Discussion of

Whither News Shocks?

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Outline

- Identification assumptions for news shocks
- Empirical Findings
- Using NK model used to think about BBL identification.
- Why should we care about news shocks?

BBL Identification for News Shocks

- Identification problem:

$$Y_t = A(L)Y_{t-1} + u_t,$$

$$u_t = C \overbrace{\varepsilon_t}^{\text{fundamental shocks}}, \; E\varepsilon_t\varepsilon_t' = I$$

$$\overbrace{C}^{N^2 \text{ unknowns}} C' = Eu_tu_t' = \overbrace{V}^{\frac{N\times(N+1)}{2} \text{ known things}}$$

BBL News Identification

- Problem

$$u_t = C\varepsilon_t = \overbrace{C_N}^{\text{must get this vector}} \varepsilon_{N,t} + \sum_{i \neq N} C_i \varepsilon_{i,t}$$

- Revision in forecast of TFP growth *k* periods in the future:

$$E_t \Delta TFP_{t+k} - E_{t-1} \Delta TFP_{t+k} = \tau A^k u_t$$

- Here,

$$A \sim \text{companion matrix of VAR}$$

Two Identifying Assumptions

- For large enough *k*, the revision in expectations is proportional to 'news' shock:

$$E_t \Delta TFP_{t+k} - E_{t-1} \Delta TFP_{t+k} = \tau A^k u_t = a\varepsilon_{N,t}$$

- News shock does not have an immediate impact on technology:

$$C_N = \begin{pmatrix} 0 \\ x \\ \vdots \\ x \end{pmatrix}$$

Identification

$$cov(u_t, \tau A^k u_t) = cov(u_t, a\varepsilon_{N,t}) = cov\left(C_N \varepsilon_{N,t} + \sum_{i \neq N} C_i \varepsilon_{i,t}, a\varepsilon_{N,t} \right)$$

$$= cov(C_N \varepsilon_{N,t}, a\varepsilon_{N,t})$$

$$= C_N a.$$

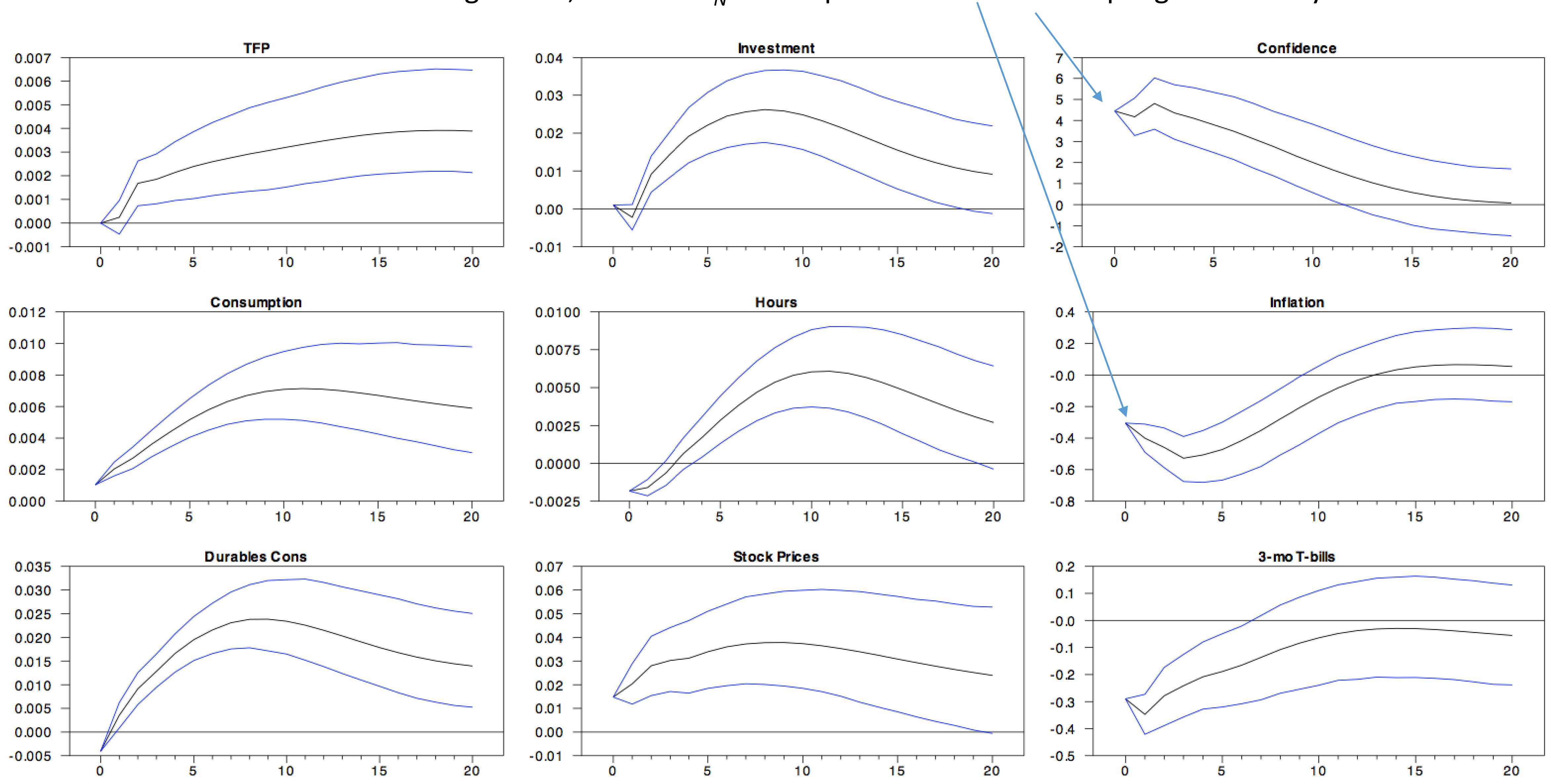
$$std(\tau A^k u_t) = std(a\varepsilon_{N,t}) = a$$

$$\rightarrow \frac{cov(u_t, \tau A^k u_t)}{std(\tau A^k u_t)} = C_N$$

Results

- Results reported in the paper are preliminary.
  - Confidence intervals ignore sampling uncertainty in estimator of C_N.
  - Confidence intervals overstate precision.

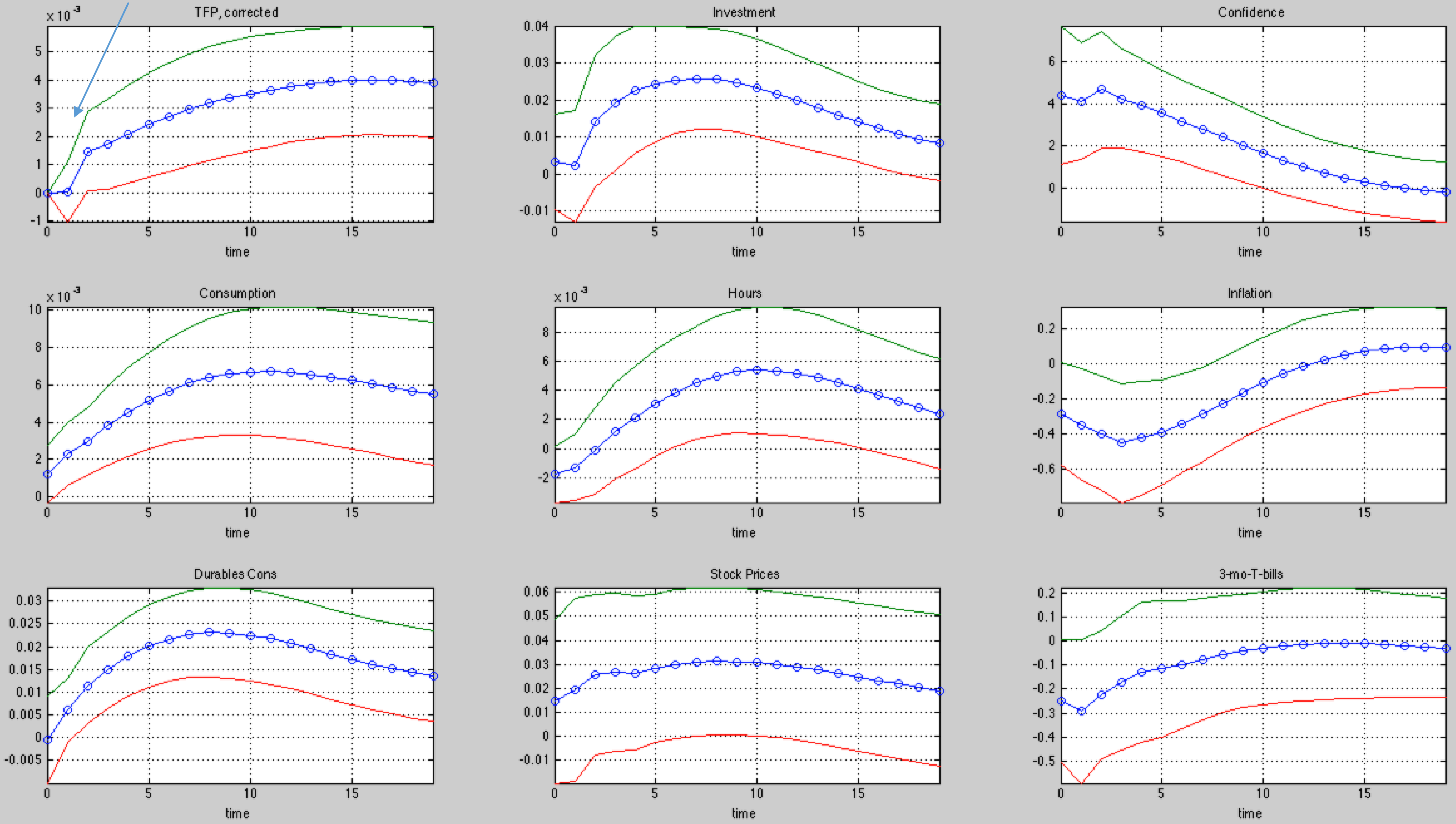
All the confidence intervals are length zero, because C_N was imposed to have no sampling uncertainty.

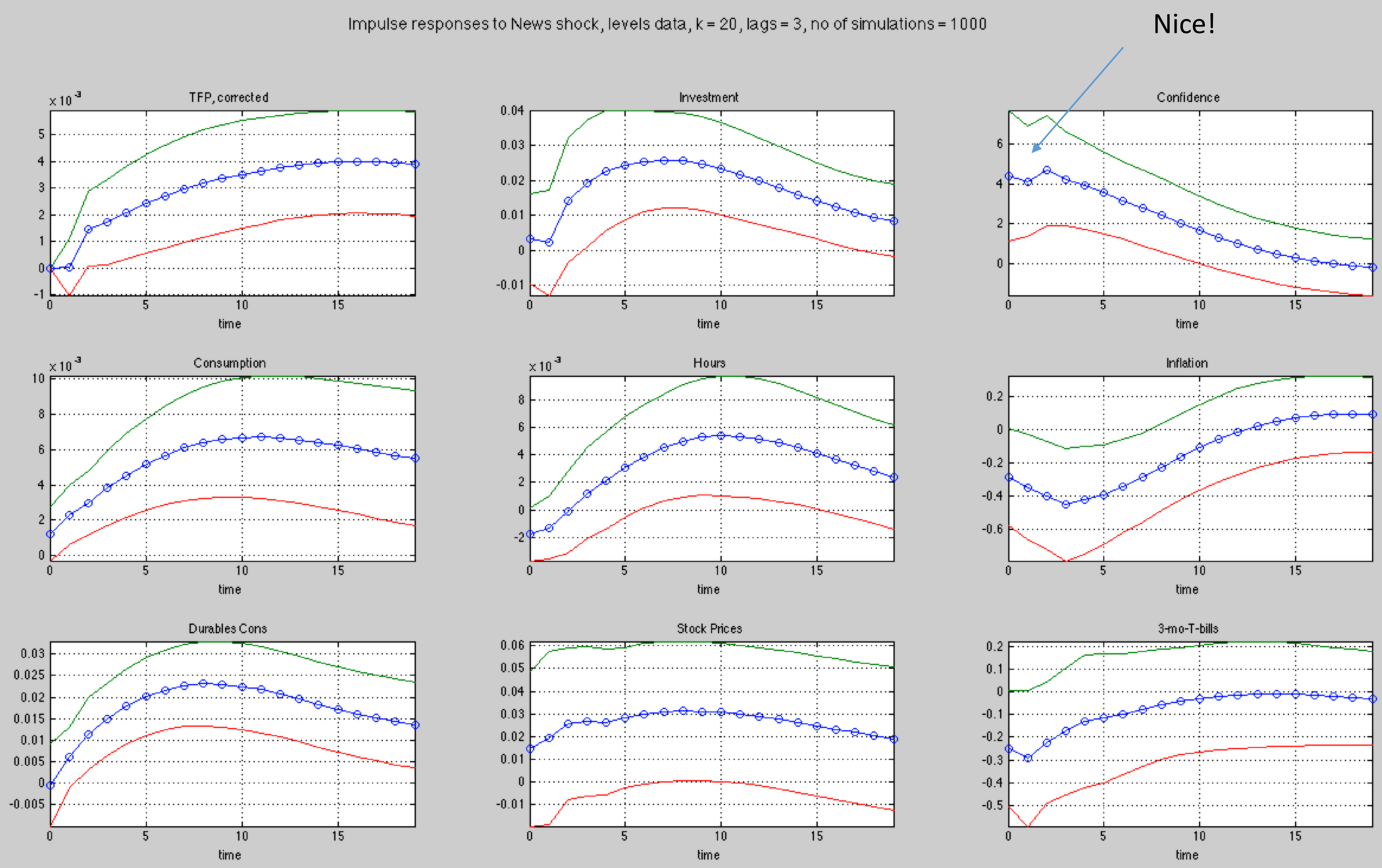


Responses to News Shock (Levels)

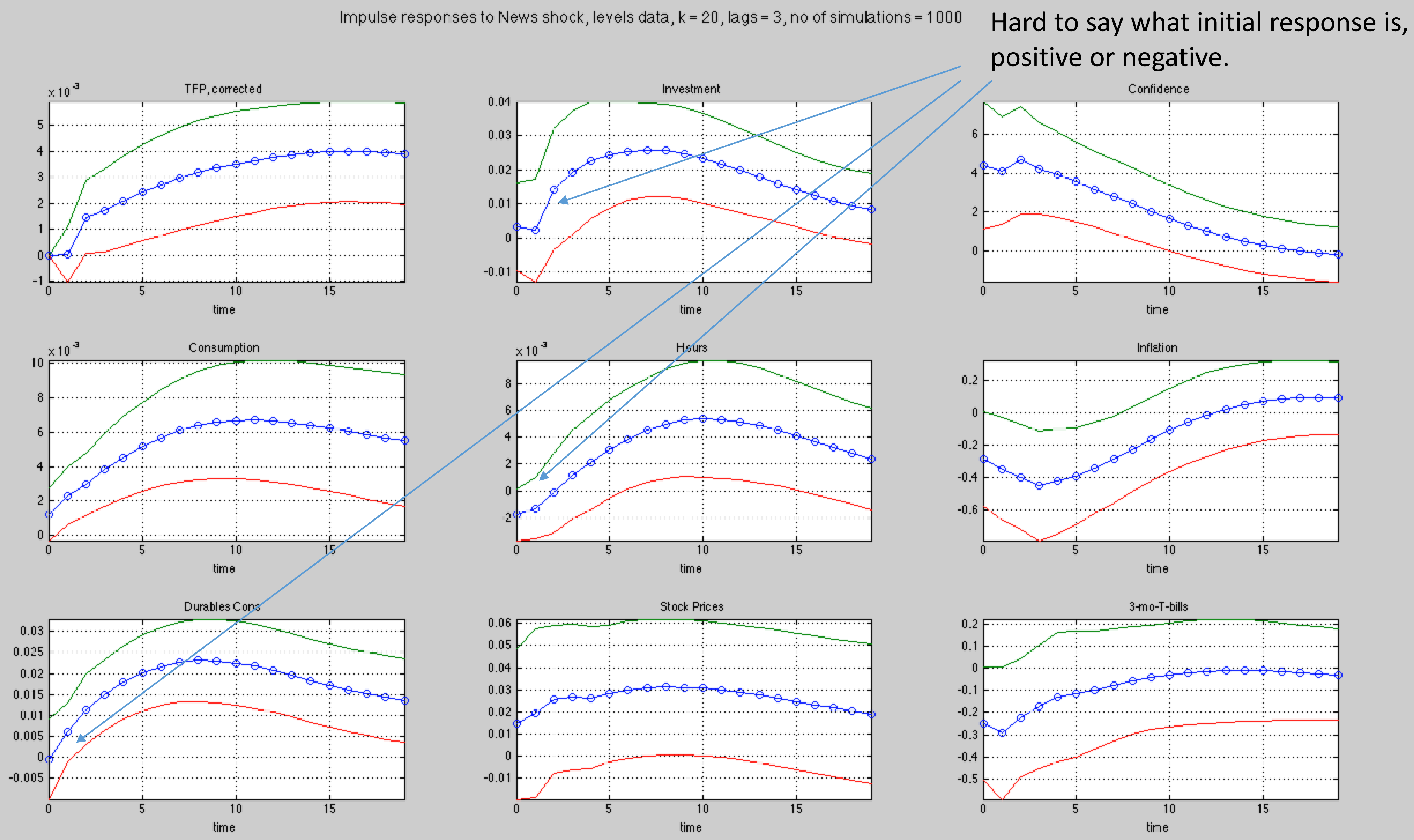
Impulse responses to News shock, levels data, k = 20, lags = 3, no of simulations = 1000

Not a lot of news: TFP starts moving 2 quarters after news





Impulse responses to News shock, levels data, k = 20, lags = 3, no of simulations = 1000
Nice!
TFP, corrected
Investment
Confidence
Consumption
Hours
Inflation
Durables Cons
Stock Prices
3-mo-T-bills
time



Impulse responses to News shock, levels data, k = 20, lags = 3, no of simulations = 1000
Hard to say what initial response is, positive or negative.
TFP, corrected
Investment
Confidence
Consumption
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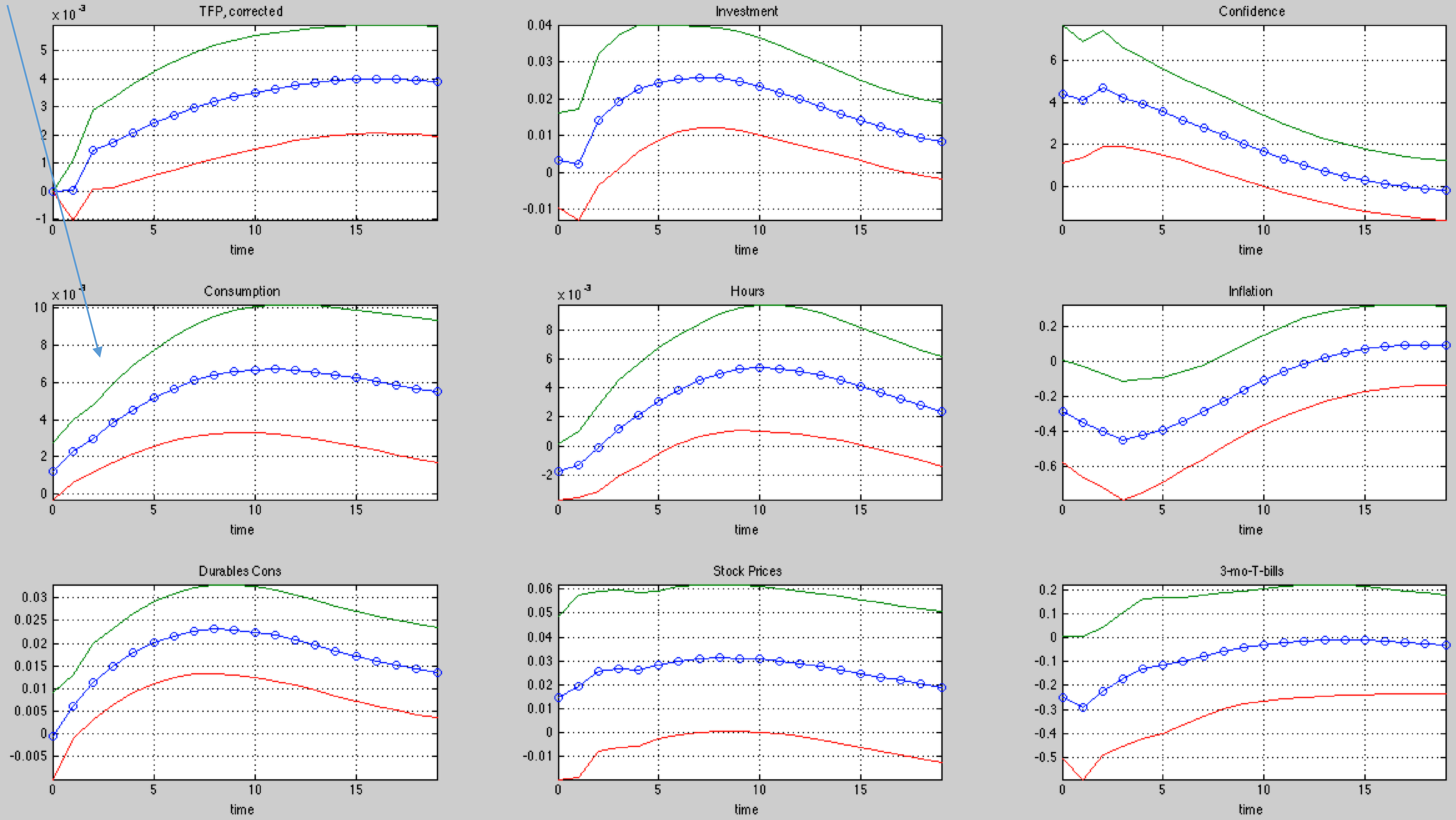
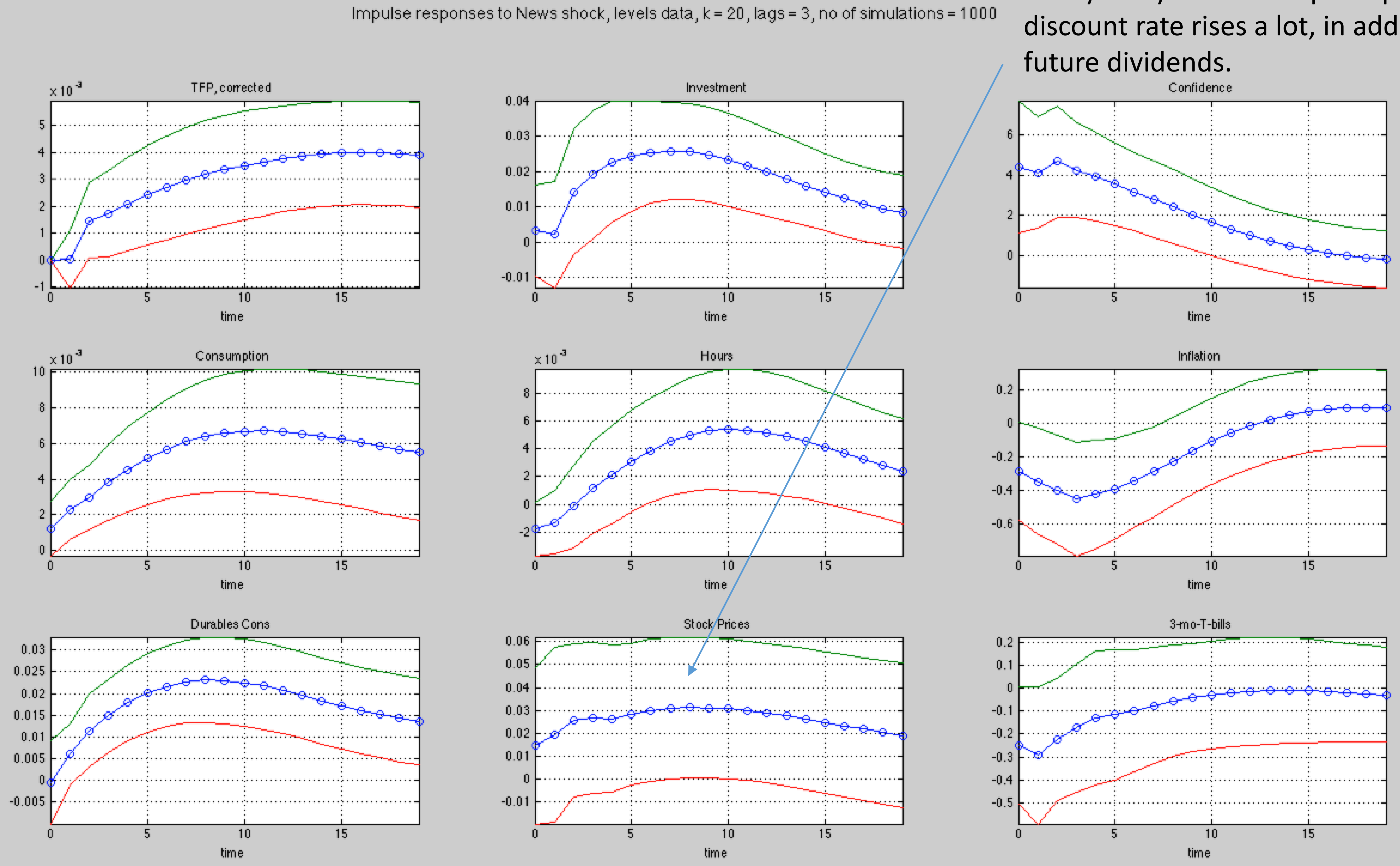
time

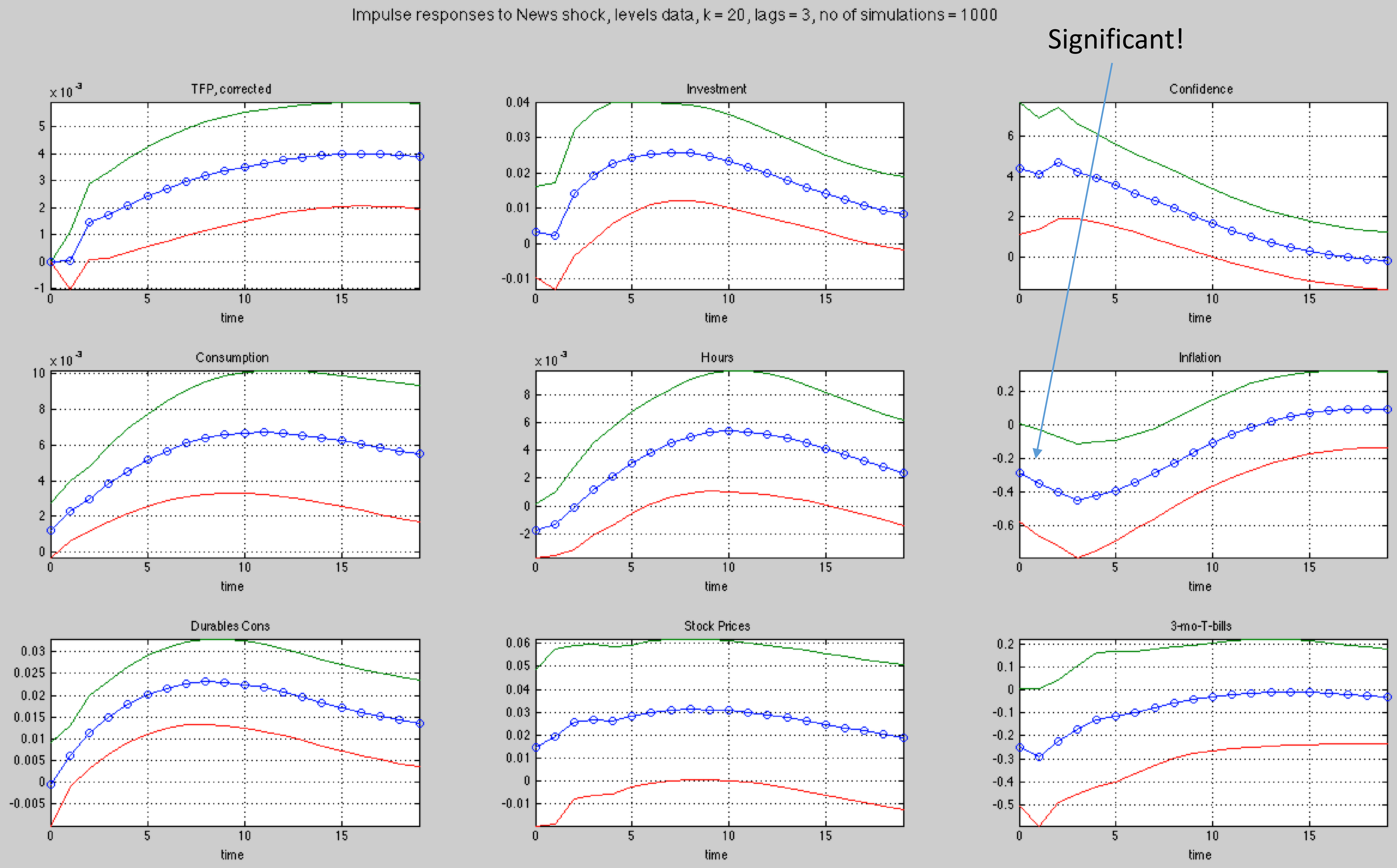
Significant expansion

Impulse responses to News shock, levels data, k = 20, lags = 3, no of simulations = 1000



Pretty noisy estimate….perhaps because discount rate rises a lot, in addition to future dividends.





Impulse responses to News shock, levels data, k = 20, lags = 3, no of simulations = 1000
Significant!
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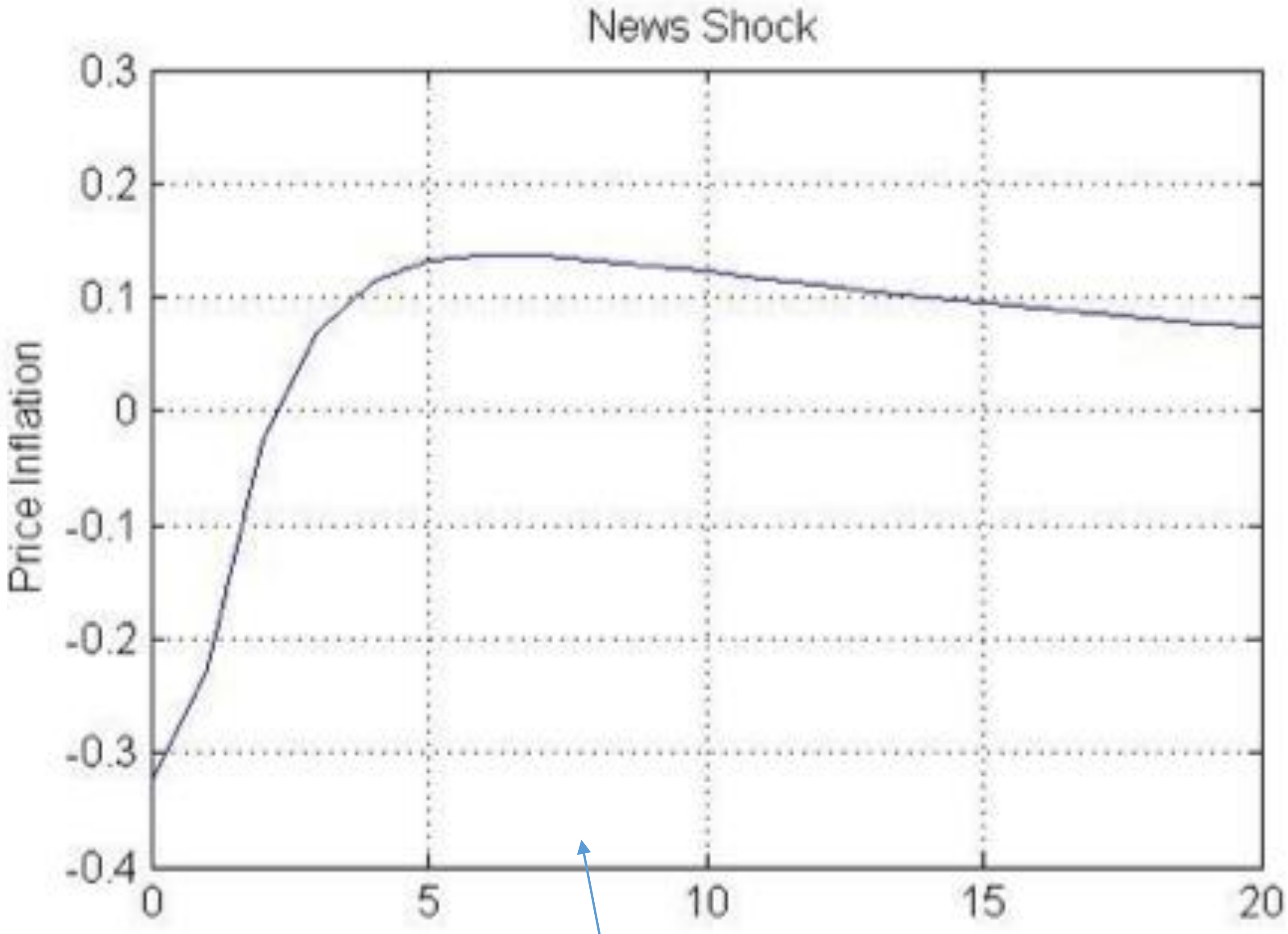
Puzzle: Why Does News Drive Down Inflation?

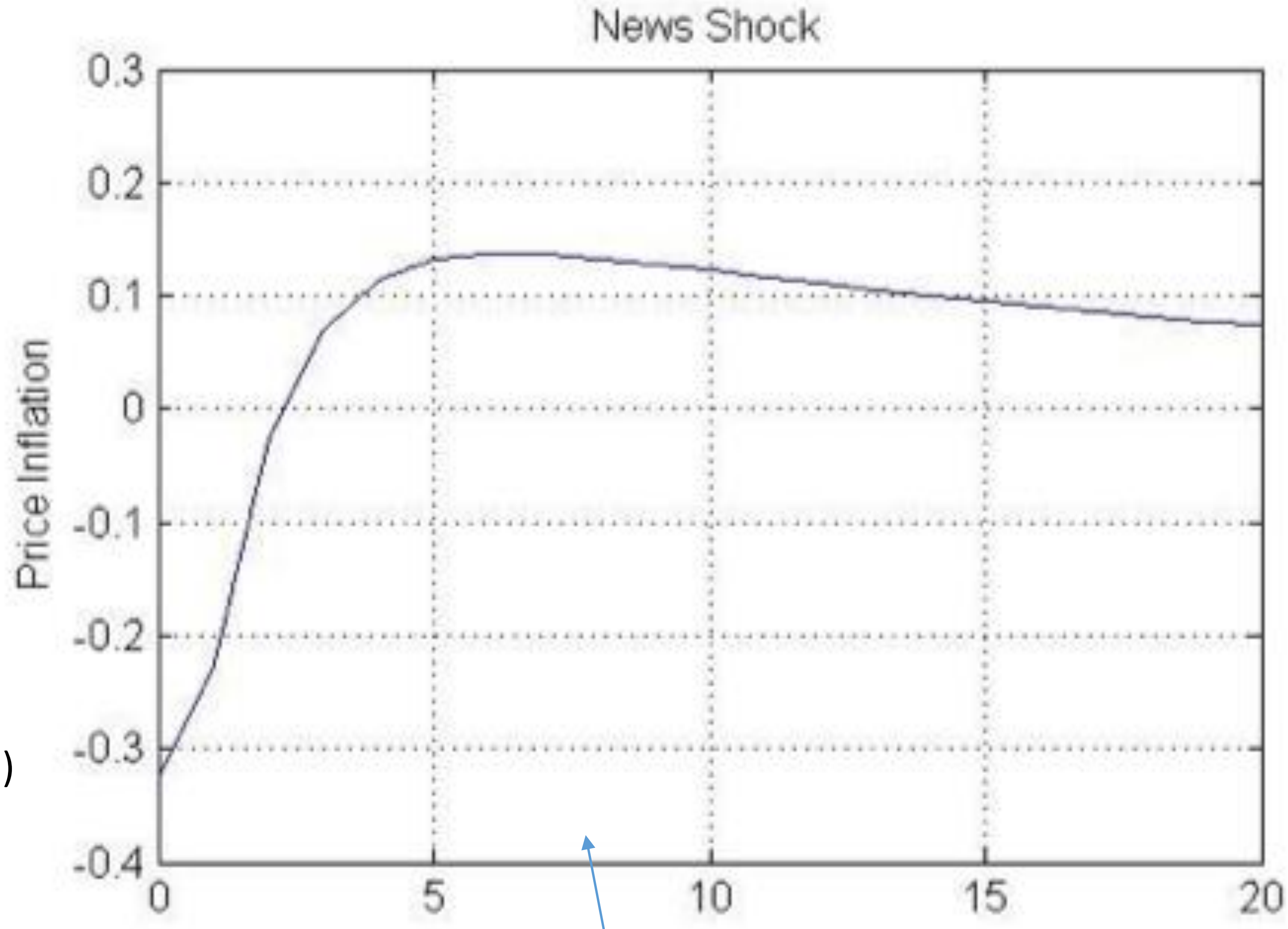
- BBL interpret their impulse responses using an RBC model.
- Allocations and real interest rate, $r - \pi^e$, driven by real part of model.
- Split of real rate into nominal rate and inflation determined by monetary policy.
  - Real rate, $r - \pi^e$, rises, and monetary policy cuts r a lot.
  - Monetary policy drives r down a lot because the coefficient on output growth in the Taylor rule is very large (0.65).
- Notion that cut in r drives inflation *down* seems inconsistent with a lot of evidence.
- Very likely, a fully fleshed out version of the model implies the 'Friedman rule' is optimal.



Inflation goes down for only two quarters, versus eight quarters in the VAR.

Would be helpful if model impulse responses were placed in the same diagram.

This has been standard practice for a long time (see, e.g., Sims, 1989, 'Models and Their Uses,' American Journal of Agricultural Economics; Rotemberg and Woodford, Macro Annual, 1997)



Inflation goes down for only two quarters, versus eight quarters in the VAR.

Next, Use New Keynesian Model to:

- get a sense of whether the identification strategy ‘works’.
- think about the ‘inflation puzzle’.
- think about the question, ‘why care about news shocks?’

Simple NK Model

- Model with three shocks:

$$\pi_t = 0.086 \times s_t + \beta E_t \pi_{t+1}$$

$$x_t = E_t x_{t+1} - [r_t - E_t \pi_{t+1} - r_t^*]$$

$$r_t = 0.8 \times r_{t-1} + (1 - 0.8)1.5 \times \pi_t + u_t$$

$$r_t^* = E_t \Delta a_{t+1}$$

$$s_t = (1 + 1)x_t$$

$$\Delta a_t = \varepsilon_{1,t} + g_{t-1},\ g_t = 0.2 \times g_{t-1} + \overbrace{\varepsilon_{2,t}}^{\text{news}}$$

- VAR with two variables:

$$Y_t = \begin{pmatrix} \Delta a_t \\ \log(\text{employment}_t) \end{pmatrix}$$

The BBL Identification Strategy

- Correctly recovers the news shock from the VAR disturbance if there are two shocks (i.e., same number of shocks as variables)
  - To get things exactly right, require infinite lags in VAR
    - Short number of lags works pretty well.
- When there are three shocks, then news shock not recoverable from VAR disturbance.
  - Suggests that approach goes awry if there are more shocks than variables.
  - I interpret this as ‘good news’ for the VAR approach in the paper, which uses a lot of variables.

Inflation Puzzle

- Inflation in the model

$$\pi_t = \kappa s_t + \beta\kappa E_t s_{t+1} + \beta^2\kappa E_t s_{t+2} + \ldots$$

- If news about future technology improvement caused future marginal cost to fall, could drive down current inflation.

- Requires that technology improvement drive marginal cost down.

$$MC = \frac{w}{MP_L}$$

NK Model and the 'Inflation Puzzle'

Period t response to 1 percent news shock, $\varepsilon_{2,t} = 0.01$			
natural rate	actual rate	log employment	inflation
$\Delta a_{t+1} = \varepsilon_{1,t+1} + g_t,\ g_t = 0.2 g_{t-1} + \varepsilon_{2,t}$			
1.0	0.051	1.03	0.17
$a_{t+1} = \varepsilon_{1,t+1} + g_t,\ g_t = 0.2 g_{t-1} + \varepsilon_{2,t}$			
1.0	-0.03	0.14	-0.09

Smaller wealth effect associated with second time series representation: future technology shock drives marginal cost down.

Broader Lesson for Monetary Policy

- Taylor rule:

$$r_t = \overbrace{r_t^*}^{\text{natural rate (normally left out of Taylor rule)}} + \phi_\pi \pi_t + \phi_x x_t$$

- Natural rate:

$$r_t^* = E_t(a_{t+1} - a_t)$$

- Traditionally, natural rate left out of Taylor rule. Why?
  - Hard to measure.
  - People used to think that the natural rate was roughly constant anyway:
    - RBC model technology shock always had autocorrelation 0.95
    - NK DSGE model shocks always have high autocorrelation.

Implication of News Shock for Monetary Policy

- Old argument about why natural rate shouldn't be put in the Taylor rule falls apart.
- News shocks move the future without having a big impact on the present.
  - Have big impact on natural rate.
- Finding proxies for the natural rate not necessarily hard.
  - Need indicators that the future looks good.
  - High credit growth, high stock market growth.

Conclusion

- A pleasure reading and thinking about BBL work.
- BBL impulse responses not as precise as they suggest.
  - Some patterns, which drive them towards RBC model not significant.
- Their identification strategy seems to make sense in a NK model.
- We should care about news shocks:
  - They have potentially important implications for monetary policy.