1 Modelo Monetario: Análisis Dinámico

1.1 Variables de Estado

Las siguientes variables aparecen con rezago:

- $y(t-1)$
- $g(t-1)$
- $a(t-1)$
- $c^*(t-1)$
- $\xi_\pi(t-1)$
- $\xi_r(t-1)$
- $\xi_g(t-1)$

Variables forward-looking:

- $y(t+1)$
- $\pi(t+1)$
- $b(t+1)$
- $g(t+1)$

Variables estáticas:

- r
- r^{nat}

1.2 Residuos de las Ecuaciones Estáticas

Ecuación	Descripción	Residuo
1	New Phillips Curve	0
2	Dynamic IS Curve	0
3	Government Consolidated Budget Constraint	0
4	Modified Monetary-Led Policy Rule	0.26505
5	Optimal Fiscal Policy Rule	-1.0481
6	Natural Interest Rate	0
7	Technology AR(1)	0
8	International Consumption AR(1)	0
9	Domestic Price AR(1)	0
10	Interest Rate AR(1)	0
11	Public Spending AR(1)	0

Table 1: Residuos de las Ecuaciones Estáticas

1.3 Valores en Estado Estacionario

Variable	Valor
y	0.522375
π	0.110207
b	-93.0674
r	0.110207
g	0.506537
r^{nat}	0
a	0
c^*	0
ξ_π	0
ξ_r	0
ξ_g	0

Table 2: Resultados del Estado Estacionario

1.4 Autovalores

Módulo	Real	Imaginario
1.344e-17	1.344e-17	0
0.3563	0.3563	0
0.3869	0.3869	0
0.5	0.5	0
0.5	0.5	0
0.5	0.5	0
0.5	0.5	0
0.7	0.7	0
1.01	1.01	0
2.634	2.634	0
3.51	3.51	0

Table 3: Autovalores del Sistema

1.5 Condición de Equilibrio

Hay 3 autovalores mayores que 1 en módulo para 4 variables forward-looking. La condición de rango NO se verifica.

Table 4: Parameter Values

Parameter	Value	Description
θ	0.500	Calvo Probability
σ	1.000	Inverse EIS
α	0.430	Openness Degree
ϕ	1.000	Inverse Labor Supply Elasticity
β	0.990	Discount Factor
ρ_α	0.500	Productivity Shock Autocorrelation
ρ_{c^*}	0.500	Int. Consumption Shock Autocorrelation
ρ_π	0.500	Domestic Price Shock Autocorrelation
ρ_r	0.700	Interest Rate Shock Autocorrelation
ρ_g	0.500	Public Spending Shock Autocorrelation
γ_π	1.250	Monetary Authority Inflation Gap Response
ζ_π	0.250	Fiscal Authority Inflation Gap Response
γ_y	0.250	Monetary Authority Output Gap Response
ζ_y	1.250	Fiscal Authority Output Gap Response
γ_r	0.700	Interest Rate Smoothing
ζ_g	0.250	Government Spending Response
η	0.690	Domestic-Imported Goods Substitution Elasticity
υ	1.000	Cross-Country Goods Substitution Elasticity
τ	0.033	Effective Income Tax Rate
$\frac{\bar{B}}{\bar{Y}}$	0.530	Steady State Debt-GDP Ratio
$\frac{\bar{C}}{\bar{Y}}$	0.700	Steady State Consumption-GDP Ratio
r^*	0.000	Steady State Interest Rate

$$omega = \sigma\,\upsilon + (1-\alpha)\;(\sigma\,\eta - 1)$$

$$sigma\_alpha = \frac{\sigma}{1 + \alpha\;(omega - 1)}$$

$$lambda = \frac{(1-\beta\,\theta)\;(1-\theta)}{\theta}$$

$$kappa\_upsilon = lambda\;(sigma\_alpha + \phi)$$

$$OMICRON\_R\_LAG1 = \frac{1 + \beta + sigma\_alpha\,kappa\_upsilon}{\beta}$$

$$OMICRON\_R\_LAG2 = \frac{(-1)}{\beta}$$

$$OMICRON\_PI = \frac{kappa\_upsilon\,\gamma_\pi}{sigma\_alpha\,\gamma_y}$$

$$OMICRON\_Y = \frac{\gamma_y}{sigma\_alpha\,\gamma_r}$$

$$OMICRON\_R\_TAR = \frac{(-(sigma\_alpha\,kappa\_upsilon))}{\beta}$$

$$D = kappa\_upsilon + sigma\_alpha + \beta\,sigma\_alpha$$

$$PSI\_G\_PLUS = \frac{\beta\,sigma\_alpha}{D}$$

$$PSI\_G\_LAG = \frac{sigma\_alpha}{D}$$

$$PSI\_Y\_PLUS = \frac{\beta\,sigma\_alpha\,\zeta_y}{D\,\zeta_g}$$

$$PSI\_Y\_0 = \frac{sigma\_alpha\,\zeta_y\;(2+\beta)}{D\,\zeta_g}$$

$$PSI\_Y\_LAG = \frac{sigma\_alpha\,\zeta_y}{D\,\zeta_g}$$

$$PSI\_PI\_PLUS = \frac{\beta\, sigma\_alpha\, \zeta_\pi\, (sigma\_alpha - kappa\_upsilon)}{D\, \zeta_g}$$

$$PSI\_PI\_0 = \frac{(sigma\_alpha - kappa\_upsilon)\; sigma\_alpha\, \zeta_\pi}{D\, \zeta_g}$$

$$CONS = \frac{\alpha\, \Big(sigma\_alpha\, \frac{\bar{C}}{\bar{Y}} - sigma\_alpha - kappa\_upsilon\, \frac{\bar{C}}{\bar{Y}} + sigma\_alpha\, \tau - \frac{\bar{B}}{\bar{Y}}\, sigma\_alpha^2 + kappa\_up}{D\, \zeta_g\, \beta\, \frac{\bar{B}}{\bar{Y}}}$$

$$V = sigma\_alpha\, \gamma_y + sigma\_alpha\, \beta\, \gamma_y + kappa\_upsilon\, \gamma_y + \beta\, \gamma_r\, sigma\_alpha^3 + \gamma_r\, sigma\_alpha^3 + kappa\_upsilon\, \gamma_r\, sigma\_alpha^2$$

$$UPSILON\_G\_PLUS = \frac{sigma\_alpha\, \gamma_y\, (sigma\_alpha + kappa\_upsilon)}{V}$$

$$UPSILON\_G\_LAG = \frac{\gamma_y\, sigma\_alpha^2}{V}$$

$$UPSILON\_Y\_PLUS = \frac{sigma\_alpha\, \gamma_y\, (\beta\, sigma\_alpha\, \zeta_y + kappa\_upsilon\, \zeta_g + sigma\_alpha\, \beta\, \zeta_g + sigma\_alpha\, \zeta_g)}{\zeta_g\, V}$$

$$UPSILON\_Y\_0 = \frac{(2+\beta)\; sigma\_alpha^2\, \gamma_y\, \zeta_g}{\zeta_g\, V}$$

$$UPSILON\_Y\_LAG = \frac{sigma\_alpha^2\, \gamma_y\, \zeta_y}{\zeta_g\, V}$$

$$UPSILON\_PI\_PLUS = \frac{\gamma_y\, \big(\zeta_\pi\, sigma\_alpha^2\, (-\beta) - sigma\_alpha\, \beta\, \zeta_g - sigma\_alpha\, \zeta_g + \zeta_\pi\, \beta\, sigma\_alpha^3 - kappa\_upsilon}{\zeta_g\, V}$$

$$UPSILON\_PI\_0 = \frac{(sigma\_alpha - kappa\_upsilon)\; sigma\_alpha^2\, \gamma_y\, \zeta_\pi}{\zeta_g\, V}$$

$$UPSILON\_RN = \frac{\gamma_y}{\gamma_y + \gamma_r\, sigma\_alpha^2}$$

$$K = \frac{\alpha\, sigma\_alpha\, \gamma_y\, \Big(kappa\_upsilon\, sigma\_alpha\, \frac{\bar{B}}{\bar{Y}} + sigma\_alpha\, \frac{\bar{C}}{\bar{Y}} + sigma\_alpha\, \tau - sigma\_alpha\, -}{V\, \beta\, \zeta_g\, \frac{\bar{B}}{\bar{Y}}}$$

$$\pi_{tt} = \beta\, \pi_{tt+1} + kappa\_upsilon\, \tilde{y}_{tt} - sigma\_alpha\, \tilde{g}_{tt} + \xi_{\pi t} \tag{1}$$

$$\tilde{y}_{tt} = \tilde{y}_{tt+1} - \frac{1}{sigma\_alpha}\ \left(r_{tt} - \pi_{tt+1} - {r^{n}}_{t}\right) - \left(\tilde{g}_{tt+1} - \tilde{g}_{tt}\right) \tag{2}$$

$$\tilde{b}_{tt+1} = r_{tt} - {r^{n}}_{t} + \frac{1}{\beta}\ \left(\tilde{b}_{tt} - \pi_{tt} + \tilde{g}_{tt}\, \frac{\frac{\bar{C}}{\bar{Y}}}{\frac{\bar{B}}{\bar{Y}}} + \tilde{y}_{tt}\, \frac{1 - \tau - \frac{\bar{C}}{\bar{Y}}}{\frac{\bar{B}}{\bar{Y}}}\right) \tag{3}$$

$$\begin{aligned} r_{tt} = {} & K - \tilde{g}_{tt+1}\, UPSILON\_G\_PLUS + UPSILON\_G\_LAG\, \tilde{g}_{tt-1} \\ & + \tilde{y}_{tt+1}\, UPSILON\_Y\_PLUS - \tilde{y}_{tt}\, UPSILON\_Y\_0 + UPSILON\_Y\_LAG\, \tilde{y}_{tt-1} \\ & + \pi_{tt+1}\, UPSILON\_PI\_PLUS - \pi_{tt}\, UPSILON\_PI\_0 + r^{*} + {r^{n}}_{t}\, UPSILON\_RN + \xi_{rt} \end{aligned} \tag{4}$$

$$\begin{aligned} \tilde{g}_{tt} = {} & \tilde{g}_{tt+1}\, PSI\_G\_PLUS - CONS + \tilde{g}_{tt-1}\, PSI\_G\_LAG + \tilde{y}_{tt+1}\, PSI\_Y\_PLUS \\ & - \tilde{y}_{tt}\, PSI\_Y\_0 + \tilde{y}_{tt-1}\, PSI\_Y\_LAG - \pi_{tt+1}\, PSI\_PI\_PLUS + \pi_{tt}\, PSI\_PI\_0 + \xi_{g_t} \end{aligned} \tag{5}$$

$${r^{n}}_{t} = \frac{sigma\_alpha\ (1 + \phi)\ (\rho_{\alpha} - 1)}{sigma\_alpha + \phi}\, a_{tt} + \frac{(omega - 1)\ \alpha\, \phi}{sigma\_alpha + \phi}\ (\rho_{c^{*}} - 1)\ c^{*}_{t\, t} \tag{6}$$

$$a_{tt} = \rho_{\alpha}\, a_{tt-1} + {\varepsilon^{a}}_{t} \tag{7}$$

$$c^{*}_{t\, t} = \rho_{c^{*}}\, c^{*}_{t\, t-1} + {\varepsilon^{c}}_{t} \tag{8}$$

$$\xi_{\pi t} = \rho_{\pi}\, \xi_{\pi t-1} + {\varepsilon^{\pi}}_{t} \tag{9}$$

$$\xi_{rt} = \rho_{r}\, \xi_{rt-1} + {\varepsilon^{r}}_{t} \tag{10}$$

$$\xi_{g_t} = \rho_{g}\, \xi_{g_{t-1}} + {\varepsilon^{g}}_{t} \tag{11}$$