Currency devaluations, distribution conflict and inflation: revisiting Kaleckian open economy models

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Abstract

The article develops a stylized medium-run post-Kaleckian open economy model with conflict inflation and a crawling peg exchange rate mechanism. We propose a combination of two existing specifications of the income share targets of workers and firms in post-Keynesian literature as an alternative to overcome what we consider theoretical limitations in the assumption of workers' wage-setting behavior in the face of a currency devaluation. In our model, the target wage share of workers is not directly affected by the real exchange rate (RER) and therefore workers do not set nominal wages in direct consideration of international relative prices. Instead, the target of workers is affected by the rate of capacity utilization, which reflects their wage bargaining position. We present dynamic proof of the stability of the model, and we analyze the effects of currency devaluations on overall aggregate demand, growth, trade balance, and inflation. It is shown that the effects of a devaluation on aggregate demand, growth, trade balance, and inflation are generally ambiguous and highly contingent on the parameter constellation of the economy. Unlike other models in the literature, our model shows that the equilibrium inflation level may be lower after a contractionary devaluation if recession, unemployment, and the fall in workers' bargaining power are large enough. Although there may be no studies with empirical evidence of this phenomenon, this result underlines that the more contractionary a devaluation is, the smaller its impact on prices will be. The effectiveness of a currency devaluation as a stabilization policy remains unclear, its adoption is not without risk, and its negative social and distributional consequences may be large.

Keywords: currency devaluation, distribution conflict, inflation, open economy, Kaleckian model

JEL codes: E11, E12, E31, F31, F41

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1. Introduction

The effectiveness of currency devaluations[1] as a stabilizing policy instrument is a long-standing debate in economics for the most varied economic theories. On the one hand, with the goal of price stabilization, an overvaluation of the real exchange rate (RER) may work as an anchor, stimulating imports and reducing inflation; on the other hand, to improve the trade balance in the face of an external disequilibrium, an undervalued RER could be preferred (Lima and Porcile, 2013). This article focuses on the interaction of currency devaluations, distribution conflict, and inflation.

Based on the standard Mundell-Fleming framework, a devaluation is considered as a valid policy to stimulate aggregate demand and readjust the trade balance by increasing exports and reducing imports. An alternative approach pointing out the possible contractionary effects of devaluations was presented early on by Diaz Alejandro (1963), Braun and Joy (1968), and Krugman and Taylor (1978), among other authors. These analyses highlight the possible change in income distribution following a devaluation, which could reduce the income share of workers -with a higher propensity to consume- and therefore reduce aggregate demand in case this effect is stronger than the expansion in net exports present if the Marshall-Lerner (ML) condition holds. Beyond these theoretical approaches, empirical research on the links between currency devaluations and macroeconomic performance has shown ambiguous or country-specific results (Bahmani-Oskooee and Miteza, 2003; Yiheyis, 2006; Kim and Ying, 2007; Kim et al., 2015).

In a Kaleckian framework, Blecker (1989) and Bhaduri and Marglin (1990) linked domestic redistribution with international price competitiveness (i.e., the RER) and they allowed for different aggregate demand regimes in demand-led growth models. Hein and Vogel (2008) built a theoretical model based on these contributions, allowing different effects of redistribution on international price competitiveness according to the source of the distribution change. Other authors have incorporated conflict inflation into Kaleckian open economy models, explicitly describing the links between the RER and income distribution (Blecker, 2011; Cassetti, 2012; Sasaki et al., 2013; Bastian and Setterfield, 2020; Hein, 2023a,

[1] The terms ‘devaluation’ and ‘depreciation’ differ in that the first usually denotes the result of a policy action in a fixed exchange rate regime, and the latter denotes a market outcome in a flexible regime. In the remainder of this article, we do not make this distinction.

Ch. 5). Inflation is an important feature of the devaluation dynamics in small open semi-industrialized economies, with impact on distribution outcomes.

The article develops a stylized medium-run post-Kaleckian open economy model with conflict inflation and a crawling peg exchange rate mechanism. We propose a combination of two existing specifications of the income share targets of workers and firms in post-Keynesian literature as an alternative to the most commonly used specification in the open economy context, where both targets are a function of the RER. By doing so, we aim to overcome what we consider theoretical limitations in the assumption of workers' wage-setting behavior in the face of a currency devaluation. In our model, the target wage share of workers is not directly affected by the RER and therefore workers do not set nominal wages in direct consideration of international relative prices. Instead, the target of workers is affected by the rate of capacity utilization, which reflects their wage bargaining position.

We present dynamic proof of the stability of the model, and we analyze the effects of currency devaluations on overall aggregate demand, growth, trade balance, and inflation. It is shown that the effects of a devaluation are generally ambiguous and highly contingent on the parameter constellation of the economy. We find that the new conflict inflation specification does not introduce significant changes in the results with respect to other similar models (Sasaki et al., 2013; Blecker, 2011, Lavoie, 2022). However, unlike other models in the literature, our model shows that the equilibrium inflation level may be lower after a contractionary devaluation if recession, unemployment, and the fall in workers' bargaining power are large enough. Although to the best of our knowledge there are no studies with empirical evidence of this phenomenon, this result underlines that the more contractionary a devaluation is, the smaller its impact on prices will be.

The remainder of the article is organized as follows. In Section 2 we provide a review of the post-Keynesian approach to devaluations and distribution conflict in an open economy. Section 3 introduces our post-Kaleckian open economy model with conflict inflation and examines stability conditions. In Section 4 we perform a comparative static analysis of a devaluation policy. Section 5 briefly summarizes and concludes.

2. The external sector and distribution conflict

The post-Keynesian theory of inflation is based on conflicting claims over the distribution of income. Its main distinction concerning more orthodox views of inflation is that in the post-Keynesian framework, inflation is mainly considered a conflict supply-side phenomenon instead of an excess-demand one (Lavoie, 2022, Ch. 8; Hein, 2023b).[2]

Conflicting claims over income shares not only drive inflation but they also generate endogenous changes in income distribution, which are the result of the differential bargaining power of workers and firms. This was early pointed out by Kalecki (1971) and then formalized by Rowthorn (1977) in a model making use of the concept of the 'aspiration gap', which shows the difference between the income share claims of different economic actors and the effective income share of the economy that corresponds to them. In the open economy, the external sector is a third actor in the distributive conflict between workers and firms (Bastian and Setterfield, 2020), and the RER becomes a fundamental distributive variable. This idea of the external sector and external shocks influencing income distribution is also at the foundation of certain interpretations of the hyperinflation episodes in Germany after World War I and the roots of Latin American Structuralism (Vera, 2010; Bastian and Setterfield, 2020).

Conflicting claims models usually present distributional targets of different actors in the economy. These income targets are typically either the real wage or the wage or profit shares in national income. Most closed economy post-Keynesian models of income distribution and conflict inflation relate the level of employment with the bargaining power of workers and firms, making the targets endogenous (Dutt, 1992; Blecker and Setterfield, 2019) and generating a stable Phillips curve.[3] An alternative approach is followed by Hein and Stockhammer (2010), where inflation shows an accelerationist behavior with some similarities with (and major differences to) the NAIRU theory of the 'New Consensus Macroeconomics' (Hein, 2023a, Ch. 5).

[2] Some new-Keynesian economists have also modelled inflation as conflict. Lorenzoni and Werning (2023) is a recent example.

[3] Considering many post-Keynesians believe there is a flat segment of the Phillips curve where employment does not affect wage inflation, these models must imply that the economy is out of this segment (Lavoie, 2022, Ch. 8).

In an open economy setting, Blecker (2011) introduces the international price competitiveness dimension in the wage and price-setting behavior of workers and firms and analyzes the effect of a devaluation policy on aggregate demand. His model describes the target wage share of firms as a negative function of the RER. It assumes that this variable does not affect the target wage share of workers, but instead that it directly affects wage inflation once we consider that, in the face of a depreciation of the domestic currency, workers would try to keep up with the rise in the cost of imported consumption goods. In this model, the most likely case of a devaluation policy reducing the wage share occurs if firms react more to the RER and are hence in a better bargaining position than workers. The effect on aggregate demand is ambiguous and depends on the domestic aggregate demand regime, the ML effects, and the differential reaction of firms and workers to changes in the RER.

Similar to Blecker (2011), Sasaki et al. (2013) introduce the target income shares of workers and firms as implicit functions of the RER and their bargaining power. They also include the rate of capacity utilization positively affecting the target wage share of workers to incorporate the effect of higher employment on the workers' bargaining position. By doing so, they include a two-way feedback between the labor market and the goods market, and a Phillips curve-like mechanism. The effect of a devaluation policy on aggregate demand is also ambiguous in this model and, as it is assumed that the ML condition holds, it fundamentally depends on the domestic demand regime and the responsiveness of firms and workers to changes in the RER. As noticed, the channels are the same as in Blecker (2011).

Bastian and Setterfield (2020, p. 1280) argue that the asymmetrical behavior between firms and workers present in Blecker (2011) is unjustified and conceptually flawed. They point out that with that specification, workers would demand higher nominal wages for any positive constant RER value, even if nothing else changes and the wage share is at their target. Therefore, they specify the workers' target wage share as a function of the RER. Lavoie (2022, Ch. 8) also adopts this specification, and the results of a devaluation policy on aggregate demand are not affected by this modification.

Unlike the models reviewed, in the model presented in this article international price competitiveness only affects the target wage share of firms. Workers do not set nominal wages in direct consideration of international relative prices. Their target is affected by the rate of capacity utilization, which reflects their wage bargaining position. Workers would only incorporate the effect of a devaluation in following rounds of wage negotiations through the

impact it previously had on economic activity, employment, and inflation. Using this model, we analyze not only the effect of a change in the RER target on the medium-run equilibrium of aggregate demand, but also on the equilibrium values of the investment rate, the trade balance, and inflation.

3. The model

The general structure of the model is based on existing post-Kaleckian open economy models in the literature, particularly on the work of Hein and Vogel (2008) and Blecker (2011).[4] The stylized model economy produces a homogeneous good (Y) that is used both for consumption and investment purposes. The production process demands labor, a non-depreciating capital stock (K), and imported raw materials and semi-finished products as inputs, while the output also competes in international markets. Assuming fixed production technology coefficients, the ratios of labor (a) and imported goods (μ) to output are constant. Excluding technological progress and with the economy operating below full capacity and potential output (Y^p), the capital-potential output ratio (v) is constant, too. There is involuntary unemployment or a reserve army of labor describing an infinitely elastic labor supply. We abstract from overhead labor and labor productivity (y) is constant up to full-capacity output given by the capital stock. There is no government sector in the model. Given the economy is considered small, all foreign variables are taken as exogenous and changes in the domestic economy do not affect them. We assume foreign prices of imported raw materials and semi-finished products and of the competing foreign final output to be constant.

3.1. The short run

In the short run, prices are constant, while income distribution and the exchange rate are exogenous. Firms set prices (p) in imperfectly competitive markets by charging a mark-up (m) over constant unit variable costs, consisting of direct labor costs and imported raw material and semi-finished product costs. A short-run price equation for domestic goods with exogenous wages and mark-ups is given by:

[4] Versions of benchmark post-Kaleckian open economy models could be found in Hein (2014, Ch. 7) and Lavoie (2022, Ch. 7).

$$p = (1 + m)(wa + E\mu), \qquad m > 0 \tag{1}$$

$$p = (1 + m)(1 + z)wa \tag{2}$$

representing the price of domestic goods with p, the nominal wage rate as w, the constant ratios of labor and imported goods to output as a and μ, the relationship between unit material costs and unit labor costs as $z = E\mu/wa$, and the nominal exchange rate as E. The nominal exchange rate is defined as the price of foreign currency in terms of domestic currency, so a depreciation corresponds to an increase in the exchange rate. Foreign prices are assumed constant and are set to one for simplicity. An increase in foreign prices would be equivalent to a depreciation of the domestic currency. The RER (e) as an indicator of international price competitiveness is determined as follows:

$$e = \frac{E}{p} \tag{3}$$

The income shares, determined by the mark-up and the z ratio, are derived from the pricing equation. With π denoting the profit share, W total wage income, Π total profits, Y total income, y labor productivity and w_r the real wage rate, the wage share is given as:

$$\Omega = 1 - \pi = \frac{\mathrm{W}}{\Pi + W} = \frac{\mathrm{W}}{pY} = \frac{w}{py} = \frac{w_r}{y} = \frac{1}{m(1 + z) + 1} \tag{4}$$

Once we consider constant labor productivity, the growth rate of the wage share is determined by the difference between the growth of the nominal wage rate and the growth of prices:

$$\hat{\Omega} = \hat{w} - \hat{p} = \widehat{w_r}, \qquad \text{with} \quad y = \bar{y} \tag{5}$$

A rise in the wage share is equivalent to an increase in the real wage rate. That can only occur if the mark-up or the z ratio falls: there is a distribution conflict.

We assume a classical saving hypothesis and hence workers consume all their income. Saving depends on a constant propensity to save out of total profits (s). The saving rate could be decomposed in the product of this propensity, the profit share (π), the rate of capacity utilization (u), and the inverse of the capital-potential output ratio:

$$\sigma = \frac{\mathrm{S}}{pK} = \frac{\mathrm{s}\Pi}{pK} = s\frac{\Pi}{pY}\frac{Y}{Y^P}\frac{Y^P}{K} = s\frac{\pi u}{v}, \qquad 0 < s \leq 1 \tag{6}$$

This saving rate is non-linear in π and u, which will generate difficulties in solving the model analytically and would yield multiple equilibria once we allow bi-directional feedback between the goods market and the labor market. Cassetti (2012, p. 67) linearizes the saving rate "to keep the model tractable", assuming the linearization is done at an equilibrium position, and it does not significantly change the behavior of the model, therefore allowing him to perform local stability analysis. We follow this alternative, and the proposed linear approximation of the saving rate is obtained as a reduced form of equation (6):

$$\sigma = s_u u + s_\pi \pi, \qquad s_u, s_\pi > 0 \tag{7}$$

where s_u and s_π will be higher the greater the propensity to save out of total profits and the lower the capital-potential output ratio.

The rate of investment follows the standard post-Kaleckian approach pioneered by Bhaduri and Marglin (1990):

$$g = \frac{I}{K} = \gamma_0 + \gamma_u u + \gamma_\pi \pi, \qquad \gamma_u, \gamma_\pi > 0 \tag{8}$$

Capital accumulation is therefore a function of autonomous investment (γ_0), which represents Keynes' (2018 [1936], Ch. 12) 'animal spirits' and reflects business confidence, long-term expectations, and other socio-political factors. It is also a positive function of the rate of capacity utilization and the profit share, with γ_u reflecting the partial accelerator effect of higher aggregate demand and γ_π indicating the partial effect of a lower wage share/real wage rate on profitability.

The net exports rate depends on international price competitiveness, domestic demand, and foreign demand. With an exogenous and given foreign demand, the net exports to capital ratio is represented as a function of the RER and the domestic rate of capacity utilization:

$$b = \frac{NX}{pK} = \frac{pX - EM}{pK} = \beta_e e - \beta_u u, \qquad \beta_e \gtreqless 0; \beta_u > 0 \tag{9}$$

Considering that empirical analyses of the ML condition have not reached clear results,[5] we do not restrict it to hold and the sign of the parameter β_e is not defined: a real

[5] Bahmani et al. (2013) provide a survey of the literature on the ML condition of the last fifty years, and they also conducted their own estimation of the trade elasticities of 29 countries, finding inconclusive evidence.

depreciation of the domestic currency does not necessarily lead to an improvement of the trade balance.

The goods market equilibrium condition with leakages equal to injections, normalized by the nominal capital stock gives:

$$\sigma = g + b \tag{10}$$

We assume the open economy Keynesian stability condition holds in the short run, which implies that saving shows a higher elasticity to a change in capacity utilization than the investment rate and the net exports ratio together:

$$\Phi = \frac{\partial \sigma}{\partial u} - \frac{\partial b}{\partial u} - \frac{\partial g}{\partial u} > 0 \qquad \Longrightarrow \qquad \Phi = s_u + \beta_u - \gamma_u > 0 \tag{11}$$

The demand-led model developed here presents a quantity adjustment mechanism through the rate of capacity utilization. Plugging equations (7), (8), and (9) into equation (10), the equilibrium rate of capacity utilization is obtained:

$$u^* = \frac{\beta_e e + \gamma_0 + (\gamma_\pi - s_\pi)\pi}{\Phi} \tag{12}$$

The equilibrium values for the rate of capital accumulation and the trade balance respectively yield:

$$g^* = \frac{\gamma_u(\beta_e e - s_\pi \pi) + (s_u + \beta_u)(\gamma_0 + \gamma_\pi \pi)}{\Phi} \tag{13}$$

$$b^* = \frac{(s_u - \gamma_u)\beta_e e - \beta_u[\gamma_0 + (\gamma_\pi - s_\pi)\pi]}{\Phi} \tag{14}$$

3.2. Devaluation, distribution conflict and inflation

The medium-run of the model integrates the inflationary effects of distribution conflict that may arise from a devaluation of the domestic currency. The model continues to assume constant technology coefficients and no productivity growth.[6] The analytical distinction

[6] While some authors support that in the long run the RER could affect the productive structure, internal terms of trade and economic growth, others claim that the RER does not play a significant role on growth and development (see Blecker, 2023 and references therein). This potential influence of the RER on the economy is not discussed in the article and it is excluded from the model.

between the short and the medium runs of the model is thus that the latter considers the dynamic interaction of endogenous distribution and the RER.

Firms and workers have targets for their profit and wage shares, respectively, and we formulate both income claims as target wage shares. Firms set prices in search of reaching their target wage share, but their scope of action is constrained, particularly by the relevance of price competition (domestic and foreign), market concentration, and entry barriers. Workers set the nominal wage rate, rather than the real wage or the wage share, and their power is affected by the existing labor market institutional arrangements (including union related aspects and labor legislation). The inconsistency between the target income shares of firms and workers generates conflict inflation and the relative powers affect income distribution.

Denoting the target wage share of workers by Ω_W, the target wage share of firms by Ω_F and assuming $\Omega_W > \Omega_F$ normally holds, the equations describing the rate of wage and price inflation[7] are as follows:

$$\hat{w} = \varphi_1(\Omega_W - \Omega), \qquad \varphi_1 > 0 \tag{15}$$

$$\hat{p} = \Psi_1(\Omega - \Omega_F), \qquad \Psi_1 > 0 \tag{16}$$

The rate of wage inflation in the labor market and the rate of price inflation in the goods market are defined as functions of the deviations between the actual wage share and the respective target wage shares of workers[8] and firms. The parameter φ_1 indicates the sensitivity of the reaction of workers to deviations of the wage share from their target and can be considered as a reflection of institutional factors of the labor market and hence of their bargaining power. The parameter Ψ_1 indicates the speed of adjustment of firms' pricing to achieve their wage share target, and it is constrained by the degree of price competition in the goods market. Neither of the parameters change in the medium run considered here. According to Lavoie (2022, Ch. 8), the introduction of a partial indexation term in the price and wage inflation equations hardly modifies the analysis. In contrast, Hein and Stockhammer (2010) and Hein (2023a, Ch. 5) include adaptive inflation expectations in their models and

[7] Equation (16), the dynamic pricing rule of the medium-run model, replaces the static mark-up pricing rule in equation (1) of the short-run model.

[8] This is not necessarily the wage share that workers consider fair, but the one they can afford to demand given their bargaining power and labor market institutions (Lavoie, 2022, Ch. 8).

thus do not obtain equilibrium inflation and distribution if targets do not match. We decided here not to include an indexation term and to ignore inflation expectations to keep the model simple, although the results might differ if full indexation or inflation expectations were considered. However, our simplification could also be thought of as reflecting a situation with a very low trend level of inflation, which induces workers to ignore indexation or inflation expectations in wage bargaining. Furthermore, if we consider the indexation term to represent a worker's claim of compensation for past inflation, this would already be included in the aspiration gap, as Hein and Häusler (2024) have pointed out.

The target wage shares of firms and workers for the open economy model result from the combination of two specifications from the literature. On the one hand, the wage share target of firms follows existing open economy conflicting claims models (e.g., Blecker, 2011; Sasaki et al. 2013; Bastian and Setterfield, 2020; Lavoie, 2022, Ch. 8; Hein, 2023a, Ch. 5) and is modelled as a negative function of the RER. On the other hand, the target wage share of workers follows an idea present in several closed economy conflicting claims models (e.g., Dutt, 1992; Cassetti, 2002; Blecker and Setterfield, 2019, Ch. 5; Hein, 2023a, Ch. 5) and it is a positive function of the rate of capacity utilization,[9] which reflects the workers' wage bargaining position.[10]

$$\Omega_F = \Omega_{F0} - \Psi_2 e, \qquad \Psi_2 > 0 \tag{17}$$

$$\Omega_W = \Omega_{W0} + \varphi_2 u, \qquad \varphi_2 > 0 \tag{18}$$

Real depreciation reduces the target wage share of firms through the increasing effect on the cost of imported raw materials and semi-finished products. The shift parameter Ω_{F0} indicates institutional factors that affect the bargaining situation of firms (e.g., oligopoly power and the relevance of price competition). The parameter Ψ_2 indicates the response of firms' target to the RER, which is also affected by factors influencing their bargaining power at the domestic and foreign levels.

[9] Some of the mentioned models use the employment rate instead of the rate of capacity utilization. Their argument with respect to the bargaining power of workers is however equivalent.

[10] Wildauer et al. (2023) present a different approach in a closed economy three-sector model, including the rate of capacity utilization as determinant of firms' pricing behavior. Following Flaschel and Skott (2006), and in line with recent arguments by Weber and Wasner (2023), their idea is that firms tend to increase prices when they face difficulties to meet demand (supply constraints, competition for workers, etc.). This might be the case only under special circumstances.

The specification of the target wage share of workers considers the improvement in their wage bargaining position when the unemployment rate is low. Having defined the rate of capacity utilization by $u = Y/Y^P$ and resorting to Okun's Law, we hold that unemployment shows a negative relationship with the rate of capacity utilization (Blecker and Setterfield, 2019, Ch. 5), at least in the short-to-medium run considered here (Sasaki et al., 2013). The shift parameter Ω_{W0} indicates institutional factors that affect the bargaining situation of workers, including the scope of labor union negotiations and labor legislation. The parameter φ_2 indicates the extent to which a higher rate of capacity utilization positively affects the bargaining power of workers and raises their wage share target. We obtain a pseudo-Phillips curve by incorporating the feedback of aggregate demand and employment into the wage-price determination mechanism.

Unlike most open economy conflicting claims models, in our model the target wage share of workers is not directly affected by the RER and therefore workers do not set nominal wages in direct consideration of international relative prices. The theoretical explanation for the inclusion of the RER in the distribution target of workers is not convincing and entails limitations in the assumption of workers' wage-setting behavior in the face of a currency devaluation. Why would workers react more aggressively to a devaluation to defend their income claim and thus set a higher wage share target? Our specification suggests that in the face of a devaluation and rising prices of imported raw material and semi-finished products, which would most likely raise firms' target markup on labor costs and their target profit share, workers would not target a higher wage share but would only try to get closer to their previous target.

In an otherwise different model, Hein (2023a, p. 178) also assumes that the RER does not directly affect the wage share target of workers because they only demand domestically produced consumption goods. However, wages would not be directly affected by a devaluation even if workers consume imported goods, unless they buy a significant share of their consumption basket directly from foreign firms, an unlikely case. Nevertheless, workers would indirectly incorporate the effect of a devaluation in following rounds of wage negotiations through the impact it previously had on economic activity, employment, and inflation.

The final configuration of the conflict inflation module of the model is given by:

$$\widehat{w} = \varphi_1[(\Omega_{W0} + \varphi_2 u) - \Omega], \qquad \varphi_1, \varphi_2 > 0 \tag{15'}$$

$$\hat{p} = \Psi_1[\Omega - (\Omega_{F0} - \Psi_2 e)], \qquad \Psi_1, \Psi_2 > 0 \tag{16'}$$

The institutional factors affecting the bargaining position of firms and workers do not change in the period considered for adjustment. The distribution equilibrium is reached when the wage share is constant and therefore $\hat{p} = \widehat{w}$. The steady-state equilibrium wage share yields:

$$\Omega^* = \frac{\varphi_1 \Omega_{W0} + \Psi_1 \Omega_{F0} + \varphi_1 \varphi_2 u - \Psi_1 \Psi_2 e}{\varphi_1 + \Psi_1} \tag{19}$$

The equilibrium wage share is a function of a weighted average of the coefficients representing institutional factors affecting the bargaining situation of both firms and workers, the rate of capacity utilization, and the RER, both last variables also mediated by parameters defining the price and nominal wage setting power of firms and workers, respectively.

Plugging the equilibrium wage share into the price inflation function we obtain the equilibrium price inflation, which is also a function of the RER and the rate of capacity utilization:

$$\hat{p}^* = \frac{\varphi_1 \Psi_1[(\Omega_{W0} - \Omega_{F0}) + \varphi_2 u + \Psi_2 e]}{\varphi_1 + \Psi_1} \tag{20}$$

We model next the RER determination mechanism following the exchange rate literature which states that in the short-to-medium run the RER closely follows the nominal exchange rate (Razmi et al., 2012; Libman, 2018). Like Blecker (2011), we assume a crawling peg regime[11] where the Central Bank adjusts the nominal exchange rate to reach its target RER ($\bar{e}$):

$$\hat{E} = \tau(\bar{e} - e), \qquad \tau > 0 \tag{21}$$

with τ as the speed of adjustment of the nominal exchange rate towards the target RER, which is an exogenously determined policy variable. For the monetary authority to effectively reach

[11] Classifications of exchange rate regimes in different countries show a joint prevalence of fixed and intermediate regimes compared to floating regimes (Levy-Yeyati and Sturzenegger, 2005; IMF, 2021). Despite this, the choice of a crawling peg mechanism in our model is a simplification, leaving the possibility of more flexible exchange rate regimes for future research.

a RER closer to its target, inflation must be moderate and evolve at a slower pace than the nominal exchange rate during the adjustment.

The medium-run equilibrium RER is reached when $\hat{e} = \widehat{E} - \hat{p} = 0$:[12]

$$e^* = \frac{\tau\bar{e} + \Psi_1(\Omega_{F0} - \Omega)}{\tau + \Psi_1\Psi_2} \tag{22}$$

3.3. Medium-run dynamic stability

We assume that there are different speeds of adjustment of the variables given short-run rigidities in wages and prices, a common assumption in most post-Keynesian and Kaleckian macroeconomic models (Blecker and Setterfield, 2019). Demand and output adjust faster than income distribution and the RER, which in a continuous time setting means that in the medium run, we are always in the short-run equilibrium of the rate of capacity utilization. We define the laws of motion of the wage share and the RER using equations (3), (5), $(15')$, $(16')$ and (21):

$$\dot{\Omega} = \Omega[\varphi_1\Omega_{W0} + \Psi_1\Omega_{F0} - (\varphi_1 + \Psi_1)\Omega + \varphi_1\varphi_2 u^* - \Psi_1\Psi_2 e] \tag{23}$$

$$\dot{e} = e[\tau\bar{e} + \Psi_1\Omega_{F0} - \Psi_1\Omega - (\tau + \Psi_1\Psi_2)e] \tag{24}$$

The Jacobian matrix of this two-dimensional dynamic system, evaluated at the medium run equilibrium values, is given by:

$$J(\Omega^*, \mathrm{e}^*) = \begin{bmatrix} J_{11} & J_{12} \\ J_{21} & J_{22} \end{bmatrix} = \begin{bmatrix} \frac{\partial\dot{\Omega}}{\partial\Omega} & \frac{\partial\dot{\Omega}}{\partial e} \\ \frac{\partial\dot{e}}{\partial\Omega} & \frac{\partial\dot{e}}{\partial e} \end{bmatrix} \tag{25}$$

where its elements are

$$J_{11} = -\left(\varphi_1 + \Psi_1 - \varphi_1\varphi_2\frac{\partial u^*}{\partial\Omega}\right)\Omega^* = -\left[\frac{(\varphi_1 + \Psi_1)\Phi + \varphi_1\varphi_2(\gamma_\pi - s_\pi)}{\Phi}\right]\Omega^*$$

[12] It is worth noticing that, as Bastian and Setterfield (2020, p. 1281) point out, this equilibrium "is not a fully adjusted position" because equation (22) does not describe the equilibrium where the RER is equal to the target set by the monetary authority. Further nominal exchange rate, price and distribution adjustments in following rounds would occur until a fully adjusted position is reached. This reflects the medium-run character of the model presented here, which does not analyze these further adjustments.

$$J_{12} = \left(\varphi_1\varphi_2\frac{\partial u^*}{\partial \mathrm{e}} - \Psi_1\Psi_2\right)\Omega^* = \left(\frac{\varphi_1\varphi_2\beta_e - \Psi_1\Psi_2\Phi}{\Phi}\right)\Omega^*$$

$$J_{21} = -\Psi_1 e^* < 0$$

$$J_{22} = -(\tau + \Psi_1\Psi_2)e^* < 0$$

For dynamic stability, the trace of the Jacobian must be negative and its determinant positive:

$$Tr(J) = J_{11} + J_{22} = -\left[\frac{(\varphi_1 + \Psi_1)\Phi + \varphi_1\varphi_2(\gamma_\pi - s_\pi)}{\Phi}\right]\Omega^* - (\tau + \Psi_1\Psi_2)e^* \tag{26}$$

$$Det(J) = J_{11}J_{22} - J_{12}J_{21} \tag{27}$$
$$= \left[\frac{(\varphi_1 + \Psi_1)\Phi + \varphi_1\varphi_2(\gamma_\pi - s_\pi)}{\Phi}\right]\Omega^*(\tau + \Psi_1\Psi_2)e^* + \left(\frac{\varphi_1\varphi_2\beta_e - \Psi_1\Psi_2\Phi}{\Phi}\right)\Omega^*\Psi_1 e^*$$

Before continuing with the stability analysis, we introduce the following definition:

$$R = \gamma_\pi - s_\pi \begin{cases} > 0 \Longrightarrow profit - led\ domestic\ demand\ regime \\ < 0 \Longrightarrow wage - led\ domestic\ demand\ regime \end{cases}, \qquad with\ \Phi > 0 \tag{28}$$

Provided that the open economy Keynesian stability condition is fulfilled ($\Phi > 0$), which we assume is in the short-to-medium run of the model, the term R describes the domestic aggregate demand regime of the economy. If it is positive, it means that the positive direct effect of the profit share on capital accumulation is higher than its negative direct effect on consumption, hence the economy is in a profit-led domestic demand regime. If it is negative, the opposite case stands and the effect of a rise in the profit share on consumption is stronger than the effect on investment, leading to a wage-led domestic demand regime.

A sufficient condition for a negative trace is a negative element J_{11} (the wage share is self-stabilizing):

$$J_{11} = -\left[\frac{(\varphi_1 + \Psi_1)\Phi + \varphi_1\varphi_2 R}{\Phi}\right]\Omega^* \tag{29}$$

$$\Longrightarrow J_{11} < 0 \quad if \quad (\varphi_1 + \Psi_1)\Phi + \varphi_1\varphi_2 R > 0$$

This condition unequivocally holds if the domestic aggregate demand regime of the economy is profit-led ($R > 0$). If the economy is in a wage-led domestic demand regime ($R < 0$) the fulfillment of the inequality is undetermined. In this latter case, the condition is more likely to hold if the economy is weakly wage-led, if the nominal wage setting power of workers

(φ_1, φ_2) is low, which would occur in an economy with weak labor market institutions, and if the reaction of saving to changes in capacity utilization is strong compared to the reaction of investment and net exports (large Φ). An unstable configuration leads to explosive distribution dynamics. A lower than the equilibrium wage share would reduce consumption and increase investment, albeit less than proportionately. The rate of capacity utilization and employment would fall, the target wage share of workers would go down and, everything else equal, the conflict inflation process would result in an even lower wage share, driving the economy further away from the distribution equilibrium.

The case where a devaluation negatively affects the real wage rate and the wage share is considered more likely in the literature (Herr, 2002; Blecker, 2011; Kohler, 2017), and that is the assumption we consider. Using the equilibrium wage share in equation (19) and the equilibrium rate of capacity utilization in equation (12), we obtain that the condition for this to occur is equivalent to the J_{12} element of the Jacobian being negative.

$$J_{12} = \left(\frac{\varphi_1\varphi_2\beta_e - \Psi_1\Psi_2\Phi}{\Phi}\right)\Omega^* < 0 \tag{30}$$

$$\Longrightarrow J_{12} < 0 \quad if \quad \varphi_1\varphi_2\beta_e - \Psi_1\Psi_2\Phi < 0$$

If $\beta_e \leq 0$ and therefore the ML condition does not hold and a real depreciation of the domestic currency does not improve the trade balance, the condition is fulfilled. However, the element J_{12} could still be negative even if the ML condition holds if the positive effect of the RER on the trade balance is sufficiently small. The condition is more likely to hold if the nominal wage setting power of workers is low and if the speed of adjustment of firms' pricing and their target response to the RER (Ψ_1, Ψ_2) are high. Once again, a comparatively strong reaction of saving to changes in capacity utilization contributes to the condition to hold. A devaluation would then lead to income redistribution in favor of profits.

Considering $J_{12} < 0$, then $J_{11} < 0$ is not only a sufficient condition for a negative trace but also a necessary condition for a positive determinant.

$$Det(J) = \left[\frac{(\varphi_1 + \Psi_1)\Phi + \varphi_1\varphi_2 R}{\Phi}\right]\Omega^*(\tau + \Psi_1\Psi_2)e^* + \left(\frac{\varphi_1\varphi_2\beta_e - \Psi_1\Psi_2\Phi}{\Phi}\right)\Omega^*\Psi_1 e^* \tag{31}$$

$$\Longrightarrow Det(J) > 0 \quad if \quad [(\varphi_1 + \Psi_1)\Phi + \varphi_1\varphi_2 R]\,(\tau + \Psi_1\Psi_2) > -(\varphi_1\varphi_2\beta_e - \Psi_1\Psi_2\Phi)\Psi_1$$

However, with all negative elements in the Jacobian, the sign of the determinant remains ambiguous. The parameter configuration of the model is crucial to determine the

local stability of the dynamic system. Overall, a profit-led domestic demand regime or a weakly wage-led regime with low nominal wage setting power of workers and a negative or sufficiently small direct impact of the RER on the trade balance are necessary conditions for stability.

4. Comparative statics of a devaluation

We analyze next the effect of currency devaluations (i.e., an increase in the target RER set by the Central Bank) on aggregate demand, growth, the trade balance, and inflation. For the comparative static analysis, we only consider parameter configurations that potentially allow us to reach the stable equilibrium described in the previous section.[13]

For convenience, we re-express the steady-state equilibria of the model. First, given $\pi = 1 - \Omega$ and using equations (12) and (19), we obtain the profit share equilibrium dependent only on the RER and parameters:

$$\pi^{**} = \frac{(\varphi_1 + \Psi_1 - \varphi_1\Omega_{W0} - \Psi_1\Omega_{F0})\Phi - \varphi_1\varphi_2\gamma_0 - (\varphi_1\varphi_2\beta_e - \Psi_1\Psi_2\Phi)e}{(\varphi_1 + \Psi_1)\Phi + \varphi_1\varphi_2 R} \tag{32}$$

By plugging this profit share equilibrium into the RER equilibrium of equation (22) we find an equilibrium of the RER as a function of the RER target of the monetary authority, the exogenous policy variable. This RER equilibrium corresponds both to the distribution equilibrium of the economy and to its inflation equilibrium:

$$e^{**} = \frac{(\tau\bar{e} + \Psi_1\Omega_{F0})[(\varphi_1 + \Psi_1)\Phi + \varphi_1\varphi_2 R] - \Psi_1[(\varphi_1\Omega_{W0} + \Psi_1\Omega_{F0})\Phi + \varphi_1\varphi_2(\gamma_0 + R)]}{(\tau + \Psi_1\Psi_2)[(\varphi_1 + \Psi_1)\Phi + \varphi_1\varphi_2 R] + \Psi_1(\varphi_1\varphi_2\beta_e - \Psi_1\Psi_2\Phi)} \tag{33}$$

The effect of a rise of the target RER on the RER equilibrium is unequivocally positive in the stable case where conditions (29) and (31) are met. The effect on the profit share is positive by assumption since the derivation of the stability condition (30) assumed the more likely case where a currency depreciation reduces the real wage rate and the wage share.

$$\frac{de^{**}}{d\bar{e}} = \frac{\tau[(\varphi_1 + \Psi_1)\Phi + \varphi_1\varphi_2 R]}{(\tau + \Psi_1\Psi_2)[(\varphi_1 + \Psi_1)\Phi + \varphi_1\varphi_2 R] + \Psi_1(\varphi_1\varphi_2\beta_e - \Psi_1\Psi_2\Phi)} > 0 \tag{34}$$

[13] Different to Sasaki et al. (2013), we do not restrict the analysis to a specific sub-sample of the stable alternatives, particularly to the case where the ML condition is satisfied.

$$\frac{d\pi^{**}}{d\bar{e}} = -\frac{(\varphi_1\varphi_2\beta_e - \Psi_1\Psi_2\Phi)\frac{de^{**}}{d\bar{e}}}{(\varphi_1 + \Psi_1)\Phi + \varphi_1\varphi_2 R} > 0 \tag{35}$$

We proceed with the comparative static analysis of an increase of the RER target on the remaining medium-run equilibrium values of the model. First, the effect on the rate of capacity utilization is given by:

$$\frac{du^{**}}{d\bar{e}} = \frac{(\gamma_\pi - s_\pi)\frac{d\pi^{**}}{d\bar{e}} + \beta_e\frac{de^{**}}{d\bar{e}}}{\Phi} = \frac{R\frac{d\pi^{**}}{d\bar{e}} + \beta_e\frac{de^{**}}{d\bar{e}}}{\Phi} \tag{36}$$

The denominator is positive since the open economy Keynesian stability condition holds. Therefore, the sign depends on the numerator terms. Both derivatives are positive, meaning a rise in the target RER increases the profit share and positively affects the RER equilibrium value. There are two terms in the numerator describing different effects of a rise in the RER target of the monetary authority on the rate of capacity utilization. The first term describes the impact of the profit share or distribution channel, and its sign depends on R, the domestic aggregate demand regime of the economy. If it is wage-led, this term is negative, and a devaluation is contractionary for domestic aggregate demand due to its redistribution of income toward profits. On the contrary, if the regime is profit-led, the term is positive, and a devaluation is expansionary for domestic aggregate demand because the depressive effect on consumption is lower than the expansionary effect on investment. The sign of the second term, the external channel, depends on β_e. If the ML condition holds and the direct effect of a devaluation on the trade balance is positive, then this last term is positive. If the ML condition does not hold, the sign is negative.

The overall impact on aggregate demand is therefore ambiguous and depends on two main channels:

- The direction and size of the effects on consumption and investment reflected on the domestic aggregate demand regime: wage- or profit-led.
- Whether the Marshall-Lerner condition holds or not and the magnitude of the impact of the RER on the trade balance.

Table 1. Effect of a devaluation on aggregate demand: main channels and cases.

Case	R Domestic aggregate demand regime	β_e	Overall effect
$[1]$	< 0, wage-led	≤ 0	Contractionary
$[2]$		> 0	Ambiguous
$[3]$	> 0, profit-led	< 0	Ambiguous
$[4]$		≥ 0	Expansionary

Note: The open economy Keynesian stability condition holds in all cases $(\Phi > 0)$. $\beta_e > 0$ *if the ML condition holds,* ≤ 0 *otherwise. A contractionary devaluation effect indicates* $\frac{du^{**}}{d\bar{e}} < 0$*, an expansionary devaluation effect indicates* $\frac{du^{**}}{d\bar{e}} > 0$.

Table 1 summarizes the different possible cases describing the effects of a devaluation on aggregate demand. If the economy is in a wage-led domestic demand regime and the ML condition does not hold ($\beta_e \leq 0$), a devaluation is unequivocally contractionary for aggregate demand as shown in case $[1]$. If the economy is in a profit-led domestic demand regime and the ML condition holds or there is no direct effect of the RER on the trade balance ($\beta_e \geq 0$), a devaluation is unambiguously expansionary (case $[4]$).

Two additional ambiguous cases are shown in Table 1, where R and β_e take opposite signs. In these cases, the different possible directions of the overall effect are not only determined by the domestic aggregate demand regime and the direct impact of the RER on the trade balance but also by the magnitude of the effects of a change of the RER target on the equilibrium RER $\left(\frac{de^{**}}{d\bar{e}}\right)$ and on the equilibrium profit share $\left(\frac{d\pi^{**}}{d\bar{e}}\right)$. In turn, the magnitude of these effects depends on the distribution and external channels (i.e., R and β_e) and on institutional and structural parameters of the economy, both from the goods and labor markets, that influence the endogenous determination of income distribution and the RER. This introduces an additional layer of complexity to the determination of the overall effect.

The results regarding the effects on the rate of capacity utilization are consistent with the literature on demand regimes (e.g. Blecker, 2011; Lavoie, 2022, Ch. 8): if the economy is in a wage-led domestic demand regime, to turn to a globally profit-led demand regime (i.e., also considering the open economy effects) where a devaluation is expansionary, the ML condition must hold and the coefficient β_e must be large enough. A devaluation policy might fail to stimulate aggregate demand even considering the ML condition holds and the trade balance improves. If already in a profit-led domestic demand regime, a positive and large β_e

would only reinforce the profit-led character of the economy and a devaluation would show expansionary effects.

The effects of an increase in the target RER on the medium-run equilibrium investment rate and on the medium-run equilibrium net exports rate are given by:

$$\frac{dg^{**}}{d\bar{e}} = \frac{(\gamma_u)\left(\beta_e \frac{de^{**}}{d\bar{e}} - s_\pi \frac{d\pi^{**}}{d\bar{e}}\right) + (s_u + \beta_u)\gamma_\pi \frac{d\pi^{**}}{d\bar{e}}}{\Phi} \tag{37}$$

$$\frac{db^{**}}{d\bar{e}} = \frac{(s_u - \gamma_u)\beta_e \frac{de^{**}}{d\bar{e}} - (\beta_u)R \frac{d\pi^{**}}{d\bar{e}}}{\Phi} \tag{38}$$

With a positive denominator, the same channels determining the impact on aggregate demand operate in the numerator describing the effects on the investment rate and the trade balance.

In the case of the effect on the investment rate, on the one hand, the first term includes the indeterminate impact of a higher RER target on the trade balance and the depressive effect on consumption due to a higher share of profits. On the other hand, the second term includes the expansionary effect on investment due to the rise of the profit share. If the ML condition does not hold, the overall effect of a rise in the target RER on the investment rate is more likely to be negative since all the effects but one would exert a negative influence. The opposite is true otherwise.

Regarding the effect on the net exports rate, the first term describes the impact of international price competitiveness on the trade balance (β_e), the sign of which is defined by the ML condition. The domestic Keynesian stability condition ($s_u - \gamma_u$) and the effect of a rise of the target RER on the RER equilibrium have both a positive sign. The second term shows the impact of domestic aggregate demand on the trade balance (β_u) and its overall sign depends on the domestic aggregate demand regime. If the ML condition holds and a devaluation depresses domestic aggregate demand because of the redistribution toward profits (i.e., the economy is domestically wage-led), the trade balance unequivocally improves through both the international price competitiveness channel and the domestic demand channel. Even if the ML condition does not hold, under these conditions the net exports rate could improve if the domestic demand channel effect is large enough to counteract the negative or null international price competitiveness effect.

Despite differences between model specifications and analysis conditions, our results for the impact of a devaluation on aggregate demand, growth and the trade balance are consistent with those of the conflict inflation models of Blecker (2011), Sasaki et al. (2013) and Lavoie (2022, Ch. 8).

Our model also allows for the analysis of the impact of an increase of the RER target on the equilibrium inflation rate. Totally differentiating equation (20) we obtain:

$$\frac{d\hat{p}^*}{d\bar{e}} = \frac{\varphi_1\Psi_1}{\varphi_1+\Psi_1}\left(\varphi_2\frac{du^{**}}{d\bar{e}} + \Psi_2\frac{de^{**}}{d\bar{e}}\right) = \frac{\varphi_1\Psi_1}{\varphi_1+\Psi_1}\left[\varphi_2\left(\frac{R\frac{d\pi^{**}}{d\bar{e}} + \beta_e\frac{de^{**}}{d\bar{e}}}{\Phi}\right) + \Psi_2\frac{de^{**}}{d\bar{e}}\right] \tag{39}$$

Inflation is the outcome of distribution conflict between workers and firms. The terms in brackets define the sign of the overall effect of a devaluation on inflation. The first term shows the impact of aggregate demand on nominal wage demands of workers (φ_2). As mentioned, workers indirectly incorporate the effect of a devaluation in following rounds of wage negotiations through the impact it previously had on economic activity. This impact depends mainly on the domestic aggregate demand regime and the effect of the RER on the trade balance. The second term describes the impact of the RER on firm's price setting (Ψ_2) through the increasing effect on the cost of imported raw material and semi-finished products.

If a devaluation is expansionary for aggregate demand, its impact is unequivocally inflationary. Unlike other models in the literature, if a devaluation is contractionary and the recession, unemployment and the fall in workers' bargaining power are large enough to offset the inflationary pressures through firms' price setting, the equilibrium inflation level may be lower after an increase in the RER target. Our result shows that Blecker (2011) and Lavoie's (2022, Ch. 8) finding may be a special case, where the impact of a devaluation on inflation is always positive because their models do not include goods market feedback in the wage-price determination mechanism. Sasaki et al. (2013) do include this two-way feedback, but they do not analyze the impact of a devaluation on inflation.[14] Although it is theoretically possible, the model does not indicate how plausible a scenario with lower equilibrium inflation after a devaluation is in reality, and to the best of our knowledge there are no studies with empirical

[14] While this is not explicitly addressed by the authors, it would be possible to indirectly derive it from their equations. We thank a colleague for pointing this out.

evidence of this phenomenon. Nonetheless, this result underlines that the more contractionary a devaluation is, the smaller its impact on prices will be. In any case, the potential negative social consequences of such a policy should be carefully considered. These effects, coupled with the regressive impact on income distribution, could turn a devaluation detrimental even if it reduces inflation and/or slightly improves investment or the trade balance.

5. Final remarks

In this article we presented a post-Kaleckian open economy model with conflict inflation. The target wage shares of firms and workers result from the combination of two existing specifications in the modelling literature. In our model, only the target wage share of firms is directly affected by the RER, but neither workers' target wage share nor their wage inflation. The target of workers is affected by the rate of capacity utilization, which reflects their wage bargaining position. We presented an analysis of the dynamic stability of the model and analyzed the effects of currency devaluations on aggregate demand, investment, the trade balance, and inflation for stable equilibria.

Assuming the more likely case where a devaluation negatively affects the real wage rate and the wage share, we identified a profit-led domestic demand regime or a weakly wage-led regime with low nominal wage setting power of workers and a negative or sufficiently small direct impact of the RER on the trade balance as necessary conditions for local stability. An unstable configuration may lead to explosive distribution dynamics.

The overall effect of a devaluation on the equilibrium values of the model depends on two main channels: the direction and size of the effects on consumption and investment reflected by the domestic aggregate demand regime; and whether the ML condition holds and the magnitude of the impact of the RER on the trade balance. Additionally, the parameters describing institutional and structural factors, both from the goods and labor markets are crucial in ambiguous cases where the impact of the two main channels takes opposite directions, increasing the complexity of the analysis and the possibility of alternative outcomes.

We found that the new conflict inflation specification did not introduce significant changes in the results with respect to other similar models (Sasaki et al., 2013; Blecker, 2011,

Lavoie, 2022). If the domestic demand regime of the economy is wage-led and the ML condition does not hold, a devaluation is unequivocally contractionary for aggregate demand. In the opposite configuration, a devaluation would be expansionary. Regarding the trade balance, if the ML condition holds and the economy is domestically wage-led, it would unequivocally improve after a devaluation. However, even if the ML condition does not hold, the net exports rate could improve if the domestic demand channel effect is large enough. A devaluation is inflationary if it is expansionary for aggregate demand. Unlike other models in the literature, the model presented here shows that the equilibrium inflation level may be lower after a contractionary devaluation if recession, unemployment, and the fall in workers' bargaining power are large enough. Although there may be no studies with empirical evidence of this phenomenon, this result underlines that the more contractionary a devaluation is, the smaller its impact on prices will be. In any case, the potential negative social consequences of a devaluation policy should be carefully considered and not underestimated.

The stylized model presented here captured the importance of the structural and institutional particularities of an economy to determine the impact of a devaluation. However, it contains some limitations and suggests avenues for future research. First, there is only one homogeneous productive sector. An extension of the model to two sectors – tradable/non-tradable – would provide a more detailed setup to explain channels operating in dual or developing economies. Another limitation is the simplifying adoption of a crawling peg system for the RER determination, and further research regarding flexible exchange rate regimes should be conducted (Blecker, 2011). It is also left for the future to incorporate firms' external indebtedness, which may reinforce the potentially contractionary character of a devaluation (Kohler, 2017).

The article showed that the effects of a devaluation on aggregate demand, growth, the trade balance, and inflation are generally ambiguous and highly contingent on the parameter constellation of the economy. The effectiveness of a currency devaluation as a stabilization policy remains unclear, its adoption is not without risk, and its negative social and distributional consequences may be large.

References

Bahmani-Oskooee, M. and Miteza, I. (2003). Are devaluations expansionary or contractionary? A survey article. *Economic Issues*, 8(2), 1-28.

Bahmani, M., Harvey, H. and Hegerty, S.W. (2013). Empirical tests of the Marshall-Lerner condition: a literature review. *Journal of Economic Studies*, 40(3), 411-443.

Bastian, E. F. and Setterfield, M. (2020). Nominal exchange rate shocks and inflation in an open economy: Towards a structuralist inflation targeting agenda. *Cambridge Journal of Economics*, *44*(6), 1271–1299.

Bhaduri, A. and Marglin, S. (1990). Unemployment and the real wage: the economic basis for contesting political ideologies. *Cambridge Journal of Economics*, 14(4), 375–393.

Blecker, R.A. (1989). International competition, income distribution and economic growth. *Cambridge Journal of Economics*, 13(3), 395–412.

Blecker, R.A. (2011). Open economy models of distribution and growth. In E. Hein & E. Stockhammer (Eds.), *A Modern Guide to Keynesian Macroeconomics and Economic Policies* (pp. 215–239), Edward Elgar.

Blecker, R.A. (2016). Wage-led versus profit-led demand regimes: the long and the short of it. *Review of Keynesian Economics*, 4(4), 373–390.

Blecker, R.A. (2023). How important is the real exchange rate for exports and growth? *European Journal of Economics and Economic Policies: Intervention*, 20(2), 250–265.

Blecker, R.A. and Setterfield, M. (2019). *Heterodox Macroeconomics: Models of Demand, Distribution and Growth*, Cheltenham, UK: Edward Elgar Publishing.

Braun, O. and Joy, L. (1968). A Model of Economic Stagnation—A Case Study of the Argentine Economy, *The Economic Journal*, 78(312), 868–887.

Cassetti, M. (2002). Conflict, Inflation, Distribution and Terms of Trade in the Kaleckian Model. In M. Setterfield (ed.), *The Economics of Demand-Led Growth: Challenging the Supply-side Vision of the Long Run* (Ch. 11, pp. 189-211), Edward Elgar Publishing.

Cassetti, M. (2012). Macroeconomic outcomes of changing social bargains. The Feasibility of a wage-led open economy reconsidered. *Metroeconomica*, 63(1), 64-91.

Diaz Alejandro, C.F. (1963). A Note on the impact of devaluation and the redistributive effect. *Journal of Political Economy*, 71, 577–80.

Dutt, A.K. (1992). Conflict inflation, distribution, cyclical accumulation and crises. *European Journal of Political Economy*, 8(4), 579-597.

Flaschel, P. and Skott, P. (2006). Steindlian models of growth and stagnation. *Metroeconomica*, 57(3), 303-338.

Hein, E. (2014). *Distribution and Growth after Keynes: A post-Keynesian Guide.* Cheltenham, UK: Edward Elgar Publishing.

Hein, E. (2023a). *Macroeconomics after Kalecki and Keynes: Post-Keynesian Foundations*. Cheltenham, UK: Edward Elgar Publishing.

Hein, E. (2023b). Inflation is always and everywhere … a conflict phenomenon: post-Keynesian inflation theory and energy price driven conflict inflation. Working Paper No. 224/2023, Institute for International Political Economy (IPE), Berlin.

Hein, E. and Häusler, C. (2024). Kaleckian models of conflict inflation, distribution and employment: A comparative analysis. Working Paper No. 225/2024, Institute for International Political Economy (IPE), Berlin.

Hein, E. and Stockhammer, E. (2010). Macroeconomic Policy Mix, Employment and Inflation in a Post-Keynesian Alternative to the New Consensus Model, *Review of Political Economy*, 22(3), 317-354.

Hein, E. and Vogel, L. (2008). Distribution and growth reconsidered: Empirical results for six OECD countries. *Cambridge Journal of Economics*, 32(3), 479–511.

Herr, H. (2002). Wages, Employment and Prices. An Analysis of the Relationship Between Wage Level, Wage Structure, Minimum Wages and Employment and Prices. Working Papers of the Business Institute Berlin at the Berlin School of Economics, Paper No. 15.

IMF - International Monetary Fund (2021). Annual Report on Exchange Arrangements and Exchange Restrictions (AREAER), Washington, DC: International Monetary Fund.

Keynes, J.M. (2018) [1936]. *The General Theory of Employment, Interest, and Money*. Reprinted in 2018 by Palgrave Macmillan - Springer International.

Kim, Y. and Ying, Y. (2007). An empirical assessment of currency devaluation in East Asian countries. *Journal of International Money and Finance*, 26(2), 265-283.

Kim, G., An, L. and Kim, Y. (2015). Exchange rate, capital flow and output: developed versus developing economies. *Atlantic Economic Journal*, 43, 195-207.

Kohler, K. (2017). Currency devaluations, aggregate demand, and debt dynamics in economies with foreign currency liabilities. *Journal of Post Keynesian Economics*, *40*(4), 487–511.

Krugman, P. and Taylor, L. (1978). Contractionary effects of devaluation, *Journal of International Economics*, 8, 445–56.

Lavoie, M. (2022). *Post-Keynesian Economics: New Foundations*. Cheltenham, UK: Edward Elgar Publishing.

Levy-Yeyati, E. and Sturzenegger, F. (2005). Classifying exchange rate regimes: Deeds vs. words. *European Economic Review*, 49(6), 1603-1635.

Libman, E. (2018). Endogenous norms in wage and price setting and hysteresis in the real exchange rate. *Metroeconomica*, 69(3), 546–565.

Lima, G.T. and Porcile, G. (2013). Economic growth and income distribution with heterogeneous preferences on the real exchange rate. *Journal of Post Keynesian Economics*, 35(4), 651–674.

Lorenzoni, G. and Werning, I. (2023). Inflation is conflict. NBER Working Paper No. 31099.

Razmi, A., Rapetti, M. and Skott, P. (2012). The real exchange rate and economic development. *Structural Change and Economic Dynamics*, 23(2), 151-169.

Rowthorn, R. E. (1977). Conflict, inflation and money. *Cambridge Journal of Economics*, 1(3), 215–239.

Sasaki, H., Sonoda, R. and Fujita, S. (2013). International competition and distributive class conflict in an open economy Kaleckian model. *Metroeconomica*, 64(4), 683-715.

Vera, L. (2010). Conflict inflation: an open economy approach. *Journal of Economic Studies*, 37(6), 597-615.

Weber, I. M. and Wasner, E. (2023). Sellers' inflation, profits and conflict: why can large firms hike prices in an emergency? *Review of Keynesian Economics*, 11(2), 183-213.

Wildauer, R., Kohler, K., Aboobaker, A. and Guschanski, A. (2023). Energy price shocks, conflict inflation, and income distribution in a three-sector model. *Energy Economics*, vol. 127, Part B.

Yiheyis, Z. (2006). The Effects of Devaluation on Aggregate Output: Empirical Evidence from Africa. *International Review of Applied Economics*, 20(1), 21-45.