Comments on Fiscal Influences on Inflation in OECD Countries, 2020-2022 by Robert J. Barro and Francesco Bianchi

Luis Garicano
London School of Economics

ECB Fiscal Conference
December 19, 2023

What isn't FTPL

Fiscal deficits lead to inflation

What is FTPL?

- Fiscal deficits cause inflation when agents have the *expectation* that they will be unfunded

  - Not financed through spending cuts, increases in taxes or lower real interest rates.

- Economic history tells us often happens during wars (Hall and Sargent, 2022)
- It also tells us that deficits that DO correspond to surpluses happen typically in normal time (Cochrane, 2023 book.)
- Barro and Bianchi:

> *"The upshot of this perspective is that fiscal deficits and inflation might not be much related during normal economic times but could be closely connected during unusual events."*

Explicit model of this regime switch

Bassetto and Miller (2023) model explicitly 2 regimes, M and F:

- Bond buyers perceive the probability of the M regime to be high: expect the future price level to be unresponsive to fiscal news (flat part of Figure)
- Bad news about deficits have an immediate impact on prices when fear about likelihood of F regime, information sensitiveness increases. Risk is high near fiscal capacity limit.

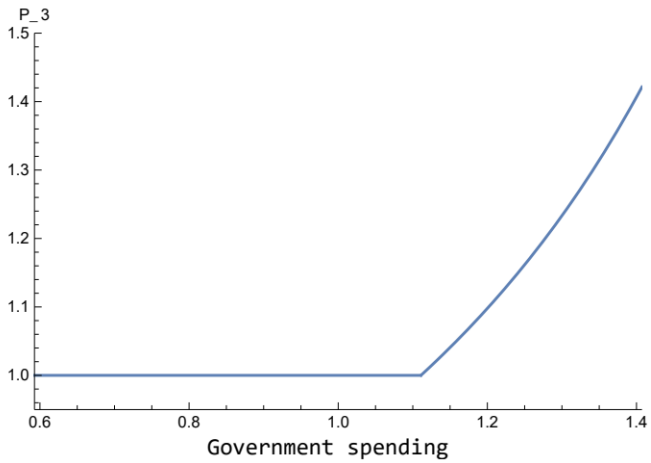

Figure 1: "Long-run" relationship between prices and government spending

Barro and Bianchi

- With short term debt, flexible prices and one-off shock, price-level jumps.
  - The price level does not jump (although a price shock is a pretty good description of what happened.)
- Three possible ways to generalize the model while keeping it simple to account for 3 years of inflation due to single shock
  - Sticky prices (Cochrane's preferred approach).
  - Or add up 3 years of inflation to handle sticky prices.
  - Here: Long term debt: even with flexible prices, higher future inflation can devalue today's debt.
    - Get a simple equation that holds even with flexible prices in which a single fiscal shock leads to three years of inflation.
    - Measure eventual rise in price level divided by the initial surplus shock. Slope is the fraction that is not repaid by subsequent surpluses.

$$\pi - \pi^* = \eta \frac{\sum_{i=0}^{M} \Delta \left(\frac{G_{t+i}}{Y_{t+i}} \right)}{\frac{B_t^*}{2 Y_t P_t} T}$$

Contribution

- Novel use of fiscal theory to understand a crucial empirical question
- FTPL is the right framework to study the interaction of monetary and fiscal policy in determining inflation
- Findings consistent with a significant impact of unfunded COVID deficits on inflation
- Under the FTPL null 40% to 50% where unbacked.
  - the rest perceived as backed by either cuts in spending or higher taxes or lower rates.

Model: Intertemporal equilibrium

Eq. condition: NPV of government real primary surplus must be enough to finance the outstanding stock of public debt:

$$\frac{B_t}{P_t} = \sum_{i=0}^{\infty} \frac{(T_{t+i} - G_{t+i})}{(1+r)^i}$$

Assume no govt revenue increase. Covid shock increases spending for M periods:

$$\sum_{i=0}^{M} \frac{\Delta(G_{t+i})}{(1+r)^i} =$$

or equivalently (assuming g=r), the change in primary surplus is:

$$\sum_{i=0}^{M} \frac{\Delta(G_{t+i})}{(1+r)^i} \frac{Y_t g^i}{Y_{t+i}} = Y_t \sum_{i=0}^{M} \Delta\left(\frac{G_{t+i}}{Y_{t+i}}\right) =$$

$$= Y_t \sum_{i=0}^{M} \Delta\left(\frac{G_{t+i}}{Y_{t+i}}\right)$$

i.e. sum of change in ratio of primary govt spending to GDP.

Value of debt

The total stock of bonds today is the NPV of bonds due at each future date

$$B_t = \sum_{i=0}^{T} \frac{B_t^{(i)}}{(1+r)^i \prod_{k=1}^{i}(1+\pi_k)}$$

Assume: (1) debt to gdp expected constant (debt grows at rate g=r); (2) expected inflation is $\pi^\star$ Then:

$$B_t = B_0 \sum_{t=0}^{T} \frac{(1+\pi^*)^t}{\prod_{i=1}^{T}(1+\pi_{t+i})}$$

If inflation turns out as anticipated:

$$B_t^* = B_t^0(1+T)$$

And if inflation deviates from the expected level:

$$\Delta B = B_0 \left[\frac{1+\pi^*}{1+\pi_{t+1}} - 1\right] + B_0 \left[\frac{(1+\pi^*)^2}{(1+\pi_{t+1})(1+\pi_{t+2})} - 1\right] + \cdots$$

Simplifying

Mechanism: CB ensures inflation to a constant $\pi > \pi^*$ goes up smoothly to ensure debt sustainability,

$$\Delta B_t = B_0 \left[\left(\frac{1+\pi}{\pi - \pi^*} \right) \left(1 - \left(\frac{1+\pi^*}{1+\pi} \right)^T \right) - T \right]$$

note that the Taylor expansion for π around π^* is

$$\left(\frac{1+\pi^*}{1+\pi} \right)^T = 1 + \frac{T(\pi - \pi^*))}{(\pi^* + 1)} + \frac{((T-1)T(\pi - \pi^*)^2)}{(2(\pi^* + 1)^2)}$$

Which simplifies the increase in debt to

$$\Delta B_t = -B_0^t \frac{1}{2} T^2 (\pi - \pi^*)$$

Estimating Equation

Now we have that the real value of unfunded debt increase is

$$\frac{\Delta B_t}{P_t} = -B_0^t \frac{1}{2P_t} T^2(\pi - \pi^*)$$

Where we can replace $\frac{B_t^*}{(1+T)} = B_t^0$
The right hand side is the NPV of unfunded government deficit:

$$-\frac{B_t^*}{(1+T)} \frac{1}{2P_t} T^2(\pi - \pi^*) = Y_t \sum_{i=0}^{M} \Delta \left(\frac{G_{t+i}}{Y_{t+i}} \right)$$

Estimating equation assumes some new debt will be funded:

$$\pi - \pi^* = \eta \frac{\sum_{i=0}^{M} \Delta \left(\frac{G_{t+i}}{Y_{t+i}} \right)}{\frac{B_t^*}{2Y_t P_t} T}$$

The role of the maturity structure

Long-term debt with a given maturity structure

- Fiscal shock need not lead to immediate inflation $\frac{P_t}{P_{t-1}}$
- But can instead be soaked up by lower bond prices $Q_t^{(t+j)}$ which in turn, those come from expected future inflation $\mathbb{E}_t(\frac{P_t}{P_{t+j}})$

$$\sum_j \frac{Q_t^{(t+j)} B_{t-1}^{(t+j)}}{P_t} = \mathbb{E}_t \left[\sum \beta^j s_{t+j}\right]$$

$$Q_t^{(t+j)} = \beta^j \mathbb{E}_t \left(\frac{P_t}{P_{t+j}}\right)$$

Who decides between current and future inflation? Assume that "Monetary authority does whatever is necessary to generate the chosen time path of inflation levels"

Taking it to the data

$$\pi - \pi^* = \eta \frac{\sum_{i=0}^{M} \Delta \left(\frac{G_{t+i}}{Y_{t+i}} \right)}{\frac{B_t^*}{2 Y_t P_t} T}$$

1. Inflation rate reacts to the cumulative surge in ratios of government spending to GDP divided by the initial debt-GDP
2. Slope η measures the unfunded part of the deficit. $\eta = 0$ if all spending paid by cuts.
   - Should be part of model from start
3. Hypothesis/explanation of "this time is different":
   - Normal times: $\eta = 0$, expect government budgets to balance.
   - War/pandemics: expect some debt defaulted through inflation.
4. Inflation increase larger the smaller baseline debt-GDP, $\frac{B_t^*}{Y_t P_t}$.
5. Higher debt maturity, $T - >$ smaller increase in inflation
   - With cumulative increase in G/Y held fixed and the inflation rate equalized over T periods, a higher T implies that a smaller inflation rate is required each period

Empirical strategy

Estimate ("old school" econometrics!) cross-country correlation of:

1. excess inflation $\pi - \pi^{\star}$ (in three years 2020-22, relative to inflation for 2010-2019); with
2. excess govt spending/GDP (in 2020-22 relative to 2019) divided by the ratio of gross public debt to GDP in 2019 and by the duration of the debt in 2019.

Comments

1. Supply shock interpretation
2. Initial debt in the denominator
3. Europe/eurozone implications

1. Can we rule out Supply Shock interpretation?

Authors argue that "The important property needed for identification is that most of the cross-country variations in this composite spending variable can be treated as exogenous with respect to inflation." Can we rule out a large supply shock?

Supply Shock example

- Suppose supply shock drives increase in energy price.
- Higher energy prices or lower prices of everything else?
- CB given sticky prices/wages, chooses higher overall price level.
- Supply shock spreads through the economy
- Nothing nefarious, a natural result of the inflation targeting (not price level targeting) with a medium term orientation

Does this matter? Result is the same, key claim still true:

> *"The point estimates suggest that only 40-50% of the extra spending was financed through inflation, whereas the remaining 50-60% was paid for through the more conventional method of intertemporal public finance that involves increases in current or prospective government revenue or cuts in prospective future spending."*

2. Initial debt in denominator

As authors recognize, it is less intuitive that the rise in the inflation rate is larger the smaller the baseline debt-GDP ratio, $\frac{B_t^*}{Y_t P_t}$.

- This result follows because a smaller debt-GDP ratio implies that a higher inflation rate is required to get the decline in the real market value of public debt needed to balance the surge in real primary deficits.

Is this a feature of this version of FTPL? Or would it be true in any version. Consider a simple two period model

3. The Eurozone

Is this a European story also? Wide variation across countries in inflation rates.

Fixing the Euro:
How to Avoid Bailouts and Inflation, and Separate Monetary and Fiscal Policies

[Preliminary Draft. Please do not quote. We welcome comments.]

John H. Cochrane
Luis Garicano
and Klaus Masuch[1]

[1]John H. Cochrane: Hoover Institution at Stanford University and NBER. john.cochrane@stanford.edu. Luis Garicano: London School of Economics and CEPR. Klaus Masuch: European Central Bank. The views expressed are those of the authors and do not necessarily reflect those of our institutions, in particular the ECB.

Cochrane, Garicano, Masuch (2024)

- Discuss how institutions governing the euro changed over time, leading to lack of credibility of fiscal rules for mainly large member states and a blurring of monetary-fiscal separation.
- Fragile current state: high debt in several large member states, large sovereign bond holdings of the Eurosystem and TPI risk to expectations and incentives of national governments and private actors / investors.
- Institutional changes are urgent to ensure that the euro area is prepared for future adverse shocks, and can avoid the risks of high inflation, socially costly bail-outs and weak trend income growth.

Conclusion

- Path-breaking work taking fiscal theory to data
- Parsimonious explanation of an important phenomenon.
- Important implications for policy.