Discussion of “Risk and Return Trade-off in the U.S. Treasury Market”

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Summary

- The authors first use simple regressions to shed light on the potential relations between risks and returns in the bond markets.
- Motivated by the results from simple regressions, the authors develop a discrete-time term structure model, which explains both the conditional volatility and the expectation hypothesis puzzle in the data, to formally study the risk-return trade off in the U.S. Treasury market.
- The empirical results highlight a few novel findings. One of them is that it is the short-run volatility component of bond yields that explains the risk-return trade off, not the long-run volatility.
General observation

- Well written! The empirical results in the paper help us better understand the fundamental question about the risk return relation in the Treasury market.
Time-varying quantity of risk v.s. time-varying market prices of risks

- Risk vs return = conditional volatility vs conditional mean
- I am totally convinced that GARCH is the proper way to measure the time-varying the conditional volatility, i.e. the time-varying quantity of risk.
- I, however, do feel that the modeling of the conditional mean could be improved, especially the component related to the time-varying market prices of risks.
Time-varying quantity of risk v.s. time-varying market prices of risks (cont.)

- In light of the recent literature, Cochrane and Piazzesi (2005); Joslin, Priebsch, and Singleton (2014); Feunou and Fontaine (2014); Li, Ye, and Yu (2015).

- At least, in addition to the current PCs, two types of variables need to be controlled in the time-varying market prices of risks: a) unspanned macro risks; b) aggregate information in long lagged yields.

- These variables have been proved to have significantly predictive power in forecasting bond excess returns.
Concrete proxy of risks

- For us to infer more practical implications from the revealed risk-return relation, we might as well expect the risk proxy to be more concrete.

- Let’s look at the expected excess return implied by the model (eqn.(16) in the paper):

$$E_t[x_{r,n,t+1}] = c + (nB_{n,1} - (n-1)B_{n-1,1}X_1 - B_{1,1})X_t - (n-1)B_{n-1,1}K V_t$$

- Suppose we are able to trade zero coupon bonds. If we think from the perspective of a trader holding this $n$-year zero coupon bond, is $V_t$ the genuine proxy of risks that this trader faces?
Concrete proxy of risks (cont.)

- Probably,

\[ \text{Var}_t(xr_{n,t+1}) = (n - 1)^2 B_{n-1} \sum t B'_{n-1} \]

is a more relevant proxy of risks this trader is facing. So it might be more interesting to know the sign of the coefficient \( c \) of \( \text{Var}_t(xr_{n,t+1}) \) in the following reduced form equation:

\[ E_t[xr_{n,t+1}] = \ldots + c\text{Var}_t(xr_{n,t+1}) \]

- Similarly, it is equally important to look at the above relation for the excess returns of a coupon bond.

Feunou, B., and J.-S. Fontaine (2014): “Gaussian Term Structure Models and Bond Risk Premia,” Available at SSRN.
