The Interaction of Fiscal and Monetary Policies in the Open Macroeconomic model

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1. Introduction

The aim of this article is to analyze the inflation targeting and the economic stabilization policy about the interaction of the fiscal and monetary policies using Post Keynesian open macroeconomic model. The theoretical contributions of this article are as follows: 1) the real exchange rate and the interest rate are modeled as endogenous variables in the Post Keynesian open macroeconomic model, and 2) we consider the different preferences of the macroeconomic regimes about the inflation and employment in the monetary authority.

The alternative models of the inflation targeting and monetary policy rule have gained attention in the formal Post Keynesian models. These models have taken into account both closed economies (Kriesler and Lavoie, 2007; Lima and Setterfield, 2008) and open economies (Drumond and Porcile, 2012; Vera,2014; Drumond and De Jesus, 2016).

An important aspect of Post Keynesian economics is the practical interest in the macroeconomic policy. In particular, through the models developed by Setterfield(2006) and Rochon and Setterfield (2007), the literature has advanced in its effort to understand the role of the interest rate or the interest rate operating procedure (IROP) and its compatibility with the Post Keynesian economics (Drumond and De Jesus, 2016,173).

Drumond and Porcile (2012) incorporate the dynamics of the real exchange rate and the dynamics of the expected rate of inflation, and developed Kaleckian macroeconomic model. The monetary policy rule considering the effects on the employment and the inflation rate will contribute to the economic stability. On the other hand, if the adaptive expectation interrupts the process of the wage bargaining, the regime focusing on the employment will be unstabilized on the economy.

Drumond and De Jesus(2016) analyze the interaction of the fiscal and monetary policies in the open economy in the framework of the Post Keynesian macroeconomic model. The dynamical properties of the macroeconomic equilibrium are evaluated in the different regimes of the fiscal and monetary policies.

Lima and Porcile(2013) developed the dynamic model determined the interaction of the international competitiveness and the income distribution.

The content of this paper is as follows. In section 2, we present the basic model considering on the income distribution in open economy. In section 3, we consider the monetary policy rule and the real exchange rate. In section 4, we consider the stability of economic equilibrium under the different policy regimes of the fiscal and monetary policies. In the section 5, we present the concluding remarks.

2． The Basic model in open economy

The behavior of the firms in an economy with the imperfect competition is taken as the starting point. For simplicity, disregarding as the existence of the intermediate goods costs, the general price level can be described as the following form.

$$P = \mu\left(\frac{W}{A}\right) \quad (1)$$

P is the general price level, μ is the markup factor of the firms, W is the nominal wage, and A is the labor productivity($A = Y/N$).

The inflation rate is as follows:

$$p = w - a \quad (2)$$

where p is the inflation rate, w is the growth rate of the nominal wage, and a is the growth rate of the labor productivity.

The wage demand takes an worker's desired wage as the target.

$$w = p^e + a + (1-\theta)\left(\omega^d - \omega^f\right) + \theta\rho \quad ; \quad 0 < \theta < 1 \quad (3)$$

Workers negotiate wages in the hopes of making up for possible inflation losses by indexing wages to the expected inflation. However, besides wage indexing, they want to incorporate real gains, thus increasing wage bargaining whenever the desired wage is lower than the one that is determined by firms (Drumond and De Jesus, 2016, 176).

Worker's desired wage depends on the level of the employment in an economy.

$$\omega^d = au \quad (4)$$

where the rate of capacity utilization ($u = Y/\bar{Y}$) is also an endogenous variable related to the aggregate demand.

Having in mind that the wages desired by workers (ω^d) are an endogenous variable that responds to employment level, and considering that employment positively responds to the rate of capacity utilization u, the inflation dynamics may be rewritten as follows(Drumond and De

Jesus, 2016, 176).

$$p = p^e + (1-\theta)(au - \omega^f) + \theta\rho \quad ; \quad 0 < \theta < 1 \tag{5}$$

We take as a point of departure the following traditional Keynesian aggregate demand curve.

$$Y = c_w(1-\pi)Y + c_k\pi Y + D + I + B \ ; \ 0 < c_w < 1,\ 0 < c_k < 1 \tag{6}$$

π:profit share, $\pi = \frac{\mu - 1}{\mu}$

where the aggregate demand is the sum of worker's consumption, capitalist's consumption, government expenditure D, investment I, and the net export B. We will express in terms of ratio with respect to the stock of capital, considering a constant product to capital ratio $v = \frac{\bar{Y}}{K}$, *and assume* $c_w(1-\pi) + c_k\pi = c, 0 < c < 1.$

$$uv = c_w(1-\pi)uv + c_k\pi uv + d + g + h \tag{7}$$

$u = Y/\bar{Y}$ is the rate of capacity utilization, and $v = \frac{\bar{Y}}{K}$ is the inverse of the capital-production ratio, d is the government expenditure as the share of the capital stock, g is the investment as the share of the capital stock, h is the net export as the share of the capital stock. (Drumond and Porcile,2012,143).

Assuming linear functions for investment and net exports:

$$g = \tau + \delta_1 u - \delta_2 r; \quad \delta_1 > 0, \delta_2 > 0 \tag{8}$$

$$h = \sigma + b_1\rho - b_2 u; \quad b_1 > 0,\ b_2 > 0 \tag{9}$$

where the investment is the increasing function of the rate of capacity utilization, and the decreasing function of the real interest rate, and the net export is the increasing function of the real exchange rate, and the decreasing function of the rate of the capacity utilization(Drumond and De Jesus, 2016, 175-177).

All parameters $\tau, \sigma, \delta_1, b_1, \delta_2, b_2$ are positive. τ is responsive the capitalist's animal spirits, and σ is the individual net export.

The government expenditure d is expressed the function of the gap between the rate of capacity utilization u and the target rate of capacity utilization u^T.

$$d = d_0 - \lambda(u - u^T); \ \lambda \geq 0,\ d_0 > 0 \tag{10}$$

where the term d_0 is the individual government expenditure, λ responds to the gap between the rate of capacity utilization and the target rate of the capacity utilization.
With this simplification we obtain a Post Keynesian IS (investment/saving) curve as

$$u = \frac{A - \delta_2 r + b_1 \rho}{b_2 + \lambda - \delta_1 + vs} \quad ; A = \sigma + \tau + \lambda u^T + d_0 \tag{11}$$

(Drumond and De Jesus, 2016,177－178)。

3． Monetary Policy Rule and Real Exchange Rate

The real exchange rate is treated as an endogenous variable. In the model, the economy works in the regulated exchange rate regime. We assume the nominal exchange rate regulate the expectation of the real exchange rate (Drumond and De Jesus, 2016, 178).

$$\dot{e} = \psi(\rho^e - \rho), \ \psi > 0 \tag{12}$$

e：nominal exchange rate, ρ: real exchange rate, ρ^e: expected real exchange rate

Combining the nominal exchange rate dynamics with the real exchange rate dynamics, and taking the external inflation equal to zero, for simplicity, the real exchange rate dynamics is as follows:

$$\dot{\rho} = \psi(\rho^e - \rho) - p \tag{13}$$

Monetary policy is described as following interest rate rule or IROP (Drumond and De Jesus, 2016,178).

$$\dot{r} = \beta(u - u^T) + \gamma(p - p^T) \tag{14}$$

Equation(14) shows that the monetary authority regulates the interest rate taking into account the deviations of the installed capacity utilization rate in regard to the target and the inflation deviations in regard to the target (Drumond and De Jesus, 2016,179).

4． Fiscal and Monetary Policy: Economic Stabilization of the different regimes

4.1 Dual-mandate monetary regime with the passive fiscal policy ($\lambda = 0$)

The first policy regime is the dual-mandate monetary regime($\beta > 0, \gamma > 0$): the monetary authority is concerned with two objectives, inflation and employment, the latter through a target for the rate of capacity utilization.

Combining the Philips curve, the equilibrium of the goods market, the dynamics of the interest rate, and the dynamics of the real exchange rate, the following dynamic system is obtained.

$$\dot{r} = \beta\left(\frac{A-\delta_2 r+b_1\rho}{b_2-\delta_1+vs} - u^T\right) + \gamma((1-\theta)\left(a\frac{A-\delta_2 r+b_1\rho}{b_2-\delta_1+vs} - \omega^f\right) + \theta\rho) \quad (15)$$

$$\dot{\rho} = \psi(\rho^e-\rho) - (p^e + (1-\theta)\left(a\frac{A-\delta_2 r+b_1\rho}{b_2-\delta_1+vs} - \omega^f\right) + \theta\rho) \quad (16)$$

The dynamic system of Equation(15) and (16) has the following Jacobian matrix.

$$J = \begin{bmatrix} (\frac{-\delta_2[\beta+\gamma a(1-\theta)]}{b_2-\delta_1+vs}) & (\frac{b_1(\beta+\gamma a(1-\theta))}{b_2-\delta_1+vs} + \alpha\theta) \\ (\frac{\delta_2(1-\theta)a}{b_2-\delta_1+vs}) & -\psi - (\frac{b_1 a(1-\theta)}{b_2-\delta_1+vs} - \theta) \end{bmatrix} \quad (17)$$

$$trace\, J = \frac{-\delta_2[\beta+\gamma a(1-\theta)]}{b_2-\delta_1+vs} - \left(\psi + \left(\frac{b_1 a(1-\theta)}{b_2-\delta_1+vs} - \theta\right)\right) < 0$$

$$\det J = \left(\frac{-\delta_2[\beta+\gamma a(1-\theta)]}{b_2-\delta_1+vs}\right)\left(-\psi - \left(\frac{b_1 a(1-\theta)}{b_2-\delta_1+vs} - \theta\right)\right) - \left(\frac{b_1(\beta+\gamma a(1-\theta))}{b_2-\delta_1+vs} + \alpha\theta\right)\left(\frac{\delta_2(1-\theta)a}{b_2-\delta_1+vs}\right) > 0$$

Because the trace of J is negative and the determinant of J is positive, the dynamic system converges to the medium-run equilibrium values that are stable.

4.2 Single mandate employment for monetary policy and active fiscal policy ($\lambda > 0$)

The next regime is assumed that the fiscal authority behaves actively ($\lambda > 0$). It is assumed that the monetary authority assumes not to commit to the inflation target, and to commit the rate of capacity utilization , and to focus on the employment ($\beta > 0$, $\gamma = 0$).

In this regime, we introduce the dynamic equation on the expected inflation rate.

$$\dot{p^e} = k(p - p^e) \quad (18)$$

Equation (18) describes the dynamics of the expected inflation rate as the gap between the inflation rate and the expected inflation rate (Yoshida and Asada,2007).

Combining the Philips curve, the equilibrium of the goods market, the dynamics of the interest rate, and the dynamics of the real exchange rate, the following dynamic system is obtained.

$$\dot{r} = \beta\left(\frac{A-\delta_2 r+b_1\rho}{b_2+\lambda-\delta_1+vs} - u^T\right) \quad (19)$$

$$\dot{\rho} = \psi(\rho^e-\rho) - \left(p^e + (1-\theta)\left(a\frac{A-\delta_2 r+b_1\rho}{b_2+\lambda-\delta_1+vs} - \omega^f\right) + \theta\rho\right) \quad (20)$$

$$\dot{p^e} = k(1-\theta)(\alpha \frac{A-\delta_2 r+b_1\rho}{b_2+\lambda-\delta_1+vs} - \omega^f + \theta\rho) \quad (21)$$

The dynamic system of Equation (19),(20),(21) has the following Jacobian matrix.

$$J = \begin{bmatrix} (\frac{-\delta_2\beta}{b+\lambda_2-\delta_1+vs}) & (\frac{b_1\beta}{b_2+\lambda-\delta_1+vs}) & 0 \\ (\frac{\delta_2(1-\theta)\alpha}{b_2+\lambda-\delta_1+vs}) & -\psi-(\frac{b_1\alpha(1-\theta)}{b_2+\lambda-\delta_1+vs} - \theta) & -1 \\ \frac{-k(1-\theta)\alpha\delta_2}{b_2+\lambda-\delta_1+vs} & \left[\frac{k(1-\theta)\alpha b_1}{b_2+\lambda-\delta_1+vs} + k\theta\right] & 0 \end{bmatrix} \quad (22)$$

We use the Routh-Hurwitz conditions to show the stability of the three dimensions dynamic system.

The characteristic equation is as follows:

$$\varepsilon^3 + c_1\varepsilon^2 + c_2\varepsilon + c_3 = 0 \quad (23)$$

The Routh-Hurwitz conditions is that if $c_1, \ c_2, \ c_3 > 0$ and $c_1 c_2 - c_3 > 0$, the real part of eigenvalue is negative, and it satisfies the stability condition.

$$c_1 = -\,trace\,J = -\left\{\left(\frac{-\delta_2\beta}{b_2+\lambda-\delta_1+vs}\right) + \left(-\psi - (\frac{b_1\alpha(1-\theta)}{b_2+\lambda-\delta_1+vs} - \theta)\right)\right\} > 0$$

$$c_2 = \left(\frac{-\delta_2\beta}{b_2+\lambda-\delta_1+vs}\right)\left(-\psi - (\frac{b_1\alpha(1-\theta)}{b_2+\lambda-\delta_1+vs} - \theta)\right) - \left(\frac{b_1\beta}{b_2+\lambda-\delta_1+vs}\right)\left(\frac{-k(1-\theta)\alpha\delta_2}{b_2+\lambda-\delta_1+vs}\right) > 0$$

$$c_3 = -\det J = -\left(\left(\frac{-\delta_2\beta}{b_2+\lambda-\delta_1+vs}\right)\left[\frac{k(1-\theta)\alpha b_1}{b_2+\lambda-\delta_1+vs} + k\theta\right] + \left(\frac{-k(1-\theta)\alpha\delta_2}{b_2+\lambda-\delta_1+vs}\right)\left(\frac{b_1\beta}{b_2+\lambda-\delta_1+vs}\right)\right) > 0$$

$$c_1 c_2 - c_3 = -\left\{\left(\frac{-\delta_2\beta}{b_2+\lambda-\delta_1+vs}\right) - \left(\psi - \left(\frac{b_1\alpha(1-\theta)}{b_2+\lambda-\delta_1+vs} - \theta\right)\right)\right\}\left\{\left(\frac{-\delta_2\beta}{b_2+\lambda-\delta_1+vs}\right)\left(-\psi - (\frac{b_1\alpha(1-\theta)}{b_2+\lambda-\delta_1+vs} - \theta)\right) - \left(\frac{b_1\beta}{b_2+\lambda-\delta_1+vs}\right)\left(\frac{-k(1-\theta)\alpha\delta_2}{b_2+\lambda-\delta_1+vs}\right)\right\} + \left(\left(\frac{-\delta_2\beta}{b_2+\lambda-\delta_1+vs}\right)\left[\frac{k(1-\theta)\alpha b_1}{b_2+\lambda-\delta_1+vs} + k\theta\right] + \left(\frac{-k(1-\theta)\alpha\delta_2}{b_2+\lambda-\delta_1+vs}\right)\left(\frac{b_1\beta}{b_2+\lambda-\delta_1+vs}\right)\right)$$

Using the Routh-Hurwitz conditions, we conclude that the dynamic system can not determine the stability of equilibrium is stable or unstable.

Therefore, the macroeconomic policy regime with the active fiscal policy and employment does not ensure that the endogenous variables converge to the steady state.

4.3 Single mandate target inflation rate regime with the active fiscal policy($\lambda > 0$)

Next, we consider the policy regime that the Central Bank does not commit the rate of capacity utilization , and commits only to the inflation rate($\beta = 0, \ \gamma > 0$). Besides, it is assumed that the government take the active fiscal policy ($\lambda > 0$).

Combining the Philips curve, the equilibrium of the goods market, the dynamics of the interest rate, and the dynamics of the real exchange rate, the following dynamic system is obtained.

$$\dot{r} = \gamma((1-\theta)\left(a\frac{A-\delta_2 r+b_1\rho}{b_2+\lambda-\delta_1+vs} - \omega^f\right) + \theta\rho), \tag{24}$$

$$\dot{\rho} = \psi(\rho^e - \rho) - \left(p^e + (1-\theta)\left(a\frac{A-\delta_2 r+b_1\rho}{b_2+\lambda-\delta_1+vs} - \omega^f\right) + \theta\rho\right), \tag{25}$$

$$\dot{p^e} = k(1-\theta)\left(a\frac{A-\delta_2 r+b_1\rho}{b_2+\lambda-\delta_1+vs} - \omega^f + \theta\rho\right) \tag{26}$$

The dynamic system of Equation (24),(25),(26) has the following Jacobian matrix.

$$J = \begin{bmatrix} (\frac{-\delta_2\gamma(1-\theta)a}{b_2+\lambda-\delta_1+vs}) & (\frac{\gamma(1-\theta)ab_1}{b_2+\lambda-\delta_1+vs}) & 0 \\ (\frac{\delta_2\gamma(1-\theta)a}{b_2+\lambda-\delta_1+vs}) & -\psi - (\frac{\gamma(1-\theta)b_1 a}{b_2+\lambda-\delta_1+vs} - \theta) & -1 \\ \frac{-k(1-\theta)a\delta_2}{b_2+\lambda-\delta_1+vs} & \left[\frac{k(1-\theta)\alpha b_1}{b_2+\lambda-\delta_1+vs} + k\theta\right] & 0 \end{bmatrix} \tag{27}$$

We use the Routh-Hurwitz conditions to show the stability of the three dimensions dynamic system.
The characteristic equation is as follows:

$$\upsilon^3 + c_1\upsilon^2 + c_2\upsilon + c_3 = 0 \tag{28}$$

The Routh-Hurwitz conditions is that if $c_1, c_2, c_3 > 0$ and $c_1 c_2 - c_3 > 0$, the real part of eigenvalue is negative, and it satisfies the stability condition.

$$c_1 = -\,trace\,J = -\left\{(\frac{-\delta_2\gamma(1-\theta)a}{b_2+\lambda-\delta_1+vs}) + \left(-\psi - (\frac{\gamma(1-\theta)b_1 a}{b_2+\lambda-\delta_1+vs} - \theta)\right)\right\} > 0$$

$$c_2 = \left(\frac{-\delta_2\gamma(1-\theta)a}{b_2+\lambda-\delta_1+vs}\right)\left(-\psi - \left(\frac{\gamma(1-\theta)b_1 a}{b_2+\lambda-\delta_1+vs} - \theta\right)\right) - \left(\frac{\gamma(1-\theta)ab_1}{b_2+\lambda-\delta_1+vs}\right)\left(\frac{-k(1-\theta)a\delta_2}{b_2+\lambda-\delta_1+vs}\right) > 0$$

$$c_3 = -\det J = -\left(\left(\frac{-\delta_2\gamma(1-\theta)a}{b_2+\lambda-\delta_1+vs}\right)\left[\frac{k(1-\theta)\alpha b_1}{b_2+\lambda-\delta_1+vs} + k\theta\right] - \left(\frac{\gamma(1-\theta)ab_1}{b_2+\lambda-\delta_1+vs}\right)\left(\frac{-k(1-\theta)a\delta_2}{b_2+\lambda-\delta_1+vs}\right)\right) > 0$$

$$c_1 c_2 - c_3 = -\left\{\left(\frac{-\delta_2\gamma(1-\theta)a}{b_2+\lambda-\delta_1+vs}\right) + \left(-\psi - (\frac{b_1\alpha(1-\theta)}{b_2+\lambda-\delta_1+vs} - \theta)\right)\right\}\left\{\left(\frac{-\delta_2\gamma(1-\theta)a}{b_2+\lambda-\delta_1+vs}\right)\left(-\psi + \left(\frac{\gamma(1-\theta)b_1 a}{b_2+\lambda-\delta_1+vs} - \theta\right)\right) - \left(\frac{\gamma(1-\theta)ab_1}{b_2+\lambda-\delta_1+vs}\right)\left(\frac{-k(1-\theta)a\delta_2}{b_2+\lambda-\delta_1+vs}\right)\right\} + \left(\left(\frac{-\delta_2\gamma(1-\theta)a}{b_2+\lambda-\delta_1+vs}\right)\left[\frac{k(1-\theta)\alpha b_1}{b_2+\lambda-\delta_1+vs} + k\theta\right] - \left(\frac{\gamma(1-\theta)ab_1}{b_2+\lambda-\delta_1+vs}\right)\left(\frac{-k(1-\theta)a\delta_2}{b_2+\lambda-\delta_1+vs}\right)\right) > 0$$

Using the Routh-Hurwitz conditions, c_1, c_2, c_3>0 and $c_1c_2 - c_3$>0, the real part of eigenvalue is negative, and it satisfies the stability condition.

The macroeconomic policy regime with a monetary authority focused only on the target inflation rate and not to commit the rate of capacity utilization. In this regime, it is compatible with the active fiscal policy and the inflation targeting policy in the economic stability.

4.4 Dual-mandate monetary regime with the active fiscal policy ($\lambda>0$)

The fourth policy regime is assumed that the fiscal authority takes the active fiscal policy, and the monetary authority commits to the inflation rate and the employment($\beta>0,\gamma>0$).

The following dynamic system is contained with the dynamics of the interest rate, the dynamics of the real exchange rate, and the dynamics of the expected inflation rate.

$$\dot{r} = \beta\left(\frac{A-\delta_2 r+b_1\rho}{b_2+\lambda-\delta_1+vs} - u^T\right) + \gamma((1-\theta)\left(a\frac{A-\delta_2 r+b_1\rho}{b_2+\lambda-\delta_1+vs} - \omega^f\right) + \theta\rho) \tag{29}$$

$$\dot{\rho} = \psi(\rho^e - \rho) - \left(p^e + (1-\theta)\left(a\frac{A-\delta_2 r+b_1\rho}{b_2+\lambda-\delta_1+vs} - \omega^f\right) + \theta\rho\right) \tag{30}$$

$$\dot{p^e} = k(1-\theta)\left(a\frac{A-\delta_2 r+b_1\rho}{b_2+\lambda-\delta_1+vs} - \omega^f + \theta\rho\right) \tag{31}$$

The dynamic system of (29),(30),(31) has the following Jacobian matrix.

$$J = \begin{bmatrix} (\frac{-\delta_2[\beta+\gamma a(1-\theta)]}{b_2+\lambda-\delta_1+vs}) & (\frac{b_1(\beta+\gamma a(1-\theta))}{b_2+\lambda-\delta_1+vs} + a\theta) & 0 \\ (\frac{\delta_2(1-\theta)a}{b_2+\lambda-\delta_1+vs}) & -\psi - (\frac{b_1 a(1-\theta)}{b_2+\lambda-\delta_1+vs} - \theta) & -1 \\ \frac{-k(1-\theta)a\delta_2}{b_2+\lambda-\delta_1+vs} & \left[\frac{k(1-\theta)ab_1}{b_2+\lambda-\delta_1+vs} + k\theta\right] & 0 \end{bmatrix} \tag{32}$$

We use the Routh-Hurwitz conditions to show the stability of the three dimensions dynamic system.

The characteristic equation is as follows:

$$\kappa^3 + c_1\kappa^2 + c_2\kappa + c_3 = 0 \tag{33}$$

The Routh-Hurwitz conditions is that if c_1, c_2, c_3>0 and $c_1c_2 - c_3$>0, the real part of eigenvalue is negative, and it satisfies the stability condition.

$$c_1 = -\,trace\,J = -\{\left(\frac{-\delta_2[\beta+\gamma a(1-\theta)]}{b_2+\lambda-\delta_1+vs}\right) + (-\psi + (\frac{b_1 a(1-\theta)}{b_2+\lambda-\delta_1+vs} - \theta))\} > 0$$

$$c_2=\left(\frac{-\delta_2[\beta+\gamma a(1-\theta)]}{b_2+\lambda-\delta_1+vs}\right)\left(-\psi-(\frac{b_1\alpha(1-\theta)}{b_2+\lambda-\delta_1+vs}-\theta)\right)-\left(\frac{b_1(\beta+\gamma a(1-\theta))}{b_2+\lambda-\delta_1+vs}+a\theta\right)\left(\frac{-k(1-\theta)a\delta_2}{b_2+\lambda-\delta_1+vs}\right)>0$$

$$c_3=-\det J=-\left(\left(\frac{-\delta_2[\beta+\gamma a(1-\theta)]}{b_2+\lambda-\delta_1+vs}\right)\left[\frac{k(1-\theta)\alpha b_1}{b_2+\lambda-\delta_1+vs}+k\theta\right]-\left(\frac{b_1(\beta+\gamma a(1-\theta))}{b_2+\lambda-\delta_1+vs}+a\theta\right)\left(\frac{-k(1-\theta)a\delta_2}{b_2+\lambda-\delta_1+vs}\right)\right)>0$$

$$c_1c_2-c_3=-\left\{\left(\frac{-\delta_2[\beta+\gamma a(1-\theta)]}{b_2+\lambda-\delta_1+vs}\right)+\left(-\psi+\left(\frac{b_1a(1-\theta)}{b_2+\lambda-\delta_1+vs}-\theta\right)\right)\right\}\left\{\left(\frac{-\delta_2[\beta+\gamma a(1-\theta)]}{b_2+\lambda-\delta_1+vs}\right)\left(-\psi-\left(\frac{b_1a(1-\theta)}{b_2+\lambda-\delta_1+vs}-\theta\right)\right)-\left(\frac{b_1(\beta+\gamma a(1-\theta))}{b_2+\lambda-\delta_1+vs}+a\theta\right)\left(\frac{-k(1-\theta)a\delta_2}{b_2+\lambda-\delta_1+vs}\right)\right\}+\left(\left(\frac{-\delta_2[\beta+\gamma a(1-\theta)]}{b_2+\lambda-\delta_1+vs}\right)\left[\frac{k(1-\theta)\alpha b_1}{b_2+\lambda-\delta_1+vs}+k\theta\right]-\left(\frac{b_1(\beta+\gamma a(1-\theta))}{b_2+\lambda-\delta_1+vs}+a\theta\right)\left(\frac{-k(1-\theta)a\delta_2}{b_2+\lambda-\delta_1+vs}\right)\right)$$

Using the Routh-Hurwitz conditions, we conclude that the dynamic system can not determine the stability of equilibrium is stable or unstable.

5. Concluding Remarks

The aim of this article is to analyze the inflation targeting and the economic stabilization policy about the interaction of the fiscal and monetary policies using Post Keynesian open macroeconomic model. The theoretical contributions of this article are as follows: (1)the real exchange rate and the interest rate are modeled as endogenous variables in the Post Keynesian open macroeconomic model, and (2) we consider the different preferences of the macroeconomic regimes about the inflation and employment in the monetary authority.

The content of this paper is as follows. In section 2, we present the basic model considering on the income distribution in open economy. In section 3, we consider the monetary policy rule and the real exchange rate. In section 4, we consider the stability of economic equilibrium under the different policy regimes of the fiscal and monetary policies.

The concluding remarks of this article are as follows:

First, in the dual-mandate monetary regime, when the fiscal authority take the passive fiscal policy, Because the trace of J is negative and the determinant of J is positive, the dynamic system converges to the medium-run equilibrium values that are stable. Besides, in the dual-mandate monetary regime with the active fiscal policy, using the Routh-Hurwitz conditions, we conclude that the dynamic system can not determine the stability of equilibrium is stable or unstable.

Second, in the single mandate employment regime, when the fiscal authority take the active fiscal policy, using the Routh-Hurwitz conditions, we conclude that the dynamic system can’t determine the stability of equilibrium is stable or unstable.

Therefore, the macroeconomic policy regime with the active fiscal policy and employment does not ensure that the endogenous variables converge to the steady state.

Third, in the single mandate target inflation rate regime, using the Routh-Hurwitz conditions, c_1, c_2, c_3>0 and $c_1 c_2 - c_3$>0, the real part of eigenvalue is negative, and it satisfies the stability condition.

The macroeconomic policy regime with a monetary authority focused only on the target inflation rate and not to commit the rate of capacity utilization. In this regime, it is compatible with the active fiscal policy and the inflation targeting policy in the economic stability.

Asada (2022) studies the dynamic properties of the coordinated fiscal and monetary stabilization policy in a small open economy under flexible exchange rates and imperfect capital mobility by means of dynamic Keynesian model.

Saratchand and Datta(2021) study inflation targeting with endogenously determined heterogenous expectations in dynamic Post Keynesian model.

Notes

1) See Drumond and De Jesus(2016), p.176.
2) About the critical consideration on New Consensus Macroeconomics (NCM), see Arestis(2019), Arestis and Sawyer(2008).

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