Volume Title: NBER International Seminar on Macroeconomics 2007

Volume Author/Editor: Richard Clarida and Francesco Giavazzi, organizers

Volume Publisher: University of Chicago Press

ISSN: 1932-8796

Volume URL: http://www.nber.org/books/clar07-1

Conference Date: June 15-16, 2007

Publication Date: January 2009

Chapter Title: Comment on "Expectations, Monetary Policy, and the Misalignment of Traded Goods Prices"

Chapter Author: Gianluca Benigno

Chapter URL: http://www.nber.org/chapters/c3004

Chapter pages in book: (158 - 168)

Comment

Gianluca Benigno, *London School of Economics, CEP and CEPR*

This is a very nice and elegant paper by Michael Devereux and Charles Engel. The main objective of the paper is to examine how optimal monetary policy and exchange rate policy are affected by the presence of news shocks. The model that the authors propose belongs to the New Open Economy Macro (NOEM) literature, which builds models following the New Keynesian tradition along with rigorous microfoundations. This work follows a previous contribution of the same authors (Devereux and Engel 2006) in which the key modification with respect to the conventional NOEM framework is constituted by the introduction of news shocks. In my comments I will summarize briefly Devereux and Engel's contribution, analyze their results in the context of a related framework, and discuss the design of optimal policy.

Summary of the Paper

As I mentioned earlier, the setup of the paper is similar to many NOEM models. The authors present a two-country stochastic dynamic general equilibrium model with nominal price rigidities and monopolistic competition. The model differs from the standard framework (see Devereux and Engel 2003; and Obstfeld and Rogoff 2002) in few aspects:

1. It allows for home bias in preferences
2. It considers a commodity input (as oil for example) that is traded internationally at freely flexible prices
3. It introduces news productivity shocks: this means that at time t, agents become aware of productivity shift at time $t + 1$[1]

The preference specification implies that, in this two-country setting, there are no gains from cooperation (see Devereux and Engel 2003, and Obstfeld and Rogoff 2002).

The authors then proceed in analyzing the implications of news shocks for optimal monetary policy. In particular, they examine how domestic and foreign policy rules (money supply or interest rate rules) should be set to optimally respond to anticipated future shocks under producer and local currency pricing. The main results of the paper are that:

- For the given model specification, the flexible price allocation is efficient even in the presence of anticipated future shocks.
- Optimal policy should react to anticipated future shocks in such a way that the nominal exchange rate should not move following news about future fundamentals. If policy is conducted optimally then news shocks will not generate any misalignments in relative commodity prices across countries.

Analysis

My focus in this discussion will be to examine the interaction between news shocks and optimal policy in a simple framework by looking at the implications of anticipated future productivity shocks for the conduct of optimal policy in a closed economy setting and in a small open economy setting. Since the introduction of a commodity input does not play any role for the determination of optimal policy I will abstract from it in the analysis that follows. In doing so I will use the De Paoli's (2004) small open economy model: in this framework, the small open economy is obtained as a limit case of a two-country framework in which price-setting behavior is modeled through a partial adjustment rule à la Calvo.[2] For simplicity I will analyze only the producer currency pricing case. Since there are no gains from cooperation in the framework proposed by Devereux and Engel, focusing on the small open economy case does not imply any loss of generality. The economy produces traded goods and imports different goods from the rest of the world and international asset markets are complete. The model can be summarized by the following set of equations in log-linear form:

$$\hat{\pi}_t^H = k[\eta(\hat{Y}t - \hat{Y}_t^T) + (1-\lambda)^{-1}(\widehat{RS}_t - \widehat{RS}_t^T) + u_t] + \beta E_t \hat{\pi}_{t+1}^H \quad (1)$$

$$(\hat{Y}_t - \hat{Y}_t^T) = c(\widehat{RS}_t - \widehat{RS}_t^T) + \chi u_t \quad (2)$$

$$\widehat{RS}_t = E_t \widehat{RS}_{t+1} + \hat{\imath}_t - E_t \hat{\pi}_{t+1} - u_t^* + E_t u_{t+1}^* \quad (3)$$

where (1) represents the small open economy Phillips curve while (2) is the aggregate demand and (3) is the Euler equation for the consumer maximization problem in which the risk-sharing condition from market

completeness has been substituted. In these equations $\hat{\pi}_t^H$ denotes domestic producer inflation, $\hat{\pi}_t$ denotes consumer price inflation, $\hat{Y}_t - \hat{Y}_t^T$ denotes the deviation of domestic output from the policy target, $\widehat{RS}_t - \widehat{RS}_t^T$ the deviations of the real exchange rate from the policy target, u_t is a linear combination of various types of domestic shocks (productivity, government expenditure, markup, and foreign shocks) while u_t^* represents foreign real shocks. The parameter that captures the degree of openness of the small open economy is λ, so that as $\lambda \to 0$ the economy converge to a closed economy, while k is a constant that depends on the degree of the nominal rigidity ($k \to \infty$ when prices are flexible). The variables η, β, c and χ are constant, which are functions of the structural parameters. The model is closed by a monetary policy rule. In what follows I will consider two types of policy behavior:

1. Taylor-type rule in which $\hat{\imath}_t = \phi\hat{\pi}_t^H + \psi(\hat{Y}_t - \hat{Y}_t^T)y$
2. Optimal policy behavior in which the policy authority maximize the expected utility of agents belonging to the economy.

The Transmission Mechanism of News Shocks

To understand the transmission mechanism of the news shock I will start by focusing on the closed economy case (i.e., $\lambda = 0$). The aim of this section is to highlight how news shock will propagate under different assumptions: flexible prices, sticky prices with Taylor-rule, and sticky prices with optimal policy. As a starting point, I will consider the special case of a closed economy and quasi-flexible prices.[3] Figure 3C1.1 reports the impulse response following a productivity shock that last only one period in the case in which the shock is anticipated (continuous line) and nonanticipated (dotted line). When the shock is anticipated, in the quasi-flexible price allocation the nominal interest rate and domestic inflation will adjust such that the real interest rate does not vary and domestic demand and output are unchanged. In figure 3C1.2 the same experiment is replicated for the case in which prices are sticky and monetary policy is conducted following a Taylor-type rule.[4] The anticipated shock will have real effects in the current period since agents will increase consumption (and output) and the nominal interest rate accommodates (i.e., decreases) the anticipated shock. Under optimal policy (fig. 3C1.3), the inflation is stabilized and the nominal interest rate increases so that consumption and output do not move in the current period (as in the quasi-flexible price allocation). Since inflation is costly, the adjustment is brought by changes in the nominal interest rate.

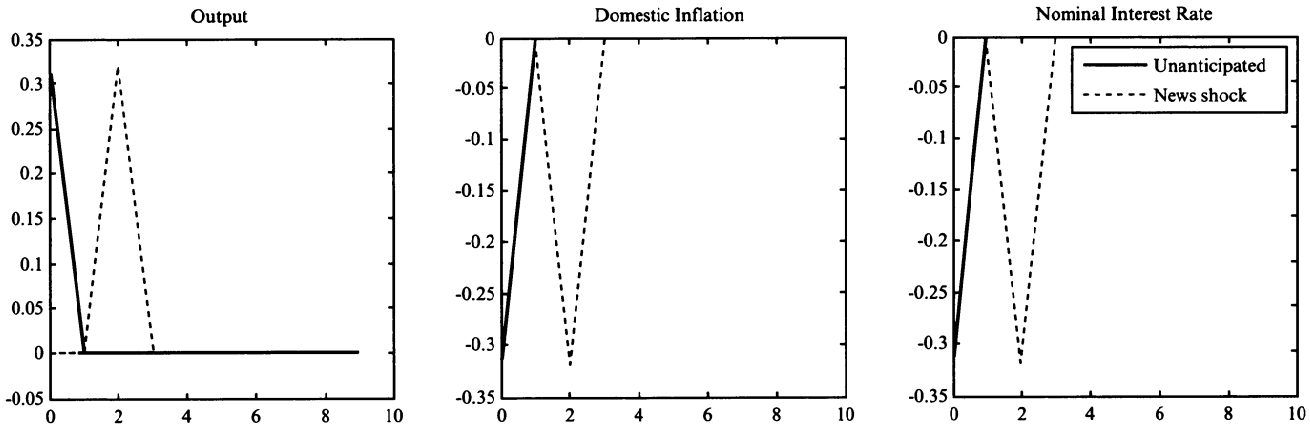

Figure 3C1.1
Closed economy, Taylor-rule, quasi-flexible prices allocation

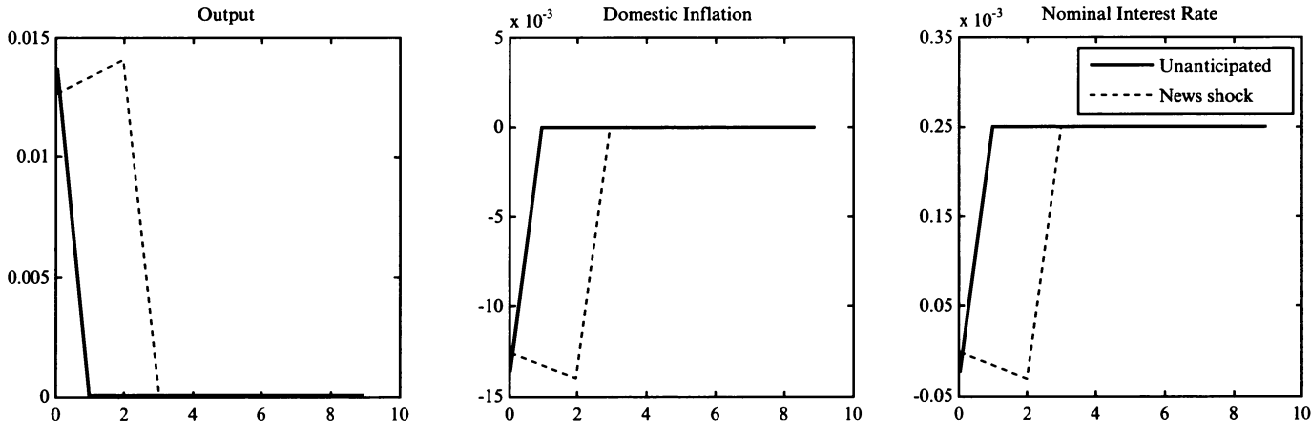

Figure 3C1.2
Closed economy, Taylor-rule, sticky-price allocation

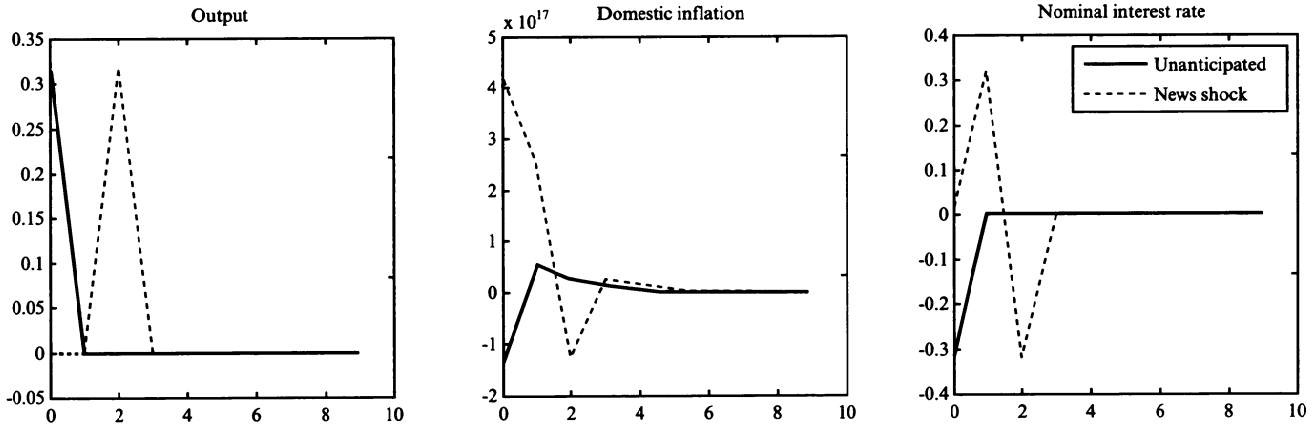

Figure 3C1.3
Closed economy, optimal monetary policy

From this simple analysis we might draw two main conclusions:

1. The first one is related to the completely different behavior between the Taylor rule and the optimal policy for an anticipated productivity shock. While the Taylor rule would imply a decrease of the nominal interest rate in the period in which the shock is announced, optimal policy would recommend to increase the domestic interest rate. This suggests that while the Taylor rule might be a good approximation to optimal policy for current shocks, news shocks might imply significant difference.

2. The second observation suggests that the targeting rule in which domestic inflation is stabilized at each point in time and in every state would be a good policy for all types of shocks (anticipated or not).

The Open Economy Dimension

How does the problem change when we consider an open economy? And, in particular, what is the implication for exchange rate policy?

In this section I am going to focus on the behavior of the nominal exchange rate when the economy is subject to news shocks. As before, I examine the sticky price allocation under the Taylor-rule and under optimal policy. In order to mimic the feature of the analysis conducted in Devereux and Engel, I will parametrize the small open economy in such a way that the flexible price allocation is optimal.[5] In their work, Devereux and Engel suggest that in their two-country framework monetary policy should stabilize the nominal exchange rate conditional on news shocks: ". . . the sticky price distortion requires eliminating the effects of news on exchange rate changes, even if inflation is controlled." What I will show is that stabilization of producer price inflation would be sufficient to eliminate the inefficiency caused by sticky prices and news shock on the behavior of the nominal exchange rate: indeed, producer price stabilization is the optimal policy for this small open economy case.

As for the closed economy case, in figure 3C1.4 I consider the impulse response for the case in which policy is conducted following a Taylor-rule. In this case, the nominal exchange rate will appreciate in anticipation of future productivity improvements and the nominal interest rate accommodates the news shock. More importantly, the real exchange rate will depreciate because of initial deflation. On the contrary, under the optimal policy (see fig. 3C1.5), the nominal and real exchange rate would change only when the shock occurs and domestic producer inflation is stabilized in every period. Similarly to what occurs in a closed

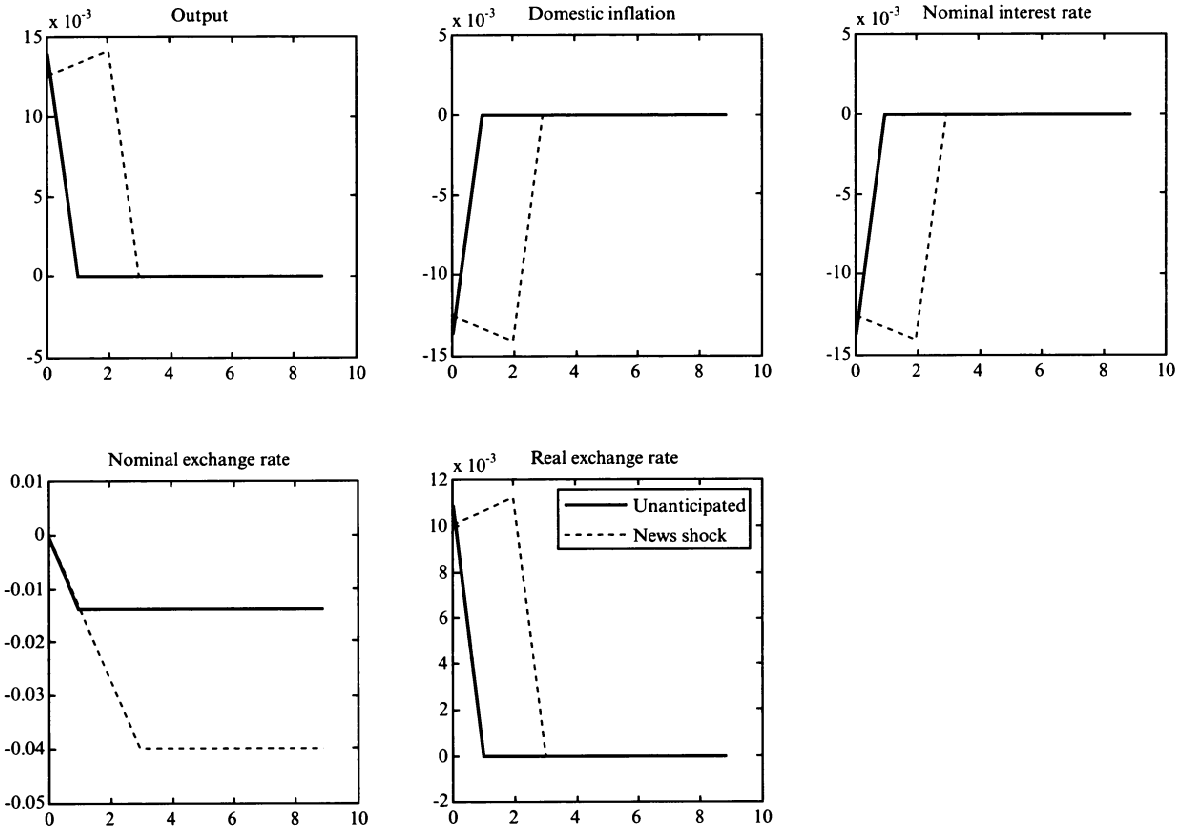

Figure 3C1.4
Small open economy, Taylor-rule, sticky-price allocation

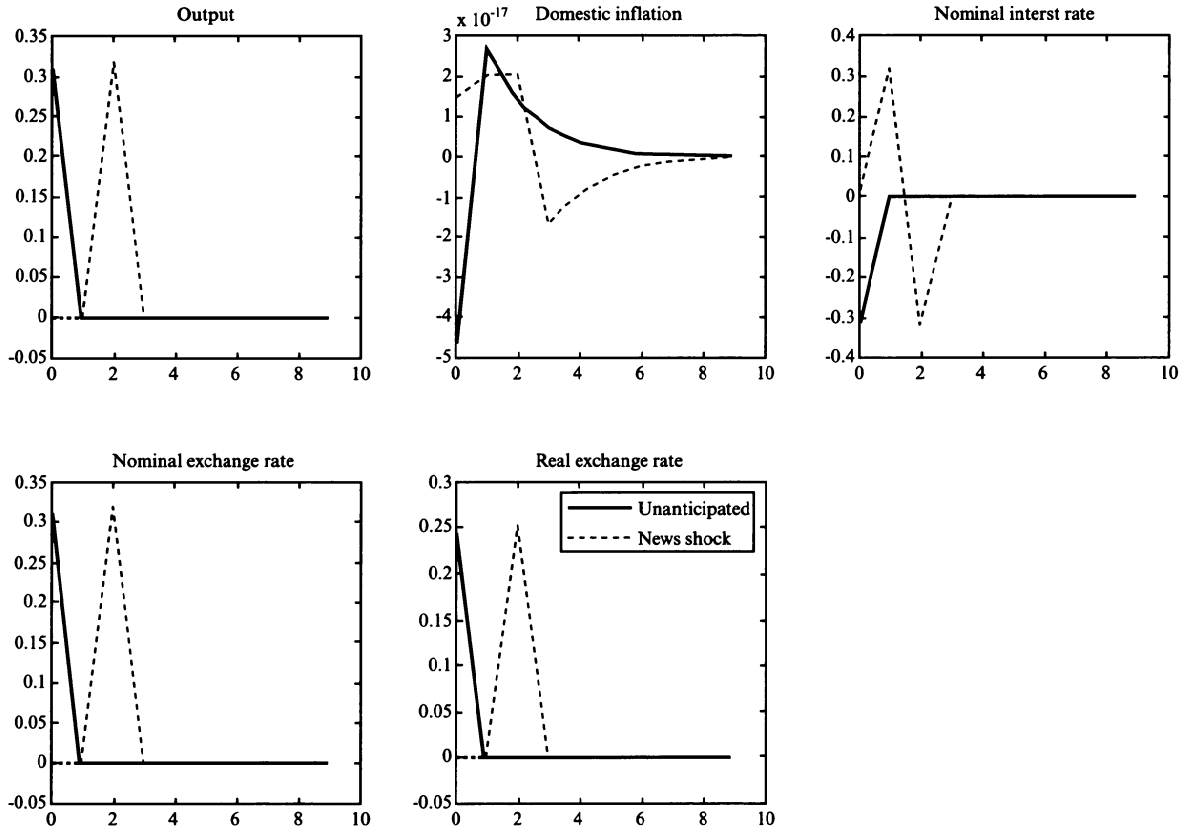

Figure 3C1.5
Small open economy, optimal monetary policy

economy, the nominal interest rate initially increases and then decreases when the shock occurs.

The two conclusions that I draw upon previously for the closed economy analysis also hold here. Taylor-rules lead to a quite different response to news shock compared to optimal policy, and the targeting rule in which domestic producer inflation is stabilized at each point in time and in every state would be a good policy for all types of shocks (anticipated or not).

How should we design policy in open economy?

Devereux and Engel suggest that policy should aim at stabilizing movements in the nominal exchange rate conditional on anticipated shocks on future fundamentals. They claim that the sticky price distortion would require to eliminate the effects of news on the exchange rate. The analysis conducted here through the previous simple examples has shown that optimal targeting rules would be robust to the introduction of news shocks. From the optimal policy problem for the small open economy or the two-country world, it is possible to derive the targeting rules that implement the optimal allocation. These targeting rules would be invariant to the introduction of news shock (see De Paoli 2004 and Benigno and Benigno 2006). In particular for the parametric case described by Devereux and Engel, a combination of policy in which countries set their own domestic producer inflation to zero would replicate the cooperative equilibrium and would be sufficient in eliminating the effects of news shocks under sticky prices (the home country would follow $\hat{\pi}^H = 0$ while the foreign country would set $\hat{\pi}_t^F = 0$).[6] Moreover, under the preference specification proposed by Devereux and Engel, producer price stabilization for both countries would also coincide with the noncooperative allocation.

Conclusions

Devereux and Engel have written an interesting and stimulating paper. It examines how optimal policy should respond to new shocks. Their main conclusion is that, given the structure of the economy, optimal policy should stabilize the nominal exchange conditional on news shocks. They suggest monetary and interest rate rules that would achieve optimality. While news shock combined with sticky price might imply inefficient behavior for the nominal exchange rate and the other variable of interests, in my analysis I have shown that an alternative way of writing the optimal policy problem (i.e., in terms of targeting rules) would be

robust to the introduction of news shock and would replicate the optimal allocation.

Notes

1. In previous work (see Devereux and Engel 2006), the authors provide evidence on the relevance and relative importance of news shocks.

2. The adoption of the partial adjustment rule à la Calvo does not change the conclusions.

3. For the simulation, unless otherwise specified, I use the parameters values as in De Paoli (2004) and consider only one-period productivity shock (anticipated and unanticipated). For the quasi-flexible allocation I set $\alpha = 0.0000001$ where α represents the probability of not changing prices in the Calvo adjustment rule.

4. For the sticky price case I set $\alpha = 0.66$.

5. This corresponds to the condition that the product of intra and intertemporal elasticity of substitution is unitary (i.e., $\rho\theta = 1$; see De Paoli 2004).

6. Benigno and Benigno (2006) derive the targeting rules for more general preference specifications.

References

Benigno, G., and P. Benigno. 2006. Designing targeting rules for international monetary policy cooperation. *Journal of Monetary Economics* 53:473–506.

De Paoli, B. 2004. Monetary policy and welfare in a small open economy. Centre for Economics Performance (CEP) Discussion Paper no. 639. London: CEP.

Devereux, M. B., and C. Engel. 2003. Monetary policy in the open economy revised: Price setting and exchange rate flexibility. *Review of Economic Studies* 70: 765–84.

———. 2006. Expectations and monetary policy. Unpublished manuscript. University of Wisconsin, Madison.

Obstfeld, M., and K. Rogoff. 2002a. Global implications of self-oriented national monetary rules. *Quarterly Journal of Economics* 117: 503–35.