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FINANCIAL GUIDING PRINCIPLE IN A LINEARLY ORDERED SET DSGE FORM

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Abstract
The study is to estimate the endogenous variables of Financial Guiding Principle to understand the response and interaction among the variables. I use the Linearly Ordered Set DSGE Form, and the findings suggest that the Financial Guiding Principle shock leads inflation falls and interest rate rises but change in interest rate decreases output.

Keywords: DSGE Form, Forecasting, Economic Guiding Principle and real GDP.

I. Introduction

This study estimates the endogenous component of Financial Guiding Principle using a DSGE Form. The idea behind using DSGE Form is to get the better feedback from the key macroeconomic variables to the fiscal instruments. Understanding the endogenous response of financial instruments is important because of endogenous movements in Financial and fiscal Guiding Principle interact each other (Davig & Leeper [12]). Increases in government spending trigger substitution effects —both inter- and intra-temporal— and a wealth effect. The ultimate impacts on the economy hinge on current and expected Financial and fiscal Guiding Principle behavior (Davig & Leeper [11]).

The literatures on estimating the economic effects of changes in Financial Guiding Principle using a DSGE Form are described in this section. In this study, I use a standard DSGE Form and estimate to explain the behavior of output growth and inflation. Two features of the macro Guiding Principle response have received little Forming attention, despite being central to the predictions of the impacts of the Guiding Principle actions. First, Financial Guiding Principle has reacted jointly to stimulate aggregate demand. A long line of research emphasizes that separating Financial and fiscal policies overlooks Guiding Principle interactions that are important for determining equilibrium (Leeper [20]). Second, few economic observers expect that the current recession-fighting mix of macro policies will persist indefinitely; eventually, policies will return to "normal". Because the impacts of current policies depend, in part, on expectations of possible future Financial-fiscal Guiding Principle regimes, predictions need to condition on the current regime and incorporate prospective future regimes. Intertemporal aspects of Financial and fiscal Guiding Principle interactions determine how any fiscal stimulus is expected to be financed, which theory suggests is a critical determinant of the efficacy of the stimulus (Leeper and Zha [21], Davig and Leeper [10], Chung et al. [8]).

This paper addresses these two features in a conventional dynamic stochastic general equilibrium (DSGE) Form with nominal price rigidities and complete specifications of Financial Guiding Principle. I use Fed interest rate and estimate Financial Guiding Principle and inserted into the calibrated DSGE Form. The rest of the study follows: Section 2 presents the dataset, Section 3 presents the DSGE Form used for the empirical analysis and discusses how I solve the Form, and Section 4 presents impulse responses to see unexpected change in interest rate on inflation and output gap.

II. The Dataset

The data is quarterly time series from 1947Q2 to 2020Q4. The data is seasonally adjusted from 1947Q2 to 2020Q4 in USA. The data is percentage change to make sure that it is stationary and taken from St. Louis Fred Website.

2.1. The Form

The Form has three sectors: households, firms, and financial authority/federal reserve bank.

Households

Household's consumption depends on the future output and real interest rate that makes them enable in decision making based on current demand and expected future demand. The Form equation is:

$$xt = Et(xt+1) – \{rt – Et(\pi t+1) – zt\} \ . (1)$$

The notation xtdenotes the output gap at time t, Et(xt+1) is the expected output gap in period t + 1, rt is the nominal Interest rate and πt+1 is the inflation rate. The equation also states that the output gap is positively related to the future expected output gap, Et(xt+1) and negatively to the interest rate gap, {rt – Et(πt+1) – zt}.

Firms

The firms produce output and set prices to satisfy demand of households and the household's decision making is represented in a pricing equation that develop relation among current inflation, expected future inflation and current output demand. The Form equation is: $\pi t = \beta Et(\_t+1) + kxt \ . (2)$

The firms set prices and produce output to satisfy demand at the set price. Their decision making is summarized by a pricing equation that relates current inflation (that is, the change in prices) to expected future inflation and current demand. The parameter capturing the degree to which inflation depends on output demand plays a key role in the Form. The parameter k determines the degree to which inflation depends on the output gap.

Federal Reserve Bank rules

Federal reserve bank sets the nominal interest rate in response to inflation. Fed increases the interest rate when inflation rises and reduces the interest rate when inflation falls. The Form equation is:

$$rt = 1/\pi\_t + ut \ . (3)$$

The endogenous variables xt, πt and rt are driven by two exogenous variables, zt and ut.

Specifying the DSGE Form

I fit the Form using data on the US interest rate and inflation rates. In my small DSGE Form, I have two control variables and two shocks. The DSGE Form is Linearly Ordered Set, and the variables are stationary. To run the Form, I set the equation for STATA under the following way:

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dsge(p=\{beta\}*E(F.p)+\{kappa\}*x)
(x=E(F.x)-(r-E(F.p)-g),unobserved)
(r=(1/\{beta\})*p+u)
(F.u=\{rhou\}*u,state)
(F.g=\{rhog\}*g,state)
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The important parameter is kappa (k), which is estimated to be positive. This parameter k is related to the price friction in the Form which means a one percentage point increases in the output gap, holding future expected inflation constant, leads to a 2.04 percentage point increase in inflation. The parameter beta (β) is estimated to be about 0.5, meaning that the coefficient on inflation (π) in the interest rate equation is about 2. So, the central bank increases interest rate about 2 for almost one in response of movement of inflation rate. The state variables, with their autoregressive coefficients of 7.172 and 0.3214 respectively, are persistent.

Table 1 - DSGE Form output

	Coef.	Std. Err.	P
BETA	0.2974	0.3123	0.341
KAPPA	2.0456	1.2770	0.109
RHOU	0.3463	0.1109	0.002
RHOG	0.9415	0.0369	0.000
SD(E.U)	7.1713	7.6913	
SD(E.G)	0.3214	0.1250	

III. Impulse-Responses

The Form question is, "What is the effect of an unexpected change in the interest rate on inflation and the output gap?" This can be answered using the Form and an unexpected change in the interest rate is formed as a shock to the u_t equation. This shock represents a contraction in Financial Guiding Principle in the language of the Form. A shock to Financial Guiding Principle leads inflation falls and interest rate rises but change in interest rate decreases output.

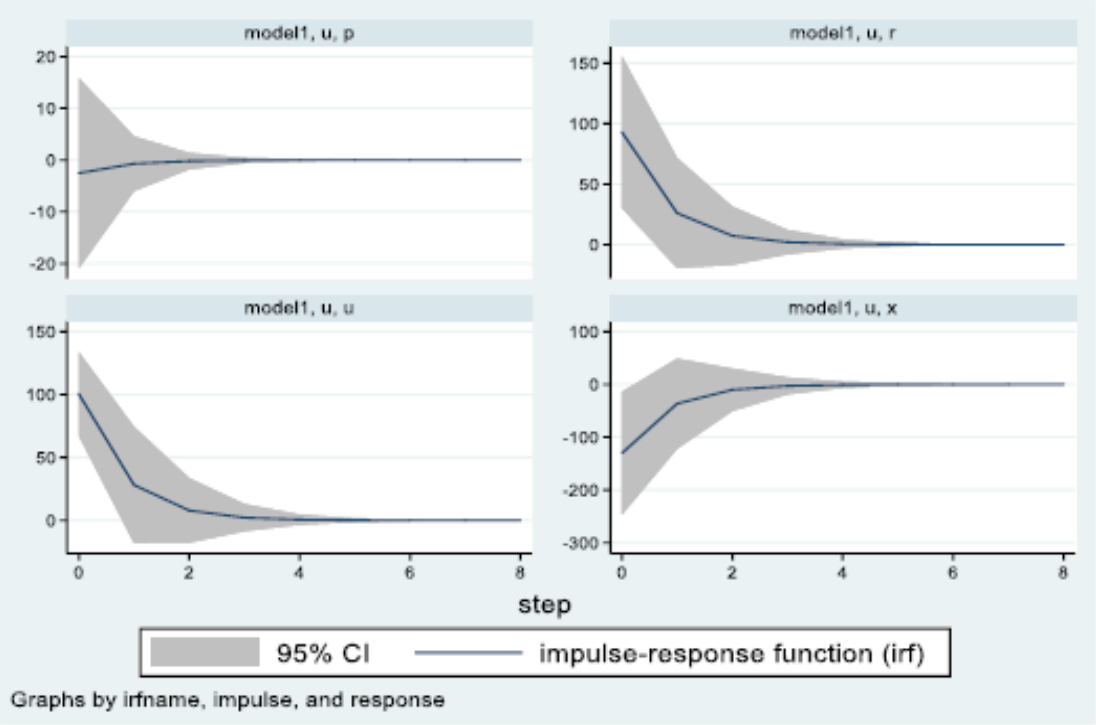

Figure 1

IV. Conclusion

The endogenous variables are output gap, interest rate and inflation. The Form specification and estimated result gives the transmission channel of the Financial Guiding Principle to prices. After the Financial Guiding Principle shocks, the estimated results suggest that a decreasing weight of short run economic activity with inflation falls and output declines.

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