GLOBAL SUPPLY CHAIN PRESSURES, INTERNATIONAL TRADE, AND INFLATION

NBER IFM MEETING

Julian di Giovanni

Federal Reserve Bank of New York and CEPR

Şebnem Kalemli-Özcan

University of Maryland, CEPR and NBER

Alvaro Silva

University of Maryland

Muhammed A. Yildirim

Harvard & Koç University

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Inflation and International Trade in the age of Covid-19

- Since early 2020 large swings in economic activity characterized by:
  - Collapse and rebound in domestic demand, GDP, and international trade
  - Consumption substitution across sectors (goods for services and back)
  - Heterogeneous labor shortages across sectors/countries (pandemic/lockdowns and recovery)

- We end up with: highest inflation of last four decades!

- Current debate: Can monetary policy be effective? To answer, we need to know:
  1. How much of the current inflation is due to supply and demand shocks?
     $\Longrightarrow$ Sectoral, domestic and global
  2. Why supply chain bottlenecks coexist with rising international trade, contributing to inflation?

Results Summary

1. What are the sources of inflation in the US and Euro Area between 2019Q4–2021Q4?
   - Closed econ quantification: Baqaee and Farhi (2022, AER) model: network + sectoral shocks.
     - Supply-side account for $\approx 1/2$ for Euro Area and $\approx 1/3$ for US
   - Open econ quantification: Çakmaklı, Demiralp, Kalemli-Özcan, Yeşiltaş, Yıldırım (2022).
     - Foreign shocks account for $\approx 2/3$ of observed Euro Area inflation

2. How sensitive are trade flows to GDP changes?
   - Apply Bems, Johnson, and Yi (2010) methodology to COVID-19 period
   - How much gross output do we get by feeding in observed changes in final demand via global network?
   - Allow us to estimate elasticities of trade flows to GDP

   Trade sensitivity to GDP **did not** change as strongly as it did during 2008–2009

Related Literature

- **Theory**: Inflation, Production Networks, and Sectoral Shocks

  Guerrieri, Lorenzoni, Straub, and Werning (2021, 2022), Gourinchas, Kalemli-Ozcan, Penciakova, Sander (2021), Afrouzi and Bhattarai (2022), Baqaee and Farhi (2022), Ferrante, Graves, and Iacovello (2022), La'O and Tahbaz-Salehi (2022), Rubbo (2022), Bonadio, Huo, Levchenko, and Pandalai-Nayar (2022)

- **Empirical**: Inflation quantification during Covid-19 w/o network and sectoral shocks

  Amiti, Heise, Karahan, and Sahin (2022), Jorda, Liu, Nechio, and Rivera-Reyes (2022), LaBelle and Santacreu (2022), Shapiro (2022)

  $\Longrightarrow$ Apply structural model to quantify inflation drivers during Covid-19 collapse and recovery.

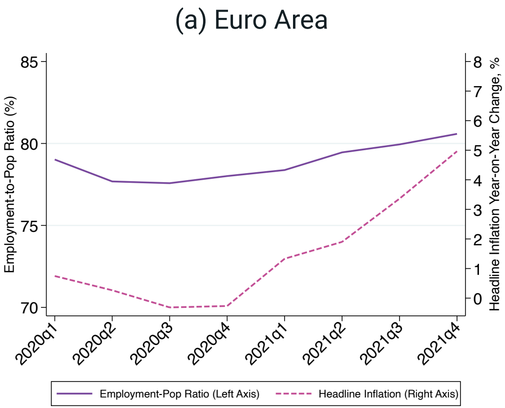
- International Trade during Covid-19 with inflationary implications

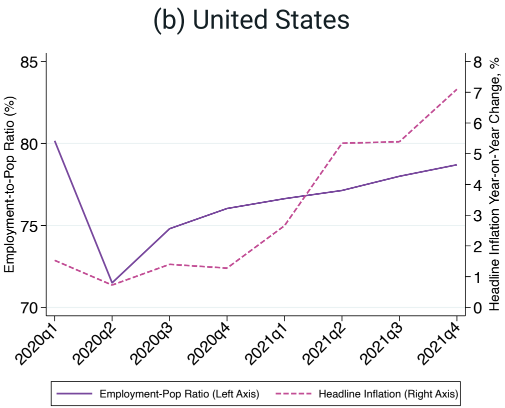
  Liu, Ornelas, and Shi (2021), Alessandria, Khan, Kenderlarian, Mix, and Ruhl (2022), IMF (2022, Ch. 4), OECD (2022)

  $\Longrightarrow$ Provide estimates of elasticities of trade to real GDP during Covid-19 to highlight role of global supply chain bottlenecks.

Stylized Facts: Importance of Country-Sector Heterogeneity

Simultaneous Slack and Inflation

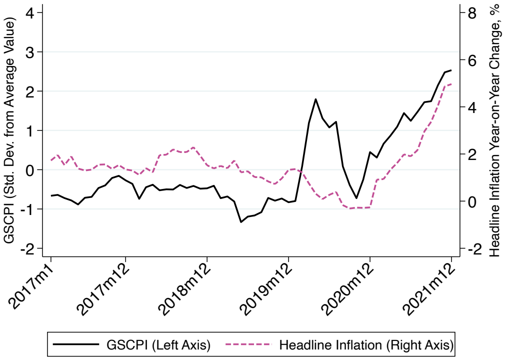




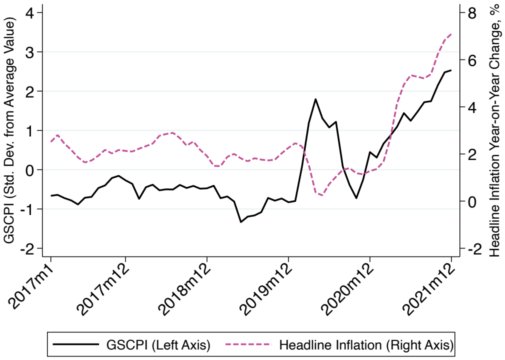
Source: FRED

Simultaneous Increase in Inflation and Supply Chain pressures

(a) Euro Area

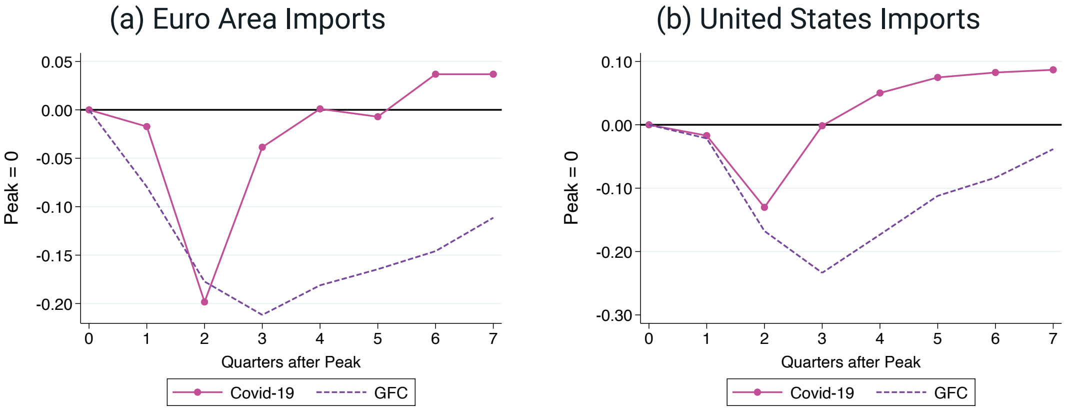


(b) United States



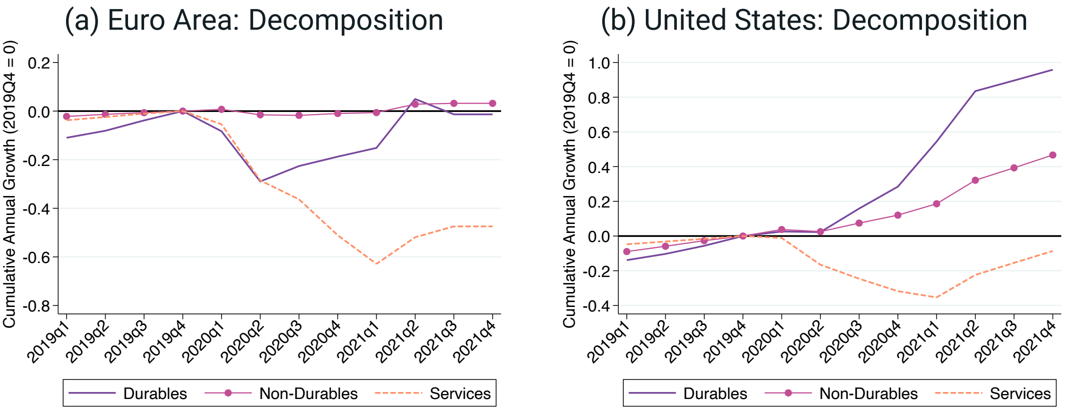
Source: FRBNY, FRED.

Country heterogeneity in trade collapse and recovery relative to 2008–2009



Notes: Merchandise trade (goods trade). Sourced: World Trade Organization .

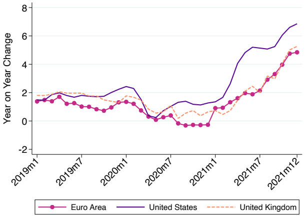
Larger declines in consumption, faster recovery in durables



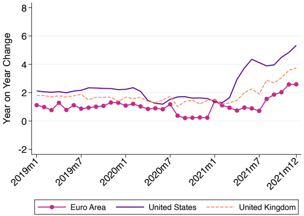
Notes: Seasonally-adjusted real private consumption. Source: OECD Quarterly National Accounts.

Inflation in goods picked up earlier than inflation in services

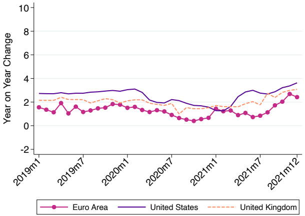
(a) Headline



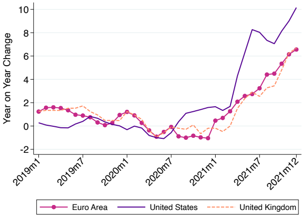
(b) Core



(c) Services

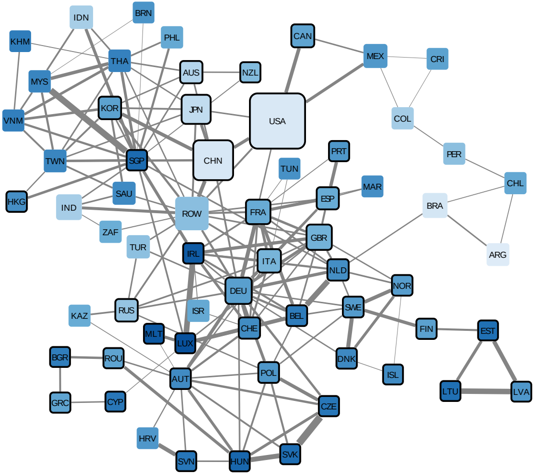


(d) Goods

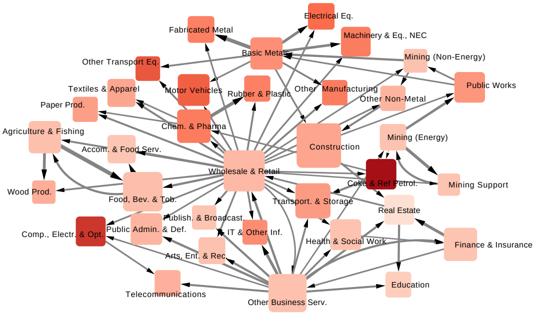


Source: FRED.

Production Network is Global



(a) 65 Countries



(b) 45 Industries

Model

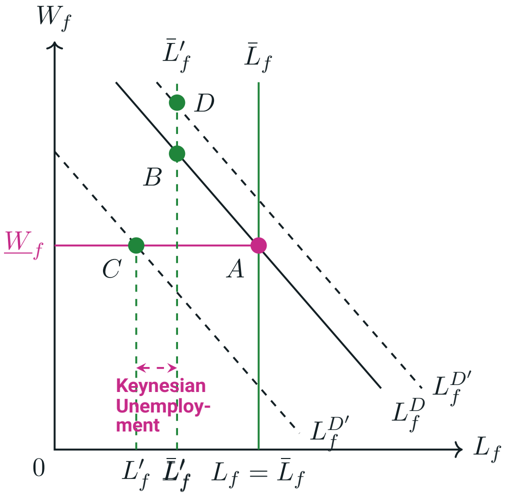
Inflation in a Network-Macro Model

- Based on Baqaee and Farhi (2022, AER) (w/simplifications)
  - Two period closed economy model
  - Ricardian households with perfect foresight
  - Multiple sectors that produce using factors and intermediate inputs
  - Perfect competition in factors and good markets
  - Downward nominal wage rigidity, Zero-lower bound.

- Model allows for rich set of shocks:
  - Aggregate demand: $\mathrm{d}\log\zeta$
  - Sectoral demand: $\mathrm{d}\kappa_i$
  - Sectoral factor supply: $\mathrm{d}\log\bar{L}_f$

Labor Market during 2019Q4– 2021Q4

- $\bar{L}_f$: Potential level for factor f. Decrease due to workers getting sick, shutdowns, etc.
- L_f: Equilibrium employment level for factor f
  - Demand effects+downward wage rigidity $\Rightarrow$ workers employed might be lower than *potential*
- Difference between $\bar{L}_f$ and L_f: Keynesian unemployment
- During recovery – point D: where these unemployment gaps are closed (heterogeneous across sectors, may not be back to 2019 but still inflationary).



Inflation

Agg. Shock Details | Good Prices | All pieces

- In the model, to a first-order, CPI inflation is

$$\mathrm{d}\log CPI = \underbrace{\mathrm{d}\log\zeta}_{\text{Aggregate Demand Shift}} - \underbrace{\sum_{i=1}^{N}\lambda_i \mathrm{d}\log A_i}_{\text{Sectoral Technology Changes}} - \underbrace{\sum_{f=1}^{F}\Lambda_f \mathrm{d}\log L_f}_{\text{Sectoral Employment Eq. Changes}}$$

- Key points:
  - Decreases in employment are always inflationary regardless of the reason
  - Sectoral demand shocks ($\mathrm{d}\kappa_i$) affects inflation only through sectoral employment.
  - Production network enters via λ and Λ.

Shocks

Calibration | F Markets | Model Structure

1. Sectoral Demand Shocks ($\mathrm{d}\kappa_i$): Observed expenditure shares changes.
   - US Data: BEA sectoral personal consumption expenditure
   - Euro Area Data: Three sectors data from OECD Quarterly National Accounts

2. Sectoral Potential Supply Shocks ($\mathrm{d}\log \bar{L}_f$): Observed changes in total hours worked.
   - US Data: BLS tables.
   - Euro Area Data: EuroStat.

Shocks

Calibration | F Markets | Model Structure

3. Aggregate Demand Shocks ($\mathrm{d}\log\zeta$): Backed out from

$$\mathrm{d}\log\zeta = \text{Observed CPI Inflation} + \underbrace{\sum_{f=1}^{F}\Lambda_f \mathrm{d}\log L_f}_{\text{Sectoral hours worked changes}}$$

- US Data: FRED, 2015 BEA IO Tables, BLS.
- Euro Area Data: FRED, EuroStat, OECD ICIO 2018.
- We set $\mathrm{d}\log A_i = 0$ for all i.
  - Recent evidence on pandemic suggests little changes in aggregate/sectoral productivity w/no labor reallocation across sectors (Fernald and Li, 2022)
  - Want to give full chance to sectoral labor shocks to mimic the reality of sectoral shortages and demand-supply imbalances
- Key Parameters
  - Elasticity between value added and intermediate inputs: 0.6 (Atalay, 2017; Carvalho et. al, 2021)
  - Elasticity between labor and capital: 0.6 (Raval, 2019; Oberfield and Raval, 2021)
  - Elasticity among intermediates: 0.2 (Atalay, 2017; Boehm, Flaaen, and Pandalai-Nayar, 2019)

Observed Data: 2019Q4 – 2021Q4

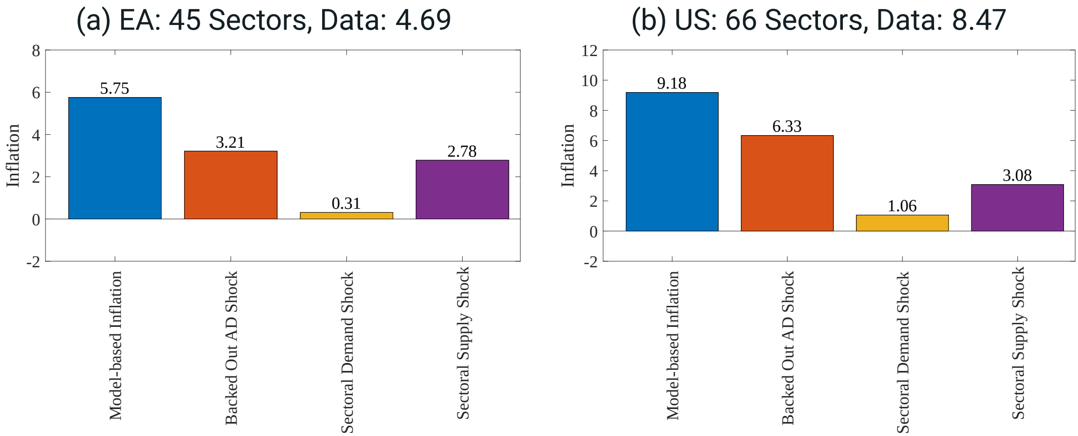
	All Sectors - Percent changes			
	Consumption	Hours Worked	Headline CPI	Nominal Wages
Euro Area	-7.54	-1.48	4.69	5.01
United States	-0.72	-2.14	8.47	7.85

Source: FRED and Eurostat.

Shock Scenarios

- All shocks: Aggregate demand, sectoral demand and sectoral supply
- Aggregate demand
- Sectoral demand
- Sectoral Supply

Sources of Inflation



Ex. 2

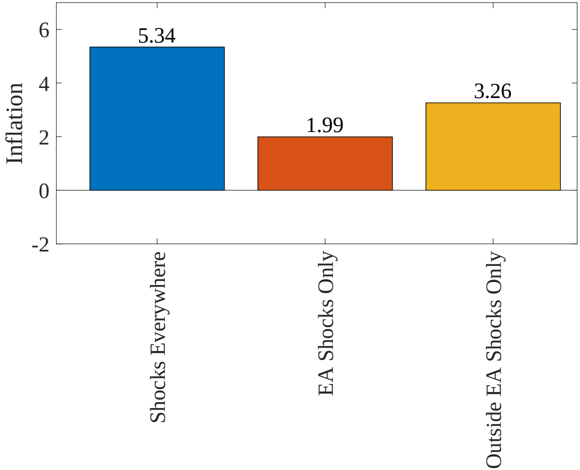
Open Economy

Decomposing Inflation in a Multi-Country Model

Details Model Structure Plot

- We follow Baqaee and Farhi (2022) and Çakmaklı, Demiralp, Kalemli-Özcan, Yeşiltaş, Yıldırım (2021, 2022).
- Model is same as the closed economy +
  - Foreign intermediate/consumption goods (Elasticity 4.55, Caliendo and Parro, 2012)
  - Trade balance at the country-level.
- Due to data availability, we consider
  - Three sectors: durables, non-durables, and services.
  - Three countries: Euro Area, United States, and the Rest of the World
- Three shocks scenarios:
  - All country shocks
  - Shocks in the Euro Area only
  - Shocks outside the Euro Area only (United States and Rest of the World)

Foreign Shocks explain 2/3 of observed EA inflation



International Trade during COVID–19

Trade and Supply Chain Bottlenecks

- The increase in trade and supply chain bottlenecks happened simultaneously
- Given pre-pandemic global input-output linkages, what are the expected international trade flows that follows from changes in final demand? (Bems, Johnson, and Yi, 2010)
- Key intuition: Model Details

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

- We report the elasticity of exports/imports to changes in 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. United States							
	Collapse		Recovery		Collapse		Recovery	
	Imports	Exports	Imports	Exports	Imports	Exports	Imports	Exports
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Great Financial Crisis	4.35	3.31	5.90	4.99	2.65	1.74	1.67	2.09
Covid-19 Pandemic	2.43	2.63	2.50	1.52	0.60	1.09	1.31	1.20
	Panel B. Euro Area							
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Great Financial Crisis	2.74	3.11	5.39	5.65	1.34	2.05	0.86	2.39
Covid-19 Pandemic	1.42	1.45	1.49	1.82	0.87	0.74	1.04	1.16

- Trade responded much less to changes in GDP during Covid-19 relative to GFC
- Intermediate goods trade played a larger role than final goods trade during Covid-19 than in GFC Decomposition

Conclusion

- Global health shock + limited substitutatibility across inputs $\Rightarrow$ supply chain bottlenecks $\Rightarrow$ rise in prices
- We decompose inflation between 2019Q4–2021Q4 in the US and Euro Area into supply and demand sources
  - Sectoral supply shocks account for 1/2 of observed EA inflation, 1/3 of observed US inflation
  - Foreign shocks played a larger role than domestic shocks in explaining observed inflation in the Euro Area
- Much lower elasticities of trade to GDP compared to 2008 crisis
  - Points to role of global supply chain bottlenecks

Thank you!

asilvub@umd.edu

asilvub.github.io

Backup Slides

Theory: Closed Economy

Households

- Ricardian consumer with perfect foresight and preferences over N goods.
- Consumer solves

$$
\begin{aligned}
\max_{\{x_{0i}\}_{i=1}^{N}} \quad & (1-\beta)\log U(C) + \beta \log U(C^*) \\
\text{subject to} \quad & U(C) = \frac{C^{1-\sigma}-1}{1-\sigma} \\
& C = \prod_{i=1}^{N} x_{0i}^{\kappa_i} \\
& PC + \frac{P^* C^*}{1+i} = \sum_{f\in F} w_f L_f + \frac{I^*}{1+i}
\end{aligned} \tag{1}
$$

Household Optimality Conditions

- Intratemporal consumption

$$x_{0i} = \kappa_i \frac{PC}{p_i} = \kappa_i \frac{E}{p_i} \tag{2}$$

$$P = \prod_{i=1}^{N} \left(\frac{p_i}{\kappa_i} \right)^{\kappa_i} \tag{3}$$

- Intertemporal Consumption (Euler Equation)

$$C = \left(\frac{\beta}{1-\beta} \frac{P(1+i)}{P^*} \right)^{-\frac{1}{\sigma}} C^*$$

Sectors

- Firms choose inputs to minimize costs

$$\min_{\{L_{if}\}_{f=1}^{F},\{X_{ij}\}_{j=1}^{N}} \quad \sum_{f} W_f L_{if} + \sum_{j} P_j X_{ij} \qquad \text{s.t.} \quad y_i = A_i G_i(\{X_{ij}\}_{j\in N}, \{L_{if}\}_{f\in F}) \tag{4}$$

Firms' Optimality Conditions

- *Optimized* total costs

$$TC_i(\{p_i\}_{i=1}^N, \{w_f\}_{f=1}^F, A_i, y_i) = \mathcal{MC}_i(\{p_i\}_{i=1}^N, \{w_f\}_{f=1}^F, A_i)y_i$$

- Efficient and competitive economy: marginal cost pricing

$$p_i = \mathcal{MC}_i(\{p_i\}_{i=1}^N, \{w_f\}_{f=1}^F, A_i)$$

Markets Clearing

Plots Example

- Goods Market Clearing

$$y_i = x_{0i} + \sum_{j=1}^{N} X_{ji} \qquad \text{for } i = 1, 2, ..., N \tag{5}$$

- Factors Market Clearing

$$\bar{L}_f \geq L_f = \sum_{i=1}^{N} L_{if}, \quad W_f \geq \bar{W}_f, \quad \left(\bar{L}_f - \sum_{i=1}^{N} L_{if}\right)(W_f - \bar{W}_f) = 0 \qquad \forall f \in F \tag{6}$$

  - If $\bar{L}_f = L_f \iff W_f \geq \bar{W}_f \implies$ a factor is *supply-constrained.*
  - If $\bar{L}_f > L_f \iff W_f = \bar{W}_f \implies$ a factor is *demand-constrained.*

A Road to CPI inflation: Supply Side Determination of Good Prices

Back

- CPI Inflation: weighted average of *good price changes*

$$\mathrm{d}\log P = \sum_{i=1}^{N} \kappa_i \mathrm{d}\log p_i \tag{7}$$

- Changes in good prices satisfy

$$d\log p_i = -\sum_{k=1}^{N} \Psi_{ik} d\log A_k + \sum_{k=1}^{N} \Psi_{ik} \sum_{f=1}^{F} \Omega_{kf} d\log w_f \tag{8}$$

Ψ_{ik} importance of producer k as a supplier to i both directly and indirectly.
Ω_{kf} cost-share of factor f for producer k.

- Given technology and factor prices changes, good prices are entirely determined by the supply side.

A Road to CPI inflation: Demand Side Determination of Factor Prices

Back

- Closed Economy: $GDP = E = PC$.
- Log-linearize Euler Equation and set $\sigma = 1$

$$\mathrm{d}\log PC = -\mathrm{d}\log\frac{\beta}{1-\beta} - \mathrm{d}\log(1+i) + \underbrace{\mathrm{d}\log P^* + \mathrm{d}\log C^*}_{\text{Future Expenditure}} = \mathrm{d}\log\zeta$$

Since β, i, P^*, C^* are *given*, changes in current total expenditure are also exogenous.

- Hence

$$\mathrm{d}\log GDP = -d\log\frac{\beta}{1-\beta} = \mathrm{d}\log\zeta$$

Intuition: Changes in *current* expenditure comes from a relative shift in demand from future to present ($\downarrow \beta$).

A Road to CPI Inflation: Putting Demand and Supply Together

Back

- Supply side goods price changes

$$d\log P = -\sum_{i=1}^{N}\lambda_i d\log A_k + \sum_{f=1}^{F}\Lambda_f d\log w_f; \quad \lambda_i = P_i Q_i / GDP; \quad \Lambda_f = W_f L_f / GDP$$

- Demand side determination of factor prices

$$d\log w_f = d\log \Lambda_f + \mathrm{d}\log GDP - \mathrm{d}\log L_f; \qquad \mathrm{d}\log GDP = \mathrm{d}\log\zeta$$

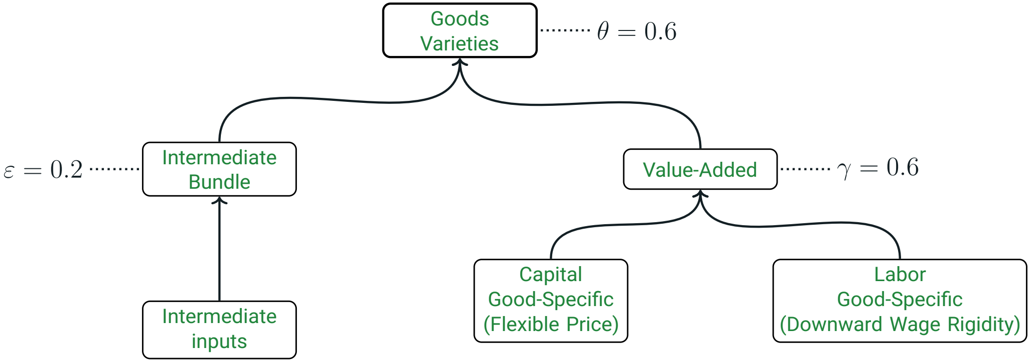
- We set $d\log A_i = 0$ for all i. Therefore,

$$\text{CPI Inflation} = \underbrace{-\sum_{f=1}^{F}\Lambda_f \mathrm{d}\log L_f}_{\text{Changes in Eq. Factor Quant.}} + \underbrace{\mathrm{d}\log\zeta}_{\text{Aggregate Demand Shift}}$$

Quantitative Model

Production Structure of Empirical Exercise: Nested CES

Back



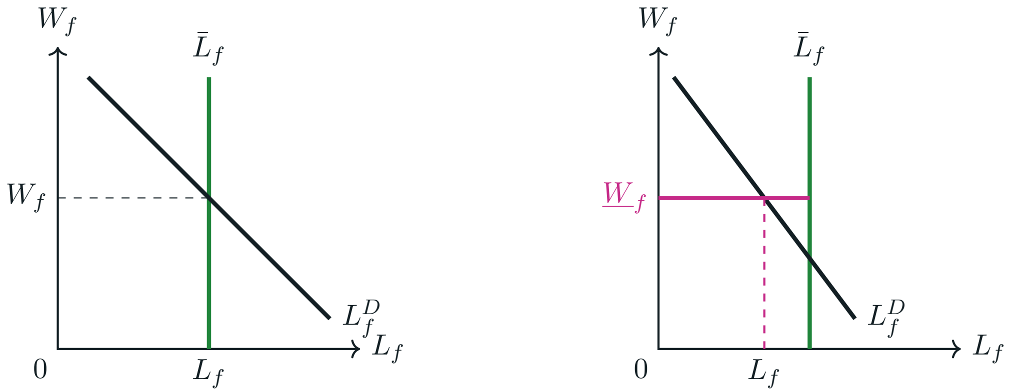
Factor Markets

Back

- $2 \times S = F$ factors of production with *exogenous potential supply*.
  - Each sector uses two-sector specific factors of production $\Longrightarrow$ no factor mobility across sectors.

(A) Capital Markets: Supply Constrained

(B) Labor Markets: Potentially Demand Constrained



Closed-Economy Calibration

Back

	Value	Description
Elasticities		
ϵ	0.2	Elasticity of substitution across intermediate inputs
θ	0.6	Elasticity of substitution between factors and intermediates
γ	0.6	Elasticity of substition between factors
σ	1	Elasticity of substitution between consumption goods within period
ρ	1	Intertemporal elasticity of substitution
At initial steady-state		
β	0.5	Weight on future utility
i	0	Interest rate
$C = P = C^* = P^*$	1	steady state values of real GDP and price index both present and future (*)
$\boldsymbol{\Lambda}$		Factor shares from Input-Output Tables
$\boldsymbol{\lambda}$		Domar Weights from Input-Output Tables
$\boldsymbol{\kappa}$		Consumption Shares from Input-Output Tables
Shocks		
$d\log\zeta = d\log(1-\beta)/\beta$		Match backed out aggregate demand shock
$d\log \boldsymbol{L}$		Match sectoral total hours worked change
$d\log \boldsymbol{\kappa}$		Match changes in sectoral consumption expenditure

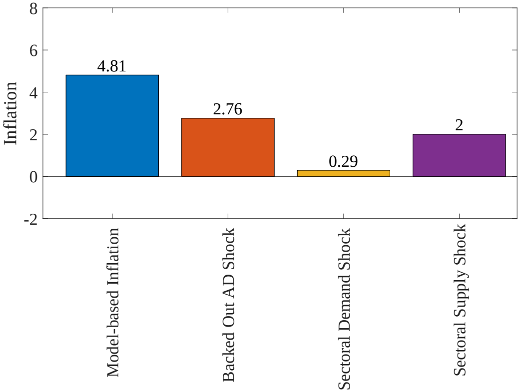
The Role of Complementarities on Inflation

Back

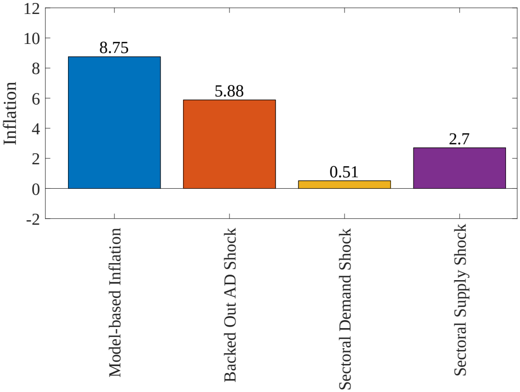
Panel A. United States			
	Calibration Model		
	Cobb-Douglas	Baseline	Leontief
Shocks	(1)	(2)	(3)
All	8.93	9.18	9.68
Aggregate Demand	6.33	6.33	6.33
Sectoral Demand	1.01	1.06	0.77
Sectoral Supply	2.70	3.08	3.56

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

Inflation Decomposition



(a) EA: 3 Sectors



(b) US: 3 Sectors

Open Economy Details

Closing Open Economy Model

Back

- Following Baqaee and Farhi (2022, Eq. 12)

$$\alpha_c \mathrm{d} \log p_{0c} e_c GDP + \beta_c \mathrm{d} \log e_c = 0$$

p_{0c} price of consumption good in country c, GDP is the nominal gross domestic product in base country's units and e_c is the exchange rate of country c.

- Downward rigidity is imposed at the US dollar level. Hence,

$$\mathrm{d} \log w_{fc} \geq -\mathrm{d} \log e_c$$

- We experiment with different $\alpha_c, \beta_c \implies$ results do not significantly depend on this.

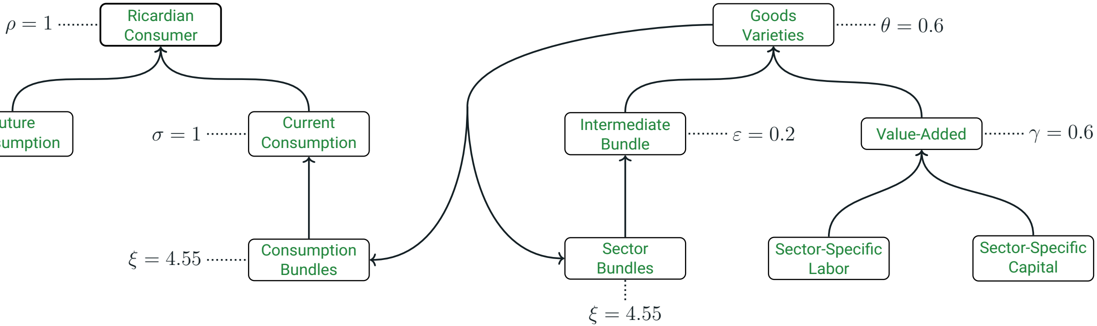
Open-Economy Model Calibration

Back

	Value	Description
Elasticities		
ϵ	0.2	Elasticity of substitution across intermediate inputs
θ	0.6	Elasticity of substitution between factors and intermediates
γ	0.6	Elasticity of substition between factors
ξ	4.55	Elasticity of substitution between foreign and intermediate goods in production and consumption
σ	1	Elasticity of substitution between consumption goods within period
ρ	1	Intertemporal elasticity of substitution
At initial steady-state		
β	0.5	Weight on future utility
i	0	Interest rate
$P_c = P_c^*$	1	steady state values of price index in each country c. both present and future (*)
$C_c = C_c^* = Y_c^* = Y_c^*$	$\frac{\text{GDP}_c}{\text{GDP}}$	real GDP share of each country c in the world GDP.
$\boldsymbol{\Lambda}$		Factor shares from Input-Output Tables
$\boldsymbol{\lambda}$		Domar Weights from Input-Output Tables
$\boldsymbol{\kappa}$		Consumption Shares from Input-Output Tables
Rest of the World Shocks		
$d \log \zeta = d \log(1-\beta)/\beta$		Match the level so that the predicted inflation in the Euro Area falls between the values reported in closed economy exercise.
$d \log \boldsymbol{L}$		Match using population weighted Oxford Stringency Index (Hale et al ,2021).
$d \log \boldsymbol{\kappa}$		Match changes in sectoral consumption expenditure for countries outside the Euro Area and United States

Model Overview

From Çakmaklı et al. 2021, 2022, Back



Sectoral Shares IO Tables

	Output	VA	Final Demand	Imports	Exports
United States					
Durables	0.06	0.05	0.08	0.31	0.22
Non-Durables	0.13	0.08	0.08	0.29	0.25
Services	0.81	0.87	0.83	0.40	0.52
Euro Area					
Durables	0.11	0.07	0.12	0.20	0.22
Non-Durables	0.16	0.10	0.10	0.32	0.35
Services	0.73	0.83	0.78	0.48	0.43
United Kingdom					
Durables	0.06	0.04	0.07	0.20	0.16
Non-Durables	0.10	0.07	0.09	0.24	0.20
Services	0.84	0.89	0.85	0.56	0.64
World					
Durables	0.09	0.06	0.10	0.21	0.21
Non-Durables	0.20	0.14	0.12	0.35	0.44
Services	0.71	0.79	0.78	0.45	0.35

Bems, Johnson, and Yi (2010) Back

- For a sector j in country m, its output, y_{jm}, must satisfy

$$y_{jm} = \sum_c \sum_k x_{kc,jm} + \sum_c x_{0c,jm}$$

- As in Bems, Johnson, and Yi (2010)
  - Leontieff production functions and preferences $\Longrightarrow$ intermediate input and final demand are sector-specific and not source-specific.
- Changes in output in each (sector,country) pair then

$$\hat{y}_{jm} = \sum_c \sum_k \frac{p_{jm} x_{kc,jm}}{p_{jm} y_{jm}} \hat{y}_{kc} + \sum_c \frac{p_{jm} x_{0c,jm}}{p_{jm} y_{jm}} \hat{x}_{0c,jm}$$

$$\Longrightarrow \underbrace{\hat{\boldsymbol{y}}}_{\Delta \text{ in Gross Output}} = \underbrace{\boldsymbol{S}}_{\text{Global IO Matrix}} \times \underbrace{\boldsymbol{M}}_{\text{Sales to Final Use}} \times \underbrace{\hat{\boldsymbol{x}}}_{\Delta \text{ in final demand}}$$

Elasticities of imports and exports to GDP Back

We use implied changes in gross output $\hat{y}_{jm}$ to get for each country m

$$\hat{Q}_m = \sum_j \frac{Y_{jm}}{Y_m} \hat{y}_{jm}, \tag{9}$$

$$\widehat{VA}_m = \sum_j \frac{VA_{jm}}{VA_m} \hat{y}_{jm}, \tag{10}$$

$$\widehat{EX}_m = \sum_{m \neq x} \sum_j \left[\sum_k \left(\frac{M_{kc,jm}}{EX_m} \right) \hat{y}_{kc} + \left(\frac{D_{c,jm}}{EX_m} \right) \hat{x}_{0c,j} \right], \tag{11}$$

$$\widehat{IM}_m = \sum_{m \neq x} \sum_j \left[\sum_k \left(\frac{M_{jm,kc}}{IM_m} \right) \hat{y}_{jm} + \left(\frac{D_{m,jk}}{IM_m} \right) \hat{x}_{0m,j} \right]. \tag{12}$$

Trade Elasticities Decomposition

Back

Panel A. Great Financial Crisis

	Collapse				Recovery			
	Imports		Exports		Imports		Exports	
	Inter.	Final	Inter.	Final	Inter.	Final	Inter.	Final
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
United States	1.88	3.53	1.53	2.00	1.43	1.95	1.87	2.36
Euro Area	1.31	1.45	1.64	2.58	1.19	0.52	2.27	2.53
United Kingdom	1.04	1.51	0.36	0.43	0.91	0.83	0.52	0.45
World	1.36	1.98	1.36	1.98	1.27	1.39	1.27	1.39

Panel B. Covid-19 Pandemic

	Collapse				Recovery			
	Imports		Exports		Imports		Exports	
	Inter.	Final	Inter.	Final	Inter.	Final	Inter.	Final
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
United States	0.80	0.39	1.06	1.14	1.16	1.48	1.19	1.29
Euro Area	0.86	0.89	0.77	0.72	1.05	1.03	1.14	1.18
United Kingdom	0.90	0.88	0.54	0.50	0.95	1.04	0.65	0.64
World	0.92	0.84	0.92	0.84	1.03	1.09	1.03	1.09