Intermediate Macroeconomics II
Inflation & the Price Level: Motivation

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Acknowledgement and source

Where todays motivation comes from

This introduction is adapted from **John H. Cochrane**, *Inflation* (Karl Brunner Distinguished Lecture; February 10, 2026), especially **Chapter 1 (Introduction)**, **Chapter 2 (The 2021–2022 inflation)**, and **Chapter 3 (Monetary Policy)**.

- Figures shown are reproduced from Cochranes lecture PDF (data series are primarily from FRED).

- Goal here is **pedagogical**: motivate what theories of inflation must explain, before we build models.

- Any remaining mistakes/interpretations are mine.

Motivation

What this course is about

- **Price level** P_t: the value of money (how many dollars buy one unit of goods).

- **Inflation** π_t: the rate of change in the price level.

- These are **macroeconomic prices**: they shape wages, contracts, taxes, debt burdens, and policy.

- A central challenge: **real macro** can explain quantities, but we also need a theory for **nominal units**.

Core aim
Build models that explain **(i) why inflation happens** and **(ii) what anchors the level of prices**.

Three questions to keep asking all semester

1. **Nominal anchor:** What pins down the price level P_t?
   - Examples: money-growth rules, a gold standard/backing, a Taylor rule, or fiscal backing of debt.

2. **Dynamics:** What makes inflation persist or fade?
   (expectations, frictions, Phillips curve, credibility)

3. **Policy regime:** What do monetary and fiscal authorities *commit* to do when shocks hit?
   - "Monetary dominance" vs "fiscal dominance" is a regime statement.

A theme

Many disagreements about inflation are really disagreements about the **policy regime** and the **anchor**.

The standard policy doctrine (in words)

- Central banks often describe a **monetary transmission mechanism**:

  - Raise interest rates $\Rightarrow$ spending slows $\Rightarrow$ unemployment rises $\Rightarrow$ inflation falls.
  - Lower interest rates $\Rightarrow$ demand expands $\Rightarrow$ inflation rises.

- Cochraneś complaint: this doctrine is **useful operationally**, but it is not yet a complete **economic theory**.

- Two missing pieces show up immediately:

  - **Expectations:** what determines expected inflation and expected future policy?
  - **Price-level determination:** why doesnt́ P_t drift under an interest-rate target?

- Even the Fisher equation warns us: higher nominal rates can also reflect **higher expected inflation**.

Takeaway

We want a framework that makes the doctrine **precise**, **internally consistent**, and **testable**.

Why the standard story is under strain: institutions

- Modern monetary systems are not the textbook world of money-supply control:

    - **Interest-rate targets** are the main instrument.

    - **Ample reserves** pay market interest ("floor" systems); reserves are not scarce.

    - Broad money and deposits are largely **endogenous** (created by private credit).

- "QE" changes the **composition** of government liabilities (reserves vs bonds), not necessarily "money" in the old sense.

- Cochraneś bar: a theory must fit current institutions: **fiat money, interest-rate targets, ample reserves, no money-supply control**.

Takeaway

A credible theory must match **current institutions**, not only historical ones.

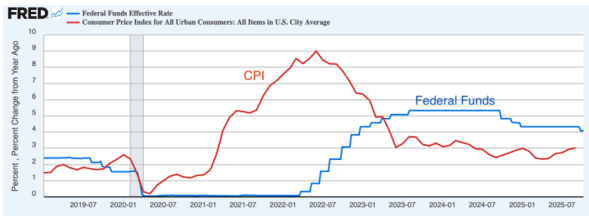# Why the standard story is under strain: theory

- Cochrane argues we are in a moment of **uncertainty** in monetary economics:
  - The verbal doctrine has changed little since the 1970s.
  - Yet standard models struggle when pushed hard (especially around expectations and regime).

- New Keynesian models make the doctrine formal, but rely on:
  - a **specific policy rule** (e.g., Taylor principle) for determinacy,
  - a **mechanism for expectation formation and credibility**,
  - a clean treatment of fiscal policy and government debt.

- The 2021–2022 episode is a stress test:
  - Inflation rose quickly while policy rates stayed near zero.
  - Inflation later fell substantially without a catastrophic recession.

Takeaway

We will study inflation like economists: **start from episodes**, then discipline theories.

A recent episode: 2021–2022

The timeline (US): recession, zero rates, then inflation

- 2020: COVID recession; inflation eases; Fed funds rate near zero.

- Late Jan 2021: new administration; economy rebounds; inflation takes off.

- 2022: sharp rate hikes come *after* inflation is already high.

- Disinflation later arrives with a slowdown, but not a deep 1980s-style recession.

First puzzle

Inflation surged **before** interest rates rose.

Facts and puzzles to explain

- **What caused inflation to surge?**
  - Demand boom, supply disruptions, energy shocks, markups, expectations,...?

- **Timing:** why early 2021 and not 2020, when policy was already extremely expansionary?

- **Persistence:** why did inflation remain above target for so long?

- **Disinflation:** why did inflation later decline without a deep recession?

- **Policy interpretation:** if rates were near zero at the start, what was the *nominal anchor*?

Takeaway

Good theories must match the **timing** and the **comovement** of inflation, rates, output, and policy.

- 2020–2021: very large deficits and transfers.

- The key question is not only *how big* deficits are, but **how they are expected to be paid for**.

- Fiscal expansions can work through:

  - **Demand** (Keynesian spending/transfer channel), and
  - **Valuation** (news about backing of nominal liabilities).

Are deficits a **demand boom**, a **debt-valuation event**, or both?

Why "deficits cause inflation" is not enough

- History shows: some large deficits are followed by inflation; others are not.

- Cochraneś emphasis: the difference is often **expectations about the future fiscal path**.
    - Do people expect future taxes/spending adjustments (future primary surpluses)?
    - Or do they expect persistent deficits and debt rollover without credible backing?

- This shifts attention from current deficits to the **entire expected present value of surpluses**.

- Put differently: inflation is about **news** and **regime**, not only todayś deficit number.

Takeaway
To explain inflation we must explain how **nominal government liabilities** are valued.

Fiscal theory: the price level as debt valuation

The key equation (government debt valuation)

Debt valuation / fiscal theory relationship

$$\frac{B_{t-1}}{P_t} = \mathbb{E}_t \sum_{j=0}^{\infty} \beta^j \, s_{t+j}$$

- B_{t-1}: outstanding **nominal** government liabilities (money + bonds).

- P_t: price level, so B_{t-1}/P_t is their **real value**.

- s_{t+j}: future **primary surpluses** (taxes minus non-interest spending) that *back* liabilities.

- Interpretation: an **asset-pricing equation** (real value = present value of backing).

- A warning from Chapter 3: a present value equation is *not* a full model by itself—we still need a regime (what policy does when shocks hit).

Interpretation

Like an asset price: **real value = present value of backing**.

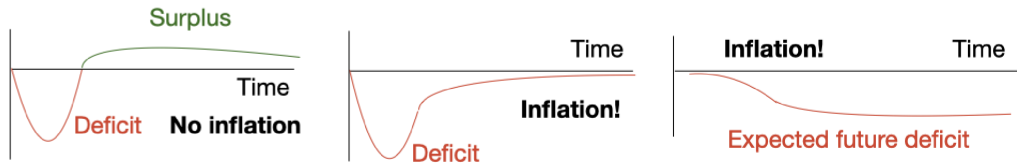# Mechanism in words: how fiscal news moves prices

1. Government issues nominal liabilities (money/bonds) today.

2. Households value them based on expected future **real backing** (surpluses).

3. If expected backing **falls**, the real value must fall.

How can the real value fall?

With nominal B given in the short run, adjustment can occur via a **higher** P_t.

- In a frictionless model, P_t can **jump** instantly (a one-time price-level revaluation).

- With sticky prices, the same revaluation can show up as **persistent inflation** over time.

- This helps explain why inflation may rise even if policy rates do not move immediately.

Three fiscal paths: why expectations matter

- **Temporary deficit** + credible future surpluses: little inflation pressure.

- **Deficit without backing**: inflation/price-level jump reduces the real value of liabilities.

- **Persistent expected deficits**: inflation can remain elevated until fiscal news improves.

- Cochraneś framing: the key object is **news about the present value of surpluses**.

Takeaway

Inflation is about the **expected fiscal/monetary regime**, not only current spending.

What this approach adds (relative to slogans)

- It separates two ideas often mixed together:

    - **Aggregate demand** effects of fiscal stimulus (Keynesian channel).

    - **Valuation/anchor** effects through backing of nominal liabilities (fiscal theory channel).

- It makes a clean prediction: inflation responds to **news** about future surpluses/deficits.

- It highlights an empirical task: measuring **expectations** and detecting **regime changes**.

- It also reframes monetary policy (Chapter 3): rate changes work differently depending on debt maturity, price stickiness, and whether fiscal policy adjusts.

Takeaway

We need models that talk about **expectations, policy rules, and debt** in one framework.

Monetary policy

A monetary-policy puzzle: interest rates and inflation

- The doctrine says: **raise rates to lower inflation**.

- But basic accounting points the other way:
    - Higher interest rates raise interest costs on government debt.
    - With one-period debt and no fiscal adjustment, higher nominal rates often imply **higher expected inflation** (a Fisher effect).

- Cochraneś Chapter 3 asks a clean conceptual question:
    - What can a central bank do **on its own**, holding fiscal surpluses fixed?
    - What requires **secondary fiscal channels** (recession-induced deficits/tightening)?

- This matters because modern central banks cannot directly compel taxes or spending.

Takeaway

To understand "rate hikes reduce inflation," we must specify **the regime and the debt structure**.

Sticky prices and long-term debt: a channel for disinflation

- Chapter 3.1 adds two ingredients to the fiscal-valuation view:

  - **Sticky prices** to avoid unrealistic instant price-level jumps.
  - **Long-term government debt** (not only one-period debt).

- Key intuition (valuation):

  - Higher expected future rates lower **today's long-term bond prices**.
  - If the present value of primary surpluses is unchanged, the real value of nominal liabilities must match.
  - Therefore, a fall in bond prices can require a **lower price level today** (disinflation on impact).

- In these models, rate hikes can generate a **temporary** fall in inflation and output, while long-run Fisher forces may still differ.

Takeaway

A coherent story of monetary policy requires: **sticky prices + debt maturity + fiscal expectations**.

Roadmap for the semester

How we will study inflation and the price level

1. **Measurement and facts**
   - CPI vs PCE; expectations; Fisher equation; stylized inflation episodes.

2. **IS–LM and AD–AS (benchmark)**
   - A first short-run framework; what it gets right/wrong given modern institutions.

3. **New Keynesian model (workhorse)**
   - Euler/IS curve, Phillips curve, Taylor rule; determinacy and credibility.

4. **Fiscal theory and regimes**
   - Government budget constraint, debt valuation, monetary vs fiscal dominance.

5. **Interest rates and inflation (the hard question)**
   - When do rate hikes disinflate? How do debt maturity and fiscal responses matter?

Promise

By the end, you should be able to tell a coherent story about **episodes** like 2021–2022.

How this connects to what you learned last semester

- RBC emphasized: real allocations, productivity shocks, and intertemporal prices.

- This semester adds two ingredients (and keeps the RBC core):
    - **Nominal frictions** (sticky prices/wages) so monetary policy matters in the short run.
    - **Nominal liabilities and fiscal backing** so the price level is anchored.

- A useful mental map:
    - **Flexible prices** determine the *real* equilibrium (output, natural rate).
    - **Nominal anchor/regime** determines P_t and inflation dynamics.

Takeaway

Think: **RBC core** + **nominal side** + **policy regime** $\Rightarrow$ inflation and P_t.

Next time

- Define inflation vs. the price level; real vs. nominal variables.

- Introduce basic identities and the Fisher equation.

- A first benchmark model: IS–LM (and why we will later move beyond it).