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MACROECONOMIC AND DISTRIBUTIVE EFFECTS OF DIFFERENT FISCAL POLICY RULES: A STOCK-FLOW-CONSISTENT ANALYSIS

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ABSTRACT
This study investigates the impact of different fiscal policy rules on key macroeconomic and distributional indicators. We present a standard Stock-Flow Consistent (SFC) model to evaluate the effect of three fiscal policy rules (a target ratio of government expenditures to GDP, a target deficit-to-GDP ratio, and a target ratio of debt to GDP) on the steady state values of inflation, unemployment rates, government and firms' indebtedness, and the participation of firms and banks in the profit share of income. To evaluate the effect of these different fiscal rules on the macro-economy and on the intra-capitalist distributional conflict, we test the results of changes to the value of the targets. The results are as follows: Regardless of the parameter values chosen in each rule, the fixed government expenditure to GDP norm results in higher inflation, lower unemployment, and larger government indebtedness when compared to the rule of fixed government debt to GDP. Banks' share of profits is also the lowest under such a rule. Our main conclusion is that the type of fiscal policy rule matters, that is, it is not neutral regarding the macroeconomic trajectory and the distribution of incomes.

Keywords: Stock-Flow Consistent models; Fiscal policy rules; Post-keynesian Macroeconomics.

EFEITOS MACROECONÔMICOS E DISTRIBUTIVOS DE DIFERENTES REGRAS DE POLÍTICA FISCAL: UMA ANÁLISE DE CONSISTÊNCIA ENTRE ESTOQUES E FLUXOS

RESUMO
Este estudo investiga o impacto de diferentes regras de política fiscal sobre os principais indicadores macroeconômicos e distributivos. Apresentamos um modelo padrão de Consistência entre Estoques e Fluxos (SFC) para avaliar o efeito de três regras de política fiscal (uma meta de proporção de gastos do governo em relação ao PIB, uma meta de proporção de déficit em relação ao PIB e uma meta de proporção de dívida em relação ao PIB) sobre os valores de estado estacionário da inflação, taxas de desemprego, endividamento do governo e das empresas e a participação de empresas e bancos na participação nos lucros da renda. Para avaliar o efeito dessas diferentes regras fiscais na macroeconomia e no conflito distributivo intracapitalista, testamos os resultados das mudanças no valor das metas. Os resultados são os seguintes: Independentemente dos valores dos parâmetros escolhidos em cada regra, a norma despesa fixa do governo em relação ao PIB resulta em maior inflação, menor desemprego e maior endividamento do governo quando comparada à regra de dívida fixa do governo em relação ao PIB. A participação dos bancos nos lucros também é a menor sob essa regra. Nossa principal conclusão é que o tipo de regra de política fiscal importa, ou seja, não é neutra em relação à trajetória macroeconômica e à distribuição de renda.

Palavras-chave: Modelos de Consistência entre Estoques e Fluxos; Regras de política fiscal; Macroeconomia Pós-keynesiana.

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1 INTRODUCTION

One of the most important questions in macroeconomics since Keynes revolutionized the field, concerns the impact of fiscal policies on the aggregate behavior of the economy. Against the stabilizing role of government outlays and taxation, many orthodox economists following the New Macroeconomic Consensus (NMC) have argued for a limited role of the fiscal policy, despite some changes in a few institutions' views after the financial crash (CLIFT, 2018). Notwithstanding the evidence that the Keynesian multiplier is larger during recessions (CHARLES *et al.,* 2018, BLANCHARD; LEIGH, 2013), the NMC gives a secondary role for fiscal policy (ARESTIS; SAWYER, 2003). Monetary policy – in conjunction with the automatic stabilizers – is still largely considered the only game in town. In this sense, fiscal policy rules would be preferable to discretionary ones. Thus, the debate is centered on the choice of a specific policy rule, without any room for the implementation of broad discretionary policies. In the most extreme cases, it is argued that even a contractionary fiscal policy could boost output through entrepreneurs' positive expectations, followed by a rise in their investments (the so called 'expansionary fiscal consolidation' of Alesina-Ardagna (2009)). Heterodox authors, on the other hand, claim that active fiscal policies can boost the economy in the short and medium terms (ARESTIS; SAWYER, 2003; KRIESLER; LAVOIE, 2007).

This article evaluates the impact of different fiscal policy rules on important macroeconomic variables, including the distribution of income between the financial and the nonfinancial sector. We employ a Stock-Flow Consistent (SFC) model to study the impact of these rules. The simulations include three fiscal policy rules: (i) a target for the ratio of government expenditures to GDP, (ii) a target for the ratio of budget deficits to GDP, and (iii) a target for the ratio of debt to GDP. The sensitivity of the results to changes in the target values is also examined. Our hypothesis is that the choice of a fiscal policy rule has consequences that are independent from the target's imputed value.

This study sheds some light on the role of fiscal policy rules and their impact on the macroeconomic variables. To the best of our knowledge, an SFC model for assessing the impacts of different fiscal policy rules and target values is lacking in the literature. The current paper attempts to fill this void. We also show that a comparison among different rules is important for policy-making purposes, since they are not equivalent in terms of impacts. Thus, policy makers could exploit different rules for achieving specific macroeconomic goals. Moreover, the exercise shows that steady-state inflation rates depend on the fiscal rule pursued and the value of the target. This goes against the orthodox view that in the long run inflation is always and everywhere exclusively a monetary phenomenon. The paper is organized as follows. Section 2 presents the matrices and behavioral equations of the SFC model. The simulation results are exhibited in Section 3. Section 4 concludes.

2 THE MODEL

The defining feature of an SFC model is the assumption that the aggregate spending and saving behavior of the institutional sectors (families, corporations, government, banks, and the rest of the world) depends on the past, current, and (expected) future income flows generated inside the economic system through their related stocks (net assets or liabilities). These models hinge on accounting schemes that include the national and flow-of-funds accounts which measure the financial links between the various sectors and their asset changes. Such schemes are "waterproof", that is, all financial flows come out of somewhere and go elsewhere and all savings flows increase (if positive) and decrease (if negative) wealth stocks (GODLEY, 1999, p. 7).

Before we present our results, we show first the procedure employed to gauge the macroeconomic and distributive impacts of different fiscal policy rules. Let us begin by exhibiting the accounting framework. The antecedents of the model are Dafermos (2012) and Le Heron (2012). Next, we display the behavioral equations of the model.

2.1 THE ACCOUNTING FRAMEWORK

The model comprises five institutional sectors: households, firms, commercial banks, a central bank, and the government. The structure of assets and liabilities is presented in Table 1, which represents the sectoral balance sheets. We considered seven types of assets/liabilities: (i) banking deposits, an asset held by households and firms and accounted as a liability for the commercial banks; (ii) tangible capital, an asset for firms whose accounting counterpart is an addition to this sector’s net wealth; (iii) equities, a liability for firms and an asset for households; (iv) Treasury bills, held by households, commercial banks and the central bank; (v) high-powered money, emitted by the central bank and held by commercial banks; (vi) central bank advances, a liability to commercial banks and an asset for the monetary authority; and (vii), banking loans, given by commercial banks to firms. Because of the model's accounting consistency, financial assets and liabilities cancel each other out, as shown in the last column of Table 1. The sum of sector's column gives its net assets. Table 1 also reveals our many simplifying assumptions, which are: (i) households do not take out loans and (ii) do not hold cash; (iii) firms also do not hold cash (no liquidity preference, despite the existence of uncertainty), and (iv) do not accumulate inventories; (v) commercial banks do not issue equities; and (vi) the economy is closed.

Table 2 shows the transactions-flow matrix of our model. A sector's use of funds receives a negative sign, while the source of funds takes a positive sign. The upper part illustrates current sales and purchases of goods and services and income composition. The middle part records the flows of financial payments. The lower part exhibits the changes in the stocks held by each sector. If receipts are larger than expenditures, the sector has a surplus that is allocated among the assets of the economy. In the case of a deficit, this sector has an increase in its liabilities. The results of this part of the table change the stocks in Table 1, which serve as a starting point for a next period. New transactions emerge in Table 2, which impact again stocks and so on. This link between stocks and flows generates the model's dynamics.

Table 1 – Balance Sheet

	Households	**Firms**	**Banks**	**Government**	**Central bank**	**Σ**
Deposits	$+ D_h$	$+ D_f$	$- D$			0
Tangible Capital		$+ K$				$+ K$
Equities	$+ e.pe$	$- e.pe$				0
Treasury bills	$+ B_h$		$+ B_b$	$- B$	$+ B_{cb}$	0
High-powered money	$+ H_h$		$+ H_b$		$- H$	0
CB advances			$- A$		$+ A$	0
Loans		$- L$	$+ L$			0
Balance	$- V$	$- Vf$	0	$- B$	0	$+ K$

Source: Elaborated by the authors.

Table 2 – Transactions flow matrix

			Firms				Central bank		
		Households	Current	Capital	**Banks**	**Government**	Current	Capital	Σ
Consumption		- C	+ C						0
Government expentitures			+ G			- G			0
Investment			+ I	- I					0
Taxes		- T				+ T			0
Wages		+ WB	- WB						0
Firms profits		+ FD_f	- F_f	+ FU_f					0
Banks profits		+ Fb			- Fb				0
Central bank profits						+ Fcb	- Fcb		0
Interest on	Deposits	+ $r_{d-1}.D_{-1}$			- $r_{d-1}.D_{-1}$				0
	Loans		- $r_{l-1}.L_{-1}$		+ $r_{l-1}.L_{-1}$				0
	CB advances				- $r_{A-1}.A_{-1}$		+ $r_{A-1}.A_{-1}$		0
	Treasury bills	+ $r_{b-1}.B_{h-1}$			+ $r_{b-1}.B_{b-1}$	- $r_{b-1}.B_{-1}$	+ $r_{b-1}.B_{cb-1}$		0
Change in the stocks of	Deposits	- ΔD_h	- ΔD_f		+ ΔD				0
	Loans			+ ΔL	- ΔL				0
	High-powered money				- ΔH_b			+ ΔH	0
	Treasury bills	- $\Delta B_h.p_B$			- $\Delta B_b.p_B$	+ $\Delta B.p_B$		- $\Delta B_{cb}.p_B$	0
	CB advances				+ ΔA			- ΔA	0
	Equities	- $\Delta e.p_e$		+ $\Delta e.p_e$					0
Σ		0	0	0	0	0	0	0	0

Source: Elaborated by the authors.

2.2 THE BEHAVIORAL EQUATIONS

2.2.1 Equations for Households

The first equation for the household sector is the definition of personal income:

$$YP = WB_{-1} + FD_f + F_b + r_{d-1}D_{h-1} + r_{b-1}B_{h_{-1}} \tag{1}$$

where YP is personal income, WB is wage bill, FD_f is distributed profits of firms, F_b represents the profits of banks, which we assume to be totally distributed to its owners, r_d is the interest rate paid on deposits, D_h is the stock of households' deposits, r_b is the interest rate paid on government bonds, and B_h is the stock of bonds held by households. The subscript -1 denotes a time lag of one period.

The personal income is subject to taxation at rate θ. The income left after taxation is the disposable income, *YD*:

$$YD = YP - T \tag{2}$$

$$T = \theta . YP \tag{3}$$

The real disposable income (*rYD*) takes into account the price level and wealth losses due to inflation (g_p)[4].

4 We follow Godley and Lavoie (2007, p. 393) in this formulation.

$$rYD = \frac{YD}{p} - g_p \left(\frac{V_{-1}}{p}\right) \tag{4}$$

In addition to the regular sources of income, households might also increase their purchasing power by accrued capital gains (*CG*) in equity transactions, given by the variation in equities prices (Δp_e) times their initial equities holdings (e_{d-1}). The stock of wealth of households (V) is the wealth of the previous period, plus capital gains and the difference between disposable income and consumption *C*. Real wealth (*rV*) is simply nominal wealth divided by prices.

$$CG = \Delta p_e e_{d-1} \tag{5}$$

$$V = V_{-1} + CG + YD - C \tag{6}$$

$$rV = \frac{V}{p} \tag{7}$$

Consumption is decided upon real magnitudes and depends on the lagged real disposable income and on the lagged real wealth.

$$rC = \alpha_1 rYD_{-1} + \alpha_2 rV_{-1} \tag{8}$$

$$C = p.rC \tag{9}$$

Household's wealth is allocated between government bills, equities and deposits following a *Tobinesque* approach. Therefore, the demand for each asset depends on the return of every other asset, with r_e standing for the total return on equities (distributed profits and capital gains over the value of equities' holdings). Since deposits constitute the residual component of the portfolio, we use equation 12 instead of 12'. The horizontal and vertical adding-up constraints on the coefficients λ were followed[5].

$$B_h = (\lambda_{10} + \lambda_{11} r_{b-1} + \lambda_{12} r_{e-1} + \lambda_{13} r_{d-1}) V_{-1} \tag{10}$$

$$e_d = (\lambda_{20} + \lambda_{21} r_{b-1} + \lambda_{22} r_{e-1} + \lambda_{23} r_{d-1}) V_{-1} \tag{11}$$

$$D_h = V - B_h - e_d \tag{12}$$

$$D_h = (\lambda_{30} + \lambda_{31} r_{b-1} + \lambda_{32} r_{e-1} + \lambda_{33} r_{d-1}) V_{-1} \tag{12'}$$

$$r_e = \frac{FD_f + CG}{e_{-1} p_{e-1}} \tag{13}$$

2.2.2 Equations for Commercial Banks

Banks' profits are composed of the interest rate charged on loans to firms (r_l) multiplied by the stock of loans (*L*) plus the interest receipts from its holdings of

[5] See Godley and Lavoie (2007, p. 143-146) for a discussion of these issues.

government bonds (B_b), minus the interest paid on households' deposits and on central bank advances (A).

$$F_b = r_{l-1}L_{-1} + r_{b-1}B_{b-1} - r_{d-1}D_{h-1} - r_{A-1}A_{-1} \tag{14}$$

The new loans given to firms are subject to a credit rationing (CR), which depends on the leverage ratio of firms (*L/K*) and on the basic interest rate. The stock of loans at the end of the period (*L*) is the previous period stock minus repayments (*rep*), plus the new loans given out in the current period.

$$CR = \rho_0 + \rho_1(L_{-1}/K_{-1}) + \rho_2 r_b \tag{15}$$

$$NL = L_D(1 - CR) \tag{16}$$

$$L = (1 - rep)L_{-1} + NL \tag{17}$$

Banks' holdings of high-powered money are composed of reserve requirements upon deposits (μ) and excess reserves, η. The amount of excess reserves depends positively on a constant (η_0) and negatively on the basic interest rate:

$$H_b = (\mu + \eta).\left(D_h + D_f\right) \tag{18}$$

$$\eta = \eta_0 - \eta_1 r_b \tag{19}$$

We distinguish between two cases regarding the demand for government bonds and central bank advances[6]. Equation 20 gives us the difference between deposits net of required reserves and loans. If the result is positive, it means that banks have extra resources. In this case, banks will use these resources to acquire government bonds (equation (21)), and advances will be equal to excess reserves (equation (22)). This last point is intended to represent the dynamics of the interbank market. If banks in a surplus position decide to hold excess reserves instead of lending these resources to banks in a deficit position, these are forced to take advances from the central bank to clear their positions. On the other hand, the second possibility shown in the equations occurs if loans are higher than the deposits net of required reserves, no government bonds are held and central bank advances are demanded to fill the gap.

$$B_{bn} = D_h + D_f - \mu.\left(D_h + D_f\right) - L \tag{20}$$

6 We follow Dafermos (2012) in this formulation.

$$B_b = \begin{cases} B_{bn}, & B_{bn} \geq 0 \\ 0, & B_{bn} < 0 \end{cases} \tag{21}$$

$$A = \begin{cases} \eta.(D_h + D_f), & B_{bn} \geq 0 \\ H_b + L - D_h - D_f, & B_{bn} < 0 \end{cases} \tag{22}$$

Finally, the interest rate on loans is simply a markup m_l upon the basic interest rate, whereas the interest rate paid on deposits is the basic interest rate minus a spread m_d.

$$r_l = r_b + m_l \tag{23}$$

$$r_d = r_b - m_d \tag{24}$$

2.2.3 Equations for Firms

Regarding firms, we first tackle their cost structure and pricing decisions, and then discuss their investment and financing behavior.

The number of workers employed in each period (N) depends on real product (rY) divided by the productivity level (pr), the latter growing at an exogenous and positive rate g_{pr}. The employment rate (ER) is the ratio between the number of employed workers and the exogenous, constant labor force (N_f). The wage bill of the economy (WB) is the wage rate w times the number of employed workers.

$$N = \frac{rY}{pr} \tag{25}$$

$$pr = pr_{-1}(1 + g_{pr}) \tag{26}$$

$$ER = \frac{N}{N_f} \tag{27}$$

$$WB = w.N \tag{28}$$

The price level is determined by a mark-up (m) upon labor costs. Both the mark-up and the wage rate are endogenous in our model, and they evolve according to adjustment rules which are based on deviations between desired and actual factor shares in income (Rowthorn, 1977), with sp as the profit share, sw the wage share, sp_d the desired profit share and sw_d the desired wage share. These desired levels depend on the degree of idle capacity of each factor: capacity utilization rate (u) for profit and the employment rate for wages. Inflation and productivity growth also determine wages.

$$p = m\frac{w}{pr} \tag{29}$$

$$m = m_{-1}(1 + g_m) \tag{30}$$

$$g_m = \chi(sp_d - sp_{-1}) \tag{31}$$

$$sp_d = m_0 + m_1 u_{-1} \tag{32}$$

$$sp = 1 - sw \tag{33}$$

$$w = w_{-1}(1 + g_w) \tag{34}$$

$$g_w = \varphi_1(sw_d - sw_{-1}) + \varphi_2 g_{p-1} + \varphi_3 g_{pr} \tag{35}$$

$$sw_d = w_0 + w_1 ER_{-1} \tag{36}$$

$$sw = \frac{WB}{Y} \tag{37}$$

$$g_p = \frac{p - p_{-1}}{p_{-1}} \tag{38}$$

We assume that the production of firms is sold out each period, and is distributed between households' consumption (*C*), firms' investment (*I*), and government purchases (*G*). Subtracting the wage costs and the interest on loans from output, it gives us the definition of firms' profits (F_f).

$$Y = C + I + G \tag{39}$$

$$rY = rC + rI + rG \tag{40}$$

$$F_f = Y - WB - r_{l-1}L_{-1} \tag{41}$$

Profits from the current period are accumulated in firms' deposits and used in the next period to finance investment (FU_f) and to be distributed as dividends (FD_f). For simplifying purposes, we assume that these deposits are not remunerated.

$$D_f = D_{f-1} - FD_f - FU_f + F_f \tag{42}$$

$$FU_f = s_f F_{f-1} \tag{43}$$

$$FD_f = (1 - s_f)F_{f-1} \tag{44}$$

Desired real investment (rI_d) depends on the lagged capacity utilization, on the undistributed profits normalized by the nominal capital stock, on the interest rate on loans, and on a parameter β_0 which represents the “animal spirits” of the entrepreneurs.

$$rI_d = \left(\beta_0 + \beta_1 u_{-1} + \beta_2\left(\frac{FU_f}{K_{-1}}\right) - \beta_3 r_l\right).K_{-1} \tag{45}$$

$$I_d = rI_d.p \tag{46}$$

$$K = K_{-1} + I \tag{47}$$

$$rK = rK_{-1} + rI \tag{48}$$

$$u = \frac{rY}{v.rK_{-1}} \tag{49}$$

Investment is financed with loans, retained profits, and issuance of equities. We treat the demand for loans as the residual of the financing decisions, and it is subject to the above described credit rationing by banks. The realized investment is thus influenced by the amount of loans that the firms actually receive.

$$L_D = I_d - FU_f - p_e \Delta e + rep.L_{-1} \tag{50}$$

$$I = \Delta L + FU_f + p_e \Delta e \tag{51}$$

$$rI = \frac{I}{p} \tag{52}$$

Firms look upon past investment decisions and equities' market valuation when they decide how much new equities to issue in the current period. x is a factor that depends on Tobin's q ratio: an increase in this factor impels the firms to issue more equities. The interaction between equities' supply (e) and demand (e_d, given by households' portfolio decisions) determine its prices (p_e).

$$e = e_{-1} + x\left(\frac{I_{d-1}}{p_e}\right) \tag{53}$$

$$x = x_0 + x_1 q_{-1} \tag{54}$$

$$q = \frac{e.p_e}{K} \tag{55}$$

$$p_e = \frac{e_d}{e} \tag{56}$$

2.2.4 Equations for Central Bank

The Central Bank makes profits, F_{cb}, which are completely distributed to the government. They are made up of the interest receipts generated by the advances given to the commercial banks and of the earnings from governments' bonds held. We assume, for simplicity, that the interest rate on central bank advances (r_A) is the same as the interest on governments' bonds. All the high-powered money demanded by commercial banks is supplied (assuming therefore full accommodation, highlighting the endogenous and horizontalist nature of money supply).

$$F_{cb} = r_{A-1}A_{-1} + r_{b-1}B_{cb-1} \tag{57}$$

$$r_A = r_b \tag{58}$$

$$H = H_b \tag{59}$$

We assume that the central bank is the residual purchaser of government bonds. The stock of bonds is the stock of the previous period plus the fiscal result of the government (*DG*).

$$B = B_{-1} + DG \tag{60}$$

$$B_{cb} = B - B_b - B_h \tag{61}$$

2.2.5 Fiscal Policy Rules

In our first fiscal rule, the government seeks to maintain a fixed proportion σ_1 of spending relative to last year's GDP. The government deficit (*DG*) is then determined by the difference between these expenditures, together with interest payments on government bills ($r_{b-1}B_{-1}$), and taxes receipts summed with central bank's profits.

$$G = \sigma_1 Y_{-1} \tag{62}$$

$$DG = G + (r_{b-1}B_{-1}) - T - F_{cb} \tag{63}$$

In the second rule, the government has a target for the ratio of the deficit to output. In this case, government expenditures vary in order to this target deficit to be achieved.

$$G = DG - (r_{b-1}B_{-1}) + T + F_{cb} \tag{64}$$

$$DG = \sigma_2 Y_{-1} \tag{65}$$

Finally, the third rule has a target for government debt relative to GDP. In this case, government expenditures are again the adjusting variable, but now it varies in order to achieve the desired *debt* target.

$$G = DG - (r_{b-1}B_{-1}) + T + F_{cb} \tag{66}$$

$$DG = \Delta B \tag{67}$$

$$\Delta B = B^T - B_{-1} \tag{68}$$

$$B^T = \sigma_3 Y_{-1} \tag{69}$$

In all rules, real government expenditures are defined as:

$$rG = \frac{G}{p} \tag{70}$$

Before we proceed with the simulations, it is important to stress a few relevant issues. First, we have not dealt with several problems raised by Auerbach (2014) regarding the implementation of fiscal rules: we suppose that our fiscal rules are not shirked by policy makers; we ignore political feasibility issues; and we also ignore demographic and aging issues and their effects on the labor force. Second, an analysis such as the one developed here, based on steady state outcomes, precludes the stabilizing role of the fiscal policy, and also downplays the role of multipliers (Mittnik and Semmler, 2012; Auerbach and Gorodnichenko, 2013; Borsi, 2016; Charles *et al*., 2018).

3 RESULTS

Our approach here is to run the SFC model with a range of values for the targets that appear in each fiscal rule. The rest of the model (that is, equations and parameters values) is held constant in all simulations, so that the differences in steady state relationships are due solely to the fiscal rule and the target value chosen.

For the first fiscal rule, that applies a fixed government spending relative to GDP (GY, in the figures below), we use values ranging from 17% to 27%. In the second rule, that sets a fixed deficit as a proportion of the GDP (DGY), the target ranges from 0.5% to 5%. Finally, for the third rule, that fixes the government debt relative to GDP (BY), the target varies from 10% to 85%[7].

The first macroeconomic impact to be analyzed is the effect on inflation and unemployment rates – presented in Figure 1. Dashed squares represent the GY rule, black dots represent the DGY rule, and triangles represent the BY rule. Regarding the first rule, the results suggest that higher shares of government expenditure on GDP generates low unemployment rates and inflation around 5% per period. Reducing the target value for government expenditures as a share of GDP leads to higher unemployment and lower inflation rates. For the smallest value considered (government expenditures fixed at 17% of GDP), we found an almost zero inflation associated with an unemployment rate above 40%. For the highest value (government expenditures fixed at 27% of GDP), we have an inflation of 6% and unemployment rates of 2.5%.

The second rule yields intermediate outcomes for inflation: for higher values for the target (that is, for a higher proportion of the budget deficit in relation to GDP),

7 The model is unstable or gives unrealistic results (such as negative unemployment) for values above and below the ones cited.

there is a mild annual inflation around 2,5% and a high rate of unemployment of 25%. If the target value is reduced, the economy moves into a situation with higher unemployment and less inflation, to a point at which deflation occurs. Finally, the third rule presents very high unemployment rates associated with very low inflation or even deflation.

All three rules show that less austerity, meaning less stringent impositions on fiscal results, although still within a framework of rules rather than discretion, leads to higher employment and inflation levels. Moreover, the results are unsensitive to what fiscal policy rule was adopted, there is always a Phillips-curve-style tradeoff in terms of unemployment and inflation for the steady state. This goes against the New Macroeconomic Consensus and its emphasis on monetary policy in determining inflation rates in the long run, with the economy always at the potential GDP (full employment) regardless of the fiscal stance. In our model, the steady-state fiscal path behaves like a Phillips curve in the unemployment-inflation space, showing the determining role of aggregate demand in interaction with labor markets on the supply side, for the long-run macroeconomic dynamics.

The second outcome regards the indebtedness of firms and government, both in relation to GDP, stressing the distribution of the financial burden of different fiscal rules (Figure 2). As could be expected, the BY rule puts the government indebtedness at its target value by design. The GY rule, in its turn, is the one that results in larger government indebtedness. This sustains a higher level of employment and sales that allow firms to finance their expenditures by means of retained profits, thus reducing their indebtedness. Reduced government debt as a share of GDP means less employment and sales, and, therefore, less profits, which increases firms' reliance upon bank loans to finance their investments.

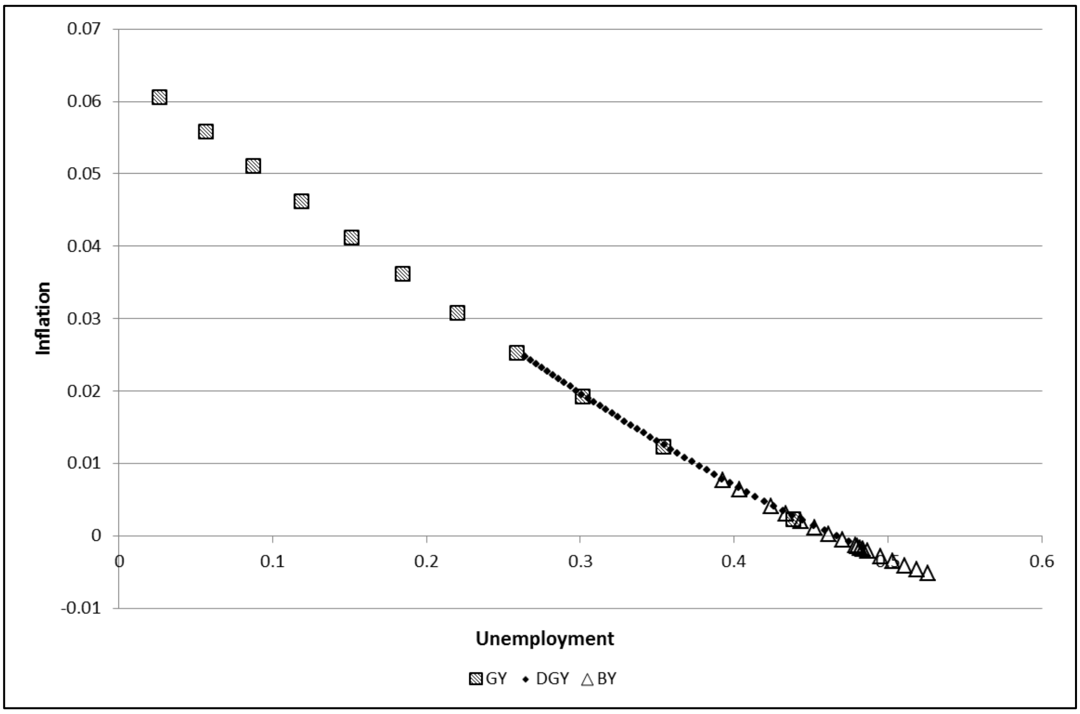
Orthodox economists are usually worried about the levels and mainly the sustainability of government debt, and less preoccupied with private debt. Yet, Jordà *et al.* (2013) show that the severity of financial crises is related to the amount of credit generated in the expansionary phase, and that this credit is usually channeled to the private sector. Indeed, Jordà *et al.* (2016) present evidence that financial crises are not preceded by public debt increases. Shularick (2013, p. 195) argues that "only about one third of the increase in total debt in the Western world since 1970 was due to public debt accumulation". In light of these evidences, it is possible to argue that the BY regime is more prone to financial crisis[8, 9], since it results in a higher debt accumulation in the private sector – a counterparty of which is a high credit expansion.

Finally, another important issue is the intracapitalist distributive conflict. The third relationship that we explore is therefore the one between banks' and firms' participation in the profit share of income. We will not deal with the wage share here because it barely varies in the simulations, going from a minimum of 62% of GDP to a maximum of 65% of GDP. This is probably due to the Kaldorian features in the setup of productivity and employment. The stable aggregate profit share, however, is disputed between banks and firms, and varies with fiscal rules and the correspondent targets values. Figure 3 exhibits the results. For all rules, firms obtain a higher share than banks, but its value ranges from 23% of GDP to 34% of GDP. Banks by their turn, perceive a range between 3% to 11% of output. The fiscal rule of a target for fixed government debt relative to GDP is the one that places the profit share split more favorable for banks. Once again, the DGY rule gives intermediate results. The GY rule renders better outcomes for firms (and workers) and does not perform so well for banks. The classical work of Epstein (1992) on monetary policy and class alliances can therefore be extended to fiscal policy. Overall, fiscal policy has relevant distributive impacts in the steady state, and changes in the targets affect the distribution of profits.

8 This conclusion should be taken with a grain of salt, because severe financial crises related to insolvency (negative net worth for banks) cannot happen in our model, given the equations and parameters values used in the simulation.

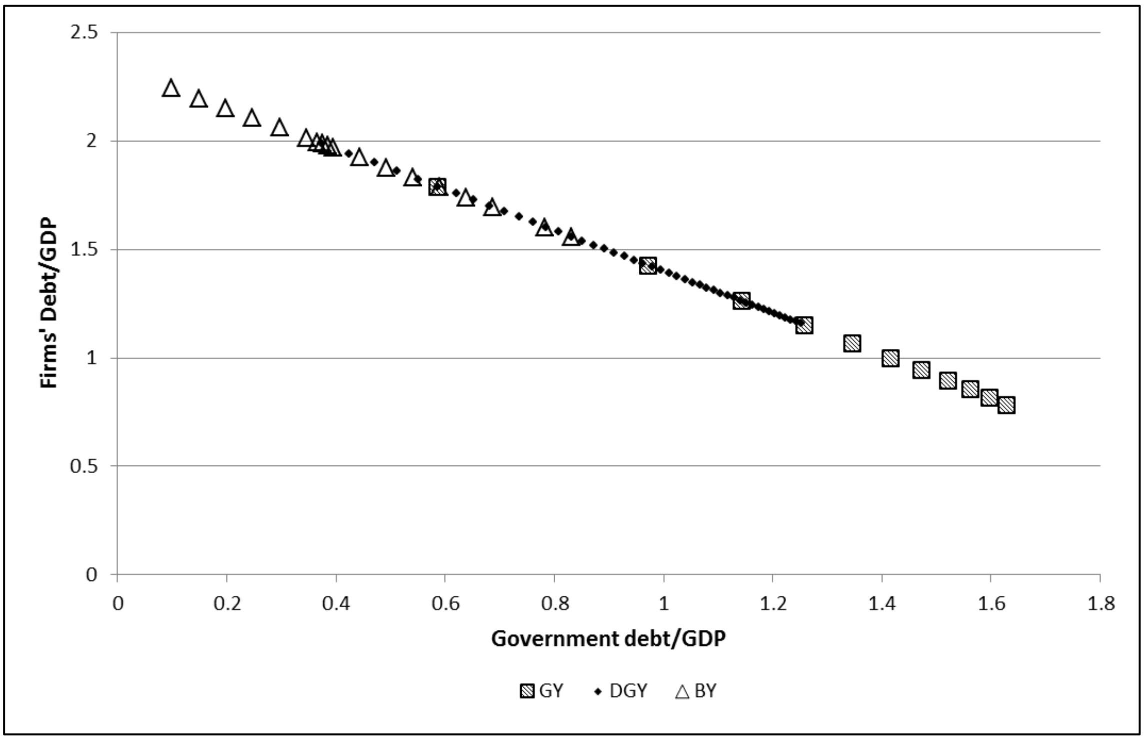
9 One major drawback of our work is the absence of feedback effects from the level of government indebtedness to the interest rate and also the tax burden of workers and capitalists. Moreover, as mentioned, our economy is closed, which precludes any analysis of exchange rates and foreign financial flows. These shortcomings will be addressed in future research.

Figure 1 – Steady state rates of inflation and unemployment for three different fiscal rules



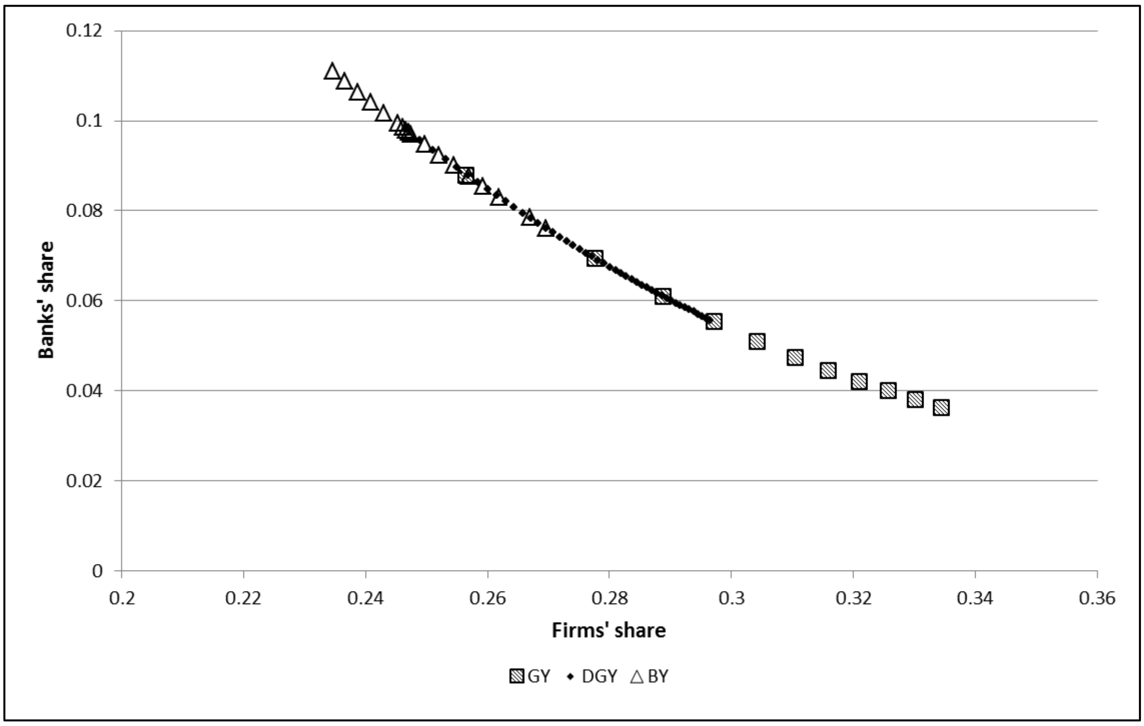
Source: author's calculations.

Figure 2 – Government and firms' indebtedness relative to GDP



Source: author's calculations.

Figure 3 – Profit share split between banks and firms



Source: author’s calculations.

4 FINAL REMARKS

This article applied a stock-flow consistent model to assess the macroeconomic and distributional impact of different fiscal policy rules. This model allows us to identify the steady-state effects of these rules on key macroeconomic and distributional variables. It can arguably serve as an important first-step guide for policymakers willing to achieve certain macroeconomic goals.

Our exercises bring an important conclusion: the choice of a fiscal policy rule has consequences that are independent of the value selected for the target. When compared to a rule for fixed government debt (BY), the rule that fixes the ratio of government expenditures to GDP (GY) results in less unemployment, more inflation, more government indebtedness, and less leverage for firms, regardless of the values chosen in each rule. Moreover, it leads to more profits accruing to firms and less going to banks. So, if a government aims to reduce the unemployment rate, it will be more successful, assuming discretion is absent, if it chooses a fixed government expenditure relative to GDP rule. Although, depending on the degree of distributive conflict, this may cause higher inflation rates. If instead it adopts a target for a fixed value of debt relative to GDP, it will achieve intermediate results for inflation, even if it allows its debt to attain high values. Our exercise also sheds light on the understanding of the lobby activity of some pressure groups. Banks get more profits under the BY rule. Yet we see bank CEOs claiming for reduced government debt all the time in the real world.

The results thus show that despite the restrictions of rules rather than discretion, the adoption of a target for a fixed government expenditure rule is less harmful to the overall economic activity in relative terms. The worst-case scenario for the entire economy includes the implementation of a debt to GDP rule. Unfortunately, in our simulations, only a restricted degree of discretion (varying targets within different fiscal policy rules) takes place. We hope that for the sake of better macroeconomic management, broad and enlightened discretion emerges in the future.

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