Monetary Policy with forward-looking rules: The Swiss case

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Empirical monetary economics (policy)

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To use rules or not to use rules?

Rules vs discretion

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Form of the rule, variables and instruments

Behavior description

↓

Information setup and rule robustness

↓

Applied to a small open economy: Switzerland

Nicolas A. CUCHE
University of California Berkeley
http://cuche.net

Motivations

- $\varkappa = f(\Omega') + \varepsilon(\Omega'')$
- Look for rules in a country which does not use rules, Switzerland
- Apply methods of rule estimation and transform them
  i. Clarida Gali Gertler (EER 98)
  ii. Clarida Gali Gertler (QJE 00)
- Construct a model as a framework
  i. to compare these rules with respect to the informational setup
  ii. to avoid the debate targeting vs intrument rules
- Focus on some econometric problems e.g. definition of output gap

Main Results

- $x = f(\Omega') + \varepsilon(\Omega'')$
  i. Variables: inflation rate, output gap, exchange rate
  ii. Policy instrument: interest rate, aggregates
  iii. Informational setup: ex-post, realistic
- **Forward-looking rules explain the past Swiss monetary policy**
- Sample 1981-1997
  i. interest rate, aggregates
  ii. exchange rates not necessary
- Sample before 1990
  i. only aggregates
  ii. without exchange rates
- Sample after 1990
  i. only interest rates
  ii. with exchange rates
- Informational setup not important
- Descriptive vs prescriptive

Methodology

2 equations

- 1st , Targeting Rule (Model 1/3)
- 2nd , Market Equation (Model 2/3)

(Model 3/3)

- Targeting Rule (1)
  i. $$w_t^* = \tilde{w} + \beta E_t\left(\pi_{t+l} - \pi_{t+l}^*\right) + \gamma E_t\left(y_{t+m} - y_{t+m}^*\right) + \delta E_t\left(q_{t+n} - q_{t+n}^*\right)$$
  ii. Explanatory variables
  iii. Explained variables
  iv. Microfoundations
- Market equation (8)
  i. $$w_t = (1-\rho)w_t^* + \rho w_{t-1} + v_t$$
  ii. Scenarios
- Data and Results
  i. Output gap
  ii. Information

Model 1/3

- Targeting Rule (1)

$$w_t^* = \tilde{w} + \beta E_t\left(\pi_{t+l} - \pi_{t+l}^*\right) + \gamma E_t\left(y_{t+m} - y_{t+m}^*\right) + \delta E_t\left(q_{t+n} - q_{t+n}^*\right)$$

$$\frac{1}{2} E_t\left(\sum_{i=0}^{\infty} \theta^i \left(a^\circ x_{t+i}^2 + b^\circ \pi_{t+i}^2\right)\right)$$

$$x_t = -b_1 s_t + b_2\left(\pi_t - E_{t-1}\left(\pi_t\right)\right) + e_t$$

$$x_t = a_1 s_t - a_2 r_t + u_t$$

$$s_t = E_t\left(s_{t+1}\right) - r_t$$

$$r_t = i_t - E_t\left(\pi_{t+1}\right)$$

Model 2/3

- Market equation (8)
  i. Equation

$$w_t = (1-\rho)w_t^* + \rho w_{t-1} + v_t$$

  ii. Variables

Model 3/3

$$\begin{aligned} w_t &= (1-\rho)\tilde{w} + (1-\rho)\beta E_t\left(\pi_{t+12} - \pi^*_{t+12}\right) + (1-\rho)\gamma\left(y_t - y_t^*\right) \\ &\quad +(1-\rho)\delta E_t\left(q_{t+12} - q^*_{t+12}\right) + \rho w_{t-1} + v_t. \end{aligned} \tag{9}$$

Description

$$\begin{aligned} w_t &= (1-\rho)\overbrace{\left(\tilde{w} - \beta\pi^*\right)}^{\alpha} + (1-\rho)\beta\pi_{t+12} \\ &\quad +(1-\rho)\gamma x_t + (1-\rho)\delta s_{t+12} + \rho w_{t-1} + \varepsilon_t, \end{aligned} \tag{10}$$

Experimental

$$\begin{aligned} w_t &= (1-\rho)\tilde{w} + (1-\rho)\beta E_t\left(\pi_{t+12} - \pi^*_{t+12}\right) + (1-\rho)\gamma x_t \\ &\quad +(1-\rho)\delta\left(q_t - q^*\right) + \rho w_{t-1} + v_t. \end{aligned} \tag{12}$$

Some Results

- ## Descriptive estimation

Table 3: Overview Descriptive Estimation

Best Combinations

Whole Sample		Before 1990		After 1990	
1 $cr\ x_1$	0.91	7 $M0\ x_1$	0.84	2 $cr\ x_1\ s^{dm}$	0.95
2 $cr\ x_1\ s^{dm}$	0.89	9 $M0\ x_5$	0.84	13 $cr\ x_1\ s^{us}$	0.94
3 $cr\ x_5$	0.91	11 $M1\ x_1$	0.85	14 $cr\ x_1\ s^{all}$	0.95
4 $cr\ x_5\ s^{dm}$	0.90	12 $M1\ x_5$	0.85		
5 $giro\ x_1\ s^{dm}$	0.95				
6 $giro\ x_5\ s^{dm}$	0.83				
7 $M0\ x_1$	0.88				
8 $M0\ x_1\ s^{dm}$	0.81				
9 $M0\ x_5$	0.88				
10 $M0\ x_5\ s^{dm}$	0.83				
11 $M1\ x_1$	0.75				
12 $M1\ x_5$	0.89				

- ## Experimental estimation

Table 4: Experimental Rule Estimation

After 1990 90:01-96:12

Model	$\tilde{w}$	β	γ	δ	ρ
15 $cr\ x_e\ s^{dm}$	5.11*	0.74*	0.47*	0.23*	0.71*
16 $giro\ x_e\ s^{dm}$	-1.02	-2.64*	-1.76*	-0.39**	0.69*
17 $M0\ x_e\ s^{dm}$	-2.63**	-0.74	-0.71*	-0.14	0.61*
18 $M1\ x_e\ s^{dm}$	-0.35	-2.03*	-1.17*	-0.22	0.56*

Conclusions and future research

- Main results

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\begin{aligned}
& \text{before 90 (7)} \\
M0_t^* &= \tilde{M0} - 2.11E_t\left(\pi_{t+12} - \pi^*\right) - 0.68E_t x_{1_t} \\
M0_t &= (1-0.62)M0_t^* + 0.62M0_{t-1} + v_t \\
& \text{after 90 (14)} \\
cr_t^* &= \tilde{cr} + 0.67E_t\left(\pi_{t+12} - \pi^*\right) + 0.53E_t x_{1_t} + 0.03E_t s_{t+12}^{all} \\
cr_t &= (1-0.44)cr_t^* + 0.44cr_{t-1} + v_t
\end{aligned}
$$

- Usefulness for the central bank?
- Targeting rule and instrument rule
- Asymmetries
  i. asymmetries in the model
  ii. asymmetries in the parameter size
  iii. asymmetries in the parameter sign
- Asymmetries in the parameter sign with respect to the output gap
  i. Is there a reluctance to boost the economy when the output gap is negative?
  ii. Is there a swiftness to react to a positive gap?