Global Supply Chain Pressures, International Trade, and Inflation

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COVID-19 AND INFLATION: 2020–2021

Covid-19 has resulted in the highest inflation for advanced economies since 1970s.

How much of the observed inflation between 2019q4-2021q4 comes from demand and how much comes from supply shocks and how much is global?

How should the monetary policy respond?

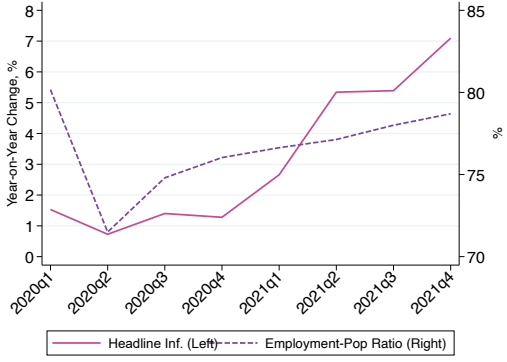
QUESTIONS AND ANSWERS

- What is the role of global trade and production network in amplifying the shift in consumption from services to goods?
- Why did we observe an increase in trade together with supply chain bottlenecks?
- How did sector specific shortages turn into broad-based inflation?
- What is the role of foreign shocks?

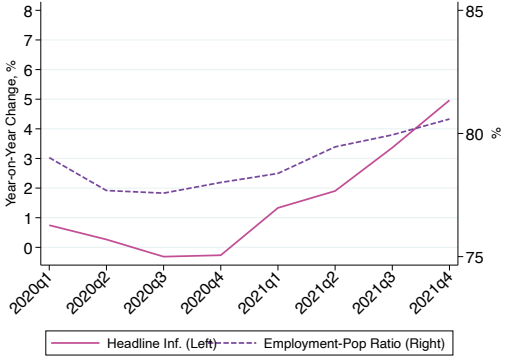
- The switch from services to goods consumption are amplified through global input-output linkages, affecting both trade and inflation.
- International trade did not respond to changes in GDP as strongly as it did during the 2008-09 crisis due to supply chain bottlenecks.
- Inflation can be higher under sector-specific labor shortages relative to a scenario with no such supply shocks.
- Foreign shocks and global supply chain bottlenecks played an outsized role relative to domestic aggregate demand shocks in explaining Euro Area inflation over 2020-21.

FACTS (NOT FOR FINAL PRESENTATION JUST FOR STRUCTURE)

INFLATION AND EMPLOYMENT

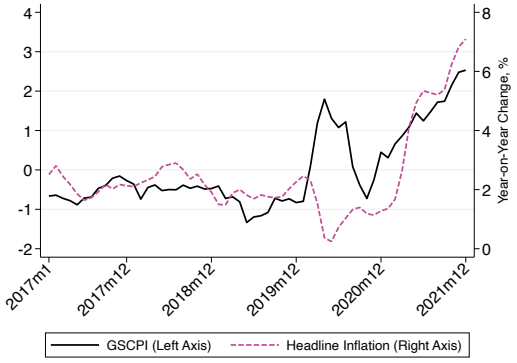


United States

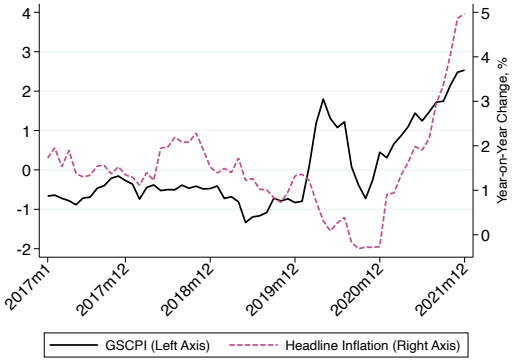


Euro Area

INFLATION AND GLOBAL SUPPLY CHAIN PRESSURES



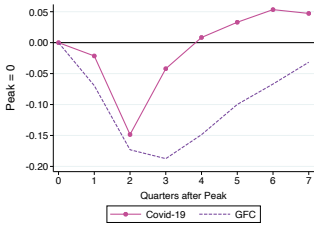
United States



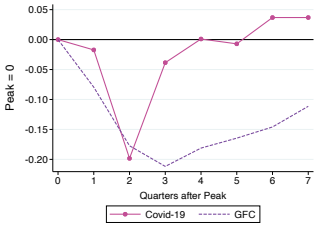
Euro Area

IMPORT QUANTITIES: GFC VS COVID-19

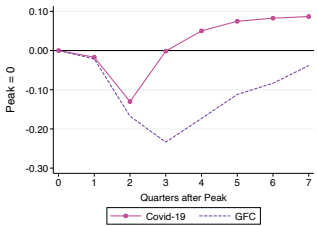
(a) World



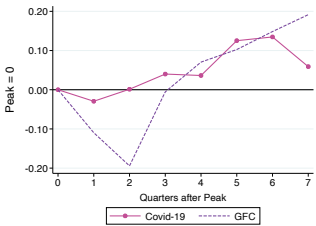
(b) Euro Area



(c) United States

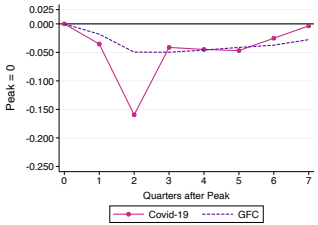


(d) China

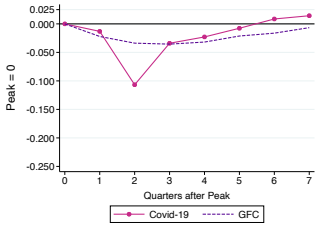


REAL GDP AND PRIVATE CONSUMPTION: GFC VS COVID-19

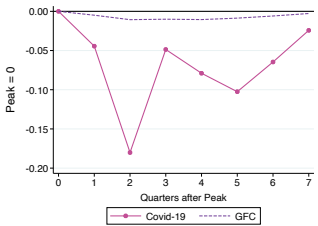
(a) Euro Area: Real GDP



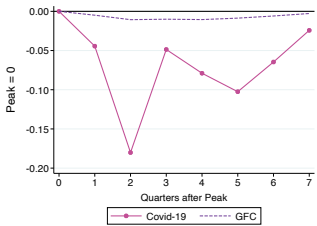
(b) United States: Real GDP



(c) Euro Area: Consumption

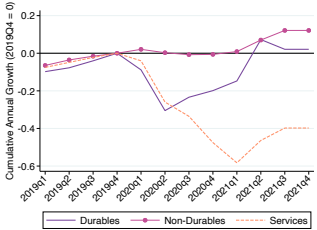


(d) United States: Consumption

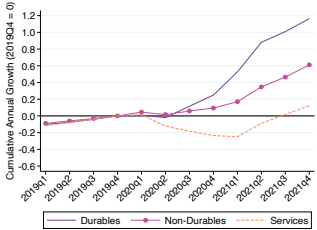


CONSUMPTION DECOMPOSITION: GFC VS COVID-19

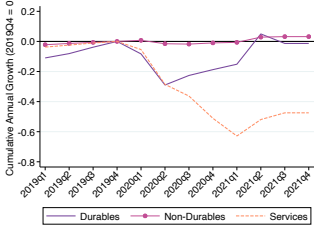
(a) Euro Area: Nominal



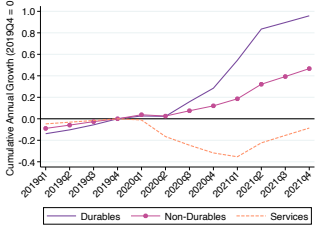
(b) United States: Nominal



(c) Euro Area: Real

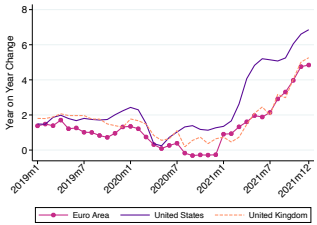


(d) United States: Real

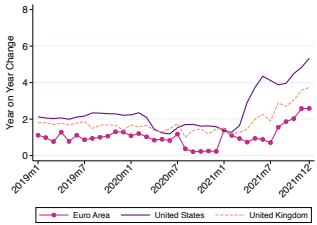


INFLATION IN SELECTED COUNTRIES

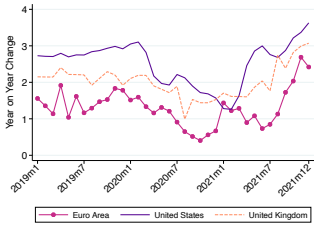
(a) Headline



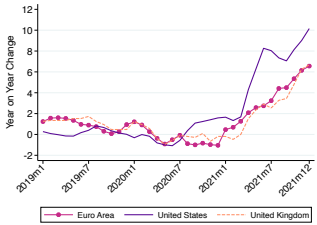
(b) Core



(c) Goods



(d) Services



International Trade during Covid-19

BEMS, JOHNSON AND YI EXERCISE (NOT TITLE)

- Question: given global input-output linkages in a baseline year, what are the expected international trade flows that follows from changes in final demand? (Bems, Johnson, and Yi, 2010)
- Key intuition

$$\text{Output Changes} = \text{Global IO Matrix} \times \text{Final Demand Shares} \times \text{Changes in Final Demand}$$

- We report the elasticity of exports/imports to changes in nominal GDP for:
  - Collapse: 2008Q2-2009Q2 (GFC), 2019Q2-2020Q2 (Covid-19)
  - Recovery: 2009Q2-2010Q2 (GFC), 2020Q2-2021Q2 (Covid-19)

TRADE ELASTICITIES WITH RESPECT TO GDP

	Panel I. Data				Panel II. Model			
	Panel A. Great Financial Crisis							
	Collapse		Recovery		Collapse		Recovery	
	Imports	Exports	Imports	Exports	Imports	Exports	Imports	Exports
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
United States	4.35	3.31	5.90	4.99	2.65	1.74	1.67	2.09
Euro Area	2.74	3.11	5.39	5.65	1.34	2.05	0.86	2.39
	Panel B. Covid-19 Pandemic							
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
United States	2.43	2.63	2.50	1.52	0.60	1.09	1.31	1.20
Euro Area	1.42	1.45	1.49	1.82	0.87	0.74	1.04	1.16

- say something here

TRADE ELASTICITIES DECOMPOSITION: EURO AREA

	Collapse				Recovery			
	Imports		Exports		Imports		Exports	
	Inter. (1)	Final (2)	Inter. (3)	Final (4)	Inter. (5)	Final (6)	Inter. (7)	Final (8)
GFC	1.31	1.45	1.64	2.58	1.19	0.52	2.27	2.53
Covid-19	0.86	0.89	0.77	0.72	1.05	1.03	1.14	1.18

- say something here

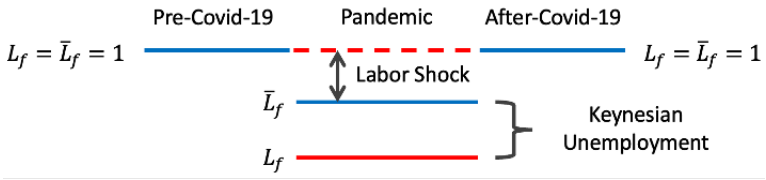
Closed Economy

DECOMPOSING INFLATION

- Multi-sector *closed* economy setup based on Baqaee and Farhi (2022) Model Scheme
  - Two periods model.
  - Allow for realistic complementarities in production and intersectoral linkages.
- Focus on period 2019Q4-2021Q4: captures both collapse and recovery.
- Allow three types of shocks
  1. Aggregate demand $\Longrightarrow$ Matched Observed Inflation.
  2. Sectoral demand $\Longrightarrow$ Sectoral Consumption.
  3. Sectoral supply $\Longrightarrow$ Sectoral Total Hours Worked.
- Key Idea:

$$\text{Inflation} \approx \text{Aggregate Demand Shocks} - \underbrace{\text{Weighted Observed Employment Changes}}_{\substack{\text{Determined by Sectoral Demand, Supply,} \\ \text{and Aggregate Shocks}}}$$

EMPLOYMENT BEHAVIOR



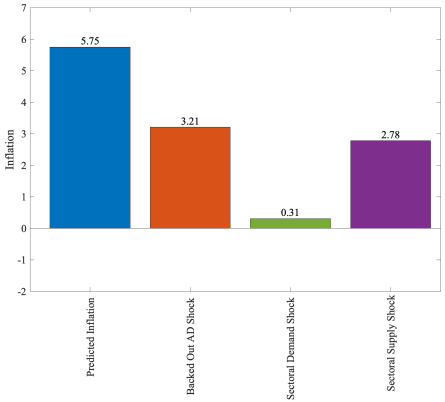
SUMMARY STATISTICS: 2019Q4 – 2021Q4

	All Sectors					
	Nominal GDP	Consumption	Hours	Headline CPI	Core CPI	Nominal Wages
United States	10.64	-0.72	-2.14	8.47	7.16	7.85
Euro Area	4.42	-7.54	-1.48	4.69	2.86	5.01

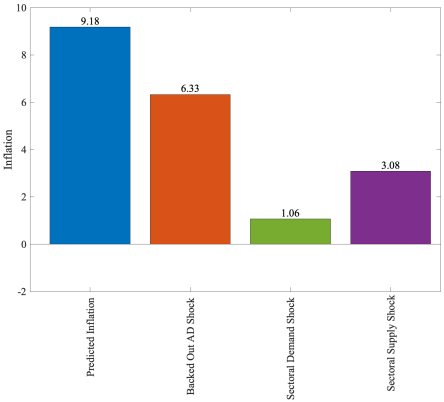
- say something here

INFLATION DECOMPOSITION

(a) Euro Area: 45 Sectors



(b) United States: 66 Sectors

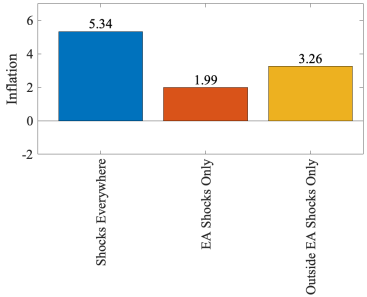


Open Economy

DECOMPOSING INFLATION: OPEN ECONOMY

- We extend Baqaee and Farhi (2022) to a multi-country setup. Model Scheme
  - Consider three countries: Euro Area, United States, and the Rest of the World
- We conduct three exercises
  - All shocks everywhere.
  - Shocks in Euro Area only.
  - Shocks outside Euro Area only (United States and Rest of the World).

EURO AREA INFLATION IN AN OPEN ECONOMY



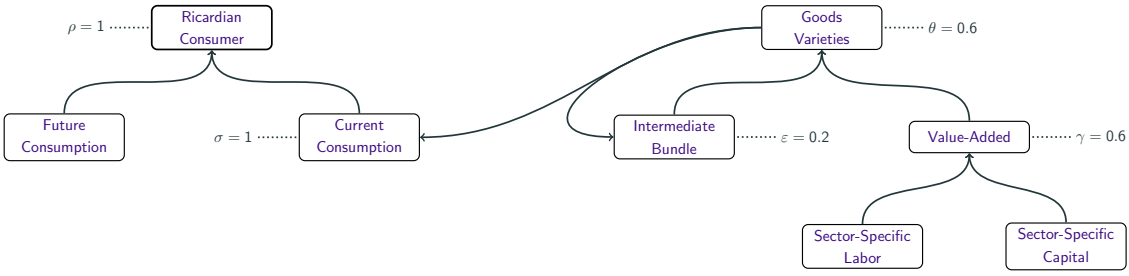
CONCLUDING REMARKS

End

Backup Slides

Figures

MODEL STRUCTURE



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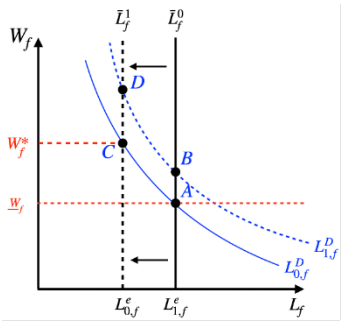
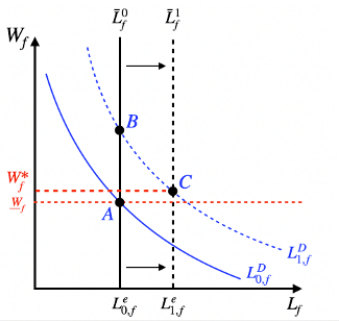
IDENTIFYING LABOR SHOCKS

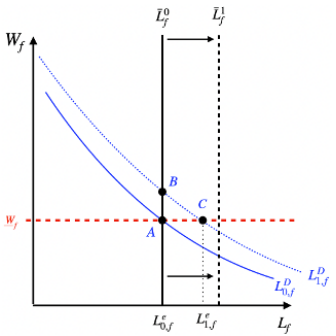
(a) Decrease in Labor



(b) Increase in Labor I

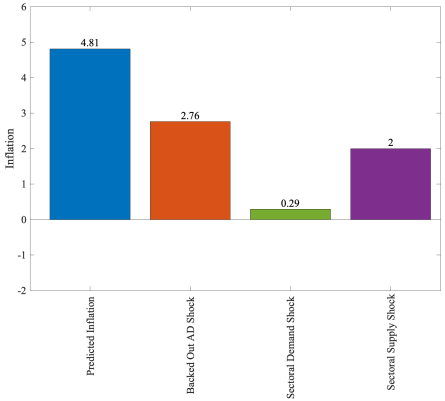


(c) Increase in Labor II

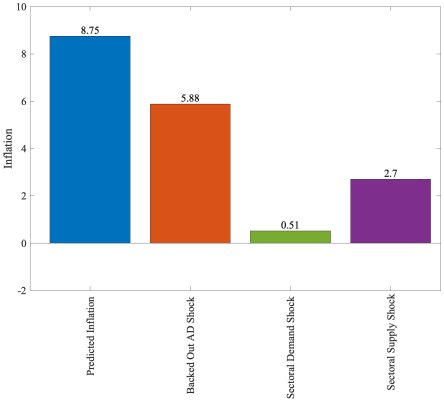


INFLATION DECOMPOSITION: AGGREGATED

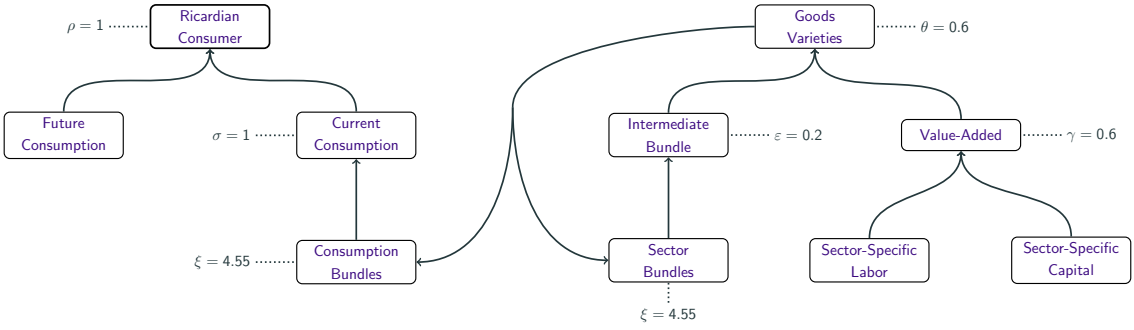
Euro Area: 3 Sectors



United States: 3 Sectors



MODEL OVERVIEW OPEN ECONOMY



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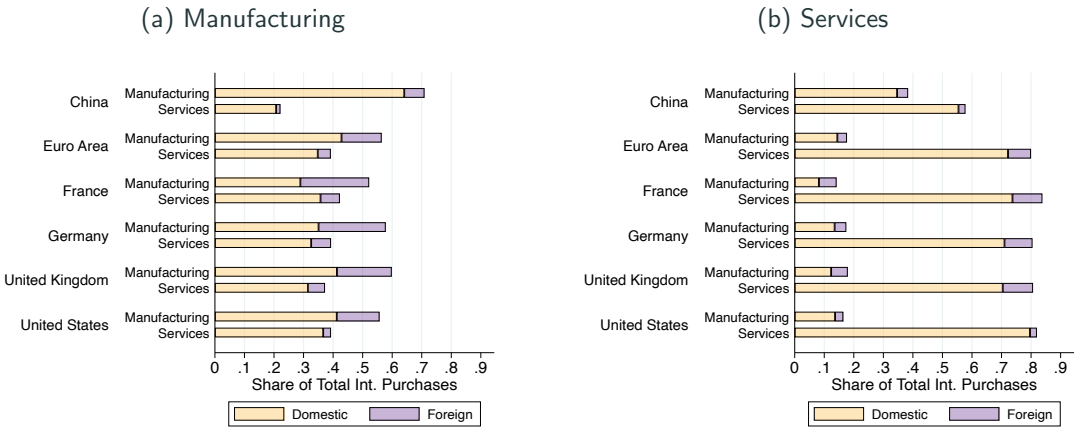
DOMESTIC AND FOREIGN CONTENT OF INTERSECTORAL TRADE



Tables

THE ROLE OF COMPLEMENTARITIES ON INFLATION

Panel A. United States

	Calibration Model		
	Cobb-Douglas	Baseline	Leontief
Shocks	(1)	(2)	(3)
All	8.93	9.18	9.68
Aggregate Demand	6.33	6.33	6.33
Sectoral Demand	1.01	1.06	0.77
Sectoral Supply	2.70	3.08	3.56

Panel B. Euro Area

	Calibration Model		
	Cobb-Douglas	Baseline	Leontief
Shocks	(1)	(2)	(3)
All	5.40	5.75	6.16
Aggregate Demand	3.21	3.21	3.21
Sectoral Demand	0.28	0.31	0.22
Sectoral Supply	2.56	2.78	3.04

- say something here