On John Taylor's Foundational Contributions to International Economics

Robert J. Hodrick

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John's 1993 Treatise on How to Do Normative Economics

Macroeconomic Policy in a World Economy: From Econometric Design to Practical Operation

Part 1: Theoretical and Empirical Foundations

Part 2: Development and Estimation of an International Macroeconomic Framework for the G7 Countries

Part 3: Econometric Policy Evaluations

A State-of-the-Art Two-Country Model

$$x_t = \frac{\delta}{3}\sum_{i=0}^{2} E_t(w_{t+i}) + \frac{1-\delta}{3}\sum_{i=0}^{2} E_t(p_{t+i}) + \frac{\gamma}{3}\sum_{i=0}^{2} E_t(y_{t+i}), \tag{1}$$

$$w_t = \frac{1}{3}\sum_{i=0}^{2} x_{t-i}. \tag{2}$$

$$p_t = \theta w_t + (1-\theta)(e_t + p_t^*), \tag{3}$$

$$y_t = -dr_t + f(e_t + p_t^* - p_t) + gy_t^*. \tag{4}$$

$$r_t = i_t - E_t(p_{t+1} - p_t). \tag{5}$$

$$m_t - p_t = -bi_t + ay_t, \tag{6}$$

$$i_t = i_t^* + E_t(e_{t+1} - e_t). \tag{7}$$

The model has 15 equations including money supply policy rules and corresponding equations for the foreign variables.

Theoretical Findings from an Increase in Domestic Money

1. Real balances increase in both countries.
2. Nominal interest rates decrease in both countries but by more in the domestic country.
3. Expected inflation increases in both countries.
4. Output increases in both countries.
5. The domestic currency depreciates to allow for its expected appreciation, but there is only slight evidence of exchange rate overshooting.

State-of-the-Art Econometric Methods

For smaller models, John suggests full information maximum likelihood estimation of the constrained vector autoregressive moving average process subject to the cross-equation restrictions induced by rational expectations.

For larger models, John uses the GMM equivalent of two-stage least squares.

Estimation of a More Complicated Model for the G7 Countries

1. Price and wage equations as before.
2. Consumption equations for services, non-durables, and durables.
3. Investment equations for non-residential structures and equipment, residential investment, and inventories.
4. Demand equations depend on permanent income and the long-term real interest rate.
5. Exports depend on the terms of trade and the weighted average of foreign country GDP gaps.
6. Imports depend on the terms of trade and the domestic GDP gap.
7. Risk premium shocks are added to uncovered interest rate parity and to the relation between long-term nominal interest rates and the path of expected future short rates.

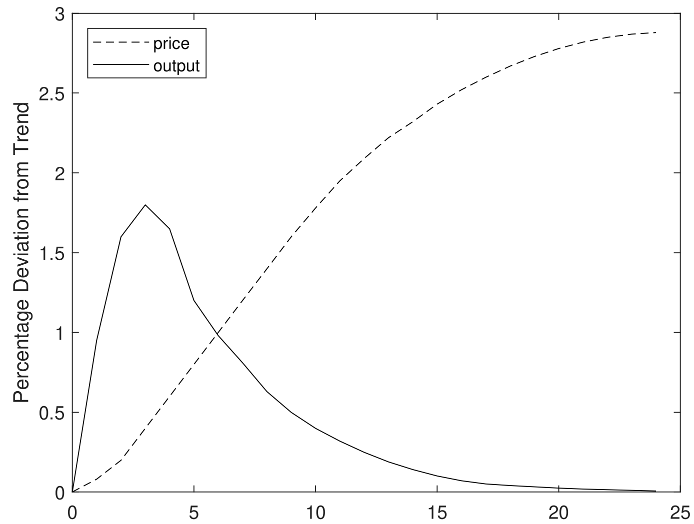
Estimating the Structural Shocks of the Model

Policy analysis requires structural shocks and their distribution.

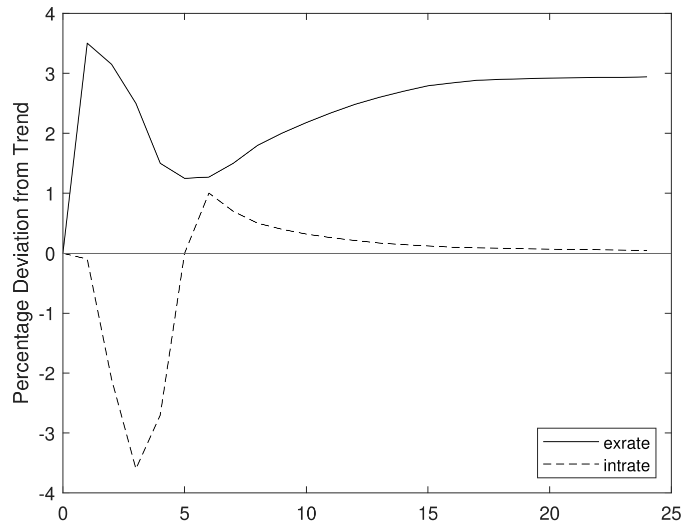
Estimated residuals contain both these structural shocks and the forecast errors associated with the expected variables.

To determine the structural shocks John dynamically simulates the model into the future conditional on the data through each sample point using the extended path method first developed by Fair and Taylor (1983).

U.S. Price and Output Responses to a 3% Increase in the Money Supply



Exchange Rate and Interest Rate Responses to a 3% Increase in the Money Supply



Investigating Alternative Policy Rules with Stochastic Simulations of the G7 Model

Three questions are addressed:

1. Is a system of fixed exchange rates better than a system of floating exchange rates? No, allowing individual feedback rules is generally better.
2. Is there significant improvement to be gained by coordinating monetary policy rules across countries? No, as long as individual countries follow sensible feedback rules, coordination is not necessary.
3. What is the best feedback rule for the interest rate? We see the first versions of the Taylor Rule!

$$i_t = i^* + E_t(\pi_{t,t+4} - \pi^*_{t,t+4}) + g_1(p_t - p^*_t) + g_2(y_t - y^*_t)$$

The Taylor Formula for How to Give Policy Advice

1. Develop a state-of-the-art theory.
2. Estimate the model with state-of-the-art econometrics.
3. Find the structural shocks and their distribution.
4. Simulate the model using the structural distribution of the shocks under alternative policy rules and observe the resulting objective function.
5. Advise policy makers to improve the lives of your fellow citizens throughout the world.