

**Comments on**  
**Forni, Monteforte, and Sessa**  
**“The Estimated General Equilibrium Effects of**  
**Fiscal Policy: The Case of the Euro Area”**

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## Overview

- Before we can use a DGE model to inform policy there are certain hurdles that the model must clear.
  - These hurdles take the form of empirical facts that the model should be able to replicate.
- The empirical fact that is the focus of this paper is **the positive response of aggregate consumption following a government spending shock**.
  - Previous attempts to replicate this empirical fact have had to compromise on capturing some other feature(s) of the data.
  - This paper is able to replicate this fact with little lost on other fronts.
  - This is achieved by adding some realistic features to the model's tax system and to the assumed composition of government spending.

## Summary (I)

- An  $\uparrow G$  leading to a large and significant  $\uparrow C$  is a robust empirical fact.
- Models with infinitely lived households who consume out of permanent income are typically unable to generate an  $\uparrow C$  in response to an  $\uparrow G$ .
  - This is because the anticipation of future tax increases reduces wealth and hence consumption (Baxter and King, 1993).
- Galí, López-Salido, and Vallés (2004) add rule-of-thumb consumers to a sticky-price model and find they can generate an  $\uparrow C$  in response to an  $\uparrow G$ .
  - However, this result relies on a large  $\uparrow \frac{W}{P}$ , which results from the fact that prices are sticky but wages are flexible.
- Coenen and Straub (2005) find that when sticky-wages are added and the model is estimated only a small fraction of households are rule-of-thumb spenders. This small fraction can not deliver an  $\uparrow C$  in response to  $\uparrow G$ .

## Summary (II)

- Forni, Monteforte, and Sessa (2006) show that Coenen and Straub's results are sensitive to the precise modelling of taxation and the composition of government spending.
- Modelling these features of the economy in a more realistic manner results in a much more significant role for rule-of-thumb spenders and delivers the result that an  $\uparrow G$  generates an  $\uparrow C$ .
- The modifications made to the model recognize that:
  - Taxes—which are levied on labor income, capital income, and consumption spending—are distortionary.
  - Government expenditures take the form of both (i) purchases of goods and services and (ii) purchases of labor services.

## Summary (III)

- These modifications:
  - Exacerbate the negative wealth effect implied by an  $\uparrow G$ ; and,
  - Increase the discrepancy between the optimizers' consumption response and the data.
- Since the data favors an  $\uparrow C$  following an  $\uparrow G$ :
  - The more perverse the consumption response of optimizers, the greater the estimated share of rule-of-thumb households in the model.
- Since rule-of-thumb spenders boost consumption in response to an  $\uparrow G$ :
  - A large share of rule-of-thumb spenders provides a large positive offset to the optimizers' perverse consumption response.
- Consequently, an  $\uparrow C$  following an  $\uparrow G$  obtains in the modified model. The model therefore succeeds in replicating this fairly elusive empirical fact.

## Initial Reactions

This paper has a lot to recommend it.

- It succeeds in replicating an important empirical fact;
- It advances the modelling of fiscal policy in new-Keynesian models;
- It uses cutting-edge estimation techniques;
- Its approach of extending the model in more realistic dimensions is very compelling; and
- Its explanation of the mechanisms that bring about the model's results is elucidated very nicely.

In addition, as part of this project, the authors have put together a dataset of quarterly fiscal variables. This is also a valuable contribution.

## Overview of my discussion

- My comments focus mostly on the broader issues implied by adopting models with a large role for rule-of-thumb households.
  - Without doubt, the introduction of rule-of-thumb spenders is very important for replicating certain empirical facts in DGE models.
  - However, there are broader implications of adding rule-of-thumb spenders to our models (and thereby diminishing the importance of optimizers).
- My specific suggestions for this convincing and well-executed paper are relatively minor.

## Broader Issues (I)

Generating an  $\uparrow C$  following an  $\uparrow G$  relies on including features that:

- Add to the model's realism; but,
- Make the optimizing consumers' behavior even more contrary to the data.

When the model is estimated, optimizers' share of spending will be small.

Should we be concerned that adding more realistic features to the model makes the behavior of optimizers conflict even further with the data?

- From the point of view of DGE modelling, we probably should be.
- These results suggest that it is inappropriate to characterize the bulk of consumption spending by optimizing behavior.
- Optimizing behavior is fundamental to the DGE school of modelling.

## Broader Issues (II)

The fact that rule-of-thumb spenders account for most of consumption suggests the need to better understand their presence.

- Does their presence reflect some households' being "too lazy" to optimize?
  - If this is the reason, it is important to verify that the simple rule of setting consumption equal to real income in every period (rather than optimizing) does not imply a particularly large welfare loss.
- Does their presence reflect households' exclusion from financial markets?
  - If this is the reason, we ought to try to understand how this arises.
  - If households' ability to participate in financial markets is endogenous, models should recognize and capture this.
  - Participation in financial markets may vary with other model variables.

## Broader Issues (III)

- Does the presence of rule-of-thumb spenders reflect some intense desire to consume every last cent of income in every period? For example, utility could be given by:

$$E_t \sum_{t=0}^{\infty} \beta^t \epsilon_t^b \left[ \frac{1}{1 - \sigma_c} (c_t^{nr}(i) - h \cdot c_{t-1}^{nr}(i))^{1 - \sigma_c} - \epsilon_t^l \cdot \frac{1}{1 + \sigma_l} \cdot l_t(i)^{1 + \sigma_l} - \text{“}\infty\text{”} \left( c_t^{nr}(i) - (1 - \tau_t^w) \frac{w_t l_t(i)}{P_t} - \frac{TR_t}{P_t} \right)^2 \right].$$

- If rule-of-thumb and optimizing households have different utility functions, this should be captured in welfare analysis.

## Broader Issues (IV)

The introduction of rule-of-thumb spenders may make utility-based welfare analysis less compelling.

- When all agents are optimizers there is a direct link between a model's utility function and the consumption Euler equation.
  - The same utility function used to generate the model's consumption function forms the basis of the welfare criterion.
  - Consequently, utility-based welfare analysis seems quite compelling.
- With rule-of-thumb spenders utility-based welfare analysis cannot be performed credibly without first understanding why these agents are present in the model.
  - Even then we may have to speculate on aspects of the utility functions.
- The ability to do utility-based welfare analysis is one of the notable advantages of working with micro-founded models.

## Broader Issues (V)

More rule-of-thumb spenders, and therefore fewer optimizers, implies that we lose the improvements in model fit brought about by habit persistence.

- In Figure 3 the consumption response is hump-shaped for optimizers but monotonically declining for rule-of-thumb spenders and in the aggregate.
- The data suggest a hump-shaped response (see Galí, *et al.* 2004).
- For government spending shocks, obtaining a response with the correct sign is of first-order importance; size and shape are second-order.
- However, the responses of consumption (and output) to other shocks could lose their humped shapes as a result of rule-of-thumb spenders.
  - It might be useful to verify that the model's responses to monetary policy shocks do not deteriorate from the presence of rule-of-thumb spenders.

## Broader Issues (VI)

Some effort should probably be made toward improving how we model the behavior of the optimizers given that:

- Optimizing behavior is one of the doctrines of DGE modelling; and,
- Moving away from full optimization does not come without cost.

Blanchard-Yaari overlapping generations models preserve optimizing behavior while allowing fiscal policy to have real effects on the economy.

- However, as Forni *et al.* note it is difficult to obtain an  $\uparrow C$  following an  $\uparrow G$  without assuming an implausibly high probability of death.

Could more exotic preferences help us to generate an  $\uparrow C$  following an  $\uparrow G$  without compromising along the optimization front?

- For example, could a modelling strategy like hyperbolic discounting help?

## Minor Comments (I)

1. It would be useful to compare the 60 percent estimate of rule-of-thumb spenders found by Forni *et al.* to other estimates for the Euro area.

- For the U.S. some estimates are available:
  - Campbell and Mankiw (1989), who estimate a consumption function with rule-of-thumb spending, report a share of about 40 to 50 percent.
  - Shapiro and Slemrod (2003), who included some questions in the Michigan survey of households following the 2001 tax rebates, report 20 percent.
  - The FRB staff's judgmental forecasting models find that about one-third of households are rule-of-thumb spenders.
  - The current version of FRB/US finds that about 50 percent of consumption of non-durables and services (ex. shelter) is accounted for by rule-of-thumb spenders.

## Minor Comments (II)

2. Depreciation should be deducted from taxable rental income. That is:

$$(1 - \tau_t^k) [R_t^k \bar{k}_t u_t + D_t]$$

should be:

$$R_t^k \bar{k}_t u_t - \tau_t^k \left[ R_t^k \bar{k}_t u_t - \frac{\tau_t^c}{1 + \tau_t^c} \cdot P_t \sum_{v=1}^V \delta_v^{leg.} I_{t-v} \right] + (1 - \tau_t^k) D_t.$$

where  $\delta_v^{leg.}$  denotes the depreciation rates in the legislated tax schedule.

- Income that merely compensates depreciation is in general not taxed.
- This change should not change the paper's results since it does not alter any of the key implications of having distortionary taxes.

## Summing up

- This paper demonstrates that appealing to the existence of rule-of-thumb spenders remains a valid approach to generating an  $\uparrow C$  in response to an  $\uparrow G$ .
  - A very careful and detailed modelling of both the revenue and expenditure sides of the government sector is required in order to generate empirically plausible responses.
- More generally, however, we need to think thoroughly about all of the implications of adopting models that move away significantly from optimizing behavior.