Modelling yields at the lower bound through regime shifts

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The paper's motivation

- the lower bound (LB) is not rigid, interest rates could turn somewhat negative, in principle (cash storage costs). A yield-curve model should allow for that.

- low interest rates are much more persistent after a recession in which they reach the lower bound, than after "normal" recessions (13 years in Japan, several years now in the US and Euro-zone).

- after the LB is reached, recessions are deeper and longer than "normal" recessions, monetary policy is not efficient and recovery is slower.

- therefore, modeling yields with one normal, and one LB regime with different (worse) economic dynamics seems warranted.

On the motivation

- slightly negative short rates certainly have been observed, hence this is a desirable model property. How important?

- the empirical evidence from the aftermath of a LB regime is so far not too strong. In the recent years there is one major episode. How far back shall we go? The Great Depression?

- some macro-models do feature deeper post-LB recessions, but the empirical link between a LB regime and the real economy is still not that clear.

Causality?

- the paper may be relying a bit too much on an assumed impact of LB on the real economy
- "periods when nominal rates reach their LB result in deeper and more prolonged recessions."
- "when interest rates are close to their lower bound ... monetary policy cannot impart sufficient economic stimulus, so the recovery is slower."
- too much structure assumed?
- QE or other unconventional tools not mentioned

The relevance of the LB

- has the LB been relevant in the past? Amirault and O'Reilly (2001) cite older papers which do not find LB to have important real implications, or conclude that the impact can be countered by monetary policy.

- did the LB have real implications in the few recent years? Or secular trends dominate? (Fernald, Hall, Stock and Watson (2017))

- will the LB be relevant in the future?
  - a recent NY Fed Survey of primary dealers finds on average 20% probability for the US to be back to the LB by 2019. However, the same respondents expect the Fed target of 2% inflation to be met.
  - Kiley and Roberts (2017) find that in the coming years short-term interest rates could be at or very close to zero 30-40% of the time! However, real implications only under certain specific assumptions about the economic environment and monetary policy.

The paper's modeling approach

- the state vector includes only observable variables (also to control the number of parameters). A yields-only model, uses the term spread, a measure of curvature, and the short rate.

- state-dependent regime-switching probabilities. Returning to a normal regime more likely when short rates are higher. If they are lower, then a "new normal" outcome more likely (secular stagnation hypothesis?).

- however, only bond market variables used, so the link with the real economy is indirect (by assumption)

- the LB applies strictly to short-term rates. Are two regimes needed for modeling the entire yield curve?

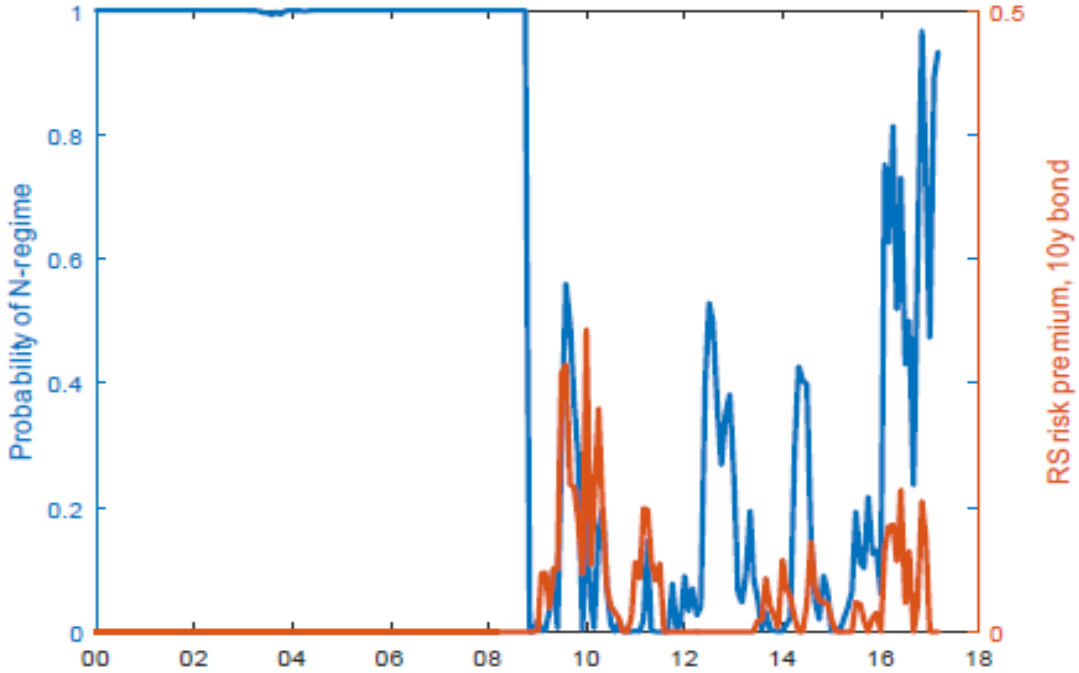
The paper's modeling approach

- in the LB regime, the short-term rate does not affect the other variables of the system and is itself an i.i.d. variable around a constant mean.

- the regime-switching probabilities (under P) are time-varying and state dependent, and assume an ad-hoc vector of critical levels (thresholds), where investors become concerned that the economy would hit the LB. Do the results depend on the choice of these levels?

Regime probability

Figure 5: Probability to be in the normal regime and regime-shift risk premia



- this dynamics is mostly attributed to announcements by the Fed (Section 3.1).
- given the Fed's active role, in what sense is the model forecasting regime probabilities?

Forecasting

- truly out-of-sample: forecasts made in April 2017.
- but isn't this simply comparing the assumptions of different models?
- does the regime-switching model uncover/predict a slower normalization process than the shadow model? Or such a slower process is just a built-in model assumption?
- what are the testable implications of the model, beyond in-sample fit? Use Japanese data (longer sample) to evaluate forecasts? View the forecasts as bond market expectations and compare to expectations from surveys, etc.?

Summary

- the paper contributes to a recent literature with important implications for monetary policy
- regime-switching model with appealing flexibility in modeling the LB regime
- for tractability, the model focuses only on observable, yield variables
- estimated regime-switching probabilities are plausible, although somewhat too dependent on Fed announcements
- the model's forecasting power can be demonstrated more forcefully. Trading?