

A discussion of “The Shadow Rate of Interest, Macroeconomic Trends, and Time-Varying Uncertainty” by

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This presentation reflects my own opinion, and only my own, and does not reflect the position of the Bank of Canada or any of its staff.

What this paper does?

- Propose and study two time series models that describe the joint behavior of short-term nominal rate, inflation, output gap and unemployment rate.
- The key departure from existing models is the introduction of the shadow rate: the observed short-term nominal rate i_t^* is

$$i_t^* = \max(i_t, 0),$$

where i_t is the shadow rate.

- The model is used to estimate the trends and transitory movements in inflation, nominal and real short-rate, output gap, and unemployment rate. It is also used to forecast the short-term nominal rate and hence to decompose the long-term yield.
- In contrast with most of the existing dynamic factor term-structure models, only the one period-ahead short-term nominal rate is used and most importantly the proposed framework is very flexible and can accommodate time variation in parameters.

Preview of some results

- While inflation and real rate have been trending down, trend level of output gap turns out to be weakly correlated to its short-term real rate counterpart.
- Both components of the long term yield, namely the expectation and the term premium, have been trending down, which translates into falling interest rate since the early 1980s.
- Although they are very different in terms of construction, this paper's long-term yield decomposition is remarkably similar to the estimates reported in the dynamic term-structure literature.

I liked...

- the fact that using only information in macroeconomic variables (combined with the short term nominal rate), it is possible to provide a realistic decomposition of the long-term yield: an economic model is always preferable to a statistical one.
- the flexibility of the model, this paper allows for shadow rate and all sort of time variation, including stochastic volatilities. This is in sharp contrast with the vast majority of the term structure of interest rate literature where most is done either under the constant variance or linear assumption.
- the estimation procedure: bayesian, which allows to estimate the distribution of each quantity of interest.

Term premium

- I think it is misleading to say that the paper proposes a decomposition of the long term yield. The paper forecasts future short term rate, but does not model the risk-premium, this implies that the term premium is just the residue of subtracting the model implied expected short term rate from the observed long-term yield.
- Related to my previous point, it has been mentioned numerous times in the paper that the proposed approach does not impose the no-arbitrage restrictions. I think this argument is irrelevant, no-arbitrage is a dimension reduction method used when modeling a large cross section of yields. Here, we are only modeling one rate: the short term.

Forecasting accuracy

- The “linear” case $i_t^* = i_t$ should be a benchmark, which can help understand why enforcing the lower constraint is important.
- The focus in the paper is on long-term yield decomposition (or forecasting the short rate at long horizon), how about the short term, less than 1 year?
- How accurate is this model prediction, especially when forecasting the short rate at long horizon? so far the similarity between this paper’s results and Kim and Wright(2005) is the only gauge of its accuracy, how about survey forecast? Is this model performing out of sample?

Survey forecasts

- Affine term structure models are known to be plagued by instability problems believed to be a combination of over-parametrization and small-sample biases due to the high persistence in yields. As a result, the expectations component, and hence the decomposition, is poorly identified. I am wondering if the models proposed have the same problem, and if yes what is the solution? In the Affine term structure models the inclusion of additional information on the actual dynamics with survey forecasts is a natural and effective way of dealing with this imbalance. Do we have to do the same thing here?

Inflation risk-premium

- In principle, this framework can also be used to describe the expected inflation and the inflation risk-premium, which are also components of the long-term yield.
- It is found that the confidence sets on the short-term real rate trend is wide, especially when macroeconomic information are not used. I wonder whether using observed real short-term yield (TIPS) cannot help narrow the confidence sets?
- This framework can also be used to infer the expected short-term real interest rate, and hence to decompose the long-term real interest rate.

Is the shadow rate really informative?

- The term structure of interest rate literature have documented the fact that model-implied shadow short rates, which have been advocated as measures of the policy stance, are largely uninformative, as they are highly sensitive to model specification, and depend on the exact data at the short end of the yield curve. This is also confirm by this paper finding as the shadow rate estimated from the bivariate model (use only the short-term nominal and inflation) is strikingly different from the flexible Macroeconomic model.

Time of liftoff of the short rate

- Given that evidence, I am wondering what kind of information can we really get out the this paper's shadow rate estimate?
- How long the policy rate can stay near zero? at the lower bound, this provides a partial summary of the stance of monetary policy. The estimation of the time until liftoff is shown to be more robust than the shadow rate, and I think this paper should perform this estimation and compare with that of the Blue Chip Financial Forecasts survey.
- There are papers in the term structure literature that combining complex dynamic, including time varying volatilities and correlation and the shadow rate: Feunou, Fontaine and Le (2015)