The Dynamic Effects of Interest Rates and Reserve Requirements by Fernando Perez-Forero and Marco Vega

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Outline of the discussion

- Brief summary of the paper
- Overall evaluation
- Comments and suggestions
- Conclusions and possible extensions

Aim of the paper

- The analysis estimates a SVAR model on the Peruvian data to study:
  - How changes in interest rates (INT) affect the economy
  - How changes in reserve requirements (RR) affect the economy
  - Evaluate the effect of foreign currency reserve requirements

Key findings

- The key findings are:
  - An interest rate shock has the standard effect on the Peruvian economy (i.e. tight monetary policy generates appreciation of domestic currency, contraction in real activity and inflation)
  - A reserve requirements shocks, in both domestic and foreign currency, affects lending levels (i.e. a rise in RR reduces the level of aggregate credit and real activity)
  - INT rate channel is more powerful than RR in affecting the economy

Overall evaluation

- I enjoyed reading the paper and learned some useful insights, especially on the effect of RR
- The analysis investigates some pressing questions for policy makers
- To my knowledge, this is the first attempt to investigate RR for Peru through the lens of a quantitative model
- The authors should be more convincing on the identifying restrictions, perform some robustness analysis and provide specific details on part of the analysis

Comment 1. Information in the data

- Is the data informative enough to identify the impact of the RR shocks?

- RR have a relatively short history in Peru, my understanding is that:

1995-2002:	RR used sporadically
2002-2008:	Inflation targeting (RR fixed)
2008-2013:	RR use to counteract capital inflow from US

  $\Rightarrow$ RR rarely in place. Is the VAR able to estimate RR effect?

- *Suggestions*:
    - Provide a detailed timeline on the use of RR in Peru and on the extent it was used as a policy tool (this would be informative and complement the survey table on the effect of INT in Peru)
    - Warn the reader about the potentially limited information in the data. As in the seminal paper of Bernanke and Mihov (QJE, 1998) on the effect of INT, you could perform sub-samples analysis or/and regime switching approach (see Hamilton)

Comment 2. VAR identification, three potential issues

- The model is estimated using zero and sign restrictions
- In principle, the methodology is powerful and agnostic in the identification of structural shocks
- However, the execution suffers from three potential issues:
  1. Some identification restrictions are contentious
  2. Are restrictions too strict on the variables' responses?
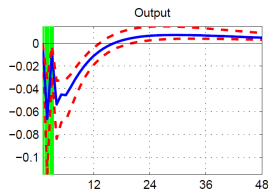 3. The uncertainty surrounding the estimates is sensitive to the particular identification scheme

- Why should conventional monetary policy not have an effect on the lending-borrowing spread? See recent paper by Gertler and Karadi (2014)

- The sign restriction on the price level (negative in first and second periods) is a contentious stylized fact (in the US)

- *Suggestion*: Either develop a theoretical model that generates the theoretical restrictions for the VAR model, or improve the motivation in the paper to strengthen the choice of restrictions, or reduce restrictions
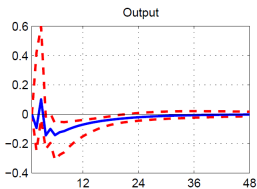
- Ensure that the sign restrictions are not forcing specific responses
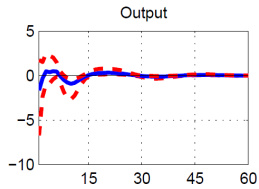- Example: Consider the response of output to INT and RR shocks:

INT shock
on output

RR shock
on output

Foreign RR shock
on output

- The restrictions are such that real activity (and inflation) fall in the short run $\Rightarrow$ Difficult to accept that the fall in output and inflation is a genuine result of the analysis

- More importantly: the response of output appears to be increasing in the first two periods, despite the negative sign restrictions, and becomes positive in the medium run. Are sign restrictions on output too strict, forcing a negative, short-run response of output?

- *Suggestion*: Relax some restrictions, especially those that impose responses that you consider results. This will also help to address issues related to the estimation of uncertainty around the responses (see next slide)
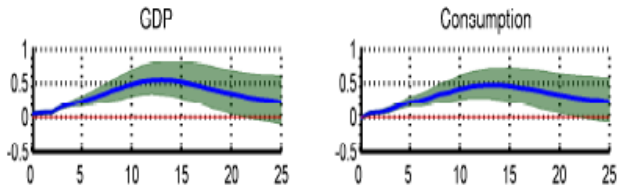
Comment 2. VAR identification, three potential issues

Potential issue 3: the uncertainty surrounding the estimates might be under-estimated

- Since the model is used for policy, the measure of uncertainty around the estimates is important
- The degree of uncertainty around the responses is heavily affected by the mix of sign and zero restrictions, see recent paper by Arias, Rubio-Remirez and Waggoner (2014)
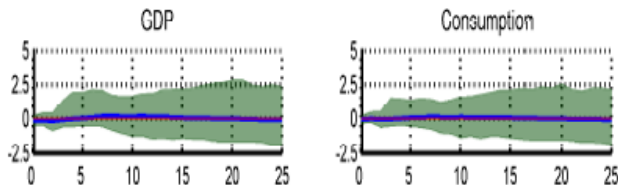
Standard restrictions sign and zero restrictions

(Deficit-financed tax cut shock)

Arias, Rubio-Remirez and Waggoner (2014)

- *Suggestion*: perform robustness checks. To decrease uncertainty embedded in the methodology: Why not impose either sign restrictions or zero restrictions?–This would also strengthen the reliability of the identification of shocks (see previous point)

Comment 3. More information on the implementation of estimation is needed

- The VAR model is

$$y_t^{'} A_0 = \sum_{i=1}^{p} y_{t-i}^{'} A_i + c + w_t^{'} D + \varepsilon_t^{'} \text{ for } t = 1, ..., T$$

- The paper needs to describe some concealed assumptions:
  - The Federal Funds Rate is assumed exogenous. Why?
  - The choice on the lag length p is not spelled out
  - Are the variables cointegrated?

Comment 4. What is the rational for RR and their effect on welfare?

- If the purpose of RR is to smooth international capital flows, why not to consider capital control instead?
- Farhi and Werning (2012) and Brunnermeier and Sannikov (2014) show that capital control is effective to counteract transitory shocks and it may be welfare improving
- How would RR be different from direct capital control to stabilize the economy?
- Extend the analysis to a welfare evaluation of INT and RR and possibly compare them against direct capital control

Conclusion

- Overall, the analysis is novel and focuses on a topical issue
  - It provides policy-relevant insights on the effect of INT and RR policies estimated on the Peruvian economy
  - It sheds light on the importance of RR as a policy tool
- Some natural extensions:
  - Challenging:
    - develop a structural model to investigate the effect of RR and use it to guide the sign restriction of the empirical model
    - use the structural model to investigate what channels of RR (that are spelled out in the introduction of the paper) are important in the Peruvian economy
  - Interesting:
    - extend the analysis to assess the welfare effect of INF and RR (and possibly direct capital control)