Monetary Policy Drivers of Bond and Equity Risks

Discussion by

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Big Picture

• What drives bond and stock prices?

• Neo-Keynesian model with four shocks:
  - preference shock
  - monetary policy shock
  - Philips curve shock
  - Trend inflation shock

• Three different sub periods with three different monetary policy regimes
  - Different focus on inflation versus output gap.
    Note: separate estimation of the model for three periods, so there are no expectations on (probability of) regime switches. Learning?

• Eventual goal: explain different levels of CAPM betas for bonds across different periods. What about other asset pricing facts?
**Big Picture**

- Important questions

- What is the role of bonds under different monetary policy regimes - when are they hedges against stock market risk?

- In recent financial crisis bonds increased in value (negative beta).

- Generally zero beta, with positive values in 80s/90s and negative in crisis.

- Authors present a nice and parsimonious framework, but can do more with this than they currently do.

- Main focus is on matching betas and volatilities.
Panel A: CAPM Beta of 10 YR Nominal Bond

Panel B: Std. of 10 YR Nominal Bond Returns (%) Ann.
Four Equations

IS curve

Price setting

Central Bank

Trend Inflation

\[
x_t = \rho^x x_{t-1} + \rho^x E_t x_{t+1} - \psi(E_t i_t - E_t \pi_{t+1}) + u_t^{IS},
\]

\[
\pi_t = \rho^\pi \pi_{t-1} + (1 - \rho^\pi) E_t \pi_{t+1} + \lambda x_t + u_t^{PC},
\]

\[
i_t = \rho^i (i_{t-1} - \pi^*_t) + (1 - \rho^i) [\gamma^x x_t + \gamma^\pi (\pi_t - \pi^*_t)] + \pi^*_t + u_t^{MP},
\]

\[
\pi^*_t = \pi_{t-1} + u^*_t.
\]
IS curve

Derived from two equations:
1. “Habit formation” preference
2. Euler equation for 1-period T-bill

What role does “habit formation” play in the paper?

Consumption surplus ratio \( S = (C - H)/C \)

Letting lower case letters denote logs, then \( s + c = \ln(C-H) \)

The authors model \( s + c \) as a linear function of the log output gap (\( x \)) and lagged output gap (stationary):

\[
s_t + c_t = x_t - \theta x_{t-1} - v_t,
\]

Detrended consumption closely related to output gap.
Habit Formation Motivation

Habit formation specification does not seem to add to time variation in risk premia, because the log(C-H) is modeled as a linear function of $x$.

Even though detrended consumption is closely related to output gap, the difference specification in $x$ (logs), implies that SDF is related to the ratio of $X$ and $X(-1)$.

To get time varying volatility, authors add stochastic volatility to all shocks, by multiplying the variance of all shocks by $\exp(-bx(-1))$, or more precisely, the log-linearized version of this: $1 - b x(-1)$. 
Main Insights


Statistically significantly different?
Some Comments

• Why are monetary policy shocks not contemporaneously taken into account? Empirically, bond markets react quickly to monetary policy announcements.

• Identifying assumption is that all shocks are uncorrelated, but do share same factor driving time varying volatility. Less degrees of freedom, but question is interpretation (variance decomposition?).
Wish List

- Usual pricing equations. How well does this SDF do?

- Bond return predictability (habit or SV?). Frequency of bond risk premium variation seems higher than stocks.

- Dividend strips

- Trend growth versus temporary deviations
Conclusion

- Important topic. Nice paper. Different monetary regimes can lead to different bond betas.

- Why just focus on bond betas and bond vols? Model allows you to focus on broad set of moments: risk premia, stock vols, etc.

- Which of your shocks predominantly drive stock and bond prices?