Current U.S Inflation:
Macroeconomic Drivers and Challenges

Mark Gertler

NYU

November 2022
CPI Inflation

- CPI: All Items
- CPI: Core
Import Prices

- Import Price Index (End Use): All Imports Excluding Food and Fuels
- CPI: Core

Percent change from a year ago

Years:
Oil and Food Prices

- Crude Oil Prices (left)
- Global price of Food Index (right)

Years:
- 2016
- 2017
- 2018
- 2019
- 2020
- 2021
- 2022

Dollars per Barrel:
- 0
- 20
- 40
- 60
- 80
- 100
- 120

Index:
- 0
- 20
- 40
- 60
- 80
- 100
- 120
- 140
- 160
- 180
Wages

Percent change from a year ago

Years


Wage Growth Tracker Atlanta Fed
CPI: Core
Long Term Inflation Expectations

10-year Breakeven Inflation
Survey of Professional Forecasters: 10 year CPI Inflation (median)
U.S. Auto Supply Chain Update

Drivers and Prospects for Inflation

Elaine Buckberg
Chief Economist, General Motors
November 18, 2022
Auto sales ran at a 14.1M SAAR YTD due to ongoing supply issues vs. the 2018-19 average of 17.6M

U.S. Total Industry Auto Sales, SAAR Mils

Avg in 2018-19 = 17.6M

Pent-up demand

Sources: Polk, Bureau of Economic Analysis

general motors
North American auto production hit the average pre-COVID pace in two of the last three months.

North America Light Vehicle Production

- Avg in 2018-19 = 1,387
- January 2018: 1,367
- July 2018: 917

Sources: IHS Markit; actuals through September 2022; forecasts beyond.
Plant downtime persists but 2022 YTD is half that of 2021. Improvement is thanks to better chip supply.

Vehicles Cut from Production in North America

<table>
<thead>
<tr>
<th>Month</th>
<th>000s</th>
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<tbody>
<tr>
<td>Apr-21</td>
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<tr>
<td>Jun-21</td>
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<tr>
<td>Aug-21</td>
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<td>Jun-22</td>
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<td>Aug-22</td>
<td>34</td>
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<td>34</td>
</tr>
<tr>
<td>Nov-22</td>
<td>34</td>
</tr>
</tbody>
</table>

Vehicles Cut from NA Production

- 2022 YTD: 1,420,400
- 2021 (Jan. – Nov.): 3,088,136

Sources: AutoForecast Solutions via Automotive News
New vehicle prices remain high, despite recent increase in inventory

**Total Industry Stock (Mils)**
- 2018: Blue line
- 2019: Green line
- 2020: Purple line
- 2021: Dashed blue line
- 2022: Dashed purple line

**New Vehicle Average Transaction Price as % of MSRP**
- 2018: Blue line
- 2019: Green line
- 2020: Purple line
- 2021: Dashed blue line
- 2022: Dashed purple line

**Avg. Transaction Prices (000s)**
- 2018: Blue line
- 2019: Green line
- 2020: Purple line
- 2021: Dashed blue line
- 2022: Dashed purple line

**Sources:**
- NA EZQ
- JD Power PIN; GM calculations
- JD Power PIN; Nominal Prices
Inventories rose in Aug-Oct.
Dealer markups over cost continue to grind down

Source: PIN
general motors
Used vehicle prices have been falling since January. Yet used vehicles still 13% more expensive, controlling for content and quality.

Auto inflation has steadily dropped over 2022

Sources: BLS, Haver Analytics
We are completely shifting our approach to buying chips, from buying components from our suppliers that contain chips, to directly managing all chip purchases and chip design for our vehicles.

GM sees our microprocessor requirements more than doubling over the next several years as vehicles become technology platforms.

GM’s new strategy will reduce the number of unique micro controller units (MCUs) required by 95 percent to industry-leading levels.

GM partnered with 7 chip makers: Qualcomm, STMicroelectronics, TSMC, Renesas, Onsemi, NXP, Infineon.

Much of the investment needed will flow to the U.S. and Canada.
Establishing a sustainable EV raw material value chain

GM is actively pursuing opportunities to localize as much of the supply chain as possible

Partnerships created for lithium, cobalt, rare earths, alloy flakes, permanent magnets, and CAM.

Recycling should be primary source of battery raw materials in the long term

*Recycling today*: cobalt, nickel

*Future recycling*: cobalt, nickel, lithium, graphite, copper, manganese, and aluminum
The inflation puzzle of the green transition

Global Research Forum, International Macro and Finance

18 November 2022

Matteo Ciccarelli
European Central Bank, DGE/FPM
The views expressed in this presentation are my own and do not necessarily reflect those of the European Central Bank or the Eurosystem.
1. Several types of climate policies: Non market-based, Technology support, Market-based

Environmental Policy Stringency by sub-indices

Note: The figure shows the aggregation structure of the revised EPS index (referred to as "EPS21").

Source: OECD (https://doi.org/10.1787/90ab82e8-en)
2. Firms expect substantial increases in costs and final prices

Overall impact of climate change and climate policies on input costs and selling prices (share of total responses)

- Significant increase
- Little or no impact
- Slight increase
- Slight decrease
- Significant decrease

Selected impacts of transition policies on firms (percent of total responses)

- Increase the price of the goods and/or services we provide
- Make the raw materials and components we use more expensive
- Make the energy inputs we use more expensive
- Make carbon prices a relevant cost component


Notes: Based on special survey in the context of the ECB’s contacts with non-financial companies, with 90 respondents in total. The respondents consist of large and mostly multinational companies engaged in a wide range of non-financial business sector activities. Firms were asked to compare to a hypothetical baseline without climate change.
3. **Standard models—that only focus on carbon tax—point to moderate inflation over short-medium term and mostly supply-type of effects, but demand may matter**

<table>
<thead>
<tr>
<th>Paper</th>
<th>Model characteristics</th>
<th>Inflation</th>
<th>Output</th>
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</thead>
<tbody>
<tr>
<td>IMF GMMET</td>
<td>Multi-country, multi-sector E-DSGE</td>
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<td>+</td>
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<td>GCUBED</td>
<td>Multi-country, multi-sector hybrid DSGE-CGE</td>
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<td>NiGEM</td>
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<tr>
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<td>Coenen, Lozej, Priftis (2022)</td>
<td>ECB NAWM with disaggregated energy</td>
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<tr>
<td>Priftis and Schoenle (2022)</td>
<td>Closed economy NK E-DSGE with disaggregated energy and banks</td>
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<td>Ferrari and Nispi Landi (2022a)</td>
<td>Closed economy NK model with green and brown sectors</td>
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<td>Ferrari and Nispi Landi (2022b)</td>
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<td>+/ -</td>
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<td>Open-economy NK E-DSGE with disaggregated energy</td>
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<tr>
<td>E-QUEST (EC DG ECFIN)</td>
<td>Multi-sector E-DSGE with abatement and R&amp;D</td>
<td>-</td>
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A carbon tax needed to reduce emissions by approx. 25% by 2030 is likely to have on average mild consequences for inflation
Uncertainty depends on different propagation channels.
Uncertainty depends on different propagation channels and assumptions about tax path, revenue redistribution, monetary policy response, expectations, counteracting negative demand effect, ...
For instance, expectations are important...

An increase in the tax today depresses current demand, putting downward pressure on prices. If the tax is non-credible, prices can increase because aggregate demand does not react.

Figure 2: Transition to a zero-emission economy, driven by an emission tax. Output is in percentage deviations with respect to the value they would have had with no increase in the emission tax; inflation is in deviations compared to the target reported at annual rates; the price of carbon is in level deviations. The path for the emission tax is announced in period 0. Blue solid line: baseline scenario; black dashed line: $F = 5$; red dotted line: $F = 10$; green solid line: $F = 15$.

Source: Ferrari and Nispi-Landi (2022)
... and different monetary policy rules may have different implications for inflation.

Policy rule targets core inflation

Policy rule targets headline inflation

Source: Coenen, Lozej, Priftis (2022)
4. Empirical analysis show that climate policies affect prices

Climate policies have strong positive effects on energy and food and moderate or negative effects on core inflation. They affect relative prices only.

4. Empirical analysis show that different climate policies affect prices differently

Climate policies have strong positive effects on energy and food and moderate or negative effects on core inflation. They affect relative prices only.

...and country heterogeneity is an important feature

A shock to aggregate climate policy in two groups of countries

High vs Low initial GHG emissions

Ciccarelli and Marotta (2021): Demand or Supply? An empirical exploration of the effects of climate change on the macroeconomy, ECB WP no. 2021/2608 and R&R at Energy Economics
Technology is welfare improving. Some policies not necessarily

Response of welfare

Ciccarelli and Marotta (2021): Demand or Supply? An empirical exploration of the effects of climate change on the macroeconomy, ECB WP no. 2021/2608 and R&R at Energy Economics
For discussion

- So far models give somewhat plausible but ambiguous responses
  - Different assumptions on relative importance of channels
  - Calibration based on history with little or no climate transition and very low carbon taxes
  - Need of more complete models (heterogeneity, welfare) and realistic design of scenarios

- Importance of empirically validated effects of combination of policies, including directed technological change (current focus is predominantly on carbon taxes)

- (A combination of) Climate policies do not necessarily hamper price stability. But an environment of price stability is important for the green transition

- Waiting for new macro and national account indicators? We compute effects on variables whose measures are bound to change to incorporate new concepts (e.g., resilience, biodiversity, degradation)
Thank you for your attention!
Research Perspective on Supply Chain Disruptions and International Forces: Implications for Inflation and Policy Coordination

Şebnem Kalemli-Özcan
University of Maryland, CEPR, NBER

NYFED, November 18, 2022
Lessons of 2020–2021

1. What did central banks miss? ⇒ Tight labor markets
Lessons of 2020–2021

1. **What did central banks miss?** ⇒ **Tight labor markets**
   - Standard measures show slack (unemployment rate, total jobs)—pandemic made these redundant (sectoral supply and demand shocks)
   - **Measurement is key:** How to measure slack under supply shocks? Without, we cannot know how high rates need to go

2. **Transitory-permanent inflation debate lacks the global perspective**
   - Compositional shifts in consumption
   - Global supply chain disruptions
   - Few sectors price increase (chips, used cars) with 2020 deflation gave the transitory impression, while repeated supply shocks happening and travelling via global supply chains (China lockdowns, Russia)

3. **Early predictors of inflation based on higher demand not correct.** If it was all demand output should be higher than potential output in 2021. It was not. CBs waited during which aggregate demand stimulus amplified the supply constraints
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CBs waited during which aggregate demand stimulus amplified the supply constraints
Supply-Demand Imbalances ↑ on a Global Scale During 2020–2021

Covid-19

Supply Shock (-)
Workers contract disease/drop-out
Lockdowns

Demand Shock (+-)
(Goods ↑, Services ↓)
Fear/Uncertainty/Savings
Limited mobility
Supply-Demand Imbalances \( \uparrow \) on a Global Scale During 2020–2021

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Aggregate Demand Stimulus
Demand Changes:
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Supply-Chain Disruptions ↑

Demand Changes:
- Goods ↑, Services ↓

Aggregate Demand Stimulus

Inflation
Compositional Shifts in Consumption ⇒ Sectoral Differences in Inflation

(a) Headline
(b) Core
(c) Services
(d) Goods

Notes: Figures plot headline, core, and services and goods annual inflation. Data sourced from the FRED system.
Global Trade and Production Network: OECD ICIO Tables

(a) Countries

(b) Industries

35 industries in 65 countries, giving us a matrix of $2275 \times 2275$ entries
1. Sectoral demand and supply shock $\implies$ Sectoral consumption and sectoral hours worked

2. Aggregate demand shock—stimulative policies

Inflation $\approx$ Aggregate Demand $-$ Network weighted $\Delta L_f$
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\[ \text{Inflation} \approx \text{Aggregate Demand} - \text{Network weighted } \Delta L_f \]

Sectoral supply shocks explain 1/2 of EA, 1/3 of US observed inflation

(a) Euro Area: 45 Sectors
(b) U.S. 66 Sectors
Foreign shocks explain 2/3 of observed EA inflation
Takeaways

- Global health shock + limited substitutability across inputs $\Rightarrow$ supply chain bottlenecks $\Rightarrow$ rise in prices

- Supply shocks are important!
- Supply shocks account for 1/2 of observed EA inflation, 1/3 of observed US inflation
- Foreign shocks account for 2/3 of the Euro Area inflation
- Demand stimulus in a supply constrained world has larger inflationary effects
- Monetary policy can tame inflation by contracting aggregate demand, however, there will remain an upward pressure on price growth with sectoral supply shocks and bottlenecks
- Blunt tools (interest rates, government transfers) cannot be fine-tuned without the benefit of hindsight; need to learn how to combine blunt tools with crisis-specific policies
- Given the extent of globalization, under supply shocks, no economy fully recovers until every economy recovers $\Rightarrow$ international coordination on health+fiscal policies
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Global inflation $+$ strong dollar $\Rightarrow$ monetary policy coordination? Not necessarily

**Trade Channel**
- Inflation
- Strong $\$$
- $\uparrow X, \downarrow M$
- Contractionary Depreciation in EM
- EM GDP falls

**Financial Channel**
- Financial Channel
- Cost of Capital
- Risk Premium
- Heterogeneity via Balance Sheet Strength
- Heterogeneity via Asset Riskiness
- EM GDP falls more if EM hikes rates to defend currency

Fed Hike
Spillovers to Rest of the World
Will the Strong Dollar Trigger a Global Recession?

Presentation at Federal Reserve Bank of New York, Global Research Forum on International Macroeconomics and Finance

Steven B. Kamin

American Enterprise Institute
November 2022
Financial media obsessed with strong dollar

“How the surging U.S. dollar is making it almost impossible to afford anything in countries around the world.”

(Fortune, October 18)

“Fallout From Rate Moves Won’t Stop the Fed.”

(NY Times, October 7)

“The Fed has the world in its hands — and its aggressive moves are creating global economic chaos that could come back and hurt the US.”

(Business Insider, October 1)
Fed Tightening Cycle Lagged Many Central Banks

*Source: Bank for International Settlements; Trading Economics. Month-end policy rate data through October 2022.*
Fed Response To Soaring Inflation In Line With International Norms

\[ y = 0.59 + 0.66 \cdot x, \quad p\text{value} = 0.00, \quad R^2 = 0.46 \]

Source: Bank for International Settlements; Trading Economics; CEIC. Monthly data through September or October 2022.
The Dollar Has Risen Far More Against Advanced Economies Than Against EMEs

EME Spreads Remain Contained, Though High-Yields Spreads Are Widening

Source: Ice Data Indices, LLC, accessed through the Board of Governors of the Federal Reserve System (US). Month-end data through October 2022.
EMEs With High CDS Spreads Are Not Those With Big Global Export Shares

Source: Council on Foreign Relations; International Monetary Fund. Share of global exports refers to share of global goods exports.
The Decline Of Currencies Against The Dollar Exaggerates Their Multilateral Decline

Source: Bank for International Settlements; CEIC. Monthly rates through October 2022.
Relationship Between Depreciation Against Dollar And Increases In Core Inflation Has Been Weak

\[ y = -0.15 \cdot x + 2.7, \quad p-value = 0.30, \quad R^2 = 0.1 \]

Source: Bank for International Settlements; Trading Economics; CEIC. Monthly data through September or October 2022.
Thanks!