The Effects of News About Future Productivity on International Relative Prices : An Empirical Investigation. By D. Nam and J. Wang

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Introduction

- The goal of this paper is to document and compare how real exchange rates and the terms of trade react to surprise changes in technology versus to anticipated changes in technology, that is, to "news".
- The difficulty with this question is identification : How can one isolate the two effects, is the identification credible and are the results robust to different identification scheme.
- My comments will focus mainly on the implications of measurement error for the identification of the the desired effects.
- I do think the paper provides considerable support for the notion that a technological news shock favors an appreciation of the US dollar. However, more care regarding biases due to measurement error may be in order.

Focus

- Why focus on measurement error.
  - Even when great care is taken in constructing data, aggregate TFP is at best a measure with error of the economies technological capacity.
  - Measurement error has the potential to explain several features of the data
  - Measurement error has the potential to reconcile some differences arising from alternative identification schemes.

- Let us begin by asking : what would the paper be identifying if there were no news shocks, but instead there were only measurement error and unpredictable technology shocks.
- For example,suppose measured TFP was composed of real productivity – denoted θ– which follows a random walk with innovations μ_{1t}, plus a moving average measurement error term (MA(1) for simplicity), ie,

$$TFP_t = \theta_t + \mu_{2t} + \gamma\mu_{2t-1}$$

$$\theta_t = \theta_0 + \theta_{t-1} + \mu_{1t}$$

- Suppose in addition to TFP we have consumption in our data set, and consumption only reacts to θ.

$$C_t = \theta_t$$

- What would the identification scheme used in this paper be isolating using these two variables.

- The structural moving average representation in this case is given by

$$\Delta TFP_t = \mu_{1t} + \mu_{2t} - (1-\gamma)\mu_{2t-1} - \gamma\mu_{2t-2}$$

$$\Delta C_t = \mu_t$$

- Note : This is a system where a Choleski decomposition could be used to recuperate the structural shocks from the reduced MA representation : requires consumption to be ordered first.
- However, the Barsky-Sims identification scheme is this case corresponds to placing *TFP* first in a Choleski decomposition.
- With a little algebra, one can show that the BS identification scheme in this case will identify as the surprise shock $\mu_{1t} + \mu_{2t}$, and as the news shock $\mu_{1t} - \mu_{2t}$.

- Define : $\hat{\mu}_{1t}$ as the identified surprise TFP shock
  and
  $\hat{\mu}_{2t}$ the identified news shock.
- The relation with the real structural shocks are

$$\hat{\mu}_{1t} = \mu_{1t} + \mu_{2t}, \qquad \hat{\mu}_{2t} = \mu_{1t} - \mu_{2t}$$

- The real structural moving average is given by

$$\Delta TFP_t = \mu_{1t} + \mu_{2t} - (1-\gamma)\mu_{2t-1} - \gamma\mu_{2t-2}, \quad \Delta C_t = \mu_{1t}$$

- The pseudo representation for TFP with be given by

$$\Delta TFP_t = \hat{\mu}_{1t} - (1-\gamma)\hat{\mu}_{1t-1} - \gamma\hat{\mu}_{1t-2} + (1-\gamma)\hat{\mu}_{2t-1} + \gamma\hat{\mu}_{2t-2}$$

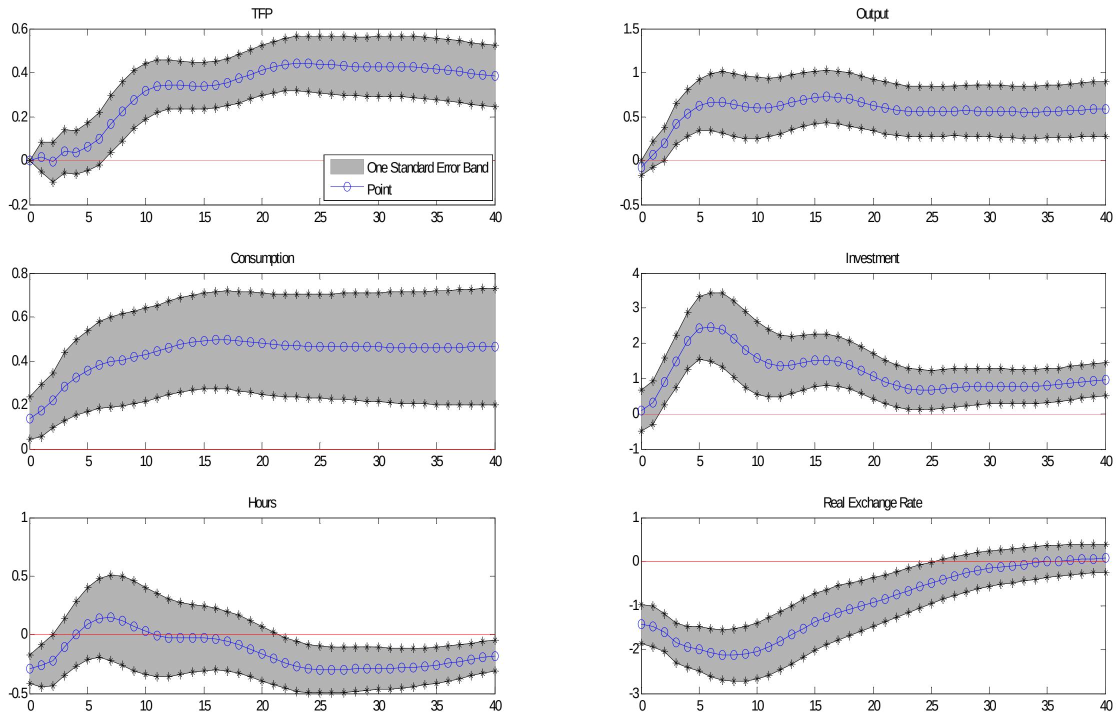
$$\Delta C_t = \frac{\hat{\mu}_{1t} + \hat{\mu}_{2t}}{2}$$

$$\Delta TFP_t = \hat{\mu}_{1t} - (1-\gamma)\hat{\mu}_{1t-1} - \gamma\hat{\mu}_{1t-2} + (1-\gamma)\hat{\mu}_{2t-1} + \gamma\hat{\mu}_{2t-2}$$

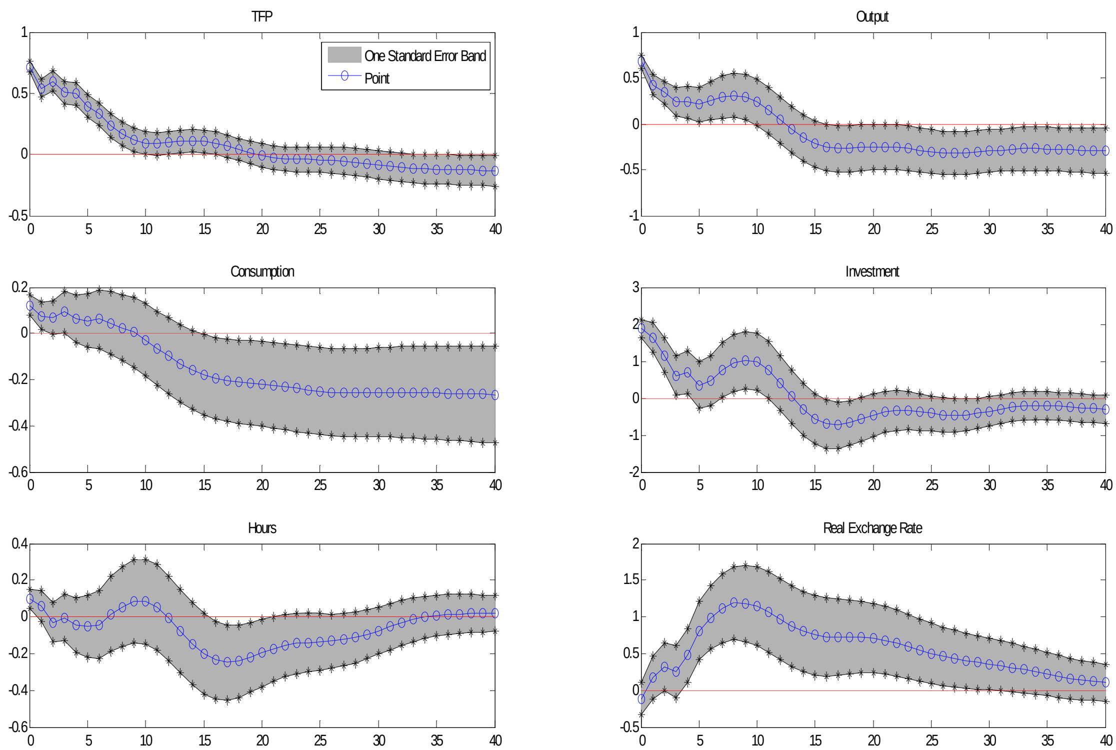
$$\Delta C_t = \frac{\hat{\mu}_{1t} + \hat{\mu}_{2t}}{2}$$

- So after an identified news shock, we would see consumption jump and stay there. While for TFP we will see it start at zero and growth over time as if there were news.
- What would happen to TFP following an identified "surprise" shock ? If would exhibit an important mean reversion component.
- What do we see in the data ? That the surprise technology shock may be capturing something that looks like measurement error. (Note the slightly negative long run effect, which is not consistent with the above simple model)

Figure 3: Impulse Response Functions: Benchmark Specification



(a) News Shock

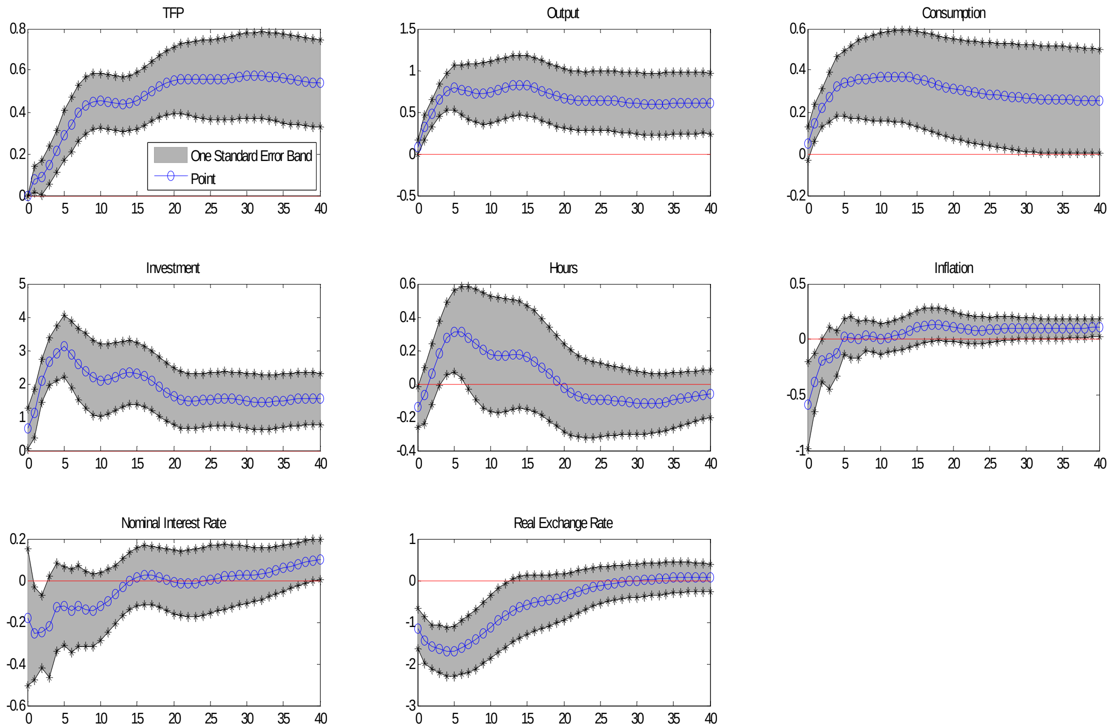


(b) Contemporaneous Shock

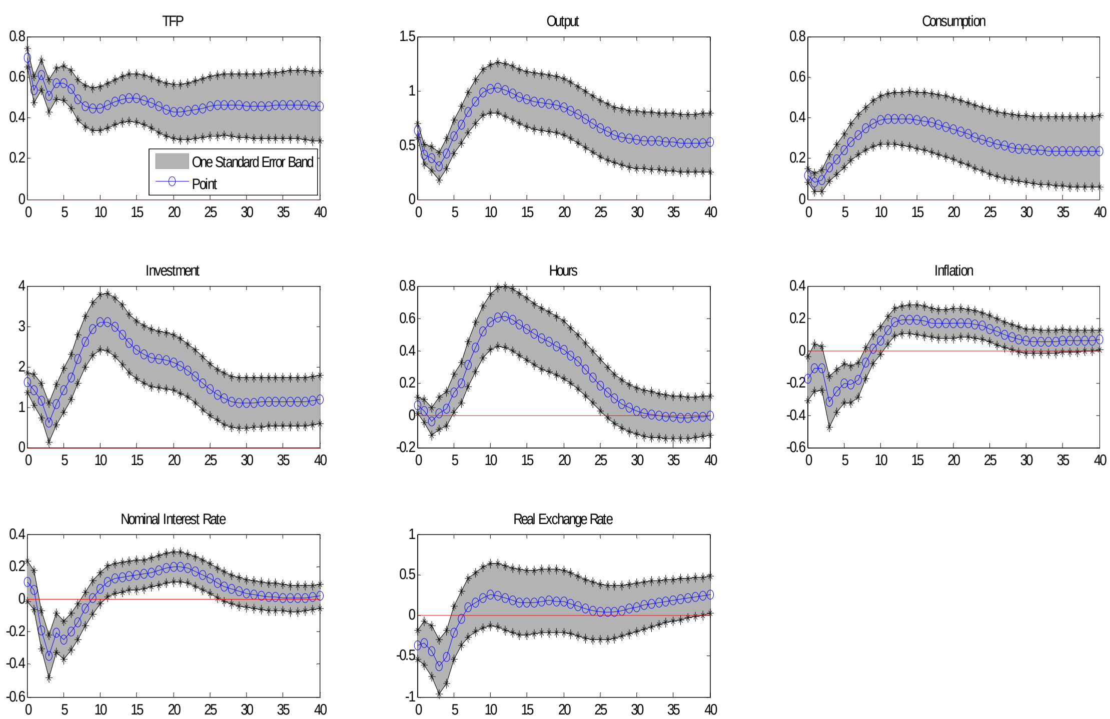
Note:
–The horizontal axis shows quarters following a positive shock and the vertical axis is the percentage deviation of each variable from its steady state.

- This can't be the whole story as the real exchange rate should move quite similarly in these two case, and there should be a positive long run effect of surprise shocks on TFP.
- Also look at large model, the results appear more consistent with the above simplistic model

Figure 6: Impulse Response Functions: Large Model



(a) News Shock



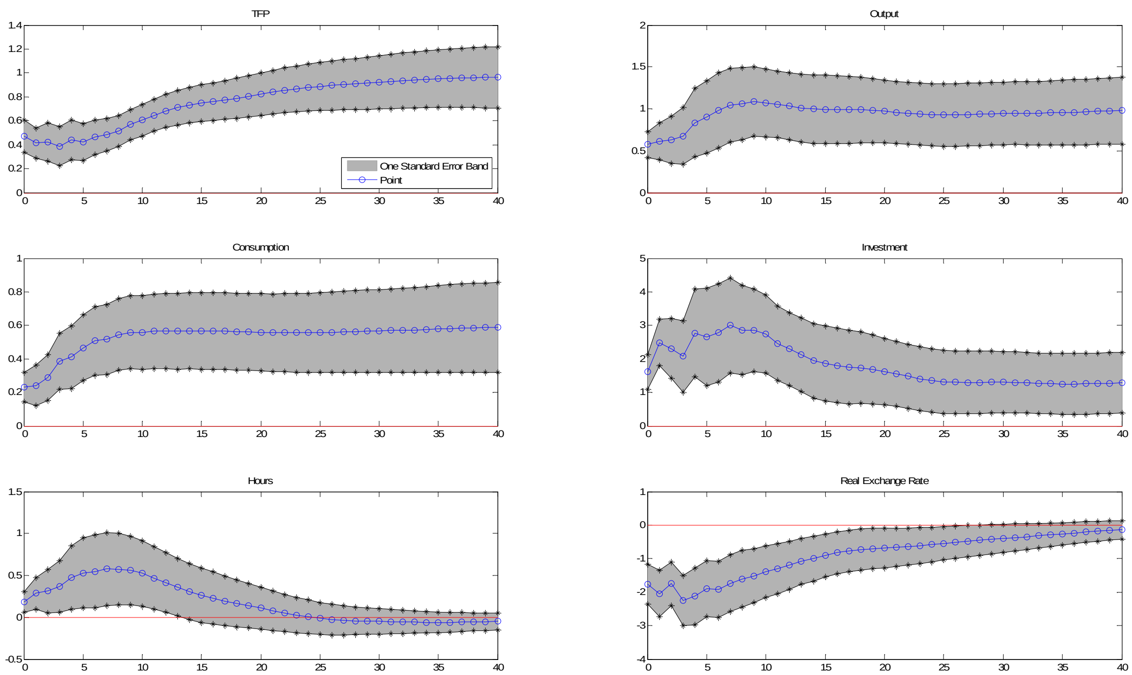
(b) Contemporaneous Shock

Note:
–The horizontal axis shows quarters following a positive shock and the vertical axis is the percentage deviation of each variable from its steady state.

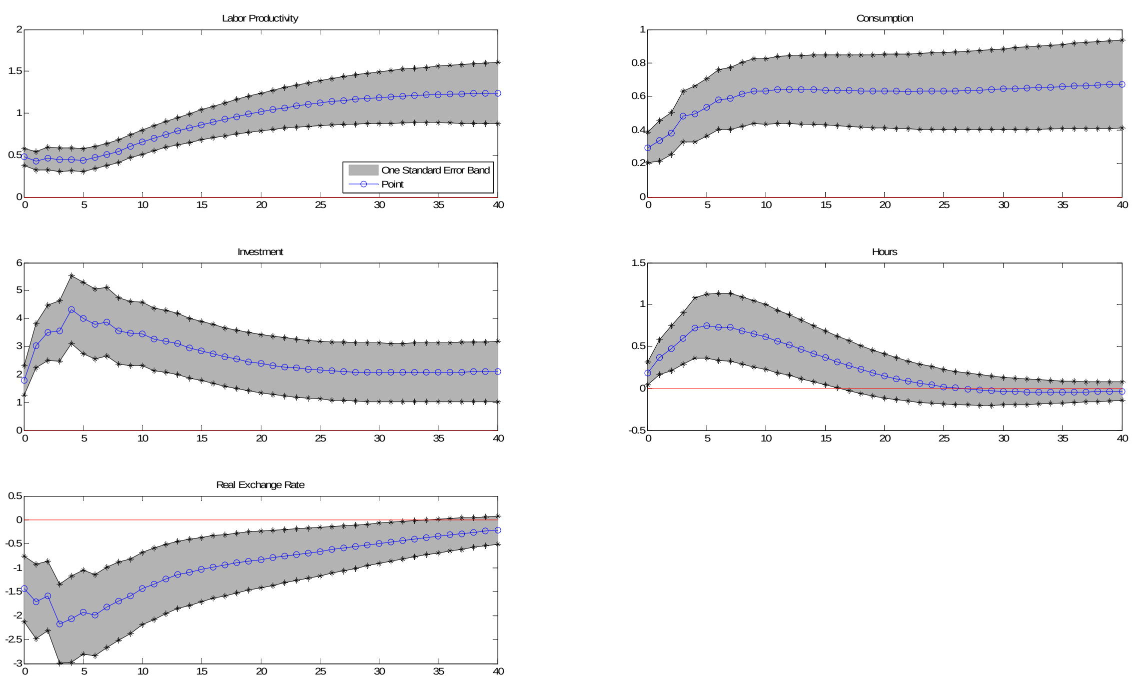
Long Run Restriction

- In this environment, using a long run restriction would be preferable, as it would extract the surprise technology shock (since only the real technology shock affect TFP in the long run).
- What we see in the data in this case, is that the surprise technology shock lead to an appreciation !
- To get a better idea of what happening, I would look at the responses to the temporary shock in a bivariate case with consumption. If TFP exhibits strong mean reversion with little permanent effect, this would be consistent with the type of DGP above and place the current interpretation into question.
- Note the different response to hours in the two cases (why different from Gali(99))

Figure 4: Impulse Response Functions: Long-run Restrictions Method



(a) Utilization-adjusted TFP as the Measure of Productivity



(b) Labor Productivity (output per hour) as the Measure of Productivity

Note:
–The horizontal axis shows quarters following a positive shock and the vertical axis is the percentage deviation of each variable from its steady state.

- Summarizing some results.
- With baseline model : "anticipated" shock leads to appreciation, surprise leads to depreciation
- In larger model : "anticipated shock" leads to appreciation, surprise leads to either appreciation of nothing.
- When using long run restrictions, long run shock leads to appreciation.
- The last two set of results are possibly consistent with the no-news model, which would mean a different interpretation of results. (leave open the question of the first set, which may reflect news)

- My point in the above is not that there are no news shocks, but that measurement error may be a serious issue. And identification strategy should take this into account.
- To address this issue, one should consider an environment where there are potentially three shock to measured TFP : surprises, news and measurement error.

- In the presence of measurement error, then the Barsky -Sims identification will not work well at identifying news shocks. It will capture a combination of surprise, measurement error and news.
- One would need to either augment the Barsky-Sims methodology, or use something else.
- Using a combination of short and long run restriction would be a possibility (as in Beaudry-Lucke(2010)). The surprise technology shock is one that can affect TFP in both the short and the long run. The measurement error can only affect in the short run. While the surprise cannot affect TFP on impact.
- My conjecture is that using a combination of short and long run restrictions would arrive at the same result than that of the paper (news causes appreciation, while surprises don't). Reason : the news is associated with an expansion, and this seems to be associated with an appreciation.