Monetary and Macropudential Policy in an Estimated DSGE Model of the Euro Area

Jesper Lindé
Federal Reserve Board

Presentation presented at the 12th Jacques Polak Annual Research Conference
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Discussion of Quint and Rabanal
”Monetary and Macroprudential Policy in an Estimated DSGE Model of the Euro Area”

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- Use estimated model to assess effects of macroprudential policy.
  - Counterfactual experiments, strength of DSGE framework.
Summary of paper

Key findings

- Small role of supply-side type of financial friction shocks during the estimation period, demand shocks drive housing prices

Propagation from housing prices to real side of the economy (non-durable goods) limited (financial and real dichotomy)

Under the assumption that monetary policy is nearly "optimal", limited role for macroprudential policy

Output and inflation volatility essentially unaffected by the introduction of macroprudential policy (all frictions effectively addressed by monetary policy)

At the same time, volatility in credit aggregates and housing prices reduced substantially by macroprudential policy (without affecting inflation and output volatility)

Conclusion: "Introduction of macroprudential instruments is likely to have minor effects on main macroeconomic variables"
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Discussion outline

- Model
- Policy Exercises
- Concluding Remarks
Quint and Rabanal report some univariate statistics (std and autocorrelation of series) to assess the fit of the model in Tables 4 and 5, but more is needed:

- Comovement in data between the regions: e.g. $\text{cor}(\Delta D, \Delta D) = 0.6$, $\text{cor}(\Delta C, \Delta C) = 0.4$, $\text{cor}(\Delta I_R, \Delta I_R) = 0.1$, $\text{cor}(\pi, \pi) = 0.8$, and $\text{cor}(R_L, R_L) = 0.9$

- Comovement in data within the regions: e.g. $\text{cor}(\Delta D, \Delta I_R) = 0.5$ in periphery, and 0.3 in core, while $\text{cor}(\Delta D, R_L) = 0.35$ in periphery, and 0.35 in core

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Model
Is There a Comovement Problem in the Model?

Var Decomp In Model
Below, Impulses to
Periphery housing dem
shk to the right

<table>
<thead>
<tr>
<th></th>
<th>$\sigma^D_\xi$</th>
<th>$\sigma^{D^*}_\xi$</th>
</tr>
</thead>
<tbody>
<tr>
<td>$R$</td>
<td>0.4</td>
<td>0.2</td>
</tr>
<tr>
<td>$R^L$</td>
<td>0.1</td>
<td>0.2</td>
</tr>
<tr>
<td>$\Delta p^C$</td>
<td>0.4</td>
<td>0.1</td>
</tr>
<tr>
<td>$\Delta \log C$</td>
<td>0.2</td>
<td>0.0</td>
</tr>
<tr>
<td>$\Delta \log Y^D$</td>
<td>51.2</td>
<td>0.0</td>
</tr>
<tr>
<td>$\Delta p^D$</td>
<td>48.4</td>
<td>0.0</td>
</tr>
<tr>
<td>$R^*$</td>
<td>0.3</td>
<td>0.4</td>
</tr>
<tr>
<td>$R^L^*$</td>
<td>0.2</td>
<td>0.1</td>
</tr>
<tr>
<td>$\Delta p^C^*$</td>
<td>0.1</td>
<td>1.2</td>
</tr>
<tr>
<td>$\Delta \log C^*$</td>
<td>0.0</td>
<td>0.5</td>
</tr>
<tr>
<td>$\Delta \log Y^{D^*}$</td>
<td>0.633</td>
<td>0.587</td>
</tr>
<tr>
<td>$\Delta p^{D^*}$</td>
<td>0.0</td>
<td>58.7</td>
</tr>
</tbody>
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Financial shocks unimportant according to variance decompositions, surprising finding in comparison to Christiano, Motto, Rostagno (2010)
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Historical decompositions useful to distill out if financial factors key drivers in the recent recession
Previous work that have used DSGE models to motivate macroprudential policies have relied on specifications where incorrect expectations about future shocks give rise to inefficient boom-bust cycles (Christiano, Ilut Motto and Rostagno, 2008, 2010).
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Christiano et al. argues that this source of welfare reducing instability can be strongly mitigated if the central bank “leans against the wind” and responds to credit growth (beyond its role in constructing the inflation forecast).
Effects of an anticipated technology shock in $t=12$ which does not materialize

- Taylor-type rule (circle) and Ramsey policy (solid)
- Ramsey policy (circle) and Taylor-type rule with credit growth (solid)
Here, no use of “News Shocks” - so how large are the inefficiencies that macroprudential policy seeks to mitigate?
Model
Role of Financial Frictions

- Here, no use of “News Shocks” - so how large are the inefficiencies that macroprudential policy seeks to mitigate?
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Specifically, examine to what extent output and inflation volatility would shrink if you took out the financial frictions and shocks in the model (without reestimating the parameters).
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If they do not change much, your model hardwires in the sufficiency of optimal monetary policy (macroprudential irrelevance).
In Tables 6 and 7, Quint and Rabanal optimize the response coefficients in the policy rules when considering the usefulness of macro-prudential policies to stabilize a “Lars Svensson” type of loss function (i.e. discounted sum of inflation and output-gap volatility).
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- Should result in more prominent role of macroprudential policy
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- Given ECB policy, each region $k = p, c$ chooses $\gamma_n$ to minimize

$$\sum_{t=0}^{\infty} \beta^t \left[ \text{var} \left( y_t^k \right) + \lambda_M \text{var} \left( c_{ret}^k \right) \right]$$
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\]

- Assume core is “Stackelberg leader“, picks \( \gamma_n \) before periphery choose \( \gamma_n^* \), both move after ECB.
Need to make sure that movements in policy measures ($R_t$ and $\eta_t \leftrightarrow R_t^L - R_t$) are reasonable

$$R_t^L = v_t R_t F \left( \frac{S_t^B}{P_t^D D_t^B} \right) \eta_t$$
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Policy Exercises
A Couple of Additional Technical Points

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- To remedy the comovement problem in the model, could compute variances as mean of \( N \) artificial samples generated by bootstrapping from the two-sided Kalman smoothed shocks rather than relying on asymptotic moments
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Concluding Remarks

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- Finally, I think extensions which relaxes the employed “No-News/No-learning” linear model framework are warranted.