			Category		
	Name	Exp	Obs	Name	Exp	Obs
1	Manufacturer 1	.05	.02	FROZEN FOOD	.07	.06
2	Manufacturer 2	.04	.01	SODAS	.04	.02
3	Manufacturer 3	.04	.01	PET FOOD AND SUPPLIES	.04	.04
4	Manufacturer 4	.04	.01	PARAPHARMACY PRODUCT	.04	.04
5	Manufacturer 5	.03	.01	CHEESE	.04	.03
6	Manufacturer 6	.03	.01	MEAT	.03	.02
7	Manufacturer 7	.02	.02	COLD CUTS AND SAUSAGES	.03	.02
8	Manufacturer 8	.02	0	CEREALS AND MUESLI	.03	.02
9	Manufacturer 9	.02	0	DIETARY SUPPLEMENT	.03	.02
10	Manufacturer 10	.02	0	OTHER HOUSEHOLD GOODS	.03	.05
	Cumulated	0.31	0.09		0.38	0.32

Motivation–Comparison with Nielsen/GS1 Data

Table: US Sales Share by Firms, 2010-2018

	Manufacturer Name	Share
1	Manufacturer 1	5.40
2	Manufacturer 2	3.52
3	Manufacturer 3	2.08
4	Manufacturer 4	2.03
5	Manufacturer 5	1.97
6	Manufacturer 6	1.86
7	Manufacturer 7	1.70
8	Manufacturer 8	1.57
9	Manufacturer 9	1.45
10	Manufacturer 10	1.40
11	Manufacturer 11	1.11
12	Manufacturer 12	1.10
13	Manufacturer 13	1.08
14	Manufacturer 14	1.04
15	Manufacturer 15	0.96
	Cumulated	28.24

Motivation–Comparison with Nielsen/GS1 Data

Table: US Sales Share by Product Group & Product Module, 2010-2018

	Product Group	Share	Product Module	Share
1	CARBONATED BEVERAGES	4.15	CIGARETTES	3.23
2	SNACKS	3.93	SOFT DRINKS - CARBONATED	2.64
3	TOBACCO & ACCESSORIES	3.71	WINE-DOMESTIC DRY TABLE	1.72
4	BEER	3.08	SOFT DRINKS - LOW CALORIE	1.51
5	CANDY	3.05	CEREAL - READY TO EAT	1.39
6	FRESH PRODUCE	3.00	LIGHT BEER (LOW CALORIE)	1.35
7	JUICE, DRINKS - CANNED, BOTTLED	2.76	FRUIT DRINKS-OTHER CONTAINER	1.29
8	PAPER PRODUCTS	2.74	CANDY-CHOCOLATE	1.27
9	BREAD AND BAKED GOODS	2.71	GROUND AND WHOLE BEAN COFFEE	1.26
10	PACKAGED MEATS-DELI	2.57	BAKERY - BREAD - FRESH	1.25
11	WINE	2.55	BEER	1.21
12	MEDICATIONS	2.49	TOILET TISSUE	1.20
13	PREPARED FOODS-FROZEN	2.28	DETERGENTS - HEAVY DUTY - LIQUID	1.12
14	PET FOOD	2.07	YOGURT-REFRIGERATED	1.09
15	DRESSINGS SALADS	1.99	WATER-BOTTLED	1.03
	Cumulated	43.07	Cumulated	22.57

Empirical Approach

- Price change of product i in country c as a function of shocks:

$$\Delta p_{ifgct} = \delta_{ct} + \lambda_{gc}\eta^{G}_{ct} + \lambda_{fc}\eta^{F}_{ct} + \delta_{gct} + \delta_{fct} + \varepsilon_{igfct}$$

  where g is category and f is firms

- Decompose aggregate inflation:

$$\Delta p_{ct} = U_{ct} + \Gamma^{g}_{ct} + \Gamma^{f}_{ct} + \Gamma^{\varepsilon}_{ct}$$

  where U_{ct} is the aggregate component; Γ^{f}_{ct} is the firm granular residual

- **Comments:**
  - Dynamics? (Past shocks)
  - Persistence of inflation important (ARMA)

Key Results–I

Table 8: *Summary statistics and correlations of total inflation and different components*

		Obs.	Mean	Corr	St. Dev	Relative St. Dev
AE	Inflation	529	.0063	1	.0188	1
	U_t		.0023	.7877	.0141	.7521
	Γ_t^g		.003	.3206	.0059	.3138
	Γ_t^f		.001	.6216	.0093	.4939
	Γ_t^ε		.0003	.7325	.0053	.2814
EM	Inflation	180	.0739	1	.106	1
	U_t		.0637	.9908	.0984	.9287
	Γ_t^g		.0013	.1791	.0085	.0805
	Γ_t^f		.009	.5407	.0128	.1211
	Γ_t^ε		.0021	.6963	.008	.0754

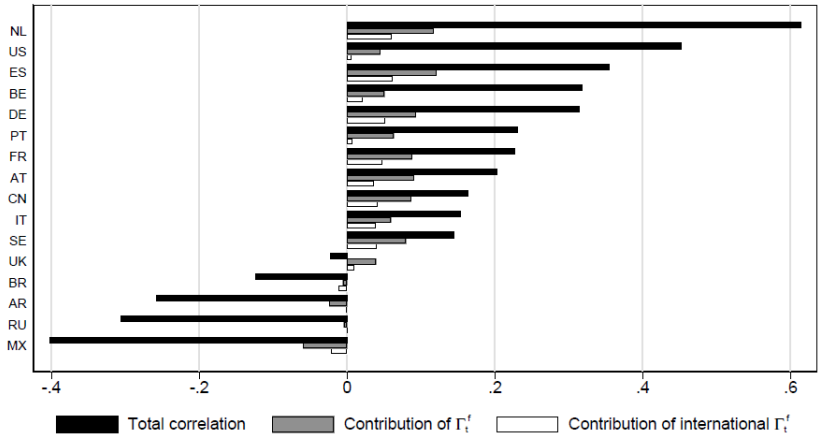
Notes: AE values computed pooling all advanced economies and EM all emerging markets. Correlation is of the component with total inflation and relative standard deviation is wrt to total inflation.

Key Results–I

- Nice result on difference between Advanced and Emerging economies
- Interpretation: The aggregate component dominant in Emerging economies because of bigger aggregate shocks
- **Comments:**
  - Pass-through of shocks to inflation also higher in emerging markets
  - Less nominal rigidities (endogenously)
  - Systematic response of monetary policy missing/not credible

Key Results–II

Figure 8: *Aggregated retail inflation and granular components*



Key Results–II

- Very intriguing result on potential role of firm component and international firm component in explaining international correlation in inflation
- **Comments:**
  - Quantitative importance might not be very high
  - More likely to have a bigger effect on open advanced economies (import share)
  - Bigger effect on import inflation?
  - Emerging economies have negative correlation with rest of the world (exchange rate effects, producer pricing, monetary policy differences, etc..)

Key Results II–Comparison with US Regions

Table: Correlations of US MSA inflation with the rest of US inflation

Metropolitan Area	Headline	Energy	Food and beverages	Housing	Recreation	Services
Atlanta-Sandy Springs-Roswell, GA	0.9285	0.9720	0.8860	0.7865	0.5799	0.6910
Baltimore-Columbia-Towson, MD	0.9047	0.8653	0.8975	0.5584	0.6283	0.6826
Boston-Cambridge-Newton, MA-NH	0.8928	0.9705	0.8852	0.7128	0.0728	0.7033
Chicago-Naperville-Elgin, IL-IN-WI	0.9496	0.9412	0.9209	0.7368	0.2262	0.7018
Dallas-Fort Worth-Arlington, TX	0.9388	0.9765	0.8746	0.7344	0.3066	0.7225
Detroit-Warren-Dearborn, MI	0.9193	0.9622	0.8184	0.7876	0.2617	0.7517
Houston-The Woodlands-Sugar Land, TX	0.8885	0.9491	0.9447	0.5315	0.4846	0.6106
Los Angeles-Long Beach-Anaheim, CA	0.9214	0.9321	0.9257	0.7581	0.7349	0.8060
Miami-Fort Lauderdale-West Palm Beach, FL	0.9508	0.9697	0.6965	0.8487	0.4745	0.8651
New York-Newark-Jersey City, NY-NJ-PA	0.8959	0.9822	0.9427	0.6225	0.5073	0.6757
Philadelphia-Camden-Wilmington, PA-NJ-DE-MD	0.9067	0.9834	0.8855	0.6806	0.2779	0.6976
San Francisco-Oakland-Hayward, CA	0.6443	0.9544	0.7957	0.3452	0.2951	0.4845
Seattle-Tacoma-Bellevue WA	0.8845	0.9527	0.9026	0.7257	0.4409	0.7083
Washington-Arlington-Alexandria, DC-VA-MD-WV	0.9100	0.9823	0.8783	0.6139	0.2594	0.6239

Theoretical Framework(s)

- Some theoretical predictions from relevant models might be useful for empirical method (to motivate or test)
- Granularity that is clear in the data calls for an oligopoly model
- Price rigidities most likely relevant empirically (data is quarterly)
- Endogenous price rigidity (e.g, through information frictions) to help interpret the Emerging vs. Advanced economies differences
- Ideally, a multi-country set-up

Theoretical Framework(s)–Afrouzi (2022)

- Prices in a static version

$$p_i = \lambda_i[(1-\alpha_i)(q+s_i) + \alpha_i p_{-i}]$$

  where λ_i is endogenous rigidity and α_i is strategic complementarity

- Aggregate shock pass-through and dependence on competitors (K)

$$PT(q) = \lambda_i[(1-\alpha_i) + \alpha_i \frac{\partial p_{-i}}{\partial q}]; \frac{dPT(q)}{dK} > 0$$

- Firm-specific shock pass-through and dependence on competitors (K)

$$PT(s_i) = \lambda_i(1-\alpha_i); \frac{\partial PT(s_i)}{\partial K} = (1-\alpha_i)\frac{\partial \lambda_i}{\partial K} + \lambda_i \frac{\partial (1-\alpha_i)}{\partial K}$$

Conclusion

- Really enjoyed reading this excellent paper!
- Intriguing results from a rich and unique multi-country dataset
- Potential to resolve some key issues in international inflation dynamics
  - Role of firm granularity in inflation behavior
  - Advanced vs. emerging economy differences
  - Cross-country correlation (or lack thereof) in inflation
- Future project: Could use some insights from theory for estimation