1. We need to start modeling fiscal-monetary interactions

- In the US currently, the public’s beliefs, as reflected in asset markets, clearly connect sustained deficits with inflation risk.
- The recent crisis, while its source was in unusual financial market disturbances, and while it has generated unusual monetary policy responses, has also generated very unusual fiscal policy responses.
- The recent US Fed balance sheet expansion has deliberately moved some risk onto the Fed and has involved the Fed negotiating unique transactions with particular private agents.
- Legislators recognize these as inherently fiscal dimensions of policy, and are accordingly (and unsurprisingly) threatening Fed independence.
- Therefore, as in Japan in recent years, the Fed must now look over its shoulder at the implications for its independence of any major policy action it might take, and markets understand this.

2. Existing models punt

- They assume from the start no connection of the fiscal situation to monetary policy, even indirectly.
- On the other hand, they typically include an exogenously drifting “inflation target” as an element of the monetary policy reaction function.
- The drift in the target explains most of the low frequency movement in inflation.
- This amounts to giving up any attempt to explain the broad outlines of inflation history — it rose in the 70’s because Arthur Burns wanted it to, it came down in the 80’s because Volcker and Greenspan Feds wanted it to.
- There is good reason to think that these low frequency movements in the target were influenced by the fiscal situation.
4. JOINT FISCAL-MONETARY POLICY RHETORIC ESSENTIAL TO CREDIBILITY

5. WHAT TO DO ABOUT IT

- Stick with theory and calibration (i.e., sophisticated guesswork) (see Eggertsson)?
- Or try to get more detailed insight from the data. (i.e., in this case, more sophisticated guesswork).
- How to model and identify?
6. Modeling fiscal policy

- Fiscal policy, in the sense of the path of the primary surplus, is persistent and variable.
- If agents can “see” the low-frequency component of fiscal policy, it will move their expectations around by large amounts while the direct effects on current fiscal variables are small.
- Rather than simply giving agents direct knowledge of fiscal variables $k$ periods in advance, we make the primary surplus a state-space model with three components:
  - a mildly persistent component
  - a large component that responds strongly and temporarily to the current level of output
  - an AR component with two roots fairly close to one and small innovation: very persistent rate of growth; small shocks imply large revisions in beliefs about the future
- If agents see these components separately, we might hope to find periods when long run expectations about fiscal policy shift, which could show up in financial markets without much current change in “fiscal variables”.
- Shocks to this long run component of fiscal policy might then change long-short interest rate spreads immediately and produce both persistent changes in the inflation rate and persistent changes in the primary surplus.

7. How does fiscal policy influence monetary policy?

- Few central bankers these days think of themselves as reacting to fiscal pressures.
- But even if they do not, the public knows that it is unsustainable for the central bank to remain hawkish on inflation indefinitely while at the same time the fiscal authorities allow real debt to expand indefinitely.
- One tractable modeling approach is to suppose that the public has in mind a (small) probability that in the next period there will be a one-time switch to a different monetary/fiscal regime, that will be sustainable, but that may involve inflationary finance.
- This approach just adds terms to the expectational equations in the model, which then can be interpreted as describing the economy before the switch.
• Standard transversality conditions apply, as long as the model implies a non-zero probability of an arbitrary long period before the switch occurs.

8. VAR evidence for the existence of this type of shock

• This is a model fit to quarterly data from 1957-2005 on the primary deficit divided by market value of marketable Treasury debt, the consumption price deflator, real GDP, the federal funds rate, and the 10 year Treasury rate.

• Observe that there is one shock, the consumption deflator innovation (after contemporaneous correlation with the primary deficit variable is removed), that is the most important source of long run variation in both the primary deficit divided by gdp, and the price level.

• Long run effects are sometimes poorly estimated. But these are statistically fairly firm.
Responses of PriDef2ByB

![Graph showing responses of PriDef2ByB with different variables and time series.](image-url)
12. Modeling Sensitivity of Interest Rate Policy to the Fiscal Situation

- Though we know that over long spans of time and across countries there is a dependence of monetary policy on the fiscal situation, the dependence is not an acknowledged component of monetary policy nowadays.
- Greenspan did occasionally suggest that interest rates could be lower if deficits were brought under control.
• The response might be nonlinear — When interest expense becomes a substantial proportion of the budget, the central bank is unlikely to ignore the potential impact of interest rate changes on the budget, and at the same time legislators might be more willing to take painful restrictive actions.

13. MODEL UNDER CONSTRUCTION

\[ M \text{ policy : } r_t = \gamma r_{t-1} + (1 - \gamma) \bar{\rho} + \theta (\pi_t - 1) + \nu_t \left( \frac{c_t}{\bar{c}_{t-1}} - 1 \right) + \nu_2 b_t + \epsilon_{m,t} \]

\[ IS^* : \beta (1 + r_t) \left( \frac{c_{t+1} \bar{c}_{t+1}}{\bar{c}_t} \right)^{-\sigma_1} \frac{\lambda_{t+1}}{\bar{\lambda}_{t+1}} = \lambda_t c_t^{-\sigma_1} \]

\[ IS^* : \bar{b}_t = \frac{b_{t-1} \bar{c}_{t-1}}{\pi_t \bar{c}_t} \left( a_{t-1} + \frac{a_{t-1}}{a_t} \right) - \bar{\tau} - \tau_t \]

\[ \text{termstruc}^* : 1 + r_t = a_t + \frac{a_t}{a_{t+1}} - z_{a,t} \]

\[ \text{Phillps Curve}^* : \pi_t = \bar{\pi}_{t+1} \left( \frac{c_{t+1}}{\bar{c}_t} \right)^{\delta_2} (1 + z_{p,t}) \]

\[ F \text{ policy : } \tau = \phi_0 + \omega_0 \frac{c_t}{\bar{c}_t} + \phi_1 b + z_{\ell,t} + z_{st} + \epsilon_{\tau} \]

\[ \lambda \text{ defn}^* : \lambda_t = \beta \left( \left( \beta + \frac{(c_{t-1} \bar{c}_t)}{c_t \bar{c}_{t-1}} \right)^{1-\sigma_0} \frac{\sigma_0 - \sigma_1}{1-\sigma_0} + \left( \beta \left( \frac{c_{t+1} \bar{c}_t}{c_t \bar{c}_{t+1}} \right)^{1-\sigma_0} + 1 \right)^{\frac{\sigma_0 - \sigma_1}{1-\sigma_0}} \right) \]

\[ \text{growth : } \bar{c}_t = \mu \bar{c}_{t-1} \cdot (1 + \epsilon_{g,t}) \]

\[ \text{fiscal shocks : } \begin{cases} z_{\ell,t} = \alpha_{\ell_1} z_{\ell,t-1} + \alpha_{\ell_2} z_{\ell,t-2} + \epsilon_{\ell,t} \\ z_{s,t} = \alpha_s z_{s,t-1} + \epsilon_{s,t} \end{cases} \]

\[ \hat{\pi} \text{ definition : } \hat{\pi}_t = \pi_t + x_{t-1} \]

\[ \text{jump prob : } x_t = \alpha_x x_{t-1} + \psi b_t + \epsilon_{x,t} \]

14. MODEL NOTES

• The “\( \lambda \text{ defn} \)” equation is a FOC generated from a specification in which agents maximize a discounted sum of CES aggregates of current and lagged consumption:

\[ E \left[ \frac{1}{1-\sigma_1} \sum_{t=0}^{\infty} \beta^t (C_t^{1-\sigma_0} + \beta C_{t+1}^{1-\sigma_0}) \right] \]
The starred equations are forward-looking — i.e. implicitly contain endogenous forecast error disturbances.

- $E_t \hat{\pi}_{t+1}$ is expected inflation accounting for the possibility of a one-time price-jump event. $E_t \pi_{t+1}$ is expected inflation conditional on there being no jump. The model solution describes the behavior of the economy as long as the jump does not occur.

15.

Responses to inflation expectation shock
16. **Responses to long run fiscal shock**

17. **Is any of this relevant to Japan?**

- The mechanism by which deficits generate inflationary pressure is that increased debt in the hands of the public at a given price level, if it corresponds to no expectation of future primary surpluses to finance it, makes people wealthier and thereby increases their spending.
- If the debt debt issue generates expectations that future taxes will increase, or that future transfer payments in the form of retirement benefits or health insurance payments will decrease, there is no inflationary pressure.
Another way to make the same point: Deflationary equilibria are a problem only if they correspond to a situation where the public is trying to replace real capital with government paper, thus depressing real investment. The policy prescription to get out of such an equilibrium is to commit to making government paper a worse investment than real capital.

This requires that fiscal and monetary authorities deliver a consistent message: Government debt is not a great investment, because we intend to pay for it partly with inflation, while keeping nominal interest rates low.

18. Conclusion

- We need to bring coherence to monetary and fiscal policy, both in the US and Japan.
- In Japan, it could mainly focus on commitment to devaluing government debt via inflation.
- In the US, we may be moving beyond the need for that kind of commitment. But we may shortly be needing the other kind of co-ordination, which was missing in the 1970’s, that makes it clear that the fiscal authorities are not relying indefinitely on a low-interest rate, high deficit policy.
- In any case, monetary policy models that cannot begin to discuss these issues need to be replaced.