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Foreign debt, conflicting claims and income policies in a Kaleckian model of growth and distribution

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Abstract:
The paper develops a Kaleckian model of growth with endogenous income distribution, determined by conflicting claims on income shares. The article analyzes different demand, distribution and debt regimes, with external debt playing a differential role according to its impact on the exchange rate and on debt-servicing. We further study the impact of a tax-based income policy on the exchange-rate pass-through and external competitiveness. We find that the threat of taxation (or subsidies) can serve as an instrument to coordinate income claims, lower inflationary pressures and improve external price competitiveness.

Keywords: Foreign debt, Global risk perceptions, Income claims, International financial flows, Kaleckian models of growth and distribution

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1 Introduction

The aim of this paper is to provide an integrated understanding of three concomitant trends, "stylized facts" that can be identified in the world economy in the last four decades, namely a slowdown of growth rates in comparison with the first three post war decades; an increase in income inequality; and an exponential growth in international capital flows. To do so, we expand the literature on Kaleckian models of growth and distribution (Rowthorn 1981), which allow for the possibility of negative impacts of worsening income inequality on aggregate demand and economic growth. We identify a gap in this literature, however, related to the omission of considerations referring to the ebb and flow of international capital movements and their impact on exchange rate, indebtedness, balance sheets and aggregate demand. The article is devoted to fulfill this gap and include an analysis of the effects of international capital flows upon the interaction between income distribution and economic growth, a development justified by the mentioned "stylized facts." The contribution of this paper lies in the inclusion of external indebtedness (and particularly, gross external debt) as another determining factor of the performance of economic activity and income distribution. When including the effect of financial flows, mainly through the exchange rate channel, there are chances for greater combinations of income, debt and demand "regimes," as well as previously ignored cases such as the "exchange-rate driven" channel, to be described below. It proves convenient to include a brief description of Kaleckian models to support this claim.

Set in the context of imperfect competition, with excess capacity as a normal feature, Kaleckian models of growth[1] allow differentiated impacts of changes in wages, profit margins and interest payments on economic activity and investment. The determinants of these effects are the reaction of consumption to income variables (real wages, dividends, interest payments), the impact of aggregate demand (via the accelerator effect), profitability and debt burdens on investment; and the influence of price and non-price competitiveness and domestic demand on the balance of trade. Generally speaking, lowering profit margins (and rising real wages) have a significant impact on consumption, and domestic demand. If this increase in demand (and capacity utilization) compensates (or does not compensate) the fall in profitability per unit of output, then investment rates would also increase (fall), and the economy could be said to be of a wage-led regime (profit-led). When adding interest payments to this simple picture, Kaleckian models of growth and income distribution take into consideration

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at least three elements. First, the depressing impact of interest payments on investment decisions. Second, the eventual rise in consumption out of interest income (and dividend payments, if included in the model). Third, the elasticity of profit margins to rising interest rates, and therefore the eventual fall in real wages, which would depress aggregate demand.

To close this brief summary, we should mention that Kaleckian models have been extended to accommodate wage bargaining and price inflation into the story (Cassetti 2012). In a profit-led, weak trade unions would lead to positive impacts on aggregate demand (because of a high sensitivity of investment to profit margins) and low inflation. In a wage-led regime, however, the impact on economic activity would be negative (Cassetti 2002).

One possible determinant of bargaining power, particularly in emerging economies, is the liberalization of the financial account, which led to rising flows of financial assets and liabilities between countries (IMF, 2016 and 2015; UNCTAD, 2015). In the case of Emerging and Developing Economies (EDEs), they witnessed a steady increase in net capital inflows in the pre-crisis period, a step increase after the crisis, and then a slowdown coupled with increased volatility after 2011 (Hannan 2017). However, *gross* capital inflows have been on the mounting. Capital inflows for the period 2006–2015 averaged 6.1 per cent of GDP, while the same number for 1996–2005 was 3.9 per cent, already above the average of the previous two decades (Bortz and Kaltenbrunner, 2018). The most dynamic factor of external indebtedness of EDEs in this regard has been the rise in international debt securities issuance by the corporate non-financial sector, generally denominated in external currency (Akyüz 2014; Ahmed and Zlate 2014; Chui, Kuruc, and Turner 2016).

Capital account liberalization has worsened income inequality in EDEs, as found by Jayadev (2007), Charlton (2008), Stockhammer (2013), and Furceri and Loungani (2015), among others. In fact, both developed and developing countries witnessed an increase in income inequality, either looked at from a functional classification or when looking at a personal level (ILO 2011; Atkinson, Piketty, and Saez 2011; Rodriguez and Jayadev 2013; Cingano 2014; Domanski, Scatigna, and Zabai 2016).

Economic growth has not always responded positively to mounting financial flows and worsening income inequality. Since the 1980s economic growth has receded compared to the growth rates in the three decades after the Second World War. This trend is not merely restricted to developed countries (Stockhammer 2004; Storm and Naastepad 2012; Summers 2014), but can also be appreciated in several developing economies, though not all. The average GDP growth rate of Latin American economies for the period 2000–2016, for instance, was less than half (2.75 per cent) than the average growth rate between 1961 and 1980 (5.9 per cent), according to data from the World Development Indicators. For Middle East and North African (MENA) economies, the same rates are 3.7 per cent and 5.7 per cent, respectively.

The relationship between these trends has been generally approached from a partial angle. Evidence is mixed on the influence of financial liberalization and financial inflows on economic growth. Bekaert, Harvey, and Lundblad (2005) find positive effects of financial openness on economic growth, while Bussiere and Fratzscher (2008) and Kose et al. (2009), found no robust evidence of such relations. Negative effects have been found by Demir (2008 and 2009), while the IMF (2015) and Bruno and Shin (2017) show that higher external borrowing by firms has not been reflected in higher investment rates. There is evidence however of the damaging effects of surges of capital inflows on several macroeconomic variables such as financial stability and the likelihood of economic crises (Ocampo, Spiegel, and Stiglitz 2008; Aoki, Benigno, and Kiyotaki 2009; Rodrik and Subramanian 2009; Furceri, Guichard, and Rusticelli 2012; Ostry et al. 2012; Aizenman, Chinn, and Ito 2016; Ghosh and Qureshi 2016; Korinek and Sandri 2016; Gluzmann and Guzmán 2017).

The congruence in time and the concordant effects of these interactions suggests that the contemporaneous irruption of these phenomena may not be a coincidence. The effects of financial flows are not restricted, in this sense, to the financial sphere; they also have impact on economic growth and income distribution, through their influence on the indebtedness of governments and firms, exchange rate, and prices and wages. Mounting private indebtedness puts pressure on mark-ups, and therefore on real wages. Debt-servicing can also have a detrimental influence on investment. But the movements of the exchange rate, dictated mostly by financial movements, also weight on these decisions: Exchange rate appreciations lower the costs of borrowing in domestic currency, and therefore could attenuate the impact of foreign indebtedness. This paper states that this interaction between the variables can result in a variety of debt, demand and distributional regimes, according to the effects of foreign indebtedness on the wage share, firms' balance sheets and aggregate demand.

As mentioned, one possible transmission mechanism of foreign indebtedness into the domestic economy comes through its impact on mark-ups, borrowing costs and exchange rates. To harmonize the potential distributive conflict, authorities are equipped with different policy instruments. Nowadays, the favorite tool of central banks is the monetary policy. In this paper, however, we explore the adoption of a Tax-Based Income Policy (TIPs) to curb the demands of workers and firms in terms of nominal wages and prices. Advancing the results of this specification, we find that this policy reduces the pass-through of exchange rate movements to wage and price demands, improving external (price) competitiveness (Blecker 1989).

The paper is structured as follows. The next section will present our model, with endogenous income distribution, and with foreign private and public debt. The third section will analyze the conditions for the dynamic stability of the model, while the next section dwells into the impact of a higher affluence of foreign financial inflows. Section five discusses the implementation of a TIPs rule. The sixth section offers some closing remarks.

2 A Kaleckian model of growth, distribution and foreign debt

2.1 Sectors, assets, liabilities and flows

We present initially the institutional description of our fictitious economy, with the sectors, assets, liabilities and flows. We model an economy with five constituent sectors: Households-workers; firms; government; a central bank (split from the former for exposition purposes); and the rest of the world (ROW). Table 1 presents the balance sheets of these sectors, their assets, liabilities and net wealth/worth.

Table 1: Balance sheet of the model.

HOUSEHOLDS		FIRMS		GOVERNMENT		CENTRAL BANK		ROW	
Assets	**Liabilities**	**Assets**	**Liabilities**	**Assets**	**Liabilities**	**Assets**	**Liabilities**	**Assets**	**Liabilities**
H	NW_h	K	ED_f	H_p	ED_p	ER	H	D	R
		H_f							
			NW_f						

Cash (supplied on demand by the central bank) is the only asset of households, who do not have any other liability. The only liability of firms is their foreign debt, entirely denominated in a foreign currency (and therefore multiplied by the nominal exchange rate). As for their assets, they have a capital stock and cash holdings that they obtain when they sell the foreign currency of their debt. The difference between assets and liabilities is their net worth.

The same case holds for government: The external public debt constitutes its liabilities, and its cash holdings are their only asset. For the central bank, its liabilities are the high-powered money stocks, while its assets amounts to the foreign reserves, in turn the liabilities of the rest of the world.[2] Without domestic banks, there is only external debt as a source of financing.

Table 2 tracks the transactions between the different sectors presented above. A plus sign is a source of income (via sales, wages, or loans) and a minus sign is a use (for instance, "buying cash" by selling reserves).

Table 2: Flow-of-Funds of the model.

	HOUSE HOLDS	FIRMS		GOVERNMENT		CENTRAL BANK	ROW
		Current	**Capital**	**Current**	**Capital**		
Consumption	$-C$	$+C$					
Investment		$+I$	$-I$				
Public Expenditure		$+G$		$-G$			
Exports		$+X$					$-X$
Imports		$-M$					$+M$
Wage bill	$+WN$	$-WN$					
Interests		$-i^* ED_{f(-1)}$		$-i^* ED_{f(-1)}$			$+D_{(-1)}$
Pre-tax income	Y^{pt}	F^{pt}					
Taxes	$-T_h$	$-T_f$		$+T$			
Savings	S_h	S_f					
After-tax profits		$-F_f$	$+F_f$				
External debt			$+\Delta(ED_f)$		$+\Delta(ED_g)$		$-\Delta D$
Cash	$-\Delta(H_h)$		$-\Delta(H_f)$		$-\Delta(H_g)$	$+\Delta H$	
Reserves						$-\Delta R$	$+\Delta R$

Households consume, earn salaries, pay taxes, and only save cash. From their sales revenues, firms have to deduct wages, interests on their external debt and taxes. The "capital" column tracks patrimonial changes,

i.e. stocks, borrowing and cash holdings. Transactions by the government, the central bank and the ROW are self-explanatory.

2.2 Foreign financial flows

One of our three endogenous variables is total foreign debt, decomposed into its private and public components. Normalizing by the capital stock, we have:

$$d = D/K = d_g + d_f \tag{1}$$

The literature since Calvo, Leiderman, and Reinhart (1996) has differentiated between "push" and "pull" factors as drivers of capital flows, the former making reference to factors unrelated to the conditions of the recipients, and the latter referring to the variables of the recipient economy. There is ample evidence that in the last decades push factors, particularly the monetary stance of the United States, have been the major driver of inflows and outflows to EDEs.[3] Changes in the US monetary policy were transmitted to EDEs through risk premia (Rey 2013; Chari, Dilts Stedman, and Lundblad 2017). Adding to these facts, financial inflows have exerted a predominant influence on exchange rates and other asset prices (De Paula 2008; Jongwanich 2010; Bhattarai, Chatterjee, and Park 2015; Kaltenbrunner 2015; Cimoli, Lima, and Porcile 2016a; Cimoli, Ocampo, and Porcile 2016b). This paper, therefore, will stress the impacts of exogenous changes in global risk perceptions, transmitted through fluctuations in external indebtedness, on income distribution and economic growth.

Following the arguments about the impact of debt flows on exchange rates, the nominal exchange rate (interpreted as the units of local currency per unit of foreign currency) varies according to changes in the volume of foreign debt:

$$\hat{E} = \omega\hat{d} \tag{2}$$

We borrow therefore from the literature on the foreign exchange market and exchange rate determination, in order to model the determinants of debt flows. That literature has identified heterogeneous behavior among investors, generally regrouped under two separate types of agents according to the general way in which they form their expectations and make their decisions. One set of traders is called "fundamentalists," in the sense that they act according to some rule, based *on their view* of relevant fundamentals. The other set of traders is called "chartists," and base their decisions in trends and past behavior.[4] In our model, we differentiate between chartists and fundamentalists investors. Chartists follow recent trends, which in "normal times" are influenced by interest rate differentials. Their behavior is interesting in the specific aspect that it implies a rejection of the Uncovered Interest Rate Parity (UIP), because expectations of exchange rate movements do *not* nullify the impact of interest rate differentials: The former actually reinforce the latter, a characteristic called "the forward premium puzzle" (Engel 2014, 2016).

Fundamentalist investors, in turn, invest according to some rule. The one adopted here is that they look at the level of external debt (normalized by the capital stock) relative to some critical value, of a conventional nature, that can vary from country to country.[5] That is what the parameter d^f tries to capture.

The movement of exchange rates and interest rates differentials only diverge when the influence of fundamentalist traders is more powerful than the action of chartist traders. But this divergence can be captured by variables other than exchange rate expectations (such as the risk premium, or quantity variables such as credit rationing). We believe this matches the observed relationship between exchange rate movements and interest rate differentials: When times "are normal," interest rate differentials lead to persistently high returns in the high interest rate country; while in crisis times there is no interest rate differential that can counteract a sudden capital outflow. This secondary role of exchange rate expectations allows us to develop a deterministic (instead of stochastic) model. Ahmed and Zlate (2014) find that growth is another determinant of financial flows, while Nier and Sedik (2014) and Yildirim (2016) find evidence that the magnitude of the impact of international financial flows on domestic indicators are influenced by domestic factors, including growth rates. We therefore include the capacity utilization rate to capture pull (growth) factors. One plausible channel is that with rising economic growth and rising investment, firms in EMEs increase their imports of capital goods, usually aided by external funding.

Expressing d in variation rates we have:

$$\hat{d} = d_u u + \mu(i - i^*) + (1 - \mu)(d^f - d) \tag{3}$$

An alternative specification would make the country risk premium endogenous (Frenkel 1983; Rocha and Oreiro 2013; Cañonero and Winograd 2016). We consider that variable exogenous, though, because there is no clear relationship between objective fundamentals (such as the actual external debt stock, or the external debt to GDP ratio) and the risk premium actually charged to EDEs. Global factors tend to predominate, particularly in the short run (Csonto and Ivaschenko 2013). Adding the influence of interest payments on existing debt on the change in external debt level does not change the argument, since it would merely imply that "fundamentalist" investors are deterred earlier from lending.

As for the allocation between public and private debt, for simplicity purposes we assume that the proportion is determined by an exogenous parameter. It should be clear that the fiscal deficit does not need to be equal to the increase in public indebtedness in the event of capital inflows, since government can accumulate part of the excess borrowing, and identical principle applies to the private sector.

$$d_f = d_1 d, 0 < d_1 < 1 \tag{4}$$

$$d_g = (1 - d_1)d \tag{5}$$

2.3 Distribution

The economy under consideration produces one good, fit for consumption, investment and export purposes, under a Leontief production function with excess capacity as a permanent condition. The macroeconomic model depicted here is of a short run-medium run nature, so that we will set aside the dynamics and feedback effects from the accumulation of capital stock. We will treat investment as merely adding to aggregate demand, not as expanding the productive capacity, in line with the model by Blecker (2011), on which we build. We rule out the depreciation of the capital stock for simplicity purposes. The list of equations and the full list of variables is presented in Appendix A.

Starting with the short run, in which wages and mark-ups are taken as exogenous (see Hein and Vogel 2008; Vera 2010; Blecker 2011; and Bortz 2016; among others), our price equation is of the form:

$$P = (1 + z)\left[\frac{W}{a_o} + E((i^* + \rho)D_f + \bar{P}m)\right] \tag{6}$$

In the short run, the mark up z, the nominal wage W and labor productivity a_o are constant and exogenous variables. There are two more additional costs to cover in the price-setting equation: Imported inputs (with prices set abroad), and the interest payments on their external private debt ($(i^*+\rho)D_f$), times the nominal exchange rate. In this case, i^* measures the international interest rate, while ρ measures the country-risk, a risk premium subjectively assessed by foreign investors.

In the medium run, however, the mark-up is not exogenous, and workers and firms bargain over nominal wages and prices. We follow here the conflicting-claims approach to income distribution found in Cassetti (2003) and Rowthorn (1977), Setterfield (2007), Blecker (2011), Lavoie (2014), and Sasaki, Sonoda, and Fujita (2013). But first, we need to define the income shares of workers and firms. The labor share of income is:

$$\psi = \frac{WN}{PY} = \frac{w}{a_o} \tag{7}$$

where ω is the real wage and L the total level of employment. The profit share, in turn, is a residual, following the specification of Cimoli, Lima, and Porcile (2016a) and Cimoli, Ocampo, and Porcile (2016b):

$$\pi = \frac{P}{P} - \frac{W}{Pa_0} - \frac{E}{P}(i^* + \rho)D_f - \frac{E\bar{P}}{Pj} = 1 - \psi - \Xi - \frac{e}{j} \tag{8}$$

where $\Xi \equiv \frac{E}{P}(i^* + \rho)D_f$ is the income share of foreign creditors on output (debt interest payments expressed in local currency and in real terms) while $\frac{e}{j}$ represents the share of intermediate imported inputs, keeping in mind that j represents the unit requirement of imports for production and e represents the nominal exchange rate.

Workers bid for a nominal wage with a targeted wage-share in mind, adjusting the actual wage share to their target according to their relative bargaining power (exogenously given, captured by ϕ_w). The nominal wage demand equation is:

$$\hat{W} = \phi_w(\psi_w - \psi) \tag{9}$$

The price-setting curve, in turn, is:

$$\hat{P} = \zeta(\psi - \psi_f) \tag{10}$$

where ζ is the bargaining power of firms (also exogenous), and ψ_f is the wage share targeted by firms, determining implicitly a profit share, once we take into account as well imports and interest payments.

How is that variable determined? Equation (8) gives us a clue. The profit share is affected, besides the wage share, by the volume of private debt (times the interest rate) and the nominal (and real) exchange rate; the nominal exchange rate being determined in turn by the evolution of total debt.

Thus, when external debt rises, there are two effects. On the one hand, obviously, the volume of debt servicing increases as well. But on the other hand, the exchange rate appreciates (both in nominal and real terms)[6], and external financing (and imports) becomes cheaper, effectively increasing domestic income, since it is akin to an improvement in terms of trade. Though we believe it is a rather short-term effect[7], in that period of time there are indeed counteracting influence of rising external debt. That is reflected in equation (11):

$$\psi_f = \quad - d_f(\delta - \omega) \tag{11}$$

$$\psi_f = \quad - d_1 d(\delta - \omega) \tag{12}$$

The targeted wage-share by firms is a residual from the normal wage share firms would tolerate (κ), less the volume of private debt (itself a constant of total external debt), weighted by two factors. δ captures the effect of rising debt servicing payments, while ω captures the effect of an appreciating exchange rate, which results in a slowdown of inflation. We have then:

$$\hat{P} = \zeta(\psi - \quad + d_1 d(\delta - \omega)) \tag{13}$$

Keeping in mind that the wage share increases with the nominal wage, and decreases with exogenous productivity growth $\widehat{a_o}$ and price inflation, the equation describing its movement is:

$$\hat{\psi} = \phi_w(\psi_w - \psi) - \widehat{a_o} - \zeta(\psi - \quad + d_1 d(\delta - \omega)) \tag{14}$$

With some reordering, we get the equation describing the dynamics of the wage-share:[8]

$$\hat{\psi} = \psi(-\phi_w - \zeta) - \zeta d_1 d(\delta - \omega) + \phi_w \psi_w + \zeta\kappa - \widehat{a_o} \tag{15}$$

2.4 Aggregate demand

Taxes are levied by the same rate on all types of income:

$$T = \tau\pi Y + \tau\psi Y \tag{16}$$

Savings arise out of wage income (with an average propensity s_w) and profits (s_f). After some substitutions, total private savings net of taxes amount to:

$$\sigma_{priv} = S/K = [\pi s_f + s_w\psi]Y(1-\tau)/K = [\pi s_f + s_w\psi]uv(1-\tau) \tag{17}$$

The investment equation reflects the traditional Bhaduri and Marglin (1990) approach, which splits the profit rate into two of its components: The capacity utilization rate (to capture a kind of accelerator effect, linked to the state of aggregate demand) and the profit share, as a profitability indicator. We also include the detrimental impact of interest payments on firms' external debt, the only source of debt (Ndikumana 1999; Tori and Onaran 2016). But then again, we take into account the two counteracting effects of rising external (private) debt, via the parenthesis ($\delta-\omega$). In fact, borrowing abroad at low interest in times when the funding currency is expected to depreciate is an enticing factor for firms. In this view, there is an implicit "pecking order" for firms. Therefore, the private investment function is:

$$g_f = {}^{I_f}/_{K} = g_o + g_u u + g_\pi \pi - g_{i^*} d_1 d(\delta - \omega) \tag{18}$$

The current account expressed in foreign currency terms is defined as:

$$B = X - IM - (D_f + D_p)(i^* + \rho) \tag{19}$$

A current account deficit increases with rising domestic demand (measured by the capacity utilization rate), and with rising interest payments on external debt. Rising foreign demand increases the trade surplus. An appreciating exchange rates deteriorates external (price) competitiveness, but it implies fewer domestic resources destined to pay external debt, i.e. a terms of trade improvement, and an amelioration in the current account when measured in domestic currency. We include again the term $(\delta - \omega)$, but we add a parameter reflecting the influence of the Marshall-Lerner condition, b_e. In linear terms, the current account equation, expressed as a proportion of capital stock, becomes:

$$b = {}^{B}/_{K} = -b_u u + b_f u^* - d(\delta + b_e - \omega) \tag{20}$$

In this setting, b_u would capture the income elasticity of imports, while b_f would represent the income elasticity of exports.

Turning our attention to the government balance, we assume simply that public (current) expenditure grows at a constant rate:

$$G = G_0 e^{\alpha t} \tag{21}$$

The budget surplus is:

$$S_{gov} = T - G - (1 - d_1) D(\delta - \omega) \tag{22}$$

Finally, normalizing government expenditure by the capital stock we have:

$$\gamma = {}^{G}/_{K} \tag{23}$$

So that, when replacing tax revenues and interest-payments, the budget surplus becomes:

$$\sigma_{gov} = {}^{S_{gov}}/_{K} = \tau u v(\pi + \psi) - \gamma - (1 - d_1) d(\delta - \omega) \tag{24}$$

Our law of motion for the rate of change in the capacity utilization rate follows the specification adopted by La Marca (2010):

$$\hat{u} = \lambda(g_f + b - \sigma_{priv} - \sigma_{gov}) \tag{25}$$

After appropriate substitutions and reordering, we obtain:

$$\begin{aligned} \hat{u} = u\lambda(g_u - b_u - [\pi s_f + s_w \psi] v(1 - \tau) - \tau v(\pi + \psi)) + g_\pi \pi \lambda + \lambda d[(-d_1 - \\ g_i d_1)(\delta - \omega) - b_e] + \lambda(b_f u^* + \gamma) \end{aligned} \tag{26}$$

Changes in the capacity utilization rate depend positively on the impact of profitability and economic activity upon investment, public expenditure and external demand. Rising external debt has a negative or a positive influence depending on the term ($\delta-\omega$). We therefore have a three-endogenous variables dynamic system composed of equations (3), (14) and (26).

3 Analytical solution

The steady state equilibrium values of our three endogenous variables, $\hat{d}$, $\hat{\psi}$ and $\hat{u}$, are as follows:

$$d^* = \Big((d_u u + \mu(i - i^*))\Big/(1-\mu)\Big) + d_f \tag{27}$$

$$\psi^* = (-\zeta d_1 d(\delta - \omega) + \phi_w \psi_w + \zeta\kappa - \widehat{a_o})\Big/(\phi_w + \zeta) \tag{28}$$

$$u^* = \frac{g_\pi \pi + d[(-d_1 - g_i d_1)(\delta - \omega) - b_e] + (b_f u^* + \gamma)}{[\pi s_f + s_w \psi]v(1-\tau) + \tau v(\pi + \psi) + b_u - g_u} \tag{29}$$

Table 3 sums up the signs of the partial differentials.

Table 3: Signs of the Jacobian matrix.

		Sign			Sign			Sign
1)	$\frac{\partial \hat{d}}{\partial d}$	−	4)	$\frac{\partial \hat{\psi}}{\partial d}$	?	7)	$\frac{\partial \hat{u}}{\partial d}$	?
2)	$\frac{\partial \hat{d}}{\partial \psi}$	0	5)	$\frac{\partial \hat{\psi}}{\partial \psi}$	−	8)	$\frac{\partial \hat{u}}{\partial \psi}$	?
3)	$\frac{\partial \hat{d}}{\partial u}$	+	6)	$\frac{\partial \hat{\psi}}{\partial u}$	0	9)	$\frac{\partial \hat{u}}{\partial u}$	−

Appendix B describes the conditions for dynamic stability. We will sum up here the main features. First, we need that $\frac{\partial \hat{u}}{\partial u}$ be negative. For that to happen, the following inequality must hold:

$$g_u < b_u + [\pi s_f + s_w \psi]v(1-\tau) + \tau v(\pi + \psi) \tag{30}$$

This is the typical Keynesian stability condition (Lima and Setterfield 2016), which requires that the reaction of investment to changes in capacity utilization be smaller than the reaction of savings, the current account and tax revenues. We will assume this condition holds.

The differential $\frac{\partial \hat{u}}{\partial \psi}$, in turn, expresses the demand-regime of this economy (Blecker 2011). If it is positive (negative), then one can say the economy is of a wage-led (profit-led) nature. For that to happen, parameters must imply the following inequality:

$$-u\left[\frac{\partial \pi}{\partial \psi} s_f + s_w\right] v(1-\tau) > \tau v\left(1 + \frac{\partial \pi}{\partial \psi}\right) + g_\pi \frac{\partial \pi}{\partial \psi} \tag{31}$$

In that case, the dampening effects on economic performance of increased firms' savings would be significant. If the difference is small, or the inequality is of reversed sign, then the economy would be profit-led, because of the more powerful impact of profitability on investment.

The sign of differentials 4) and 7) depends crucially on the sign of the term $(\delta - \omega)$. To see why, we express them here:

$$\frac{\partial \hat{\psi}}{\partial d} = -\zeta d_1(\delta - \omega) \tag{32}$$

and

$$\frac{\partial \hat{u}}{\partial d} = (-d_1 - g_i d_1)(\delta - \omega) - b_e \tag{33}$$

If the cost of indebtedness outweighs, as it is usually expected to do, the cheapening of external debt in domestic currency (because of the appreciatory impact of inflows), then the wage-share targeted by firms will fall, and the sign of $\frac{\partial \hat{\psi}}{\partial d}$ will be negative. We call this the "debt-service driven" regime, when the wage-share falls in face of

rising external indebtedness. If the opposite happens, the sign of $\frac{\partial \hat{\psi}}{\partial d}$ will be positive. We call this the "exchange-rate driven" regime. It is important to notice that a higher share of private debt over total debt (a higher $-d_1$) would influence the magnitude of the reaction of the wage share to changes in external indebtedness, but not the direction of the reaction.

As for the impact of rising indebtedness on aggregate demand (i.e. capacity utilization), the same logic applies, particularly with regards to investment and the current account (Köhler 2017). Reinhart and Reinhart (2009) find that the lasting detrimental effects of higher indebtedness linger for longer on investment than the short term effects of an appreciating exchange rate. One has to add as well the impact on competitiveness, captured by b_e. When the sign of $\frac{\partial \hat{u}}{\partial d}$ is negative, we call that situation a "debt-burdened" demand regime; if the sign is positive, we call it a "debt-led" regime. A higher $-d_1$ accentuates the magnitude of the effects but not their direction. Table 4 sums up the variety of possible regimes.

Table 4: List of alternative regimes.

Derivative	Regime	Mathematical expression	Meaning
$\frac{\partial \hat{\psi}}{\partial d}$	Exchange-rate driven	$\frac{\partial \hat{\psi}}{\partial d} > 0$	Wage share reacts positively to increments in foreign indebtedness.
	Debt-service driven	$\frac{\partial \hat{\psi}}{\partial d} < 0$	Wage share reacts negatively to increments in foreign indebtedness.
$\frac{\partial \hat{u}}{\partial d}$	Debt-led	$\frac{\partial \hat{u}}{\partial d} > 0$	Economic activity reacts positively to increments in foreign indebtedness.
	Debt-burdened	$\frac{\partial \hat{u}}{\partial d} < 0$	Economic activity reacts negatively to increments in foreign indebtedness.
$\frac{\partial \hat{u}}{\partial \psi}$	Wage-led	$\frac{\partial \hat{u}}{\partial \psi} > 0$	Economic activity reacts positively to increments in the wage share.
	Profit-led	$\frac{\partial \hat{u}}{\partial \psi} < 0$	Economic activity reacts negatively to increments in the wage share.

The dynamic stability analysis shows that there are three regime combinations that lead to stability, summed up in Table 5. The first combination consists of a debt-service driven regime and a debt-burdened regime. It is depicted in Figure 1, and it is called the "normal" case, since it reflects the impacts of financial inflows according to the literature (Jayadev 2007; Reinhart and Reinhart 2009; Furceri, Guichard, and Rusticelli 2012; Furceri and Loungani 2015). The slope of $\hat{u} = 0$ is negative according to equation (33), while the slope of $\hat{d} = 0$ is positive according to the sign of $\frac{\partial \hat{d}}{\partial u}$. Finally, the slope of $\hat{\psi} = 0$ reflects the sign of equation (32). As for the demand regime, the "normal" case can accommodate both profit-led and wage-led regimes, though the impact on economic activity will be different according to the case. We will develop this issue further in the next section.

Table 5: List of stable regime combinations.

Case	$\frac{\partial \hat{\psi}}{\partial \hat{d}}$	$\frac{\partial \hat{u}}{\partial \hat{d}}$	Equilibrium capacity utilization
NORMAL	−	−	Wage-led: Higher Profit-led: Lower
PUZZLING	+	+	Wage-led: Higher Profit-led: Lower
CONCILIATING-DEBT	+	−	Wage-led: Higher Profit-led: Lower

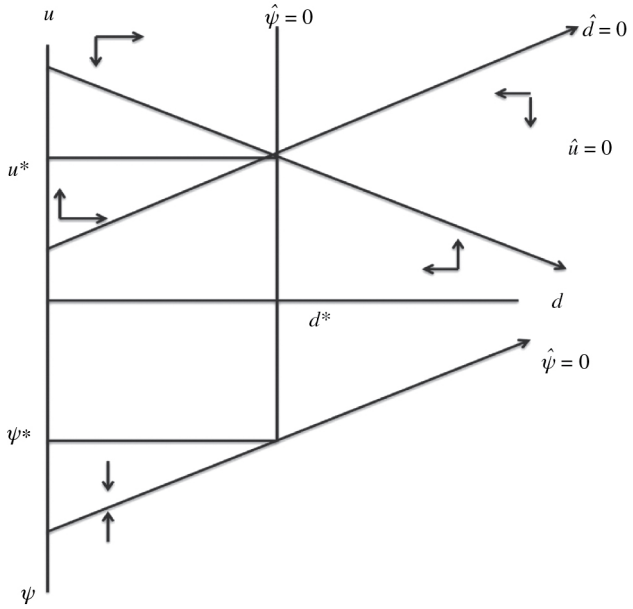

Figure 1: Negative derivatives (the "normal" case).

The second stable case is what we call a "puzzling" case, and is depicted in Figure 2. It consists of an exchange-rate driven distributional regime (therefore the positive slope of the curve $\hat{\psi} = 0$) and a debt-led aggregate demand regime (a positive slope of $\hat{u} = 0$). In this scenario, rising indebtedness goes hand in hand with rising aggregate demand and a more egalitarian income distribution. However, it requires that the slope of $\hat{u} = 0$ must be smaller in absolute value than the slope of $\hat{d} = 0$.

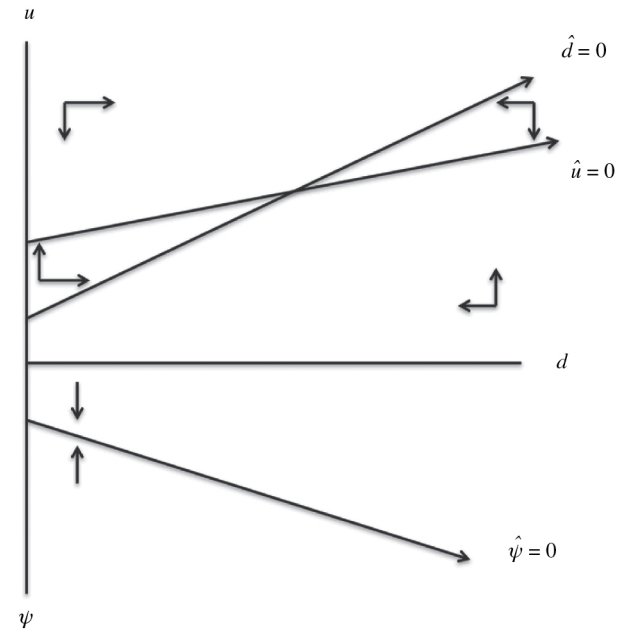

Figure 2: Positive derivatives (the "puzzling" case).

We call the third combination the "conciliating-debt" case. It results from the joint occurrence of an exchange-rate-driven distribution regime, and a debt-burdened demand regime. Though foreign inflows and exchange rate appreciation lift up the wage-share, their negative influence on the current account predominates as a determining factor of aggregate demand. In terms of Figure 1 and Figure 2, it would feature a downward-sloped curve $\hat{u} = 0$ with a positive sloped curve $\hat{\psi} = 0$. In a sense, the exchange rate exerts a short-term nuancing effect on the wage-share, mitigating to some extent the negative impact on employment of falling economic activity. Therefore the denomination of "conciliating-debt."

4 Effects of surges

This paper focuses on the impact of increasing external indebtedness on income distribution and economic activity. Global risk perceptions and the monetary stance of the United States have been identified as the major determinants of financial flows to emerging economies (Rey 2013; Cerutti, Claessens, and Puy 2015; IMF 2016; Aizenman, Chinn, and Ito 2016). What happens when there is a surge of capital inflows in our model?

This situation is depicted in Figure 3, for the normal case, and in Figure 4, for the "puzzling" case. Let's start with the former. Lax global risk perceptions are captured through a higher value of d^f. *Ceteris paribus*, investors now tolerate a higher level of indebtedness. Though in the short term there is an appreciating pressure on the exchange rate, eventually the costs of debt servicing start to pile up, both on firms' investment, on prices (and the wage share), and on the current account. Both the wage-share and capacity utilization are lower in the new equilibrium. If the demand regime is *wage-led*, the fall in economic activity would be even greater (and the opposite occurs if it is *profit-led*).

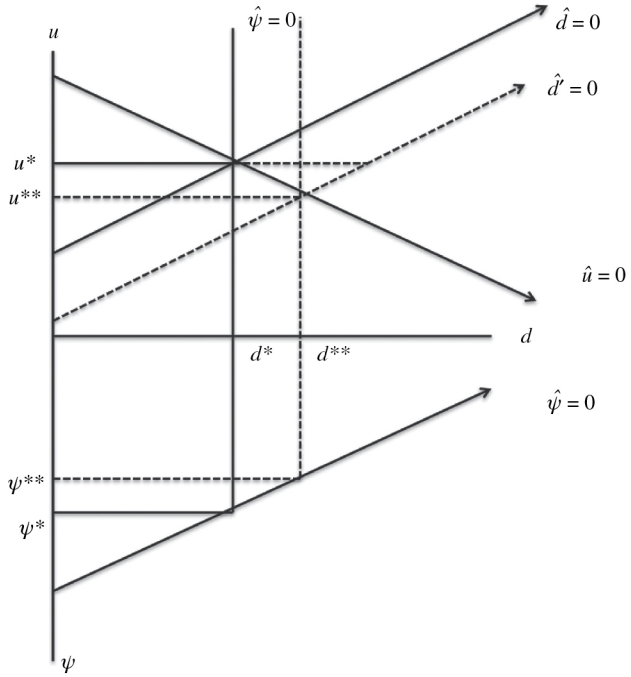

Figure 3: Higher external indebtedness in the "normal" case.

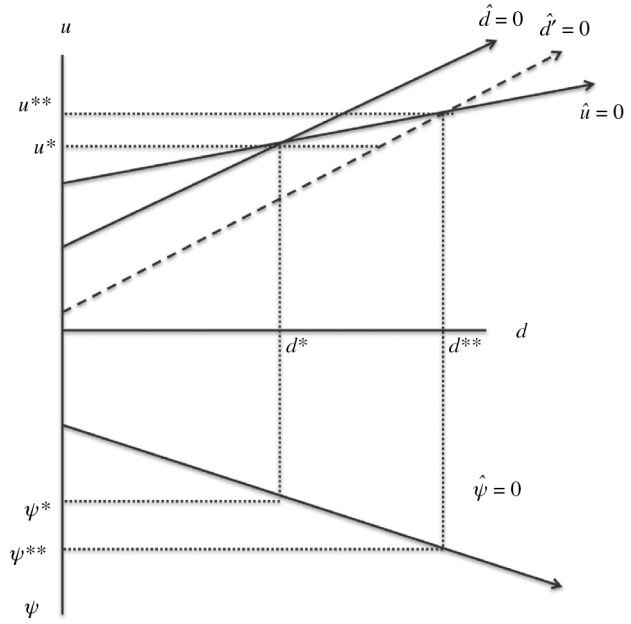

Figure 4: Higher external indebtedness in the "puzzling" case.

This case correspond, in our view, to the late phase of a typical Kindlebergerian-Minskyan cycle of foreign borrowing spree and surges of capital inflows, building up debt imbalances and that end when a tightening in external conditions lead to a reversal of flows, with unaffordable debt legacies, financial crises, sharp depreciations and abrupt fall of incomes and employments. The Latin American debt crisis of the early 1980s, the Tequila crisis of 1994 (and its reverberations throughout the region), the East Asian crisis of late 1990s, the Argentinean crisis of 2001, and even the European crisis of 2010s, each with its own characteristics and details, broadly belong to this type of scenario.

In the "puzzling" case, rising indebtedness improves the wage-share and economic activity by reducing inflation and cheapening the costs of borrowing. The wage-share and capacity utilization would have a higher value in the new equilibrium. Though stability, in this case, can occur with a wage-led regime, the danger of unsustainable dynamics is greater, because the curve $\hat{\psi} = 0$ would shift downwards, stimulating again economic activity and (therefore) external borrowing, leading to unsustainable dynamics.

We do not believe that the characteristics of a stable puzzling case can realistically describe the experience of emerging economies. However, these effects (rising aggregate demand and increasing wage share in the context of rising capital flows) could be the description of the very early phases of stabilization programs (such as those in South America in the early 1990s) that tackled hyperinflation experiences with liberalizations of the financial account, privatizations and capital inflows that provided the foreign currency required to stabilize the exchange rate and reduce inflationary pressures.

The in-between, "conciliating-debt" case, would feature a mix of these characteristics. There would be an appreciating exchange rate that would improve real wages, lower the weight of imports in national income and improve the wage share, but would depress external demand (through the Marshall-Lerner condition) and reduce aggregate demand.

In a sense, all three cases could form three phases of the Kindlebergerian-Minskyan cycle, which has many similarities with the Global Financial Cycle literature (Rey 2013, Bruno and Shin 2017, and Bortz, Michelena, and Toledo 2018). The early expansionary phases of the cycle provides the seeds of its future reversals. In this sense it seems that, left to its own, the system cannot provide for an equitable distribution and stable economic growth while capital flows move freely. What policy alternatives are available to governments to reconcile these objectives? In this paper we explore one of them: To implement TIPs in order to reconcile income claims and isolate them from movements in the exchange rate.[9]

5 Price and wage coordination

The current macroeconomic policy framework adopts the interest rate as the preferred policy instrument to address inflationary pressures, and to tackle excessive or faltering aggregate demand. One of its main functions is to coordinate inflationary expectations of forward-looking agents, and influencing their spending decisions. Only in times when the zero-lower bound becomes binding, is the fiscal policy considered as a viable instrument to spur aggregate demand. But as we mentioned before, inflationary pressures in the Kaleckian conflicting-claims approach to income distribution are mainly influenced by discrepancies in income aspirations of heterogeneous agents. In this context, instead of a single, blunt instrument as the interest rate, authorities may resort to a more flexible and wide design of anti-inflationary policy framework, in which fiscal policy can be helpful to coordinate price and wage-setting bargaining between firms and trade unions. Income policy was a valid policy choice in the 1960s and 1970s[10], but has currently fallen out of favor in the mainstream. We suggest that income policies based on taxes (or subsidies) can serve a useful purpose by coordinating inflationary income demands (Seidman 1978; Weintraub 1978), though this does not mean ruling out other available policy instruments (Lima and Setterfield 2007). It is certainly the case that Tax-based Income Policies (TIPs) are not incorporated in the Kaleckian literature. In filling this gap, we want to highlight the usefulness of this type of policy.

One way to implement TIPs is through the threat of taxation (though analogous results can be obtained by public transfers). In this extension on the canonical model, we assume that the government imposes a penalty on (wage and price) demands by workers and firms that go beyond what it judges to be reasonable, as proxied by a government distributive target. We distinguish between taxes on workers (τ_w) and taxes on firms (τ_f). The wage-setting function now refers to the *notional* or *ex-ante* demand of nominal wage rise:

$$\widehat{W_n} = \phi_w(\psi_{wn} - \psi) \tag{34}$$

However, actual wage increases are not equal to this notional demand, if the latter imply a wage-share above the government distributive target ψ_g. In that case, the government puts a wage tax, with a growing marginal rate:

$$\tau_w = \tau_0 + n_0(\psi_{wn} - \psi_g) \tag{35}$$

Therefore, actual nominal wage increase becomes:

$$\hat{W} = \widehat{W_n}(1 - \tau_w) = [\phi_w(\psi_{wn} - \psi)](1 - \tau_w) \tag{36}$$

Same logic applies to pricing. The *notional price setting* function changes little with respect to the canonical model:

$$\widehat{P_n} = \zeta(\psi - \psi_{fn}) \tag{37}$$

where ψ_{fn} is now the *notional* wage-share targeted by firms. If this share is below the government distributive target, authorities will impose a tax penalty, affecting actual profits. If firms try to compensate this tax passing it onto prices, the marginal tax-rate will increase even further, rendering futile the adopted strategy. Formally:

$$\psi_f = \psi_{fn}(1 + \tau_f) \tag{38}$$

$$\tau_f = \tau_1 + n_1(\psi_g - \psi_{fn}) \tag{39}$$

The actual price-setting function is:

$$\hat{P} = \zeta(\psi - \psi_f) \tag{40}$$

And the dynamics of the actual wage-share is:

$$\hat{\psi} = [\phi_w(\psi_{wn} - \psi)](1 - \tau_w) - \widehat{a_o} - \zeta[\psi - [\ - d_1 d(\delta - \omega)](1 - t_f)] \tag{41}$$

It can be shown now that the actual wage-share with this new tax policy, the actual wage share responds *less* to the aspirations of workers. Remembering from equation (14) in the canonical model we have:

$$\frac{\partial \hat{\psi}}{\partial \psi_w} = \phi_w \tag{42}$$

Now, with the income claims-coordination strategy modeled above, we have:

$$\frac{\partial \hat{\psi}}{\partial \psi_{wn}} = \phi_w(1 - \tau_0 - 2n_0\psi + \psi_g) \tag{43}$$

The term in parenthesis is smaller than unity (and larger than zero) for a reasonable set of parameters. This implies that the adoption of a tax-based coordination policy reduces the sensitivity of wage demands to real depreciations, and the same holds for firms' income claims. We can say therefore that this policy reduces the pass-through from nominal depreciations to prices, so that the real exchange rate is less sensitive to distributive struggles, and competitiveness improves.

What are the effects on the dynamics of the model? In the modified version, the wage share responds with less intensity to changes in external debt:

$$\frac{\partial \hat{\psi}}{\partial d} = -\zeta d_1(\delta - \omega)(1 - \tau_f) \tag{44}$$

The nature of the regime (exchange-rate or debt-service driven) does not change, but the magnitude does. In the "normal," debt-service driven case, firms are *less able* to translate increments in costs onto prices, because the increases would be taxed away. The wage share would still fall, but now the government would take a greater slice of income (the curve $\hat{\psi} = 0$ becomes flatter, because it rotates clock-wise). This affects both private and public savings. The former becomes:

$$\sigma_{priv} = {}^{S}/_{K} = [\pi s_f(1-\tau_f) + s_w\psi(1-\tau_w)]{}^{Y}/_{K} = [\pi s_f(1-\tau_f) + s_w\psi(1-\tau_w)]uv \tag{45}$$

While the public fiscal balance becomes:

$$\sigma_{gov} = {}^{S_{gov}}/_{K} = (\tau_f\pi + \tau_w\psi)uv - \gamma - (1-d_1)d(\delta-\omega) \tag{46}$$

These changes affect the macroeconomic stability condition, and the nature of the demand-regime (wage-led or profit-led). A progressive tax policy (with the tax-rate on firms greater than the tax rate on workers) would make the system more wage-led, even in the context of a small open economy exposed to capital flows. The stability condition becomes more lax, since public savings detract from aggregate demand. The equilibrium capacity utilization rate, however, is smaller. A tax-rebate would have the opposite effect.

In the "puzzling case," the introduction of TIPs would mean that the wage share does not fall (rise) too much in the event of capital outflows (inflows). In terms of Figure 2, the curve $\hat{\psi} = 0$ becomes flatter (rotates anti-clockwise), so that the fall in aggregate demand (and the consequent decline in foreign indebtedness) does not have negative repercussions on income distribution.

6 Conclusion

This paper investigates the impact of changes in global risk perceptions, transmitted through financial flows and external debt, on income distribution and economic activity of a stereotypical middle-income economy which borrows in international markets in a foreign currency. Through its impact on price setting and investment decisions, an economy open to capital flows can observe severe changes in the wage-share and economic activity. The short term appreciatory impact on the exchange rate, which reduces inflationary pressures and reduces the cost of external borrowing for firms, would be overcome in a normal regime by the weight of external indebtedness and debt-servicing payments, leading to increases in income inequality and stagnated aggregate demand.

There are some alternative policies available to governments, though each has collateral effects when applied in isolation. The article analyses one of such alternatives, the implementation of a TIPs, which isolates the wage-bargaining process and the price-making decision from changes in external borrowing and the exchange rate. According to its implementation, it would have positive or negative effects on aggregate demand. The spillovers over economic activity suggest the need to adopt a holistic and integral approach, with multiple instruments and targets, to aim a multiplicity of potentially-conflicting policy objectives.

Appendix A

Table 6: Full list of equations.

No.	Equation	Meaning
Foreign financial flows		
1	$d = {}^{D}/_{K} = d_g + d_f$	Total foreign debt
2	$\hat{E} = \omega\hat{d}$	Nominal exchange rate
3	$\hat{d} = d_u u + \mu(i-i^*) + (1-\mu)(\hat{d^f} - \hat{d})$	Rate of change of foreign debt
4	$d_f = d_1 d, 0 < d_1 < 1$	Foreign private debt
5	$d_g = (1-d_1)d$	Foreign public debt
Income distribution		
6	$P = (1+z)\left[\frac{W}{a_o} + E((i^*+\rho)D_f + \bar{P}m)\right]$	Price level
7	$\psi = \frac{WN}{PY} = \frac{w}{a_o}$	Wage share
8	$\pi = \frac{P}{P} - \frac{W}{Pa_0} - \frac{E}{P}(i^*+\rho)D_f - \frac{E\bar{P}}{P\bar{j}} = 1 - \psi - \Xi - \frac{e}{j}$	Profit share
9	$\hat{W} = \phi_w(\psi_w - \psi)$	Nominal wage increases
10	$\hat{P} = \zeta(\psi - \psi_f)$	Price increases
11	$\psi_f = \ - d_1 d(\delta - \omega)$	Targeted wage share by firms

12	$\hat{P} = \zeta(\psi - \ + d_1 d(\delta - \omega))$	Price increases
14	$\hat{\psi} = \psi(-\phi_w - \zeta) - \zeta d_1 d(\delta - \omega) + \phi_w \psi_w + \zeta\kappa - \widehat{a_o}$	Rate of change of wage share
Aggregate demand		
15	$T = \tau\pi Y + \tau\psi Y$	Tax revenues
16	$\sigma_{priv} = {}^{S}/_{K} = [\pi s_f + s_w\psi]Y(1-\tau)/_{K} = [\pi s_f + s_w\psi]uv(1-\tau)$	Private saving rate
17	$g_f = {}^{I_f}/_{K} = g_o + g_u u + g_\pi \pi - g_{i^*} d_1 d(\delta - \omega)$	Private investment rate
18	$B = X - IM - (D_f + D_p)(i^* + \rho)$	Trade balance
19	$b = {}^{B}/_{K} = -b_u u + b_f u^* - d(\delta + b_e - \omega)$	Normalized trade balance
20	$b = {}^{B}/_{K} = -b_u u + b_f u^* - d(\delta + b_e - \omega)$	Public expenditure
22	$\gamma = {}^{G}/_{K}$	Normalized public expenditure
23	$\sigma_{gov} = {}^{S_{gov}}/_{K} = \tau uv(\pi + \psi) - \gamma - (1 - d_1)d(\delta - \omega)$	Normalized budget surplus
23	$\hat{u} = \lambda(g_f + b - \sigma_{priv} - \sigma_{gov})$	Rate of change of capacity utilization
24	$\hat{u} = u\lambda(g_u - b_u - [\pi s_f + s_w\psi]v(1-\tau) - \tau v(\pi + \psi)) + g_\pi \pi\lambda + \lambda d[(-d_1 - g_i d_1)(\delta - \omega) - b_e] + \lambda(b_f u^* + \gamma)$	Rate of change of capacity utilization
Steady state values and equilibrium conditions		
26	$d^* = \left({}^{(d_u u + \mu(i - i^*))}/_{(1-\mu)}\right) + d_f$	Equilibrium value of foreign debt
27	$\psi^* = {}^{(-\zeta d_1 d(\delta - \omega) + \phi_w \psi_w + \zeta\kappa - \widehat{a_o})}/_{(\phi_w + \zeta)}$	Equilibrium value of wage share
28	$u^* = \frac{g_\pi \pi + d[(-d_1 - g_i d_1)(\delta - \omega) - b_e] + (b_f u^* + \gamma)}{[\pi s_f + s_w\psi]v(1-\tau) + \tau v(\pi + \psi) + b_u - g_u}$	Equilibrium value of capacity utilization
29	$g_u < b_u + [\pi s_f + s_w\psi]v(1-\tau) + \tau v(\pi + \psi)$	Stability condition of capacity utilization
Regime conditions		
30	$-u\left[\frac{\partial\pi}{\partial\psi} s_f + s_w\right] v(1-\tau) > \tau v\left(1 + \frac{\partial\pi}{\partial\psi}\right) + g_\pi \frac{\partial\pi}{\partial\psi}$	Wage-led regime condition
31	$\frac{\partial\hat{\psi}}{\partial d} = -\zeta d_1(\delta - \omega)$	Distribution regime condition
32	$\frac{\partial\hat{u}}{\partial d} = (-d_1 - g_i d_1)(\delta - \omega) - b_e$	Debt regime condition
TIPs model		
33	$\widehat{W_n} = \phi_w(\psi_{wn} - \psi)$	Notional nominal wage increases
34	$\tau_w = \tau_0 + n_0(\psi_{wn} - \psi_g)$	Taxes on wages
9′	$\hat{W} = \widehat{W_n}(1 - \tau_w) = [\phi_w(\psi_{wn} - \psi)](1 - \tau_w)$	Nominal wage increases
35	$\widehat{P_n} = \zeta(\psi - \psi_{fn})$	Notional price increases
36	$\psi_f = \psi_{fn}(1 + \tau_f)$	Targeted wage share by firms after taxes
37	$\tau_f = \tau_1 + n_1(\psi_g - \psi_{fn})$	Taxes on profits
10′	$\hat{P} = \zeta(\psi - \psi_f)$	Price increases in TIPs Model
14′	$\hat{\psi} = [\phi_w(\psi_{wn} - \psi)](1 - \tau_w) - \widehat{a_o} - \zeta[\psi - [\ - d_1 d(\delta - \omega)](1 - t_f)]$	Rate of change of wage share in TIPs Model
38	$\frac{\partial\hat{\psi}}{\partial\psi_w} = \phi_w$	Reaction of wage share to workers' aspirations
38′	$\frac{\partial\hat{\psi}}{\partial\psi_{wn}} = \phi_w(1 - \tau_0 - 2n_0\psi + \psi_g)$	Reaction of wage share to workers' aspirations in TIPs Model
31′	$\frac{\partial\hat{\psi}}{\partial d} = -\zeta d_1(\delta - \omega)(1 - \tau_f))$	Distribution regime condition in TIPs Model
16′	$\sigma_{priv} = {}^{S}/_{K} = [\pi s_f(1 - \tau_f) + s_w\psi(1 - \tau_w)]{}^{Y}/_{K} = [\pi s_f(1 - \tau_f) + s_w\psi(1 - \tau_w)]uv$	Private saving rate in TIPs Model
23′	$\sigma_{gov} = {}^{S_{gov}}/_{K} = (\tau_f \pi + \tau_w\psi)uv - \gamma - (1 - d_1)d(\delta - \omega)$	Normalized budget surplus in TIPs model

Table 7: Full list of variables.

Variable	Meaning	Character
H_h	High-powered money held by households	Endogenous
NW_h	Households net wealth	Endogenous
H_f	High-powered money held by firms	Endogenous
K	Capital stock	Endogenous
E	Nominal exchange rate	Endogenous
D_f	External private debt	Endogenous

NW_f	Firms' net worths	Endogenous
H_p	High-powered money held by the public sector	Endogenous
D_g	External public debt	Endogenous
R	Monetary reserves	Endogenous
H	Monetary base	Endogenous
D	Total external debt	Endogenous
R	International reserves	Exogenous
d_f	External private debt normalized by capital stock	Endogenous
d_g	External public debt normalized by capital stock	Endogenous
$\boldsymbol{d}$	**Total external debt normalized by capital stock**	**Endogenous**
d_1	Share of private external debt on total external debt	Parameter
C	Consumption	Endogenous
I	Investment	Endogenous
G	Primary public expenditure	Endogenous
X	Exports	Endogenous
M	Imports	Endogenous
WN	Wage bill	Endogenous
Y^{pt}	Pre-tax income	Endogenous
F^{pt}	Pre-tax profits	Endogenous
T_h	Wage-tax revenues	Endogenous
T_f	Profits-tax revenues	Endogenous
T	Total tax revenues	Endogenous
d_u	Parameter of debt function (sensitivity to capacity utilization, pull)	Parameter
μ	Parameter of debt function (sensitivity to interest differential, push)	Parameter
i	Domestic interest rate	Parameter
d^f	Maximum debt level tolerated by fundamentalist traders (push)	Exogenous
S_h	Households savings	Endogenous
S_f	Firms savings	Endogenous
Y	Output	Endogenous
a_0	Labor productivity	Exogenous
N	Employment level	Endogenous
v	Capital – full capacity output ratio	Exogenous
j	Unit requirement of imported inputs	Exogenous
m	Volume of imported imputs	Endogenous
Y^*	Full-capacity output level	Exogenous
$\boldsymbol{u}$	**Capacity utilization**	**Endogenous**
P	Domestic price level	Endogenous
z	Profit margin	Exógena
W	Endogenous	Endogenous
i^*	International interest rate	Exogenous
ρ	Sovereign risk	Exogenous
$\bar{P}$	External price level	Exogenous
e	Real exchange rate	Endogenous
$\boldsymbol{\psi}$	**Wage share**	**Endogenous**
π	Profit share	Endogenous
w	Real wage	Endogenous
Ξ	Foreign investors' income share	Endogenous
ϕ_w	Workers' wage bargaining power	Parameter
ψ_w	Targeted wage share by workers	Exogenous
ζ	Firms' bargaining power	Parameter
ψ_f	Targeted wage share by firms	Endogenous
κ	Normal wage share targeted by firms	Exogenous
δ	Effect of debt servicing payments	Parameter
ω	Effect of appreciating exchange rate	Parameter
g_f	Investment rate	Endogenous
I_f	Investment flow	Endogenous
g_o	Parameter of the investment function (animal spirits)	Parameter
g_u	Parameter of investment function (sensitivity to capacity utilization)	Parameter
g_π	Parameter of investment function (sensitivity to profit share)	Parameter
g_{i^*}	Parameter of investment function (sensitivity to interest payments)	Parameter
s_f	Firms' saving propensity	Parameter
s_w	Workers' saving propensity	Parameter
S_{priv}	Private savings	Endógena
σ_{priv}	Private savings normalized by capital stock	Endogenous

B	Current account balance	Endogenous
b	Current account balance normalized by capital stock	Endogenous
u^*	Foreign capacity utilization	Exogenous
b_e	Sensitivity of trade balance to the real exchange rate	Parameter
b_u	Parameter of current account (sensitivity to capacity utilization)	Parameter
b_f	Parameter of current account (sensitivity to foreign capacity utilization)	Parameter
G_0	Initial level of public primary expenditure	Parameter
α	Growth rate of public primary expenditure	Parameter
γ	Primary public expenditure normalized by capital stock	Endogenous
τ	Tax rate	Parameter
S_{gov}	Government budget surplus	Endogenous
σ_{gov}	Government budget surplus normalized by capital stock	Endogenous
λ	Adjustment speed of capacity utilization	Parameter
τ_w	Tax rate on wage income (TIPs)	Endogenous
τ_f	Tax rate on profits income (TIPs)	Endogenous
W_n	Notional wage increments (TIPs)	Endogenous
ψ_{wn}	Notional targeted wage share by workers (TIPs)	Exogenous
ψ_g	Targeted wage share by the government (TIPs)	Exogenous
τ_0	Parameter of tax rate on wage income (TIPs)	Parameter
n_0	Parameter of tax rate on wage income (TIPs)	Parameter
P_n	Notional price increments	Endogenous
ψ_{fn}	Notional targeted wage share by firms	Endogenous
τ_1	Parameter of tax rate on profit income (TIPs)	Parameter
n_1	Parameter of tax rate on profit income (TIPs)	Parameter

Appendix B

Dynamic stability requires the fulfillment of Routh-Horwitz conditions for the case of a three-equation system with three endogenous variables:

i. Tr($\boldsymbol{J}$) <0

ii. Det $|\boldsymbol{J}| < 0$

iii. Det $|\mathbf{1}|$ + Det $|\mathbf{2}|$ + Det $|\mathbf{3}| > 0$

iv. Tr($\boldsymbol{J}$)(Det $|\mathbf{1}|$ + Det $|\mathbf{2}|$ + Det $|\mathbf{3}|$) + Det $|\boldsymbol{J}| >0$

Keeping in mind the formal expressions for $\hat{u}$, $\hat{\psi}$ and $\hat{d}$, we can represent the system in matrix form:

$$\begin{pmatrix} \hat{d} \\ \hat{\psi} \\ \hat{u} \end{pmatrix} = \begin{pmatrix} 1 & 2 & 3 \\ 4 & 5 & 6 \\ 7 & 8 & 9 \end{pmatrix} \begin{pmatrix} d \\ \psi \\ u \end{pmatrix}$$

Which obliges us to corroborate the signature of matrix $\boldsymbol{J}$:

$$1) \quad \frac{\partial \hat{d}}{\partial d} = -$$

$$2) \quad \frac{\partial \hat{d}}{\partial \psi} = 0$$

$$3) \quad \frac{\partial \hat{d}}{\partial u} = +$$

$$4) \quad \frac{\partial \hat{\psi}}{\partial d} == -\zeta d_1(\delta - \omega)$$

$$5) \quad \frac{\partial \hat{\psi}}{\partial \psi} = -$$

$$6) \quad \frac{\partial \hat{\psi}}{\partial u} = 0$$

$$7) \quad \frac{\partial \hat{u}}{\partial d} = (-d_1 - g_i d_1)(\delta - \omega) - b_e$$

$$8) \quad \frac{\partial \hat{u}}{\partial \psi} = \lambda \left(-u \left[\frac{\partial \pi}{\partial \psi} s_f + s_w \right] v(1-\tau) - \tau v \left(1 + \frac{\partial \pi}{\partial \psi} \right) + g_\pi \frac{\partial \pi}{\partial \psi} \right)$$

$$9) \quad \frac{\partial \hat{u}}{\partial u} = \lambda(g_u - b_u - [\pi s_f + s_w \psi] v(1-\tau) - \tau v(\pi + \psi))$$

1), 5) and 9) must be negatives. For 9) to be negative, we need:

$$g_u < b_u + [\pi(s_f + s_d - s_f s_d) + s_w \psi] v(1-\tau) + \tau v(\pi + \psi)$$

We will assume that this inequality holds.

In the "normal" case, (4) and (7) would be negative; while in the "puzzling" case they would be positive. A wage-led (profit-led) regime implies that (8) is positive (negative).

Formally, for the "normal" case:

$$\boldsymbol{J} = \begin{pmatrix} - & 0 & + \\ - & - & 0 \\ - & ? & - \end{pmatrix}$$

$$\text{Det}\,|\boldsymbol{J}| = a_{11}\begin{vmatrix} a_{22} & a_{23} \\ a_{32} & a_{33} \end{vmatrix} - a_{12}\begin{vmatrix} a_{21} & a_{23} \\ a_{31} & a_{33} \end{vmatrix} + a_{13}\begin{vmatrix} a_{21} & a_{22} \\ a_{31} & a_{32} \end{vmatrix}$$

$$\text{Det}\,|\boldsymbol{J}| = (-)\begin{vmatrix} - & o \\ ? & - \end{vmatrix} - 0\begin{vmatrix} - & 0 \\ - & - \end{vmatrix} + (+)\begin{vmatrix} - & - \\ - & ? \end{vmatrix}$$

It can be readily seen that:

Det $|1| > 0$

Det $|2| > 0$

Det $|3|$: If the demand regime is wage-led and the cell a_{31} is negative, then the determinant would be negative, and Det $|\mathbf{J}|$ is definitely negative. If the regime is profit-led, then the sign of the determinant is undetermined.

Condition 1: The trace is negative.

Condition 3: Det $|1|$ + Det $|2|$ + Det $|3| > 0$. This is more likely to hold when the regime is profit-led, because in that case the sign of Det $|3|$ is undetermined, while if the regime is wage-led, Det $|3|$ is negative

Condition 4: $-$ Tr(J)(Det $|1|$ + Det $|2|$ + Det $|3|$) + Det $|J| > 0$. This condition is more likely to hold is the system is profit-led, for the same reason as condition 3.

In the "puzzling" case, we have the following signs:

$$\boldsymbol{J} = \begin{pmatrix} - & 0 & + \\ + & - & 0 \\ + & ? & - \end{pmatrix}$$

$$\text{Det}\,|\boldsymbol{J}| = a_{11}\begin{vmatrix} a_{22} & a_{23} \\ a_{32} & a_{33} \end{vmatrix} - a_{12}\begin{vmatrix} a_{21} & a_{23} \\ a_{31} & a_{33} \end{vmatrix} + a_{13}\begin{vmatrix} a_{21} & a_{22} \\ a_{31} & a_{32} \end{vmatrix}$$

$$\text{Det}\,|\boldsymbol{J}| = (-)\begin{vmatrix} - & o \\ ? & - \end{vmatrix} - 0\begin{vmatrix} + & 0 \\ + & - \end{vmatrix} + (+)\begin{vmatrix} + & - \\ + & ? \end{vmatrix}$$

It can be readily seen that:

Det $|1| > 0$

Det $|2| < 0$

Det $|3|$: If it is wage-led, the sign is positive. If it is profit-led, the sign is undetermined, and condition 2 more likely to hold, because the determinant would be more negative.

Condition 3: Det $|1|$ + Det $|2|$ + Det $|3| > 0$. This is more likely to hold when the regime is wage-led because in that case the sign of Det $|3|$ is positive, while if the regime is profit-led, Det $|3|$ is undetermined.

Condition 4: It is more likely to hold when the regime is profit-led for the same reason as condition 3.

Finally, in the "conciliating-debt" regime, we have as follows:

$$\boldsymbol{J} = \begin{pmatrix} - & 0 & + \\ + & - & 0 \\ - & ? & - \end{pmatrix}$$

$$\text{Det}\,|\boldsymbol{J}| = a_{11}\begin{vmatrix} a_{22} & a_{23} \\ a_{32} & a_{33} \end{vmatrix} - a_{12}\begin{vmatrix} a_{21} & a_{23} \\ a_{31} & a_{33} \end{vmatrix} + a_{13}\begin{vmatrix} a_{21} & a_{22} \\ a_{31} & a_{32} \end{vmatrix}$$

$$\text{Det}\,|\boldsymbol{J}| = (-)\begin{vmatrix} - & o \\ ? & - \end{vmatrix} - 0\begin{vmatrix} + & 0 \\ - & - \end{vmatrix} + (+)\begin{vmatrix} + & - \\ - & ? \end{vmatrix}$$

Det $|1| > 0$

Det $|2| < 0$

Det $|3|$ If it is wage-led, it is undetermined, while if it is profit-led, it is definitely negative, and condition 2 more likely to hold.

Condition 3: Det $|1| + \text{Det}\,|2| + \text{Det}\,|3| > 0$. This is more likely to hold when the regime is wage-led because in that case the sign of Det $|3|$ could be positive, while if the regime is profit-led, Det $|3|$ is negative.

Condition 4: It is more likely to hold when the regime is wage-led for the same reason as condition 3.

Notes

1 See Blecker (2002), Hein (2014), Lavoie (2014), and Bortz (2016) for a comprehensive review of Kaleckian models of growth and distribution.

2 We will not model movements in international reserves for one main reason. We want to concentrate on the impact of *gross* flows, which have an importance beyond net flows (i.e., including external reserves), due to the influence of the balance sheet of the institutional sectors involved when it comes to analyze the impact of capital movements (see Al-Saffar, Ridinger, and Whitaker 2013; Avdjiev, McCauley, and Shin 2015).

3 See for instance Forbes and Warnock (2012), Ahmed and Zlate (2014), Rey (2013), Butzen, Deroose, and Ide (2014), Cimoli, Lima, and Porcile (2016a), Cimoli, Ocampo, and Porcile (2016b), and Aizenman, Chinn, and Ito (2016); and Bruno and Shin (2017).

4 There are both mainstream and post-Keynesian articles adopting this differentiation. See Frankel and Froot (1990), Cutler, Poterba, and Summers (1990), Harvey (1993), Moosa (2003), Lavoie and Daigle (2011), Spronk, Verschoor, and Zwinkels (2013), and Chutasripanich and Yetman (2015); among others.

5 This formulation is akin to Minsky's statement that "a decrease in liquidity preference allows an increase in the ratio of near-term payment commitments to near-term expected quasi-rents to take place" (Minsky 1980: 509).

6 There is evidence of a lower degree of pass-through of exchange rate movements into prices (Goldberg and Campa 2010; Amiti, Itskhoki, and Konings 2014), which implies that the real and the nominal exchange rate move together (Mussa 1986; Taylor and Taylor 2004).

7 This point holds as well for the inclusion of the possibility of domestic lending. Assuming that domestic lending is available but more expensive that foreign lending, switching from the former to the latter would imply, in the short term, effectively a decrease in interest payments even in the context of rising external debt, an effect that would be compound by the ensuing appreciation of the exchange rate. However, as firms' external indebtedness rises, the positive relation between external private debt and overall corporate debt is restored.

8 Though modelled as independent of each other, in reality $-\phi_w$ and ζ (the bargaining power of workers and firms, respectively) are inversely related. When one rises, the other falls.

9 In Bortz, Michelena, and Toledo (2018) we explore another possibility, namely the implementation of capital controls.

10 See Dore, Boyer, and Mars (1994) and Abeles, Pastrana, and Toledo (2011); and Storm and Naastepad (2012), chapter 7 for a description of a few of these coordination experiences in Northern Europe.

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