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 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?

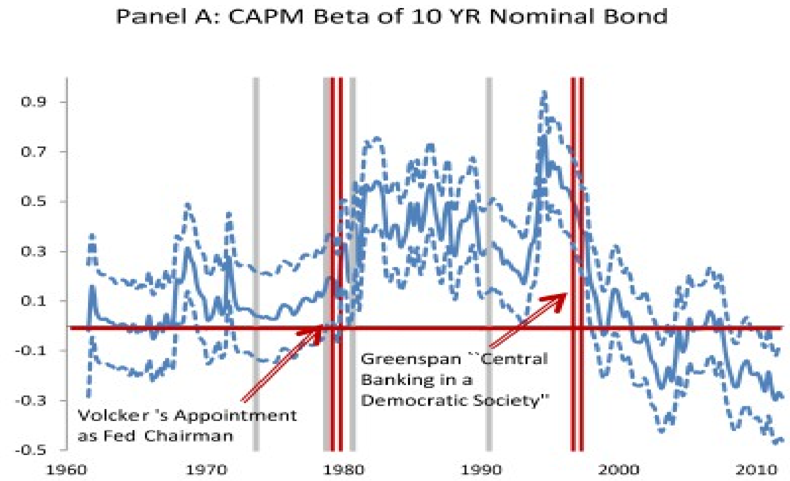
- In recent financial crisis bonds increased in value (negative beta).

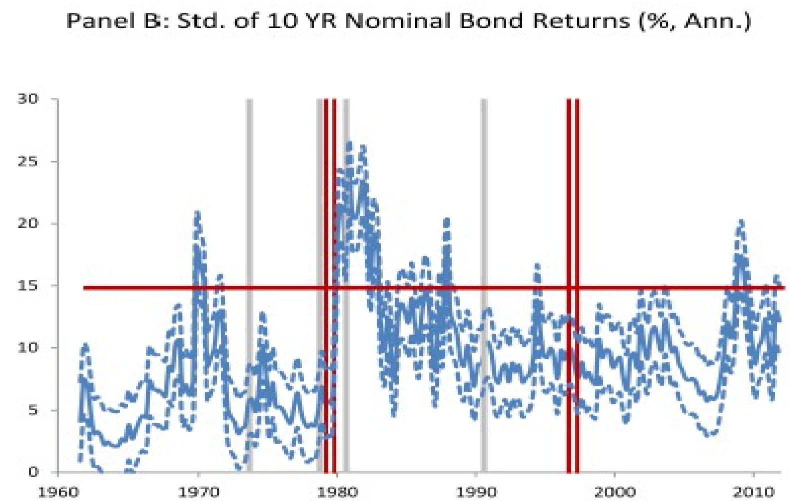
- Generally zero beta, with positive values in 80s/90s and negative in crisis.

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

- Main focus is on matching betas and volatitilties.

CAPM beta of bonds





Four Equations

IS curve

$$x_t = \rho^{x-} x_{t-1} + \rho^{x+} \mathrm{E}_{t-} x_{t+1} - \psi(\mathrm{E}_{t-} i_t - \mathrm{E}_{t-} \pi_{t+1}) + u_t^{IS},$$

Price setting

$$\pi_t = \rho^{\pi} \pi_{t-1} + (1 - \rho^{\pi}) \mathrm{E}_{t-} \pi_{t+1} + \lambda x_t + u_t^{PC},$$

Central Bank

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

Trend Inflation

$$\pi^*_t = \pi^*_{t-1} + u^*_t.$$

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

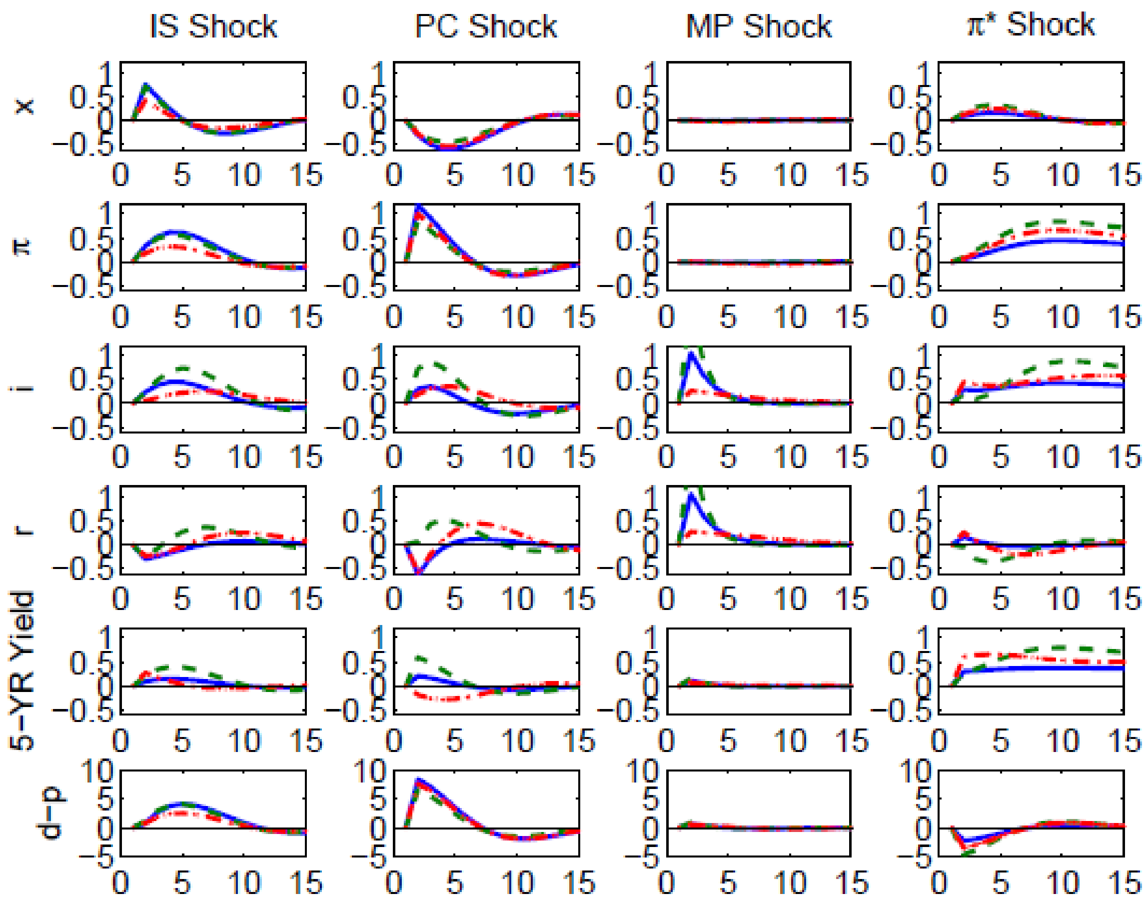
Habit formation specification does not seem to add to time variation in risk premia, because the log(C-H) is modeled as a linear function of x.

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

1960.Q1-1979.Q2 1979.Q3-1996.Q4 1997.Q1-2011.Q4



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?