



Comments on “Identifying Monetary Policy
Shocks: A Natural Language Approach”
by Aruoba and Drechsel

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My Summary of the Paper

- The paper measures monetary policy shocks in U.S. from October 1982 exploiting data obtained by applying Natural Language Processing techniques to the documents prepared for Federal Open Market Committee meetings.
- The paper derives 800+ sentiment indicators that are assumed known alongside the prepared forecasts.
- The indicators help explain interest rate movements through a RIDGE regression exercise and the abstract says "An appealing feature of our procedure is that only a small fraction of interest rate changes is attributed to exogenous shocks."
- The associated monetary policy shocks are used in a five-variable VAR and deliver sensible impulse responses.

Identification

- A key equation is

$$\Delta i_t = \alpha + \beta i_{t-1} + \Gamma(X_t, Z_t) + \varepsilon_t$$

where $\Gamma(\cdot)$ consists of level and quadratic terms in X_t , numerical info, and the sentiment indicators Z_t .

- *what are monetary policy shocks ε_t ? It seems to be some sort of FOMC judgement or interpretation arising from the "decision process" (distinct from the info available to policy makers and other economic agents)?*
- *Not arguing that Greenbook is available contemporaneously but that X_t would be known. But if Z_t measures FOMC 'judgement', is it not part of the monetary policy shock (as in R+R)?*
- *the FOMC-specific sentiment measures do not add substantially to the fit of the model that includes the Greenbook sentiment measures; but this is not evidence that the latter are known to economic agents (what if the test was reversed and the latter was added to the model including the former instead?)*

Interpretation

- I'm a fan of the use of direct measures of real-time phenomenon (e.g. surveys of expectations). But, despite the care and effort that goes into creating the sentiment variables in this paper, it is not clear what they are measuring; cf. the text-based measures of uncertainty.
- The inclusion of 'Japan', 'Mexico', 'Germany', 'Brazil', 'China' and 'weather' as key economic concepts illustrates the problem.
- The surrounding words provide colour to the economic concept (defined as 'sentiment') but still quite a long way from an economic interpretation.

Econometric Issues 1

- Much of the evaluation of the sentiment indicators is on model fit (as in abstract), with the preferred model's $R^2=0.76$ (cf. R+R's 0.5).
- With 876 regressors explaining 210 observations, fit cannot be the primary evaluation criterion
 - *the exercise choosing the RIDGE parameter λ by assuming $R^2=0.9$ shows the arbitrariness of fit in this context*
 - *the k-fold approach is only a little less arbitrary since R^2 would change as k differs from 20*
- Is there scope for finessing the penalty so that, instead of treating all variables neutrally as extra information, the model can hone in on a more economically meaningful set of indicators?
 - *the missing section on "Inspecting the Predictors" will be key here*
 - *the LASSO approach, in which a preferred set of predictors is isolated, might be more insightful in this respect*

Econometric Issues 2

- The inclusion of the quadratic terms seems important - adds a lot of variables and shifts emphasis to non-linearities. But little info on the contribution of these separately to the contribution of the new sentiment indicators.... is it the forecasts or the sentiment terms that benefit most from squaring them ? And any idea why?
- Similarly the extra forecast terms (beyond those used by R+R).... how important are these ?
- The exercise showing the contribution of the new monetary policy shocks in the five-variable VAR justifies the work and tells an interesting story compared to a R+R model. But it is difficult to disentangle the effects of the ZLB and the rest of the changes.
 - *It was unclear to me how the relationship estimated up to October 2008 was used to generate monetary policy shocks for use in the macro exercise running to 2017.*

Structural change

- Related to the above... there were very many shifts in emphasis in monetary policy over the 26 years and the estimated interest rate equation is likely to have been subject to structural change.
- The estimation of a constant interest rate relationship misses the nuances of shifting emphasis in policy setting (cf. Lee et al, *JMCB* 2015)
 - *the k-fold approach is particularly susceptible to this as it uses consistency over sub-samples as a criterion for choosing λ*
- More positively, the Natural Language Processing technique seems eminently suitable for capturing these nuances..... (e.g. highlighting shifting attention between inflationary and recessionary pressures in Taylor rule)

Concluding comments

- Very impressive piece of applied econometrics.
- But the analysis treats the sentiment series simply as 'extra information'. It feels that the sentiment series have still more to offer in exposing the nuances of the decision process.