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A SFC POLITICAL BUSINESS CYCLE: KALECKI'S 1943 MODEL REVISITED

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The task of keeping efficiency wages reasonably stable (I am sure they will creep up steadily in spite of our best efforts) is a political rather than an economic problem. In my country it is quite essential that it should not be handled in obedience to the dictates of an international currency [financial] system.

Letter of John Maynard Keynes to Benjamin
Graham (1943) in Bortz (2017, p. 570).

ABSTRACT

This paper features a stock-flow consistent (SFC) political business cycle model where the interplay between financial debt, income distribution and fiscal policy is politically mediated by the relative influence of workers and businesses over government policy and publicly provided goods. In countries where taxes are a politically costly alternative to generate fiscal revenue, debt finances fiscal expansionary activity to initially raise wages and increase output. However, institutional mechanisms keep such drivers in check, and prompt a stop-and-go cycle as Kalecki suggested in his landmark

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1943 paper. We find that the push of labor interests against business stakeholders leads to non-linear dynamics over debt, deficits and long-term growth paths.

Key words: Political business cycles, debt and public finance, Michal Kalecki, stabilization policy.

JEL Classification: E3, E6, H5, H6.

UN CICLO ECONÓMICO POLÍTICO CFC: REVISITANDO EL MODELO DE KALECKI DE 1943

RESUMEN

Este artículo presenta un modelo de ciclo económico-político consistente de flujo-cantidad (CFC) donde la interacción entre la deuda financiera, la distribución del ingreso y la política fiscal está mediada políticamente por la influencia relativa de los trabajadores y las empresas sobre la política fiscal respecto a los bienes públicos. En los países donde los impuestos representan una alternativa políticamente costosa para generar ingresos, se usa la deuda para financiar actividad fiscal expansionista, y con ello aumentar los salarios y la producción. Sin embargo, existen mecanismos institucionales que detienen estos motores e inducen un ciclo de interrupción y avance, tal como Kalecki sugirió en su innovador artículo de 1943. Encontramos que el ímpetu de los intereses de los trabajadores en contra de los empresarios conduce a una dinámica no lineal sobre las trayectorias de la deuda, los déficits y el crecimiento a largo plazo.

Palabras clave: ciclos económico-políticos, deuda y finanzas públicas, Michal Kalecki, política de estabilización.

Clasificación JEL: E3, E6, H5, H6.

1. INTRODUCTION AND MOTIVATION

In his important 1943 contribution, Kalecki shared Keynes's above concerns around the political problems involved in fiscal stabilization policy sourced in financial markets and its effects on the relative standing of wages and profits. He presciently thought this condition would define the interplay of worker and business interests in future capitalist economic regimes. In distinguishing between fascist and liberal policies, Kalecki argued that the relative clout of workers and businesses

drove such conflict under different types of government intervention and political circumstances. Against that backdrop, this paper explores how the need for stabilization *endogenously* depends on the relative clout of workers and firms, given the facilitation of financial markets, which act as a hinge between both groups.

In a downturn, both firms and workers push for stabilization through government spending to increase demand, but businesses do so up to a point; hence the non-linear nature of the model. As the bargaining power of workers increases, firms lobby for fiscal retrenchment. As raising taxes is a *politically* costly source of public revenue, debt drives stabilization policy. However, while Kalecki and recent alternative extensions focused in the struggle between businesses and workers, we propose how this struggle plays under the guidance of institutional mechanisms hardwired to government action.

Kalecki's 1943 seminal paper (Kalecki, 1943) explained in great detail how the clash between labor and capital expressed politically across the welter of government action that kept (and strayed from) full employment. By stressing a stop-and-go political mechanism, we believe that contribution strayed considerably from what would later become standard Kaleckian models. Unlike later Kaleckian models where the profit share varied in tandem with the business cycle given the stability of markups and the degree of monopoly prices in costs and labor, in that earlier paper he proposed an institutional mechanism of conflict where such dynamics focused on the role of government expenditures and how conflict determined public spending and finance decisions. We revisit his theory to propose how markups determine relative bargaining power between workers and businesses, without leaving aside the institutional workings of government that both ease and constrain popular demands for stabilization. Market power, as expressed through the relative bargaining power of businesses over workers in the determination of product costs, can institutionally determine how resources are distributed in society.

With this in mind, this paper proposes a stylized stock-flow consistent model to explain how political decisions interact with debt and deficits. In our model, firms harbor vested interests to reduce the government's role in the economy. But during politically convenient episodes, business and labor align interests to jump-start economic activity, until government intervention increases worker clout and prompts the defection of firms.

In our understanding of Kalecki's political business cycle, government expenditures are non-linear. Spending benefits both workers and businesses, as profits and wages increase given favorable prospects for accumulation and growth. It also influences the state of confidence in the economy, as government action nudges private investment decisions. The contradiction between the interests of workers and businesses arises when these policies are pursued against political and institutional constraints.

After this introduction, Section 2 surveys traditional and alternative Kaleckian-inspired conceptions of Political Business Cycles (or PBCs for short). Section 3 introduces our stylized facts. Section 4 details the models, while Section 5 attempts a general analytical discussion. Section 6 concludes.

2. THE POLITICAL STRUCTURE OF BUSINESS CYCLES

According to Alesina (1988), traditional PBC theories can be organized around a four-fold matrix that considers “whether voters evaluate candidates retro- or prospectively, whether economic actors have adaptive or rational expectations, and whether policy makers have opportunistic (office-seeking) or partisan motivations” (Franzese, 2002, p. 373). We propose a fifth rubric to explain how such political cycles arise from dynamic distributive tensions.

Traditional PBCs explain conflicts of interest out of partisan differences or mere opportunism. However, voters can also act out of awareness according to their relative standing in the functional distribution of income. Under this premise, the stark dividing line in politics remains that between profits and wages.

Unlike Nordhaus's canonical model (Nordhaus, 1975) where a simple Phillips' curve policy relation fiddles the dimensions of inflation and unemployment, in Kalecki the policy dimensions rest on political structures around such social distribution of income. Nordhaus's PBCs inspired the first wave of mainstream models (indeed Nordhaus does recognize Kalecki as an inspiration), yet subsequent work failed to spark commentary across distributive and productive dimensions (Olters, 2004). While all these models are widely cited, researchers in the Kaleckian tradition have stressed their macroeconomic implications without

much commentary on their political insights. In debt to Kalecki's work, we consider this piece to be a contribution in that regard.

In this understanding of Kalecki, political leaders strive to win elections and keep the allegiances of majority interests playing the conflict between wages and profits over output and deficits. On that note, under democratic capitalist regimes, a majority of voters are wage earners who decide who to vote into power. In return, such voters ask for higher wages through fiscal expansion if possible, and more social expenditures (via transfers). However, elite business and financial interests keep such leaders in power given their role in determining the institutional policy mechanisms, and profit from capital accumulation. On that note, their incentives would fasten an institutional constraint and define the policy problem to counterbalance majoritarian democratic pressures over a given political horizon.

Similar to Marx's theory, accumulation in Kalecki picks up during upswings. Economic booms demand more workers and push real (and nominal) wages higher. As Bortz (2017, p. 565) writes, "the bargaining power of workers increases and they enjoy more than their minimum reproductive needs, at the expense of capitalists' profits (both in terms of shares and rates)".

In countries that feature deep social iniquities, taxes become an increasingly inconvenient alternative for generating fiscal revenue to finance investment. Therefore, governments prefer these policies to be sourced by debt. Sources of government expenditure matter, especially when political costs to domestic stakeholders and investors factor in spending strategies. Kalecki recognized as much when he wrote:

In the slump, either under the pressure of the masses, or even without it, public investment financed by borrowing will be undertaken to prevent large scale unemployment. But if attempts are made to apply this method in order to maintain the high level of employment reached in the subsequent boom a strong opposition of "business leaders" is likely to be encountered (...) lasting full employment is not all to their liking. The workers would "get out of hand" and the "captains of industry" would be anxious to "teach them a lesson". Moreover, the price increase in the up-swing is to the disadvantage of small and big rentiers and makes them "boom tired" (Kalecki, 1943, p. 329).

While conventional wisdom emphasizes the role of such spending (via the size of the multiplier), resources provided for government action to temper fluctuations in employment (either through deficit spending or tax increases) are sought and supported by different constituencies. Taxes are a politically and economically costly source of public finance, as increased fiscal revenues dampen aggregate demand and election prospects for incumbents. For this reason, governments tap financial markets to pursue expansionary economic policy.

However, unlike Marx, the cyclical mechanism that checks wages for Kalecki is not necessarily the introduction of labor-saving technologies by capitalists, but a political resistance to increases in labor bargaining power. Persistent government intervention in the economy erodes a state of confidence at the core of market conditions, which would “induce the Government to return to the orthodox policy of cutting down the budget deficit (...). As has already been argued, lasting full employment is not at all to [business] liking” (Kalecki, 1943, pp. 329-330). Kalecki continues:

Under a *laissez-faire* system the level of employment depends to a great extent on the so-called state of confidence. If this deteriorates, private investment declines, which results in a fall of output and employment (...). This gives to the capitalists a powerful indirect control over government policy: Everything which may shake the state of confidence must be carefully avoided because it would cause an economic crisis (Kalecki, 1943, p. 325).

This state of confidence expresses itself in many ways: it drives financial markets, nudges the business plans undertaken by entrepreneurs and toggles investment in capital goods or business consumption. However, the binding constraint for government action is not necessarily the first order condition of financial market appetite for government debt to finance such spending, but the general institutional checks established to prevent full popular control of economic decisions, where such government finance decisions are crucial.

Dislike for government spending grows contentious if the objects of spending are increasingly considered to rival private activities or subvert the bargaining clout of firms - for example, transfers and subsidies. But more importantly, increased worker clout (expressed by higher wages) may cause a qualitative shift in business climate —as Kalecki explained:

Indeed, under a regime of permanent full employment, “the sack” would cease to play its role as a ‘disciplinary measure’. The social position of the boss would be undermined, and the self-assurance and class-consciousness of the working class would grow (...). “Discipline in the factories” and “political stability” are more appreciated than profits by business leaders (Kalecki, 1943, p. 326).

Uneven pressures between workers and firms around this threshold of tolerance produced a fragile, politically-driven dynamic induced by the “stop-and-go” character of social expenditure. As the role of government in the determination of economic activity increases, it eventually hits opposition of business leaders, as the new state of affairs strengthens the political undertow in favor of workers. Keynes himself, in a letter to Kalecki, recognized that if he had written the article, he would have stressed the “influence ... [of] old fashioned sound finance which [re-sists] against any public expenditures and high deficit...” (quoted in Bortz, 2017, p. 571).

Financial markets play a role in this state of economic expectations. Kalecki devoted some introductory comments on the matter, to explain how government securities finance effective demand by private households. If a government pays cash backed by debt, and households and banks are unwilling to absorb all such debt securities, the yield of such securities will rise. As the economy draws closer to full capacity, government action becomes the rudder of economic activity, and crowds out the private sector’s direct role in this regard. As the role of government increases, it also heightens the stakes over the control of its resources, which is reflected on such financial pricing decisions.

As the private sector pulls back, financial markets will deem riskier the government debt used for stabilization, align themselves with businesses given the increased clout of workers and ask for higher yields. This implies a political decision by financial markets in pricing the government bond, which depends on the relative clout and dominance of business over labor interests. Business weakness signals lower debt prices and higher yields given less opportunities over favorable distribution prospects to profits and capital accumulation. However, higher borrowing costs signal policymakers to scale back spending, policy which deflates wages and renews business competitiveness.

3. STYLIZED FACTS: THE POLITICAL CONTENT OF FISCAL POLICY

As introduced by Kalecki, these considerations apply to democratic market economies with responsive governance structures and access to financial markets. Government borrows to avoid higher taxes to pay for politically convenient expansionary activity. Internationally, adjustment occurs mainly through the depreciation of the exchange rate, although domestically such adjustment may also take place through an increase in government bond yields. Under our model, adjustment takes place mainly through rising bond (running) yields given the pricing of such government securities by financial markets, as Kalecki wrote in the paper. Regardless of size, this applies to economies with deep inter-linkages to financial debt markets.

Our claim finds support in empirical research: Aizenman, Hutchinson, and Jinjara (2011) argues that credit default swaps (CDs) were mispriced relative to past and prospective fundamentals before and during the 2010 European crisis. A significant component of this pricing process remains unexplained. Although fiscal space (namely, the fundamental relationship between debt and deficits with respect to past and prospective fiscal revenues) remained a major factor in determining the default risk of sovereign debt (and consequently, the risk premium on debt instruments), wild fluctuations in financial markets caused sovereign risk (when adjusted for fundamentals) to be underpriced before 2008 and overpriced after 2010. The authors suggested that actual spreads in selected European periphery countries could have been mispriced due to excess nervousness or pessimism in the trajectory of fundamentals. However, we could also suggest the political complacency during the so called *Great Moderation* and the political instability that arose after 2008, especially after the European Debt Crisis of 2010, when populist movements began to gain support in the region, to be a major cause of that mispricing.

Additionally, De Grawe and Ji (2013) empirically tested how panic-driven financial fluctuations in sovereign assets prices determined the depth of fiscal retrenchment in European countries after the crisis. Even accounting for fundamentals, they found austerity not necessarily based on underlying economic conditions but on panicked reactions that disrupted the overall state of confidence in such assets.

Financial markets, especially domestic ones, panic past given political thresholds of popular opinion regarding debt and deficits, as expressed in the desire to expand deficits and increase the clout of worker constituencies. The effect is clearer in small open economies, where the risk of a balance of payments crisis, given expectations about the scarcity of hard currency, drives higher borrowing costs. Public spending increases growth and generates balance of payments deficits. However, such growth is not neutral: Deficit-financed growth leads to higher wages and worker clout. Skeptics may attribute financial market reaction to an objective function that pushes returns beyond the reach of currency depreciation, but such reaction first is a political consideration about the government's commitment to capital accumulation (and a stronger business sector) or to the distribution of resources to labor.

With respect to such small economies, Pérez Caldentey (2007; 2009) described in a series of papers the mechanism by which the above narrative applied to Caribbean Community (CARICOM) countries. Using an analogous stock-flow model, he argued that monetary circumstances provide hard constraints for growth in these countries:

The international financial architecture provides the framework for the workings of 'real forces'. Indeed, were there no external constraints, countries could pursue full employment policies through fiscal policy, or proposals such as an international clearing union or a regional monetary institution or regional fund (Pérez Caldentey, 2009, p. 218).

We doubt whether countries without such constraints would pursue full employment policies for the same reasons argued by Kalecki in his paper. Not all constraints for small economies are external in nature. While the papers do not delve on the political dynamics affecting such fiscal issues, Pérez Caldentey argued that fiscal reform did face perennial difficulties as external shocks affect international demand for exports and governments in these countries are pressured (and expected) to pick up demand. Frustration in reform mounts as initiatives are captured and weakened by special interest groups in key strategic sectors. Such capture manifests itself in the political drivers of government action. Given these conditions, external, government and often private sector deficits increase the Caribbean stock of debt, and such debt burdens

loop into refinancing choices at the behest of international financial markets.

However, Pérez Caldentey wisely warned that “government expenditures do not necessarily result in low growth or high debt levels. The outcome depends on *the interaction between government, external, and the private sector*, an interaction that is the basis for stock-flow modelling [the emphasis is ours]” (Pérez Caldentey, 2009, p. 221).

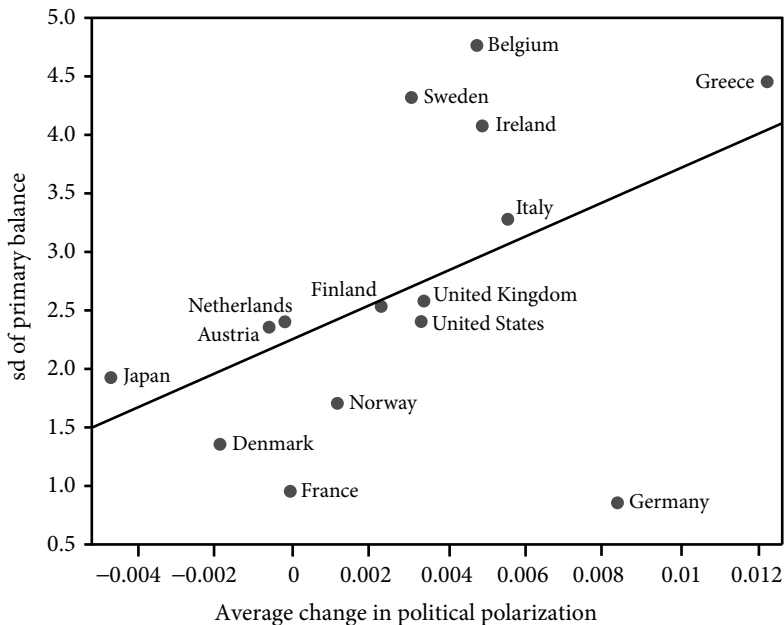
A more general take on the interaction between business, labor and financial interests was proposed by Epstein (2001) in his discussion about pro-labor and pro-rentier stances when it came to central bank policy. In that paper, Epstein discussed how financialization magnified the rentier motivations behind the relative interests of industry and finance with respect to labor. He argued that such policies depended on the productive structure of the economy, the institutional structure of the central bank (*i.e.* its integration or independence from government), the linkages between finance and industry and the international position of the country.

Unlike Epstein, Kalecki argued that such conflict expressed itself endogenously in government policy. With that in mind, we take such claim and translate it into wage share and financial yield target reaction functions next to exogenous government spending preferences. Taken together, these lead to an examination of the institutional constraints behind such spending decisions and the influence of financial markets, especially as institutional government mechanisms pull the clout of worker-voters over the long-run. Barring favorable borrowing terms (especially due to geopolitical considerations, like those behind the exceptional privilege of the United States dollar and the original sin of the rest of countries, Eichengreen, Hausmann, and Panizza, 2002), no government can borrow indefinitely to finance its budget deficit without paying a political price. Indeed, reflecting on the motivations behind his landmark 1979 paper, Anthony Thirlwall recognized that “here is a limit to the deficit/GDP ratio, and (...) debt/GDP ratio, beyond which financial markets get nervous” (Thirlwall, 2011, p. 15).

Deficits and debt finance stop-and-go stabilization policy. These allow political groups to balance broad electoral support and narrower business and financial interests to keep incumbency. This is readily seen in Figure 1 below, which plots the standard deviation of the primary balance and

the average change in political polarization as a proxy for class divisions for Organisation for Economic Co-operation and Development (OECD) countries, a group which is very dissimilar to CARICOM. However, we also note that increased political polarization correlates with more volatile government budgets.

Figure 1



Scatter plot of the standard deviation of the primary budget balance (*i.e.* the difference between current government spending and revenues from taxes) and the average change in political polarization (defined as the probability that two deputies picked at random from among the opposition parties will be of different parties) for 1980-2012 for selected OECD countries (Austria, Belgium, Denmark, Finland, France, Germany, Greece, Ireland, Italy, Japan, Netherlands, Norway, Sweden, United Kingdom and the United States).

Source: World Economic Outlook, International Monetary Fund (IMF), October 2012, <<http://www.imf.org/external/pubs/ft/weo/2012/02/weodata/index.aspx>>, and World Bank 2012 Database of Political Institutions, <<http://go.worldbank.org/2EAGGLRZ40>>.

4. THE MODEL

4.1. Businesses, market structure and investment

We model a closed economy where accrued profits to business with respect to output are the profit share π , where $\pi = (1 - \psi)$, where ψ is the wage share. Businesses have pricing power over market production through a markup τ over average variable costs, comprised of labor costs. Relative bargaining power over workers determines the markup:

$$\pi = (1 - \psi) = \frac{1}{(1 - \tau)} \quad [1]$$

Kalecki (1939 [1991]) suggested that prices could diverge from marginal costs due to cartelization or imperfect competition. Given price rigidity, a reduction in wages decreases the real purchasing power of workers. Hence, as markups increase, the real purchasing power of workers decreases and lowers their relative wage share.

Investment is a function of investment demand as determined by the growth rate of capital stock $I/K = g_i$ and the capital growth rate, as allowed by saving supply, $S/K = g_s$. Growth in capital expenditure demand is a function of the profit rate $r = (1 - \psi)Y/K$ (where K is the level of capital stock, fixed at \bar{K} over the short-run), the output-capital ratio $u = Y/K$ and autonomous investment demand I_0 (or animal spirits):

$$g_i = I_0 + [g_1(1 - \psi) + g_2]u \quad [2]$$

where $g_1, g_2 > 0$. In turn, growth in savings is determined by the after-tax savings of workers and businesses out of output:

$$g_s = [s_\pi(1 - \psi) + s_\psi\psi](1 - t)u \quad [3]$$

where $s_\pi > s_\psi > 0$ and t is the tax rate. Business owner consumption is a portion b out of after-tax, unsaved non-invested profits and transfers, $C_\pi = b(1 - \psi)(1 - s_\pi)(1 - t)Y + p_\pi$ (where p_π is a public good transfer to business owners).

4.2. Workers and employment

The wage share ψ is the total money wage bill w with respect to output Y which is the real wage per worker ω divided by labor productivity $\epsilon = Y/L$ (i.e. where L is labor and Y is output):

$$\psi = \left(\frac{\omega L}{PY} \right) = \frac{\omega}{\bar{\epsilon}} \quad [4]$$

where P are prices. Given fixed labor productivity over the short run, employment grows at a rate proportional to output, and real wages become function of the relative clout of workers with respect to businesses (as given by $\omega = \psi \bar{\epsilon}$). This assumption allows more clarity in visualizing conflict between worker and business interests as a struggle over wages and profits given their relative bargaining clout, without the influence of technical change in such conflict. Workers consume their after-tax, unsaved income plus transfers (of public goods, see below), so $C_\psi = (1 - s_\psi)(1 - t)\psi Y + p_\psi$, where C_ψ is worker consumption, s_ψ is worker saving and p_ψ is a public good transfer to workers.

4.3. The government policy function

Government spends G_0 and targets a welfare function to maximize a rivalrous, non-excludable public good p (where $p = p_\psi + p_\pi$) subject to democratic control via a policy function $H(\cdot)$, hence $G = G_0 + H(p)$. The provision of this public good increases wage and profit income earmarked for consumption, so $dY/dp = Y^p > 0$ and $C_\psi^p, C_\pi^p > 0$ (where upper script denotes partial derivatives with respect to p in worker and business consumption).

This welfare function in spending maximizes a majority rule in total consumption of private and public goods of business owners and workers subject to available tax resources over policy horizon T . The welfare function Λ is:

$$\Lambda = \sum_{t=0}^3 (C_\psi + C_\pi) \quad [5]$$

Subject to the government budget constraint $G = T + D(1 - i_G) - G_0 - H(p) - R$, where D is total government debt borrowing over T , i_G is interest payable on government debt and T are collected taxes. Additionally, the constraint includes the democratic rents in securing such majority rule by politicians, as denoted by R (where $R = R(\psi)$, and $R(\psi) > 0$). On that note, the government policy function becomes:

$$\text{Max } \Lambda \text{ s.t. } T + D - G_0 - H(p) - i_G D - R \quad [6]$$

Using Lagrange multipliers λ in the function L (over policy horizon $t \rightarrow T$):

$$o = \sum_{t=0}^3 (C_\psi + C_\pi) + \sum_{t=0}^3 (T + D - G_0 - H(p) - i_G D - R) = 0 \quad [7]$$

$$\frac{\partial o}{\partial \psi} = (1 - s_\psi - b)Y + \lambda(R_\psi - H_\psi) = 0$$

$$\frac{\partial o}{\partial g} = C_\psi^p + C_\pi^p + \lambda H'(p) = 0$$

Solving for the steady state costs (when political costs equal rents), for politicians to spend and secure a majority under such policy problem leads to:

$$R_\psi^* = \left(\frac{(1-t)[1-s_\psi - b(1-s_\pi)]Y}{C_\psi^p + C_\pi^p} \right) H'(p) + H_\psi \quad [8]$$

The spending costs for majority rule require higher relative consumption by workers of the marginal public good as a share of all consumable available public goods, in addition to the marginal production of such goods. Most voters are workers, and voters' consumption is high relative to all consumption and public resources directed to serve such needs. For this reason, it is not controversial to understand how and why politicians tend to promise more spending to win democratic elections.

4.4. Political influences in the government budget and deficits

Under this policy function, democratic governments would face unbalanced budgets over the planning horizon as political interests cater to labor groups to keep power. Rents required to consistently secure a majority imply a marginal provision of spending beyond what is allowed by the budget constraint. For this reason, some institutional mechanism implicit in government expenditures must restrain political expenditures over the longer run as to make R_ψ^* as close to zero. Doing so requires lowering the bargaining power of labor at the level of G where p and ψ are minimized over the long run (we call this G^* , where $G^* = G_0 + R_\psi^*$). This we define as the government political reaction function.

To keep the government budget constraint, government would need to endogenously restrict the provision of the public good at G^* to make $R_\psi^* - \gamma(\psi) = 0$ over the policy horizon. The budget deficit ΔD is a function of autonomous government expenditures G_0 and the provision of the public good p , collected taxes T , interest payable on government debt $i_G D$ and a political reaction function $\gamma(\cdot)$ that itself is determined by the sensitivity of spending to the wage share ψ :

$$\Delta D = G_0 - T + i_G D + [p - \gamma(\psi)] \quad [9]$$

The political reaction function γ measures the elasticity of government expenditures with respect to the wage share: The political sensitivity of government decreasing expenditures when the bargaining power of workers increases. Total tax collections are taxes paid by workers and businesses of their respective claims to output (for simplicity, we assume a flat tax $t = \bar{t}$ (over wages and profits), hence $T = (1 - \bar{t})(1 - \psi)Y + (1 - \bar{t})\psi Y - \bar{t}Y$.

4.5. Financial market influence in fiscal policy

Government reacts to financial markets given how the latter discount new offerings of sovereign debt, using interest i as the running yield (and refinancing cost) of such (zero-coupon) government securities. Indeed, such yields describe how new and existing debt burdens are discounted and priced according to the debt-to-output ratio:

$$i_G = \phi_1 \left(\frac{D}{Y} \right) \quad [10]$$

where $\phi_1 > 0$. With this in mind, we can modify γ to internalize how governments react to international bondholders given a debt-to-capacity target (as given by D/K). Indeed, the government's reaction to debt markets depends on how politically feasible are interest and principal paid on outstanding liabilities over the long term. Taken together, then equation [9] becomes:

$$\Delta D = G_0 - \bar{t}Y + p - \gamma_1 \psi - \gamma_2 \left(\frac{D}{\bar{K}} \right) + \phi_1 \left(\frac{D}{Y} \right) D \quad [11]$$

where government spending is $G = G_0 + p - \lambda_1 \psi - \lambda_2 (D/K) + \phi_1 (D/Y)$ and γ_1 and γ_2 are the political sensitivity to worker bargaining power and debt levels respectively.

4.6. The financial sector

The financial sector issues deposit accounts to accommodate households and business saving, offers loans to finance capital expenditures for businesses and buys government securities. It pays a i_s rate on worker S_ψ and business owner S_π savings and receives i_L and i_G from loans L and government securities D respectively. As loans finance business expenditures, loan spreads over savings is a function of macroeconomic business risk given by government spending policy. On that note, the deposit-loan interest risk spread $i_L - i_s$ is defined by the running yield on government securities i_G :

$$i_L - i_s = i_G \quad [12]$$

4.7. Macroeconomic balance

Macroeconomic balance is $g_i + g_d - g_s - \pi_B = 0$ where π_B is the profit rate of the financial sector B/K as determined by equations [2], [3] and [9] above and the transaction matrix below, and $g_d = \dot{D}/K$.

**Table 1. Stock-Flow Matrix for the model where $C_\psi = -\psi(1 - s_\psi)(1 - t)Y$,
 $C_\pi = b(1 - \psi)(1 - s_\pi)(1 - t)Y$**

	Workers	Owners	Business current	Capital	Government	Financial current	Sector capital
Worker consumption	$-C_\psi - p_\psi$		$+C_\psi$		$+p_\psi$		
Business owner consumption		$-C_\pi - p_\pi$	$+C_\pi$		$+p_\pi$		
Investment			$+I$	$-I$			
Government expenditures			$+G$		$-G$		
GDP (memo)			$[Y]$				
Wages	$-\psi Y$		$-\psi Y$				
Profits		$-(1 - \psi)Y$		$+(1 - \psi)Y$			
Public good transfer	$-p_\psi$	$+p_\pi$			$-p$		
Taxes	$-t\psi Y$	$-t(1 - \psi)Y$			$+tY$		
Bank profits						$-B$	$+B$
Interest on deposits	$+i_\pi s_\psi Y$	$+i_s s_\pi Y$				$+i_s Y(s_\psi + s_\pi)$	
Interest on loans				$-i_L L$		$+i_L L$	
Interest on government securities					$-i_G D$	$+i_G D$	
Changes on deposits	$-\Delta S_\psi$	$-\Delta S_\pi$					$+\Delta S$
Changes on loans				$+\Delta L$			$-\Delta L$
Changes on government securities					$+\Delta D$		$-\Delta D$

5. STEADY STATE SOLUTIONS, SHORT-RUN EFFECTS AND GROWTH

5.1. Steady states and closures

For our model closure, τ sets the relative bargaining power of businesses with respect to capital, and determines the profit and the wage share. A high τ translates to high markups and, consequently, to higher profits accrued to businesses given the cartelization of market structures. After setting ψ and π , we can solve for equilibrium output Y^* :

$$Y^* = \frac{p_\pi^* + p_\psi^* + I_0 + G_0 + H_\psi}{b(1-\psi^*)(1-s_\pi)(1-\bar{t}) + (1-s_\psi)(1-\bar{t})\psi + g_1(1-\psi^*) + g_2 + (1-\bar{t})[1-s_\psi - b(1-s_\pi)]\Omega} \quad [13]$$

where $\Omega = H'(p)/(C_\pi^p + C_\psi^p)$. Despite the non-linear nature of deficits and debt, we solve for D^* :

$$D^* = \frac{\frac{\gamma_2}{\bar{K}} \pm \sqrt{\frac{\gamma_2}{\bar{K}} - 4\Phi \frac{\phi}{Y^*}}}{\frac{2\phi}{Y^*}} \quad [14]$$

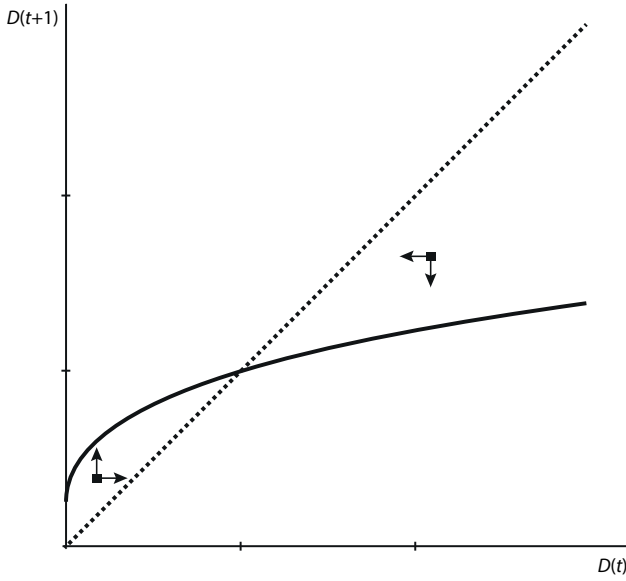
where $\Phi = G_0 - \bar{t}Y^* + p - \gamma_1\psi^*$. As long $\gamma_1\psi^* + \bar{t}Y^* \geq G_0 + p$, the root will remain real, and the level of debt will either be for a net debtor or net creditor (or between higher and lower debt levels). Indeed, the conventional solution assumes taxes finance most autonomous government expenditures, hence the government reaction function merely provides marginal political adjustment with respect to spending and deficits.

With respect to rates, government running yields equal:

$$i_G = \phi_1 \frac{D^*}{Y^*} i_s = \frac{C_\psi}{s_\psi Y^*} + \frac{(1-\psi^*)(1-\bar{t})}{s_\psi}$$

These rates determine loan rates at $i_L^* = i_G^* + i_s^*$. Finally, loan amounts are $L^* = (Y^*[1 - \psi^*)(1 - g_1) - g_2] - I_0)/i_L$ and bank profits $\$B^* = i_L^*L^* + i_G^*D^* - i_s^*Y^*(s_\psi + s_\pi)$. The wage/profit share determines the floor on savings while government risk the spread over saving rates.

Figure 2. Deficits and debt creation (the concave line is the ΔD function, the straight line is the equilibrium condition)



5.2. Analysis

5.2.1. Deficits, debt and worker bargaining power over the short-run

We start with how debt reacts to increases in the wage share and the relative bargaining power of workers. Debt dynamics are non-linear, as exhibited by the first and second derivatives of equation [14] above:

$$\begin{aligned}\frac{\partial D_{t+1}}{\partial D_t} &= 1 - \left(\frac{\gamma_2}{\bar{K}} \right) + 2\phi_1 \left(\frac{D_t}{Y^*} \right) \\ \frac{\partial^2 D_{t+1}}{\partial D_t^2} &= 2 \left(\frac{\phi_1}{Y^*} \right)\end{aligned}\tag{15}$$

Figure 2 shows a representation of deficits in the ΔD function. Given the quadratic solution with positive slope and concave shape, debt dynamics are stable over the short term.

To test the effect of a wage shock in the dynamics of debt and deficits, we need to determine some aspects of the multiplier. Indeed, the model describes a wage-led multiplier over the short term (as strong wages push demand higher, despite the relative strength of savings from profits with respect to wages as $s_\pi > s_\psi$). Hence, $dY/d\psi > 0$. Under low markups (and high labor bargaining power), the multiplier will be stronger. Given these conditions, we can perform some perturbation analysis via a Taylor expansion around D^* , through a shock $\in (\psi)$:

$$\tilde{D} = D^* + \in(\psi) = D^* + \frac{1 + \frac{\partial Y}{\partial \psi} \left(\frac{1}{Y^2} \right)}{8 \sqrt{\left(\frac{\phi_1}{Y} \right)^5 \left(\frac{\partial Y}{\partial \psi} [\bar{t}] + \gamma_1 \right)}} \quad [16]$$

We ignore higher order effects. In equation [16], the political elasticity to the bargaining power of wages in the creation of deficits and the tax rate in the denominator will dampen the scope of the wage shock over the short run, as the political system will respond endogenously to contain the effects of the multiplier. The same circumstances apply to profit-led regimes, given the interaction between numerator and denominator. Under these assumptions, the model will produce stop-and-go dynamics. However, debt increases could prove unstable if countervailing influences to wage shocks are weaker (given less responsive institutional constraints).

5.2.2. Financial risk and macroeconomic growth

The macroeconomic balance in the stock flow matrix supposes that excess investment demand and government deficits are key in capital creation. Both factors determine the creation of capital stock and the financial assets needed to support such investment. This, in turn, generates profits for financial services, all under the constraint of the relative bargaining power between workers, government and business interests. If financial profits are endogenous to the system (as capital accumulation is determined by the strength of markup pricing), then:

$$g_i + g_d - g_s = \pi_B \quad [17]$$

If we assume Kalecki's principle of increasing risk where financial profits π_B equal the marginal product of invested capital η ($B = \eta K$ where K is capital) and financial value-added for the economy g is the difference between such profits and the capital loan rate (with its requisite risk premium):

$$\begin{aligned} g &= B - i_L K \\ &= \eta K - i_L K \\ &= \eta K - (i_S + i_G) K \end{aligned} \quad [18]$$

where g can also be considered the net profit (in terms of rates, $g/K = \eta - (i_S + i_G)$, the net profit rate). In dynamical terms, $dg = \eta dK - (i_S + i_G) dK$ so at steady state growth when net profits and real capital grow at the same rate at $dg/dK = 1$:

$$\eta = 1 + i_L = 1 + (i_S + i_G) \quad [19]$$

Growth, as measured by the marginal efficiency of capital (or the expected investment return from additional units of capital), has two components: The first is the saving rate on deposits, set by wage and profit dynamics: Higher wage shares increase workers bargaining power, and raise this floor on rates from the banking sector. The second is a financial risk premium, determined by outstanding debt and deficits. Institutional constraints set over the short-run determine longer run trajectories: Deficits and debt-levels are determined over the short-run and are stable if budgetary and political institutions contain such dynamics. Such constraints will, in turn, determine marginal returns on output over a longer policy horizon.

6. CONCLUSION AND OPEN QUESTIONS

This document suggested how debt, distribution and politically-driven stabilization interact through a stock-flow consistent political business cycle in the spirit of Kalecki's original PBC model. In that paper, Kalecki sought to disentangle the political drivers of the struggle between capital and labor interests. Using a stylized model extension which factors financial debt markets, we track Kalecki's insight and propose a model

where debt-driven stabilization cycles play a critical role in the determination of politically driven deficits, especially when financial markets are politically relevant and taxes bear a political cost.

Even when business owners and firms prefer to reduce the government's role in the economy, politically convenient episodes align views with labor to press ahead and jump-start economic activity via government action, until that intervention increases the clout of workers and prompts business interest defection. In countries where taxes are a politically costly and inconvenient alternative to generate fiscal revenue, debt finances fiscal expansion, especially when debt securities are coveted by financial markets. And more importantly, how such debt is secured, sourced and spent is at the core of a fundamental political calculus between labor, government, financial markets and businesses.

Depending on prevailing economic conditions and the behavior of private interests, how politicians react to this structural political calculus leads to different policy choices and dynamics and creates a stop-and-go cycle. Policy constraints determine how debt and deficits react to wage shocks. Such constraints also influence how growth happens over the longer-run. For this reason, turning a blind eye to the political effects of economic decisions and institutional policy choices is a self-defeating policy proposition. ◀

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