Chapter Title: Comment on "Reflections on Monetary Policy in the Open Economy"

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Comment

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The implications of globalization and increased openness for optimal monetary policy have been the subject of a rapidly growing literature.[1] In this paper, Richard Clarida uses the New Keynesian two-country model of Clarida, Gali, and Gertler (2002) to partly address such questions. The paper focuses on the degree of trade openness. It does not address the implications of financial globalization, which is arguably an equally important feature of the current wave of globalization. The Clarida et al. model has become a benchmark for studying the interaction of monetary policy in a two-country world. The model is extremely elegant and allows seeing exactly what is going on. At the same time, it is very stylized, focusing on the terms of trade as the main international transmission channel. International risk sharing is assumed to be perfect. In the second part of the paper, Clarida then performs an empirical analysis of recent Fed behavior. This exercise is in the spirit of Taylor's (1993) original analysis using "eyeball econometrics." The main question asked is whether the Taylor rule can fit recent Fed behavior. Clarida argues that globalization may have affected some of the necessary inputs for calibrating a policy rule such as the equilibrium real interest rate and expectations of inflation. He therefore uses expectations data from financial markets to overcome this problem. These expectations measures should be immune to breaks and changes in regime that may plague the use of traditional instrumental generalized method of moment estimation of forward-looking Taylor rules. The Clarida et al. model gives hints about how openness may affect the optimal reaction coefficients in a Taylor rule. It would therefore be useful to explore some of those hints in the empirical part of the paper. However, in the second part the reaction coefficients in the closed-economy Taylor rule are basically kept constant.

How does openness affect the optimal relative weight on output gap versus inflation stabilization? In the stylized model of Clarida et al.

(2002), the optimal weight depends on two key elasticities: the slope of the Phillips curve (λ) and the elasticity of substitution between differentiated goods (ξ). The slope of the Phillips curve is itself a negative function of the degree of price stickiness and a positive function of the elasticity of marginal cost with respect to output. The elasticity of substitution is a negative function of the markup in the goods sector. In Clarida et al.'s paper, the degree of openness (as captured by the parameter γ, the share of imported goods in consumption) affects only the elasticity of the marginal cost with respect to output, as shown below:

$$\alpha = \frac{\lambda}{\xi} = \frac{\delta\kappa}{\xi} = \frac{\delta[\sigma(1-\gamma) + \gamma + \varphi]}{\xi}. \tag{1}$$

As discussed by Clarida, if the intertemporal elasticity of substitution is greater than one, the elasticity of marginal cost with respect to output falls with greater openness. This will tend to flatten the open-economy Phillips curve and reduce the weight on output gap stabilization. The main channel of transmission is through deterioration in the terms of trade. When $\sigma > 1$, the positive impact of a deterioration of the terms of trade through producer wages and marginal cost is dominated by the negative impact through labor supply. There is indeed quite a bit of evidence that the slope of the Phillips curve may have flattened over the past two decades. The analysis by Clarida suggests that increased trade may have been one contributing factor.

Could there be other channels? In particular, could the other parameters in equation (1) be affected by increased trade openness? In Clarida et al. (2002), they are assumed to be exogenous. One hypothesis that is not explored in the paper is whether globalization may increase the degree of competition in the domestic goods market and thereby reduce the markup. Sbordone (2007) has recently endogenized the degree of competition in a model similar to the one used in this paper by allowing the elasticity of substitution to depend on the number of firms. She finds that higher competition due to trade will reduce the "pricing power" of firms and the slope of the Phillips curve. This result goes in the same direction as the channel analyzed by Clarida. However, after calibrating the model, Sbordone finds that the effects are economically small. The overall negative effect on the weight on output gap stabilization will, however, also depend on the increase in the elasticity of substitution. Razin and Binyamini (2007) also find that greater openness reduces the

slope of the Phillips curve and increases the weight on inflation stabilization and the reaction coefficient on inflation.

Similarly, one can ask whether increased trade will affect the degree of price stickiness. There is some evidence that higher competition leads to reduced price stickiness (see, e.g., Bils and Klenow [2004] and some of the evidence of the Inflation Persistence Network [Altissimo, Ehrmann, and Smets 2006]). This will tend to go in the opposite direction of steepening the Phillips curve, as was also argued by Rogoff (2006). In the end, the effect of trade on the slope of the Phillips curve and the weight on output gap stabilization is thus an empirical question. There is quite a bit of evidence that the slope of the Phillips curve has fallen, but it remains unclear how much of this is due to globalization rather than to other forces such as the establishment of credible low-inflation regimes.

An additional question is to what extent the reaction function parameters in a Taylor rule are affected by openness. Interestingly, in Clarida et al. (2002), the slope of the Phillips curve has no impact on the reaction coefficient to inflation in the optimal simple Taylor rule (eq. [30]). The reason is that the higher weight on output due to the worse trade-off is offset by the higher cost of inflation as captured by the degree of price stickiness. What matters is the slope of the IS curve. In Clarida et al.'s paper, the effectiveness of monetary policy increases with trade through the terms of trade channel. As a result, less of a reaction to inflation is needed to stabilize output. Clearly, in more general models these results may change. It would be nice to test some of the implications of the open-economy micro-founded models in the empirical part on central bank reaction functions. Has the relative weight on inflation and output changed? Is this due to globalization?

Another interesting question is whether trade openness changes the equilibrium real interest rate and the relevant output gap. The flexible-price output gap that enters the open-economy Phillips curve is quite a bit different from the measured output gap used in the latter section and depends on foreign output. Similarly, also the natural real rate depends on foreign output growth.

Finally, Coenen et al. (forthcoming) analyze the gains from cooperation in a calibrated United States/euro area model. They find that the gains from cooperation are quite dependent on the degree of openness. The gains are small: about 0.03% of steady-state consumption for relatively closed economies such as the United States and the euro area. They become larger for more open economies: about 1% of steady-state

consumption if the home bias is reduced from 0.85 to 0.65. Moreover, the main source of the gains is the markup shocks.

Let us now turn to the second part of the paper. The idea is nice: In order to account for regime changes and structural breaks, let us use financial market–based expectations to analyze whether the original Taylor rule is still a good description of monetary policy in the United States (and the euro area). Three comments are worth making regarding the use of those market-based expectations. First, to the extent that we want to capture Fed policy, we want to have the Fed's forecasts. It is not clear that they will coincide with the markets' expectations. It would be nice to provide an explicit comparison between the central bank's forecasts and those of the financial market. Second, the forward rates (i.e., the 5-year-forward 5-year rate and the 5-year-ahead inflation compensation) are only rough measures of expectations. Time-varying risk premia are potentially large, as indicated by some of the macro-finance literature. Third, what is the appropriate horizon for the inflation forecasts entering a policy rule? Typically central bank forecasts extend to 2–3 years. It is therefore not clear that the 5-year-ahead expectation is a good measure.

Clarida's figure 2 comparing the original Taylor rule with the actual behavior of the federal funds rate is impressive. How can it be explained that during most of the new millennium the federal funds rate was consistently below the level suggested by the original Taylor rule? Was there a break? The most plausible explanation is a fall in the equilibrium real interest rate, probably related to global forces such as the savings glut that followed the Asian crisis of the late 1980s. However, his figure 3 shows that this is not the full explanation, since a large discrepancy remains using a time-varying measure of the market-based expected real equilibrium interest rate. Clarida further reduces the discrepancy by doubling the reaction coefficient on the output gap. This is, however, not what the Clarida et al. model would suggest. Moreover, it would be nice to compare this Taylor rule with one that uses the Fed's own forecasts. Orphanides and Wieland (2008) find that using the real-time Federal Open Market Committee (FOMC) forecasts in the Taylor rule does deliver a very good fit, including in the 2003–4 period (see my fig. 1). Moreover, their estimate of the reaction coefficient on the output gap is close to Taylor's number of 0.5. In contrast, the reaction coefficient to 1-year-ahead expected inflation is higher. Amazingly, using the FOMC forecasts also explains why the federal funds rate was kept low for a sustained period in 2003–4.
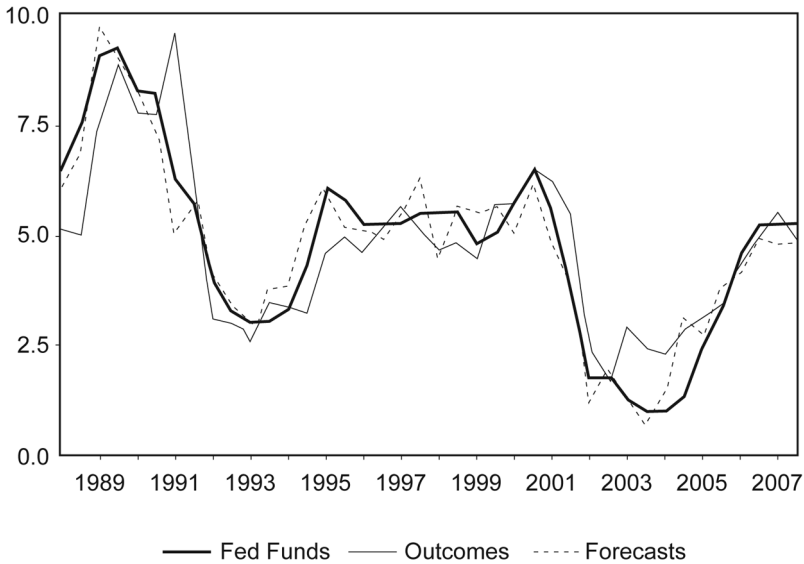
Fig. 1. Outcome-based versus forecast-based rules, 1988–2007: no interest rate smoothing. Source: Orphanides and Wieland (2008).

Endnotes

The views expressed are my own and do not necessarily reflect those of the European Central Bank.

1. Some key references are Gali and Monacelli (2005), Rogoff (2006), Razin and Binyamini (2007), Sbordone (2007), and Woodford (2008).

References

Altissimo, F., M. Ehrmann, and F. Smets. 2006. "Inflation Persistence and Price-Setting Behaviour in the Euro Area." Occasional Paper no. 46 (June), European Central Bank, Frankfurt am Main.

Bils, M., and P. Klenow. 2004. "Some Evidence on the Importance of Sticky Prices." *Journal of Political Economy* 112:947–85.

Clarida, R., J. Gali, and M. Gertler. 2002. "A Simple Framework for International Monetary Policy Analysis." *Journal of Monetary Economics* 49:879–904.

Coenen, G., G. Lombardo, F. Smets, and R. Straub. Forthcoming. "International Transmission and Monetary Policy Cooperation." In *International Dimensions of Monetary Policy*, ed. J. Gali and M. Gertler. Chicago: University of Chicago Press (for NBER).

Gali, J., and T. Monacelli. 2005. "Monetary Policy and Exchange Rate Volatility in a Small Open Economy." *Review of Economic Studies* 72:707–34.

Orphanides, A., and V. Wieland. 2008. "Economic Projections and Rules of Thumb for Monetary Policy." Working Paper no. 6748 (March), Centre for Economic Policy Research, London.

Razin, A., and A. Binyamini. 2007. "Flattened Inflation-Output Trade-off and Enhanced Anti-inflation Policy: Result of Globalization?" Working Paper no. 13280, NBER, Cambridge, MA.

Rogoff, K. 2006. "Impact of Globalization on Monetary Policy." Paper presented at a Federal Reserve Bank of Kansas City symposium on the New Economic Geography: Effects and Policy Implications, Jackson Hole, WY, August 24–26.

Sbordone, A. 2007. "Globalization and Inflation Dynamics: The Impact of Increased Competition." Working Paper no. 13556, NBER, Cambridge, MA.

Taylor, J. 1993. "Discretion versus Policy Rules in Practice." *Carnegie-Rochester Conference Series on Public Policy* 39:195–214.

Woodford, M. 2008. "Globalization and Monetary Control." Working Paper no. 13329, NBER, Cambridge, MA.