Presentation to CBO on Fed’s New Monetary Framework

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1. Mean scenario as reflected by asset markets and in response to Fed communication regarding new framework
   - I read the new framework as average inflation targeting, with a longer averaging period than current, but ambiguity over the period length.
   - Asymmetry: switch back to flexible inflation targeting if inflation runs above target
   - Experimentation: review and revise plan based on what the Fed learns

2. Tail scenarios interacting with high level of debt

Extra graphs at end.
Data from Bloomberg unless otherwise specified.
Expected Inflation Measures
Path of Short Rate from Eurodollar Futures

- Eurodollar 3Mo @8/14/2020
- Eurodollar 3Mo @8/31/2020
- Eurodollar 3Mo @6/1/2020
Present Value Budget Constraint

\[ \sum_{n=1}^{N} Q_{t,n} P_{t,n} \equiv B_t = \sum_{j=0}^{\infty} M_{t,t+j} S_{t+j} \]  

(1)

In riskless environment where debt is riskless, the discount factor is the one-period interest rate set by the Fed \( r_t \) minus liquidity services on Treasury debt, \( c_y_t \)

\[ M_{t,t+j} = \prod_{j=0}^{\infty} \frac{1}{1 + r_{t+j} - c_y_{t+j}} \]  

(2)

Fix future surpluses at \( S_{t+j} \). Impact of a change in the path of the policy rate, \( r_{t+j} \), depends on

\[ \frac{\partial}{\partial \text{Path}} \left[ \sum_{n=1}^{N} Q_{t,n} P_{t,n} - \sum_{j=0}^{\infty} M_{t,t+j} S_{t+j} \right] \]  

(3)

i.e., if the derivative is negative, then future surpluses can adjust down to satisfy budget constraint

- Duration of current debt vs duration of future surplus?
- Impact of path on future surpluses, via impact on GDP
Current debt (publicly held and counting excess reserves as 1 day debt) is 3.5 years. (Massive) Treasury issuance plus Fed purchases have led to shortening

Surplus claim is a long-duration asset.
  • For next decade(s?) surpluses are negative; negative duration
  • Presumably far into the future, surpluses are positive, and look proportional to GDP; positive duration

Government is net long duration (lower rates benefit fiscal position), while running a long/short carry position

Exposure is to path of rates from say 3.5 to 10-15 years
QE of $120bn per month (plus future expectations of QE) driving up convenience yields
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Tail: It is Hard to Maintain Risk-Free Debt when Debt is High

\[ B_t = E_t \left[ \sum_{j=0}^{\infty} M_{t,t+j} S_{t+j} \right] \]  \hspace{1cm} (4)

• Suppose output is a random walk with drift

\[ \Delta \log Y_t = g + \epsilon_t \]  \hspace{1cm} (5)

• To maintain debt risk-free, the term \( E_t \left[ \sum_{j=0}^{\infty} M_{t,t+j} S_{t+j} \right] \) must be insulated against negative \( \epsilon_t \)
  1. Financial markets drive up Treasury convenience yield after negative shocks, pushing up \( M \)
     (negative-\( \beta \))
  2. Raise future surpluses
  3. Default/restructuring/inflation

• (1) Convenience yields diminish at high levels of debt.
• (2) Suppose \( S_{t+j} = Y_{t+j} s_t \) with \( s_t \) chosen at time \( t \) after observing \( \epsilon_t \). Then -1\% realization, with \( s_t \) fixed, means \( E_t \left[ \sum_{j=0}^{\infty} M_{t,t+j} S_{t+j} \right] \) falls by \( \sim 1\% \)
  • \( s_t \) must adjust so that future surpluses rise by \( \sim 1\% \times B_t \)
March 2020, Tail Event?

(a) LT Treasury Yields

Source: He, Nagel, and Song (2020)
Tail Risk: The Bad Equilibrium

EXTRA SLIDES
Debt and Duration

Source: CRSP, Bloomberg, from Jiang, Lustig, Van Nieuwerburgh, and Xialan (2020)
Duration including Reserves

Source: CRSP, Fed, Bloomberg, from Jiang, Lustig, Van Nieuwerburgh, and Xialan (2020)
Valuation under a Conventional SDF Calibrated to Equity Risk Premium

Figure 6: Present Value of Government Surpluses and Market Value of Government Debt

Source: Jiang, Lustig, Van Nieuwerburgh, and Xialan (2020)