Project

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Objective of the Project

Estimating responses of key macroeconomic variables to a sentiment shock.

Preview of the results:

1. Most of the variables display a boom-bust response with peaks respectively at 2 and 10 quarters.
2. Effects on inflation are robustly nonsignificant or negative.

Econometric Procedure - Overview

We use a 2-step procedure

1. Estimate series of sentiment shocks using forecast revisions
2. Estimate IRFs via local projection à la Jorda (2005)

Step 1 - Overview

We estimate sentiment shocks as SPF forecast revisions of real GDP growth rate which are orthogonal to

1. contemporaneous structural shocks
2. lagged principal components from a large dataset
3. past and future TFP

Step 1 - Estimation of Z_t

Data

- X_t is log of Real GDP at time t
- $X_{t+k|t} = E[X_{t+k}|I_t]$ provided by SPF

Procedure

$$Z_t = (X_{t+4|t} - X_{t|t}) - (X_{t+4|t-1} - X_{t|t-1})$$

where

- $(X_{t+4|t} - X_{t|t})$ is expected growth rate of Real GDP conditional on information set up to time t
- $(X_{t+4|t-1} - X_{t|t-1})$ is expected growth rate of Real GDP conditional on information set up to time $t-1$
- Z_t is an innovation to the expectations of output growth rate

Step 1 - Estimation of $\tilde{Z}_t$

Problem. Z_t is correlated with current and future fundamentals such as fiscal policy, monetary policy, current and future TFP.

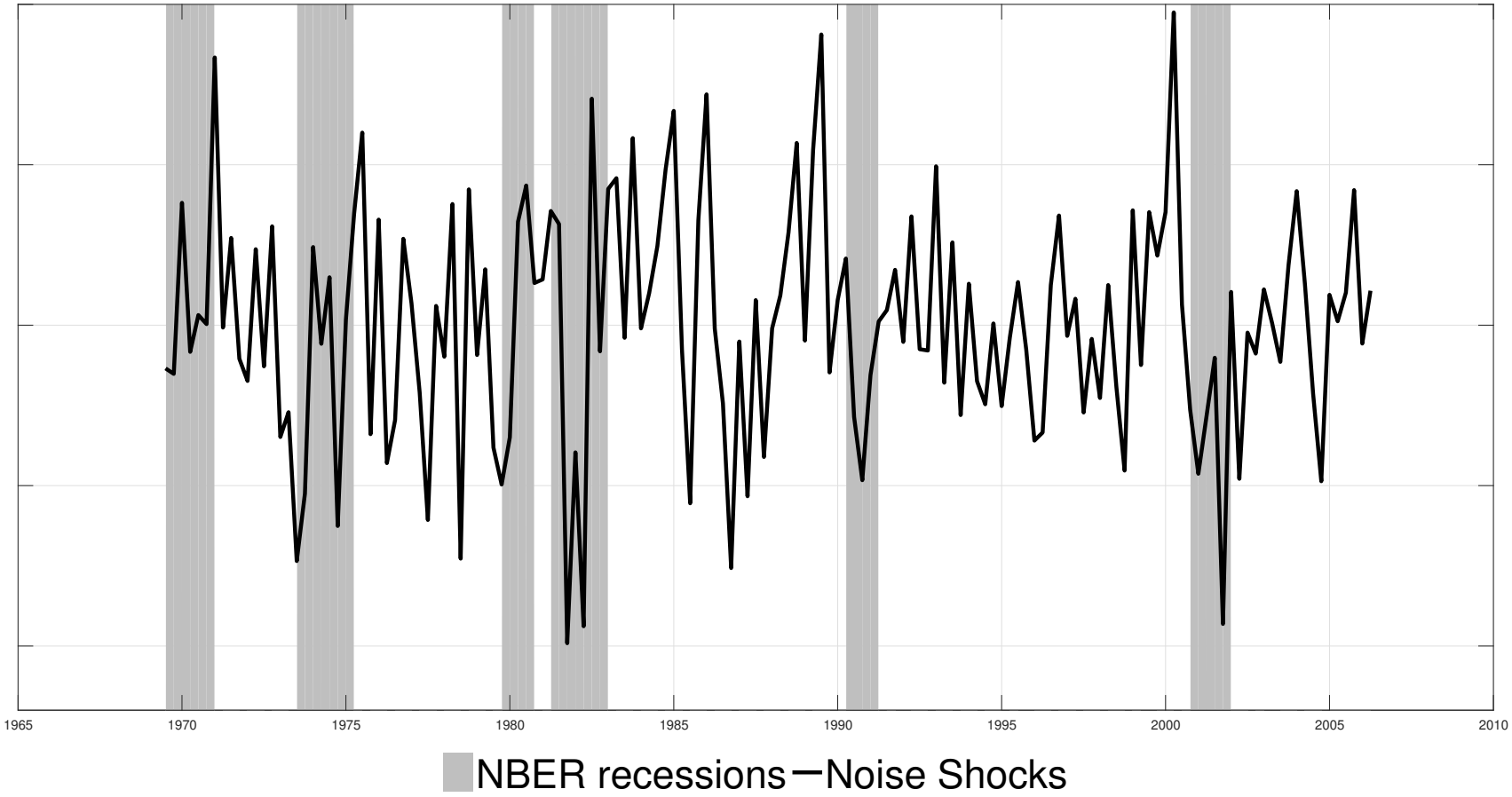
Solution. Estimate $\tilde{Z}_t$ as the residual of the following regression,

$$Z_t = C + \sum_{j=-J}^{H} \delta_j \Delta TFP_{t+j} + \gamma SS_t + \mu PC_{t-1} + \tilde{Z}_t$$

where

- C is a constant parameter
- ΔTFP_t is first difference of utility-adjusted total factor productivity at time t
- SS_t is a vector of structural shocks at time t possibly estimated via narrative approach
- PC_{t-1} is a vector of principal component at time $t-1$

Noise Shocks $\tilde{Z}_t$



Step 2 - Estimation of IRFs to $\tilde{Z}_t$

Define Y_t to be the BP-filtered log-transformation of an endogenous aggregate macroeconomic variable.

Using standard OLS techniques we estimate H regressions

$$Y_{t+h} = \Theta_h^Y \tilde{Z}_t + \epsilon_{t+h}$$

where $h = 1, 2, \ldots, H$ represent the forecast horizon.

$\Theta_1^Y,\ \Theta_2^Y,\ \ldots,\ \Theta_H^Y$ represent the path of the impulse response function of Y_t to a unit deviation of $\tilde{Z}_t$.

Bootstrapping Techniques

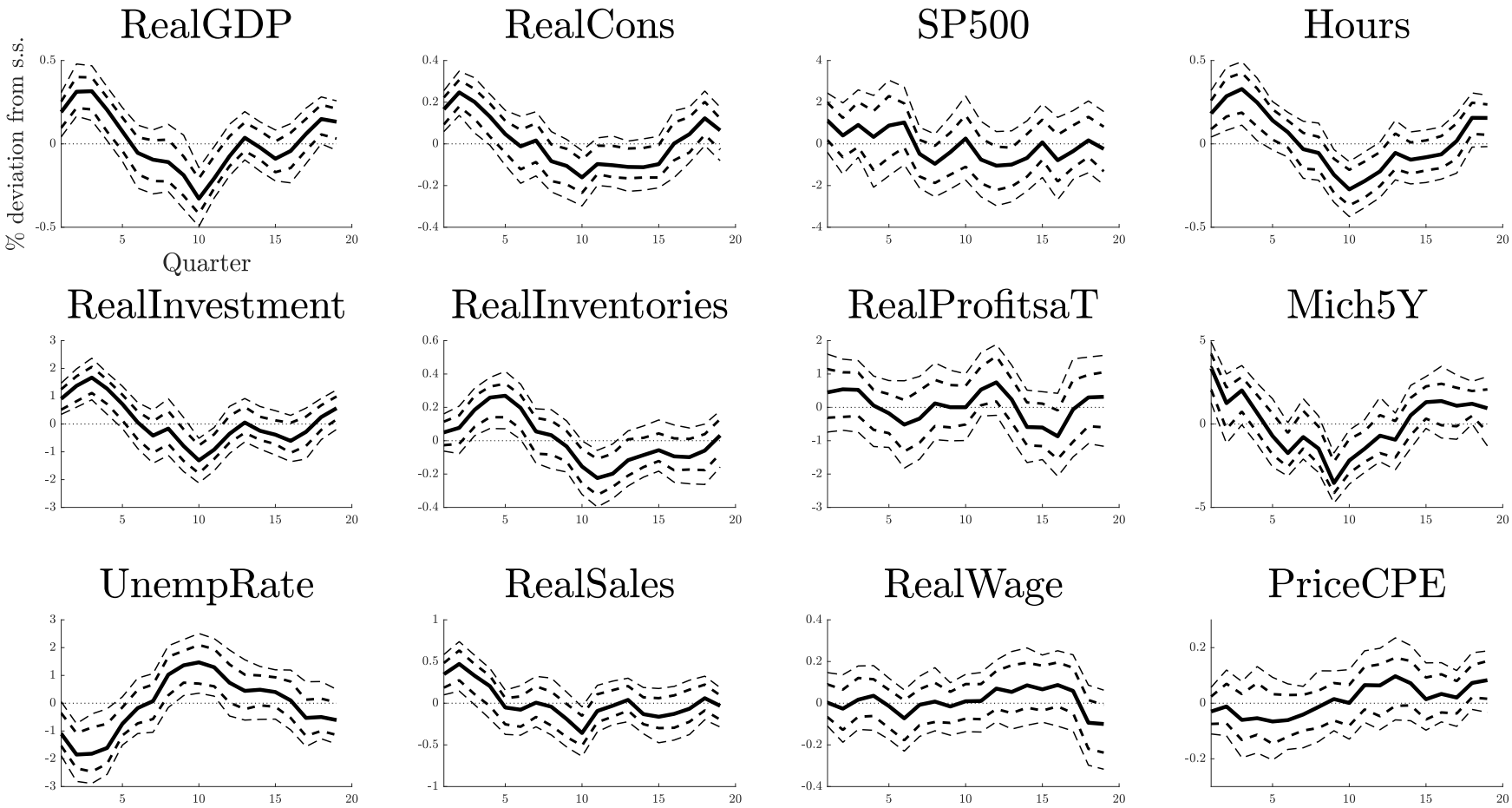
1. Consider the tuple $\Gamma_h^Y = \{Y_{t+h},\ T_t,\ \tilde{Z}_t,\ X_{t-1}\}$.

2. Divide Γ_h^Y over time t in smaller blocks and randomly reorder these blocks in order to form a new tuple $\Gamma_{h,Boot1}^Y$ of the same size of the previous one.

3. Estimate $\Theta_{h,Boot1}$ from $\Gamma_{h,Boot1}^Y$ using standards OLS techniques.

4. Redo (1)-(3) 2000 times and select confidence intervals.

Local Projection - Confidence Interval 68% and 90%



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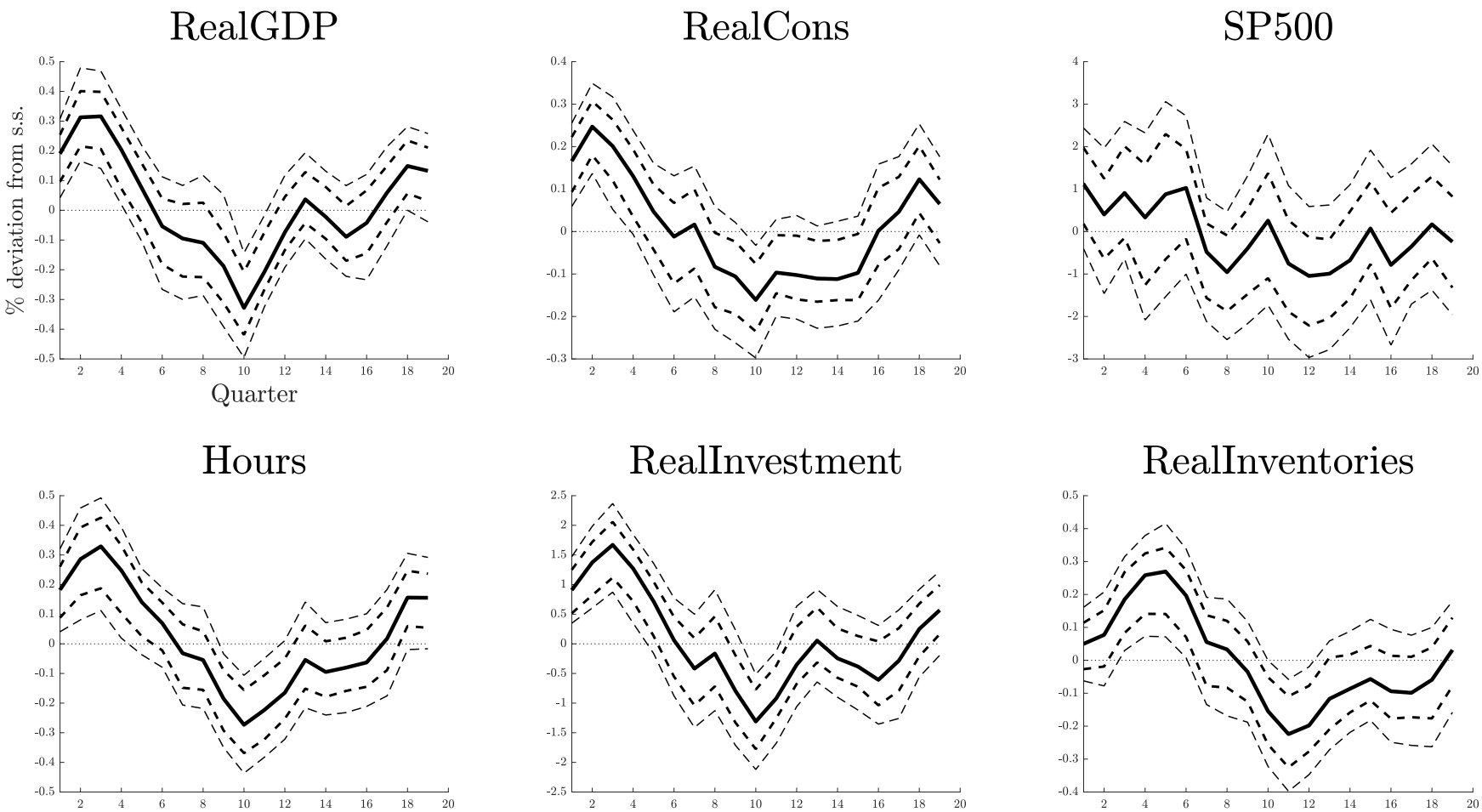

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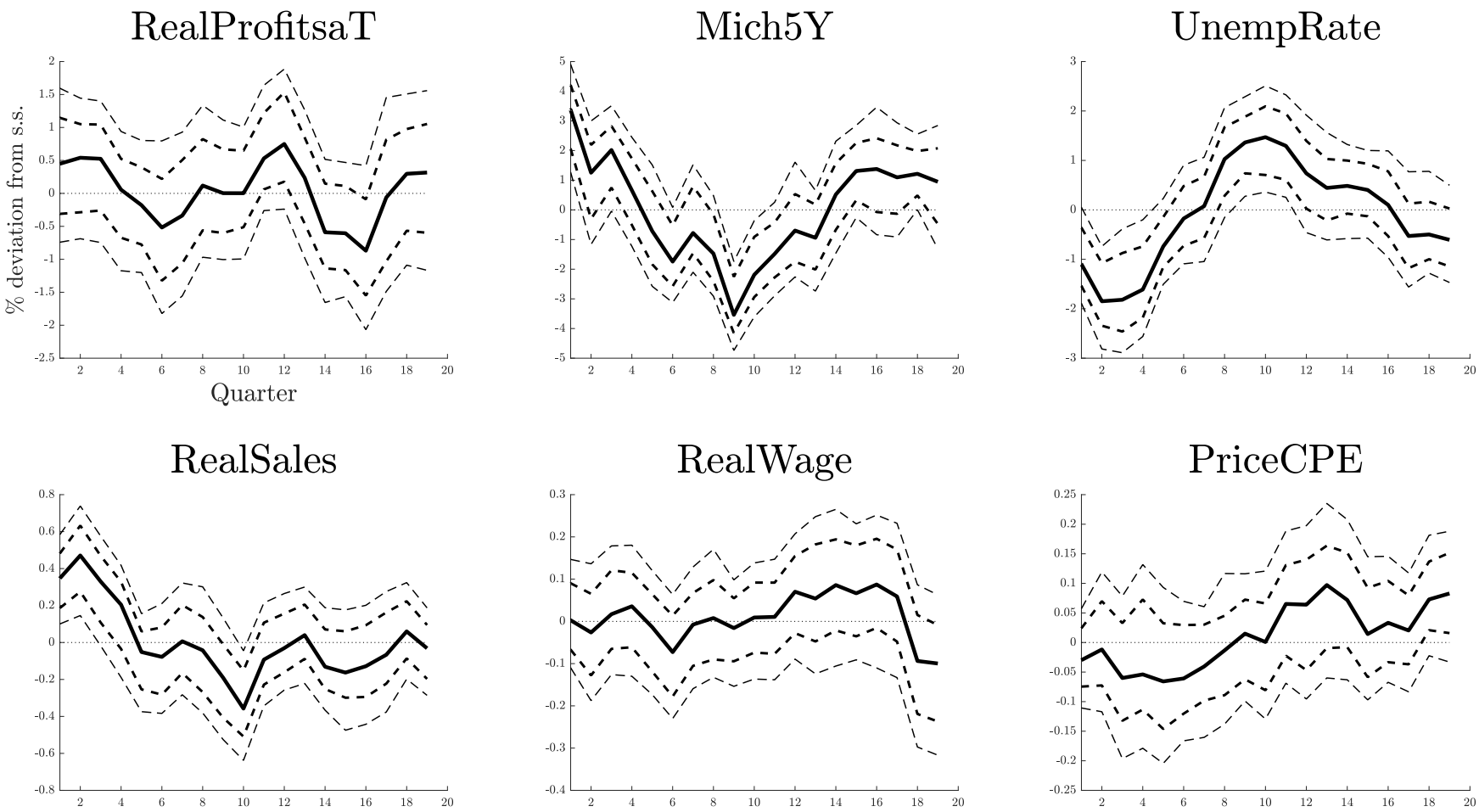

Next

1. Discuss relation with existing literature
   - Typically sentiment shocks are identified as those orthogonal to TFP surprise and news shocks. These restrictions need not to hold (CJ). In fact our shock is correlated with news shocks.
   - Discipline the literature on boom and bust: news that do not materialize vs sunspot. Our results are consistent mostly with the latter due to inventory behaviour (Crouzet and Oh). However, we need to empirically and theoretically investigate the role of non rational expectations.

2. Write a model. How specific? Ideally we would like the model to provide additional testable implications. We could use IBES data to extract expectation (error) at the firm level.