Department of Economics - FEA/USP

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MARIO CIMOLI

GILBERTO TADEU LIMA

GABRIEL PORCILE

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Mario Cimoli (mario.cimoli@cepal.org)

Gilberto Tadeu Lima (giltadeu@usp.br)

Gabriel Porcile (jose.porcile@cepal.org)

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Keywords: Economic growth, income distribution, real exchange rate, strucutural change.

JEL Codes: F43, F31, O11.

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Mario Cimoli (ECLAC, University of Venice)

Gilberto Tadeu Lima (FEA-USP)

Gabriel Porcile (ECLAC, UFPR)

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This paper focuses on the role of the production and trade structures in shaping conflicting claims over income shares and the dynamics of the real exchange rate in a Neo-Kaleckian macroeconomic model of growth and distribution. In the medium run, the economy adjusts to comply with two equilibria, one represented by a solution to conflicting claims on income between workers and firms, and another represented by a stable current account / output ratio. The profit share, wage share and the real exchange rate adjust as the different agents (firms, workers and the government) decide (respectively) on prices, wages and the nominal exchange rate, and the economy moves towards its medium run equilibrium. These variables are thus interconnected and define a trilemma by which it is not possible for workers and firms to attain their desired income shares while at the same time the economy achieves external equilibrium. Structural change allows for a way out of the trilemma as it redefines (to some extent) the value of parameters of the model and makes possible higher rates of growth along with a better income distribution, both in the short run and in the medium run. The corollary is that a better income distribution and high employment cannot be sustained solely by conventional fiscal and monetary policies; they also require structural change – industrial and technological policies that redefine structural parameters of the system as a form of reconciling conflicting claims with higher international competitiveness.

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Introduction and motivation

This paper investigates how the production structure and the interaction between the government, capitalists and workers determine the rate of growth and income distribution in an open economy in the short run and the medium run. With this aim it develops a macrodynamic model which incorporates conflicting claims on income and different preferences by the three actors as regards the exchange rate. The model contributes to the literature on Neo-Kaleckian macrodynamics in two ways.

Firstly, it offers a comprehensive discussion of how the production structure affects the short and medium run dynamics and equilibrium configurations. Typically, when the short run and medium run are discussed, the role of the production structure is set aside so as to focus on macro policies and labor market institutions. In this paper it is shown that the parameters reflecting the production structure affect the process of adjustment to shocks and the equilibrium levels of employment, income distribution and growth. The political and economic viability of the transition period to medium run equilibrium may well be challenged in countries whose production structure shows little diversification and low levels of technological intensity. The paper suggests that not only should macro policies be concerned with the traditional short term aggregate variables (inflation, real wages, unemployment, investment), but they also should be conducted in close association with industrial and trade policies that promote structural change. The latter policies strongly influence the patterns of stabilization and define the (more or less desirable in terms of growth and distribution) future possible equilibrium configurations.

Secondly, the literature has consistently pointed out that the real exchange rate plays a central role in the distributive conflict (Frenkel and Rapetti, 2011; Lima and Porcile, 2012). The mark up of the firms (and hence the income share of capitalists) and workers' real wages (and hence the income share of labor) are related to the real exchange rate. When firms set their mark up, they have a say on the real exchange rate; when workers strive to improve their income share and demand (and obtain) higher nominal wages, this is not inconsequential for the inflation rate and hence for the real exchange rate; and when the government manages the fiscal, exchange rate and monetary policies, it is also (either directly or indirectly) using the real exchange rate as a tool to attain its own objectives — either controlling inflation, encouraging growth or correcting trade unbalances. The preferences of the economic actors reflect their respective objectives,

while their tools are prices, wages and (in the case of the government) policy options. The outcomes emerge out of the strategies they adopt and their respective bargaining power.

Section I deals with the short run, while the other sections deal with the medium run. In the short run the economy adjusts through changes in the rates of capacity utilization and economic growth, while all the nominal variables are given. The government, workers and firms have different targets as regards the real exchange rate and this spurs a distributive conflict. In the medium run prices, wages, the exchange rate and the utilization rate adjust so as to equilibrate de labor market and the current account/output ratio.

In section II the medium-run dynamics is driven by the interplay between the government (whose main concern is to avoid that the economy sets in a path of external disequilibrium) and capitalists (whose aim is to keep the firms' share in total input), while workers play a passive role. This scenario may be related to a combination of two factors: the bargaining power of workers is very limited due to institutional arrangements that compromise their ability to form unions and/or negotiate with the firms; and/or labor supply is so elastic that the migration of workers (from the informal and subsistence sectors) to the formal and modern sector checks any rise in labor share.

Section III gives a more active role to workers in the conflict over income shares. Workers actively seek to keep or increase their share in total output, but they moderate these demands when unemployment is rising. With a fixed mark up and a wage-price spiral, the real exchange rate is defined by the interplay between unions and capitalists. The government can no longer use the real exchange rate as a policy instrument and has to resort instead to other types of policy. Section III specifically discusses the role of monetary policy. This new institutional (and political) scenario generates a different path towards equilibrium.

In all these scenarios, the production structure embedded in the parameters of the model is critical to define the costs, the speed and even the political viability of the adjustment process. Adjustments in historical time are far from smooth, and perturbations and shocks in the transition dynamics may shift the economy from stability to instability or from one equilibrium position to another with very different outcomes for income distribution and growth.

I. The behavior of the model in the short run

There are three economic agents, the government, workers and firms (the international economy plays a passive role, which consists of supplying capital goods and intermediate goods and demand consumer goods). The economy produces only one good that can be used for consumption and investment purposes. All wages are spent in domestic consumer goods (workers do not save), while all profits are saved (capitalists do not consume). Foreign capital goods are a fixed proportion $(1-k)$ of total investment, and therefore $k < 1$ is the domestic share in the supply of capital goods. The government sets the nominal interest rate and may intervene in the exchange market by selling and buying reserves of foreign currency. In this section, government investment is part of the autonomous component of investment, while government consumption is part of workers' consumption.

The production function is one of fixed coefficients: there is no substitution between domestic capital, labor, and foreign capital and inputs.

1) $Y = \min\left(aL, bM^m, vK\right)$

where Y is output, a is labor productivity, L is total employment, b is the productivity of foreign intermediate goods, M^m is the amount of foreign intermediate goods, v is the productivity of capital and K is the total capital stock, which is comprised by domestic capital goods and imported capital goods , $K = kK_d + (1-k)K_i$. There is imperfect competition in the goods markets, which allows firms to set prices applying a mark up factor over unit variable costs:

2) $P = z\left(\frac{W}{a} + \frac{P^* E}{b}\right)$

The level of the mark up factor (z, which is one plus the mark up) reflects the degree of monopoly that the firm holds in the market. This is in turn a function of the existence of close substitutes for the good it produces, the existence of barriers to entry (technology, marketing, established brands) and the degree of isolation or protection — granted by transport costs or by governmental policies — from international competition. Variable unit costs depend on the productivity of labor and foreign intermediate goods, the nominal wage level (W), the foreign price level (P^*) and the nominal exchange rate (E), defined as the price of the foreign currency in

terms of the domestic currency — in such a way that a higher *E* and a higher *P** mean a depreciation of the domestic currency, and hence a rise in international competitiveness. Conversely, a lower *P* means ceteris paribus an appreciation of the domestic currency (the foreign currency becomes more expensive).

As a general rule, the economy does not fully utilize its capital stock. This is consistent with the assumption of imperfect competition and constant returns to scale in the production function. The rate of capacity utilization of the capital stock, *u*, is given by the ratio between effective output and the potential output which can be produced using all the existing stock of capital at its (technology given) maximum level of productivity (*v*):

$$3) \quad u = \frac{Y}{vK}$$

The workers' share in total real output (σ) is given by:

$$4) \quad \sigma = \frac{WL}{PY} = \frac{\omega}{a}$$

where ω the real wage and L is total employment (as defined above). The profit share in total output is given by:

$$5) \quad \pi = \frac{P}{P} - \frac{W}{Pa} - \frac{P^{*}E}{Pb} = 1 - \sigma - \frac{q}{b}$$

where $q \equiv P^{*}E/P$ is the real exchange rate (the real cost of one unit of foreign goods in terms of units of domestic goods), and (q/b) is the share of foreign intermediate inputs in total production costs. Using (2), (4) and the definition of the real exchange rate, equation (5) can be rewritten as:

$$6) \quad \pi = 1 - \frac{W}{z(W/a + P^{*}E/b)a} - \frac{P^{*}E}{z(W/a + P^{*}E/b)b}$$

With some algebraic manipulation, it can be shown that the profit share in total output depends solely on the mark up z:

7) $\pi = \frac{z-1}{z}$

Equations (5), (6) and (7) highlight the idea that with a fixed mark up, changes in *W*, *P**, *E*, *a* and *b* redefine the relative share of intermediate inputs and workers in total production, but the profit share remains unaltered. The implications of this fact for the dynamics of the distributive conflict will be explored in section II.

Market clearing in the goods market implies that any positive excess demand leads to an increase in production *Y* (as prices are assumed to be given in the short run):

8) $PY = PC + kPI + (1-k)P^*EI + PX - P^*EM$

In equation (8), *PC* is total nominal consumption, $kPI + (1-k)P^*EI$ is total nominal investment (including foreign and domestic capital goods), while $PX - P^*EM$ represents net exports (denominated in the home country currency). Net exports may be expressed as:

9) $X^n = PX - P^*E\left[(1-k)I + \frac{Y}{b}\right]$

Total imports comprise two components: imports of foreign capital goods (first term between brackets) and imports of intermediate foreign goods (second term between brackets). Using equations (8) and (9), $Y = uvK$, and defining $g = I/K$ (investment rate) and $x = X/K$ (exports per unit of capital), then:

10) $uvK = WL + kPgK + (1-k)P^*EgK + PxK - P^*E\left[(1-k)gK + \frac{uvK}{b}\right]$

Dividing both sides of the preceding equation by P^kK, where $P^K = P[k + (1-k)q]$ is the composed price index of the stock of capital goods (recall that k is the share of domestic capital goods), the following expression is obtained for the equilibrium in the goods market:

11) $uv = \sigma uv + kg + x - \frac{quv}{b}$

The investment rate function and the export per unit of capital function are specified as follows. The investment rate g depends on the capitalists' animal spirits (α, which in turn depends on expectations, assumed constant in the short run), the real interest rate (r, which raises the cost of financing new investments) and the rate of utilization of the capital stock. The latter variable is perceived as a signal for raising the stock of capital to respond to demand growth and as a warning to potential entrants in the market. An increase in u points to the possible emergence of supply constraints in the market. As suggested by the theory of industrial organization, when u rises, incentives for new competitors to enter the industry rises as well. By investing when u falls, incumbents send a message to potential competitors that there is no place for new production capacity to fill in the gap of any excess of demand.

In effect, for Steindl (1952), firms hold excess capacity to be ready for a sudden rise in demand — firms aim to be the first to seize on the opportunities of a demand surge. In addition, indivisibility in investment implies that it is inevitable that firms would be — at least for some time — with a production capacity which is ahead of effective demand. Finally, entry deterrence is a concern. An increase in prices may attract competitors: the holding of excess capacity allows oligopolistic firms to confront new entrants by rapidly raising supply, which will push prices down. Formally:

12) $g = g(\alpha, r, u)$

where the partial derivative with respect to α and u is positive, and with respect to r is negative.

Exports per unit of capital are specified as a function of the real exchange rate and effective demand in the global economy (captured by the rate of capacity utilization of the stock of capital in the global economy u^*).

13) $x = x(q, u^*)$

The partial derivatives of x with respect to u^* and q are positive. In the short run u adjusts to ensure equilibrium in the goods market. Substituting (12) and (13) in (11):

14) $uv = \sigma uv + kg(\alpha, r, u) + x(q, u^*) - \frac{quv}{b}$

A linear specification is assumed for equations (8) and (9), which give the behavior of investment and exports per unit of capital:

15) $g = \alpha + \beta u - \tau r$

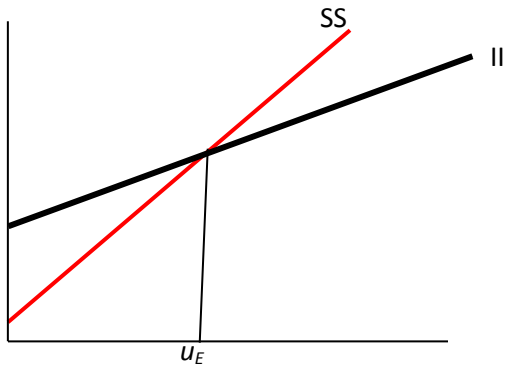
16) $x = hu^* + jq$

The parameter β is the response of the investment function to changes in the utilization rate, τ is the response to the real interest rate, h depends on non-price competitiveness (more on this below), and j is the response of exports to a rise in price competitiveness (a rise in the real exchange rate). Substitution of (15) and (16) in (14) yields the equilibrium value of u:

17) $u = \frac{1}{v}\left[\frac{k(\alpha - \tau r) + hu^* + jq}{1 - \sigma - (k\beta/v) + (q/b)}\right]$

Figure 1 shows the short run equilibrium of the economy, where $SS = (1-\sigma)vu$ and $II = k(\alpha - \tau r) + hu^* + jq + (k\beta/v - q/b)uv$. The usual condition for stability in demand-led models applies and we assume it to be satisfied: an increase in the utilization rate of the stock of capital should have a larger impact on domestic savings and imports than on investment for the equilibrium value of u to be stable $(1-\sigma > k\beta/v - q/b)$.

Figure 1: Short run equilibrium



The system is wage-led (profit-led) if a higher labor share raises (reduces) *u*. The net effect of an increase in σ on *u* depends on the forces that drive this variable up. In effect, using (1) in (3) and in the definition of the real exchange rate:

$$18)\ \sigma = \frac{W}{z\left[\left(W/a\right)+\left(P*E/b\right)\right]a}$$

$$19)\ q = \frac{P*E}{z\left[\left(W/a\right)+\left(P*E/b\right)\right]}$$

A higher *W* increases σ (per equation 18) because only a fraction of the rise in *W* is transferred to prices (see equation 2). The rise in domestic prices, in turn, reduces the real exchange rate (per equation 19), that curbs exports and makes imported intermediate goods cheaper. A rise in nominal wages will favor growth through the rise in *u* (given the parameters of the model and the interest rate), only if the positive effect of the rise in domestic consumption and cheaper imports overcome the loss in exports. Conversely, if the higher σ is related to a fall in the mark up *z*, the real exchange rate and exports move upwards along with domestic consumption. In effect, a lower *z* reduces prices and this improves income distribution, while at the same time raises *q* and boosts exports. The simultaneous increase in σ and exports makes more likely that the expansion of effective demand compensates for the negative effect of depreciation on costs of imports. In other words, when *W* increases, there is a trade-off between income distribution and competitiveness; when there is a fall in *z*, income distribution and competitiveness move in the same direction, which heightens the pro-growth effects of a depreciation (see Blecker, 1999, 2012 and Lima and Porcile, 2012).

Figure 2: Short run equilibrium after a fall in *z*

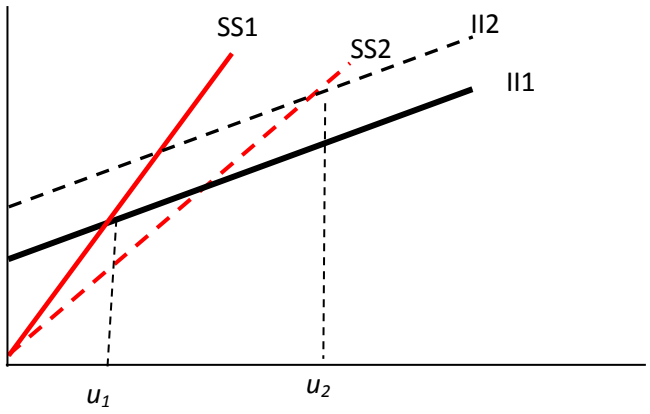


Figure 2 shows the effect of a fall in *z*. The increase in σ reduces the slope of the SS curve (which is $1-\sigma$), which falls from SS1 (full line) to SS2 (dashed line). The intercept of the II curve (which is given by $\alpha k + hu^* - \pi r + jq$) rises from II1 (full line) to II2 (dashed line; the slope of the II curve also falls, but this change is not drawn in Figure 2). Both changes boost the utilization rate in the short run equilibrium.

A similar conclusion is reached when the effects of an increase in foreign prices or the nominal exchange rate are considered. A higher *P** or *E* feeds inflation with regressive effects on income distribution. Exports increases out of the higher competitiveness of domestic production in the international market, but this does not ensure a higher level of economic activity. If the impact of depreciation on exports is too low to compensate for the fall in consumption and higher import prices, then a negative shock in international prices is recessive (or heightens output otherwise) [1].

I.1 The production structure and the short run equilibrium

The production structure determines to a large extent the rate of capacity utilization of the capital stock and income distribution in equilibrium. The production structure is defined by the set of goods that a country produces for domestic and external demand. It entails a specific combination of technological capabilities, learning and innovation opportunities, which strongly condition the levels and rate of growth of demand and productivity over time. Five parameters of the model are closely related to the production structure: *k*, the share of the domestic production of capital goods in total; *a*, labor productivity; *b*, the productivity of foreign inputs; *j*, the response of exports to price competitiveness; and *h*, which captures non-price competitiveness.

The degree of diversification, complexity and technological density of the production set contribute to determine the range of capital goods the country produces (k) and the ability of the country to participate in fast-growing markets (which defines *h*). A more diversified economy, with a higher knowledge intensity, gives rise to higher levels of *a* and *b*, that in turn impacts on price competitiveness. Firms that operate in knowledge-intensive activities will be more able to react swiftly and raise production (through *j*) when the real exchange rate becomes more

[1] The recessive impact of devaluations in Latin America was early pointed out by Diaz-Alejandro (1963); see also Krugman and Taylor (1978).

competitive. Comparative static exercises with the parameters *a*, *b*, *k*, *h* and *j* shed light on the role of the production structure on the level and stability properties of the short-run equilibrium.

Changes in productivity. Changes in productivity modify the relative share of imported inputs and the labor share in total output. A rise in *a* reduces the labor share but increases the share of imported inputs; a rise in *b* reduces the share of imported inputs but raises the labor share. These effects compensate each other in such a way that the profit share remains constant.

An increase in labor productivity (stemming, for instance, from an acceleration of technical change) leads to a fall in the share of labor in total output in the short run. Labor costs are just part of the firms' total costs, and therefore only a fraction of the rise in labor productivity is passed onto prices. If nominal wages are constant, and prices fall less than labor productivity, the share of labor in total output falls, with a consequent negative impact on aggregate consumption. At the same time, as prices fall, the real exchange rate increases and encourages exports. The net effect on *u* and *g* is ambiguous. If the positive impact of depreciation on exports exceeds (is lower than) the negative impact on domestic consumption and the higher real costs of imports, *u* and *g* will rise (fall). Real wages increase, to the extent that at least part of the productivity growth is captured by workers in the form of lower prices. But the possibility of a fall in *u*, related to the fall in σ, underlines the need to combine a policy aimed at productivity growth with a policy aimed at boosting effective demand.

A different scenario emerges when there is an increase in the parameter *b*, the productivity of foreign inputs. This has positive effects in various dimensions. By reducing the unit cost of foreign inputs in total variable costs (with a constant mark up), it reduces prices and increases the labor share in total output. Such a result is at variance with the case of an increase in *a*, which raises real wages but reduces the labor share. The fall in q/b is exactly compensated by the rise in σ. All in all, the impact on capital accumulation will be positive, for there is an expansion of aggregate demand based on both income distribution and higher competitiveness. It should be noted, however, that a rise in *b* (as well as a rise in *k*) beyond certain critical values may have negative implications for the stability of the short-run equilibrium. An economic system which responds too strongly to rising demand and productivity may experience an

explosive behavior. To avoid this, *k* and *b* should take values for which the inequality $k\beta/v < \pi + 2q/b$ holds.

Changes in the composition of production and exports. The rise in the parameters *k, h* and *j* boosts exports without changing the labor share in total output. Therefore, higher values of these parameters stimulate investment and growth while they are neutral with respect to income distribution. However, such a result strongly depends on the assumption that the production for exports and for the domestic market uses the same technology and qualification of the labor force. In fact, there is a lot of room for unequal distributive effects when it is admitted that the production function of the export sector is different from the production function of the sector that sells in the domestic market.

A rise in *k* implies the creation of more linkages in the domestic economy, and more opportunities for learning and intra-industry trade. A rise in *h* allows the economy to enter fast-growing markets (meaning higher income elasticity of demand for exports) and to capture a larger share of international effective demand. As mentioned earlier, both kinds of transformation are related to higher degrees of diversification, sophistication and complexity of production and technological capabilities. The parameters *k* and *h* offer a natural link between the Neo-Kaleckian models of growth and distribution (that usually focus on the short and medium or long runs) and the Keynesian BOP-constrained growth models (that focus on the long run; see Thirlwall, 2011). This link is based on the importance that is given to equilibrium in current account and non-price competitiveness in the two kinds of models. There are, however, two important caveats as regards the analysis of changes in *h* and *k*.

Firstly, a rise in *h* may be related to an export-promotion policy that modifies the export structure. But to effectively have a positive impact on growth, an export promotion policy should not depend on a higher content of imports in production. If a rising *h* is accompanied by a proportional fall in *k* and/or increase in *b*, the positive effect on growth will be neutralized. The ceteris paribus clause is especially important in this case. An export promotion policy that favors growth excludes, for instance, the crude cases of maquila-led exports. While using maquilas as a startup for learning makes sense, sustained growth requires combining the export promotion policy with an industrial and technological policy that fosters learning and prevents *k* (*b*) from falling (rising) sharply. The expression export-led growth is hence misleading when the rise in

exports is related to lower linkages in production (i.e. with a less dense production matrix). It is more accurate to speak of *structural change-led growth* than export-led growth, for sustainable growth requires changes in the whole pattern of production — which includes the export *and* import structures.

Secondly, a hasty interpretation of equation (15) may lead to the conclusion that reducing k and b as much as possible is a good avenue to improve income distribution while stimulating growth and investment. This conclusion is unwarranted if such a reduction is associated with persistent trade barriers that compress imports, rather than with technological learning that fosters the diversification of open economies. While tariff and nontariff barriers have historically been a necessary step for learning and diversification — in the context of specific sets of policies, whose nature and intensity depend on domestic political variables and on the international environment —, if they persist for too long and are not subject to a strict discipline, they may impair the ability of the firms to compete internationally. The risk is symmetric to that of stimulating exports based on the maquila system. In both cases the key for a good policy is to ensure that import substitution or export promotion reflects a process of building the institutional and technological capabilities required to compete in knowledge intensive sectors. Otherwise, they may become just a mechanism for transferring resources to firms that, at the end of the day, fail to reduce the distance with the technological frontier.

Demand side and supply side. The importance of the parameters related to the production structure does not compromise the role of the demand-side parameters. The positive effect on growth of a rise in the capitalist "animal spirit" (the parameter α representing autonomous investment) is the traditional Keynesian result in which investments produce their own savings by raising the level of activity measured by the utilization rate of the stock of capital. An optimistic mood of the capitalist class is a self-fulfilling prophesy according to which the ensuing expansion of investment (and hence effective demand) fills in the gap of the saving -investment equality. As Michael Kalecki would put it, according to Kaldor (1956, p. 96), "capitalists earn what they spend, and workers spend what they earn". In the same vein, a rise in the international effective demand, which raises u^*, stimulates growth without compromising the labor share. A rise in u^* implies a Pareto improvement for all actors in the global economy (and not only for domestic actors) as long as at least some countries have unemployed capital and labor. Last but

not least, monetary policy —through its effects on the rates of interest and inflation — and fiscal policy — through its effects on autonomous expenditures — represent traditional instruments of aggregated demand management that can affect the rate of growth (more on this in the next section).

In sum, the production structure, which is embedded in the key parameters of the model, strongly influences equilibrium outcomes. A higher equilibrium rate of capital accumulation can be obtained from a rise in *k*, *b* and *h*. The sign of the effect on growth of a rise in labor productivity is ambiguous. It may induce a fall in the utilization rate *if* there are no accompanying measures to stimulate effective demand. Technological and industrial policies should consider both, an improvement in labor productivity and a change in the pattern of specialization with a view to keep effective demand in pace with productivity growth.

II. Medium run dynamics

a) Distribution and external equilibrium

The short run analysis assumes that several variables — along with the parameters of the model — are given. Only by a happy fluke the short run equilibrium will represent a situation in which the distributive conflict is already settled and/or the Balance-of-Payments is stable. Conflicting claims on income and external disequilibrium place pressures on the goods, labor and exchange markets, affecting the traverse of the economy towards its medium run equilibrium. When production and employment increase or contract, wage demands, inflation, exports and imports vary and interact with each other until the economy reaches its medium run equilibrium. The latter is defined by stability in two fronts: conflicting claims over income shares between capitalists and workers are settled so as to generate a stable distribution; and the current account balance as a percentage of output settles in a non-explosive path, *i.e.* the country neither accumulates reserves nor depends on mounting levels of external lending to finance its deficits.

Stabilizing the conflicting claims dynamics implies a distribution pattern which is consistent with the expectations of the different actors regarding the income share they can obtain, given their bargaining power. Equilibrium is not a situation in which all actors are satisfied, nor is one deemed to be inherently fair or desirable. It is just a situation in which no-one thinks that can do better given the prevailing distribution of power that underlies the

distribution of income — a Nash equilibrium. In this paper the distribution of power — which provides the ultimate basis for institutions and policies — is exogenously given. Equilibrium and dynamics are discussed in the light of this given configuration of power[2].

More specifically, such a configuration defines, on the one hand, the institutional variables that regulate the labor market and wage negotiations: how frequently wages are negotiated, the strength of labor organizations, the existence of a centralized leadership versus a pulverized structure in both the labor and capitalists sides, the strength and instruments that the government may use to arbitrate the bargaining process, the net of social insurance that protects the unemployed, unemployment benefits, and regulations over firing and contracting workers. On the other hand, this configuration also affects the pricing behavior of firms. Protection against foreign competition, policies that either favor or curb cartels and price agreements, regulations of mergers and take-overs, price controls and direct subsidies, as well other income policies, are all instruments that may be used to alter the degree of monopoly of the economy — and hence the parameter *z*. There are other instruments that may improve equality and which are not related to the production process, such as, for instance, lump sum taxes on profits and its redistribution through social services, and public expenditure in health and education (Rapetti, 2011).

Throughout this paper it will be assumed that firms have power to attain their desired mark up factor in equilibrium (although the mark up may vary during the transitional dynamics). This assumption aims to reflect in a realistic way the actual distribution of power in most developing economies. Firstly, an "industrial reserve army" exists in the form of a large informal and subsistence sectors. Scores of underemployed heavily weigh on the capacity of labor unions to bargain and negotiate a higher share in total output. Secondly, developing economies tend to have few big actors (frequently multinational firms) which hold significant market power — and hence more degrees of freedom to adjust prices —, at least in the domestic market. In some specific circumstances (shocks of import liberalization, or periods of exchange rate appreciation, related to improving terms of trade or abundant capital inflows), the mark up may fall sharply, but in general it tends to remain stable in the medium run. Last but not least, the institutional capabilities of developing economies to regulate and stimulate competition are less effective and

[2] An interesting discussion on the political economy of wage led growth in open economies, for instance, can be found in Casetti (2010).

comprehensive than in developed economies. This limits the ability of the state to alter or discipline the price behavior of firms.

A note of caution, however, is necessary at this point. There is significant variation in institutional capabilities across developing economies. Some developing countries have in the past implemented income policies to curb the wage-prices spiral with some success. Institutional failure and fragility cannot be taken as an inescapable destiny. Development consists to a large extent in building institutions which incentive markets and states to work in complementary ways in order to deliver growth, equity and technological dynamism. Markets are not abstract entities that spontaneously emerge out of the uncoordinated exchange between consumers and producers. They are historically constructed by the interactions between the visible hand of governments and the most powerful business groups — particularly when structural change and technological capabilities are at stake; see Mazzucato (2012) —, along with atomistic interactions. The malfunction of the market-government relationship is driven by political economy forces rather than by the technical problem of devising institutions that provide the "correct incentives". In the long run, institutions are endogenous and development consists of building the political coalitions (and the underlying social alliances) that give rise to and sustains institutions which focus on innovation, learning and structural change.

Equation (5) shows that the participation of workers, firms and intermediate imports in total output is given by $\pi = 1 - \sigma - q/b$. If, as suggested above, firms eventually attain their desired mark up factor, this will be constant (and equal to the desired mark up factor) in equilibrium (which makes for a constant $\pi(z)$). Alternative outcomes over the distributive conflict will then depend on the trade-offs between the labor share (σ) and the share of foreign intermediate goods (q/b). Workers may rise their share while π is constant when *P** or *E* falls and/or when *b* increases, since this compresses the share of intermediate goods in total production. However, this compression is not viable beyond a certain limit.

Such a limit is in part technological: *b* varies with the intensity of technical change, which is exogenous in the short run. Although *b* changes slowly beyond the short run, its effects are uncertain and take a long time to bring about the desired results. Besides technology, there are as well economic limits. A fall in *q* may help to reduce the costs of imported inputs, but it

may also hampers the growth of exports. By reducing, for instance, the nominal exchange rate E (i.e. by promoting a revaluation of the domestic currency), q falls and income distribution improves. But as q falls (and hence σ rises for a given π), net exports will be falling too and the BOP constraint may make its appearance in the form of external unbalances. It is not rare that in developing economies external unbalances end up in exchange rate crises (Ocampo et al, 2009). Even if there is abundance of external financing in the international economy, foreign lending would not sustain a protracted period of increasing current account deficits as a percentage of output. A higher risk premium for borrowing in the international capital markets, and mounting uncertainty holding back domestic private and public investments, will reduce the rate of growth of the economy at the end of the day.

Equilibrium in the BOP and equilibrium in the distributive conflict should therefore be considered as part of the same problem. If π is constant, and the real exchange rate cannot be further compressed to avoid problems of competitiveness, then the labor share in total output is bound to adjust. *This result can be seen as another trilemma in the behavior of open economies*: for a given set of structural parameters (a, b, h, k, j, z), it is not possible to simultaneously improve the current account, redistribute income in favor of workers and keep the profit share constant.

All in all, if the mark up places a bottom for the firms share in output, and the BOP constraint places a bottom for the real exchange rate, then the burden of the adjustment in the medium run falls on workers. The key question then becomes how the adjustment proceeds. Two scenarios are discussed. In the first scenario workers are passive, while the government uses the exchange rate policy to correct external disequilibrium, in response to the loss of competitiveness associated with a rise in the mark up factor by firms. In the second scenario workers play a more active role and define their target labor share in output as a function of the unemployment rate.

b) Exchange rate policy: crawling peg

In this section the government affects the nominal exchange rate through policy of sterilized interventions, selling or buying reserves of foreign currency. The quasi-fiscal impacts of managing the exchange market are ignored; the model is valid as long as these changes remain within small values. The objective of the government in using the exchange policy is to avoid the

possibility that the economy slips towards an explosive disequilibrium path in the trade balance. Inflation in this scenario is not a concern for the government. The abundance of labor ensures a steady supply of workers that keeps wage demands at bay. Alternatively, the economy does not have a fully open capital account and is not constrained by the standard trilemma. This allows the government to use monetary policy to control the inflation rate and the exchange rate policy to control the real exchange rate.

Governments of course have more responsibilities than external equilibrium and stable inflation: they should care as well for growth and high or full employment. But the impediment to high or full employment in a developing economy is typically not that the government fails to stimulate the economy (with monetary or fiscal measures) up to the point in which full employment is attained. Rather, it comes from the fact that such a level of (fiscal or monetary) stimulus is usually inconsistent with external equilibrium. In other words, a full employment policy in a laggard economy should use the traditional demand-side stimuli *while at the same time* changing the production structure (*k*, *b* and *h*) in order to make compatible full employment and external equilibrium. It is a trajectory that requires combining industrial and macroeconomic policies, using a variety of short-, medium- and long-run instruments. For this reason macroeconomic policies and industrial policies cannot be considered separate entities: full employment means structural change, along with expansionist policies in the domestic front up to the maximum extent permitted by the external constraint.

Firms have a desired participation in total output (π^D), which amounts to a desired *z* (recall that $\pi^D = 1-(1/z^D)$). They will adjust upwards the mark up factor whenever the effective profit share in total output is below the target. Formally:

20) $\hat{\pi} = \psi\left(\pi^D - \pi\right)$

As firms raise the mark up, prices go up, the real exchange rate falls and the external balance worsens (runs into a higher deficit). To avoid this, the government resorts to nominal devaluations with a view to keeping net exports per unit of capital approximately constant — within a range of values in which a deficit in current account could be easily financed in the international markets; or in which a surplus would neither elicit defensive reactions from trade

partners nor inflationary pressures within the country. To simplify the analysis it is assumed that the government aims at zero net exports and reacts symmetrically to deficits and superavits.

Dividing equation (9) by $P^k K$, imports per unit of capital are obtained as follows:

21) $m = (uv/b) + (1-k)g$

Net exports per unit of capital ($x^n = x - m$), meanwhile, can be obtained by using the preceding result and equations (16) (exports per unit of capital) and (15) (investment rate):

22) $x^n = hu^* + jq - q[(uv/b) + (1-k)(\alpha + \beta u)]$

The rate of capacity utilization can be written in terms of π and q using $1 - \sigma = \pi + q/b$ in equation (17):

23) $u = \frac{1}{v}\left[\frac{k(\alpha - \pi r) + hu^* + jq}{\pi + 2q/b - (k\beta/v)}\right]$

Note that imports of intermediate goods appears twice in the denominator: first as an effective-demand effect (domestic consumption falls out a lower share of labor in total output); and second as a cost effect (higher cost of intermediate imports).

Recall that the real exchange rate is a function of the mark up and the nominal exchange rate, $q = P^* E/z(W/a + P^* E/b)$. A rise in *z* reduces the real exchange rate and worsens income distribution, and it is most likely that it brings about a fall in *u* in spite of reducing the cost of imports (which means $\partial u/\partial z < 0$). In turn, a rise in *E*, *ceteris paribus*, increases competitiveness and reduces domestic consumption. The net effect on the utilization rate is ambiguous: if the impact of depreciation on exports is weak it will curb growth ($\partial u/\partial E < 0$); if the impact on exports is strong it will boost growth ($\partial u/\partial E > 0$). While the conventional ISLM view assumes that the effect of real depreciation is expansionary, a view that takes into account the different consumption behavior of workers and capitalists gives more nuanced results.

Taking total differentials of equation (23) and making *du* = 0:

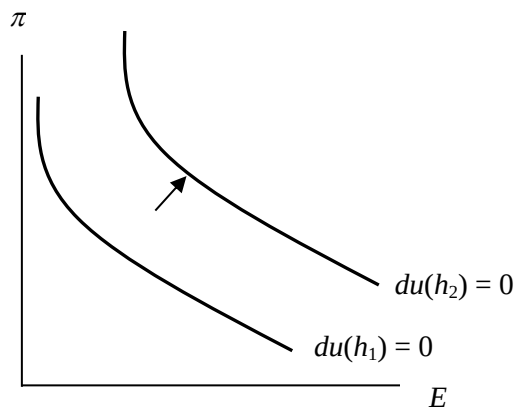
24) $\frac{d\pi}{dE} = -\frac{\partial u/\partial E}{\partial u/\partial \pi}$

Figure 3A and 3B show the isocurves representing the different combinations of π and E that give rise to the same rate of capacity utilization u (and which hence also represent iso-growth curves). Figure 3A illustrates a recessive depreciation (i.e. when $\partial u/\partial E < 0$): a high value of π requires a low value of E to keep capacity utilization constant. A fall in E is necessary to compensate for the negative impact of a rise in π on income distribution. Figure 3 B represents the case of an expansionary depreciation ($\partial u/\partial E > 0$), in which international price competitiveness is key for the growth of effective demand. A higher E is necessary to compensate for the negative impact of a rise in π on exports. Higher iso-growth curves are obtained moving downwards in Figure 3A and in Figure 3B (growth rises as π falls for the same E).

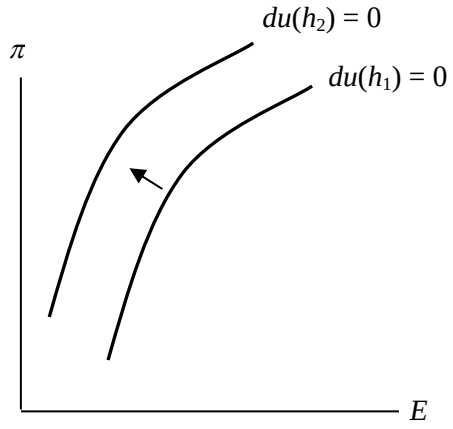
A higher non-price competitiveness h plays the same role as technical change in the analysis of isoquants in a production function: it shifts the iso-growth curves and produce higher growth for any combination of π and E. Figures 3A and 3B show the shift of a given iso-growth curve out of a change in h ($h_2 > h_1$), in the cases of a recessive depreciation and of an expansionary depreciation, respectively. The same level of production is obtained with higher levels of π for a given level of E after structural change (the iso-growth curve shifts to the right in Figure 3Aand to the left in Figure 3B).

Figure 3: Recessive and Expansionary Depreciation: the impact of non-price competitiveness

3A. Recessive Depreciation



3B. Expansionary Depreciation



The government is concerned with competitiveness and will react when it realizes that the trade balance is moving towards an unsustainable path ($x-m<0$). Such a reaction takes the form of accelerating the rate of real exchange depreciation in order to encourage exports and reduce imports — which means that the rate of nominal devaluations should be above the inflation rate plus the international rate of inflation. Formally:

25) $\hat{E}=\theta\{m[q(\pi,E),u(\pi,E)]-jq(\pi,E)-hu^*\}$

It is assumed that Marshall-Lerner condition is satisfied, i.e. a rise in the real exchange rate, given the level of output, improves the trade balance. The latter thus worsens ceteris paribus when *z* (and π) increases and improves when *E* increases, which makes $\theta_\pi>0$ and $\theta_E<0$. To save notation the foreign inflation rate is set to zero. A linear expression for (25) is:

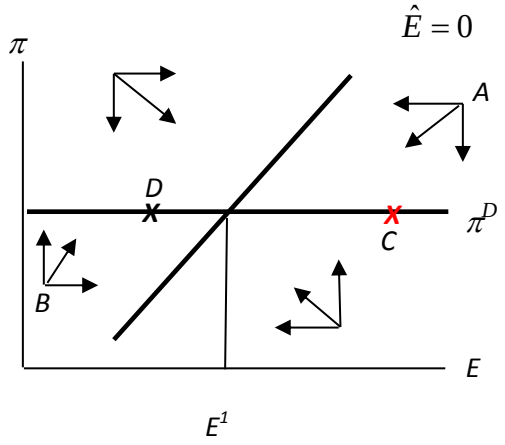
26) $\hat{E}=\theta[f_o\pi-f_1(h)u^*-f_2E]$

The parameter θ is defined by macroeconomic policy and reflects the degree of tolerance of the government to the loss of competitiveness, while f_1 is a function of *h* (non-price competitiveness). A high θ implies that the government will strongly react to any perceived threat to international competitiveness. Conversely, a government that is more concerned with

income distribution than with external equilibrium will imply a low θ. The isocline $\hat{E} = 0$ implies that $\pi = \left(f_1(h)u^* - f_2 E \right) / f_o$: any increase in the profit share represents a loss of competitiveness that the government will aim to neutralize by raising the rate of nominal devaluations. A parallel increase in π and E implies a worsening of income distribution. If depreciations are recessive, the rise in exports does not compensate for the fall in domestic consumption, and hence there will be a fall in the utilization rate. When depreciations are expansionary the increase in E above inflation fosters growth. The parameter ψ is then a measure of the readiness of the government to cope with the political impact of worsening income distribution and — in the recessive case — with higher unemployment.

The dynamic system formed by equations (20) and (26) has a stable solution that is illustrated in Figure 4. The equilibrium values of π and E define, as a residual, the equilibrium value for σ. Workers are the residual claimants in the distributive outcome that emerges out of the interplay between the government and the firms on profit shares and competitiveness.

Figure 4: Medium run equilibrium



The equilibrium values of the nominal exchange rate, the real exchange rate, the profit rate, the imports share (recalling that *b* is constant) and the labor share are as follows:

27) $\pi^E = \pi^D$

28) $E^E = \dfrac{-f_1(h)u^* + f_o\pi^D}{f_2}$

where the numerator of equation (28) has to be positive for the corresponding equilibrium value to be economically meaningful, and

29) $q^E = \dfrac{P^* E^E ab}{z^E\left(Wb + P^* E^E a\right)}$

30) $\sigma^E = 1 - \pi^D - \dfrac{q^E}{b}$

In sum, the medium run equilibrium reflects a compromise between relative shares in income distribution and the need to adjust the external sector. This can be illustrated by assuming that the initial conditions are defined by point *A* in Figure 4, a point above and to the right of the equilibrium values π^D and E^1. It will be assumed firstly that the slope of the curve *du* = 0 (*i.e.* $d\pi / dE$) is negative (recessive depreciation). The combination of a high value of π and *E* implies a low σ — a rather unequal income distribution, which means weak domestic demand and low utilization rate of the capital stock. The profit share in output is above the one aimed by firms, which restrain price increases and slows down inflation (which falls below the international inflation rate, assumed to be zero). As a result, the real exchange rate increases, and the trade balance becomes positive. This encourages the government to allow the currency to devalue at lower rates than that of inflation (*E* decreases less than *z*). The economy reaches a new equilibrium with a lower π (which equals π^D) and a lower *E* (which equals E^1). Such equilibrium entails higher capital utilization than in *A*, for both π and *E* (and *q*) have fallen, while σ has increased. In equilibrium, the trade balance is under control, the profit share is that desired by capitalists and the nominal exchange rate is that desired by the government.

A symmetric story can be told if the economy is initially in a position below and to the left of the medium run equilibrium (point B in Figure 4) — a low π and a low *E*. The rate of utilization of the capital stock is rather high at this point in spite of feeble exports, for the share of labor in total output supports a vigorous domestic demand (high σ and *u*). Firms adjust upwards the mark up, towards their desired level, and this appreciates the real exchange rate, giving rise to a trade deficit. Negative net exports prompt the government to act firmly to correct

the external disequilibrium — i.e., allowing for a faster rate of nominal devaluations, beyond the inflation rate (hence *q* rises and exports are encouraged). The rise in π reduces domestic demand, which is not compensated by the rise in exports. The economy eventually settles in a new equilibrium, featuring a higher *E, q* and π. The net effect of these changes on *u* is negative, out of the concomitant rise in *E* and π.

When it is adopted the (conventional) expansionist assumption as regards the effect on the level of depreciation on *u*, the adjustment process is not different. In point A the profit share in total output is above the desired share, and therefore firms reduce *z* and π. As in the previous case, the emergence of a trade surplus compels the government to devalue the nominal exchange rate at a lower rate than that of inflation. The difference is that in this case there are two opposing forces on *u*: the decrease in *E*, which compromises competitiveness and exports; the fall in π which favors domestic consumption and exports. The net effect will be mildly expansionist. Conversely, in the case in which devaluation is contractionary, the fall in *E* reinforces the pro-growth effect of the fall in π and the net effect is strongly expansionist.

If the initial position of the economy is in point *C* upon the horizontal $\pi = \pi^D$ line (see Figure 4) the story will be very different in the cases of recessive and expansionary depreciations. The economy will move to its equilibrium position along the horizontal line; at any point in time the profit share is constant ($\hat{\pi} = 0$). Therefore, in the case of a contractionary depreciation, the economy will be moving from lower to higher levels of utilization (and hence from a lower to a higher iso-growth curve). If depreciations are expansionary, the economy will be moving from a higher to a lower rate of capacity utilization (from a higher to a lower iso-growth curve). This opposite effects on growth will occur if the initial position of the economy is on point *D* on the horizontal $\pi = \pi^D$ line. The move towards equilibrium will involve higher growth in the case of expansionary depreciations, and lower growth in the case of contractionary depreciations. These scenarios are valid not only in the special cases in which the initial conditions lie on the horizontal line, but also when the parameter ψ (that expresses the velocity with which firms adjust their mark up factor to avoid any losses in income share) is very high — the extreme case is when mark up adjustments are instantaneous and hence ψ is infinite. All changes in income shares and u will arise from changes in *E*. The intensity of the fall (rise) in *u*

will therefore depend on the relative intensity with which nominal (and real) depreciation affects consumption demand and the behavior of exports and imports.

The preferences of the government as regards the exchange rate are unable to affect the equilibrium position of the economy in the medium run; it just influences the adjustment path. There is just one combination of *z* and *E* that ensures that the trade balance is in equilibrium. If in equilibrium *z* is given (as a result of firms' monopoly power) along with the structural parameters of the model that define the pattern of specialization, the only course of action open to the government is to adjust *E*, so that *q* moves to its equilibrium level. The government may choose *E* in the short run, but in the middle run it can only manage the transitional dynamics. This reinforces the importance of thinking of macro policies along with the industrial and technology policies which redefine the production structure beyond the short run.

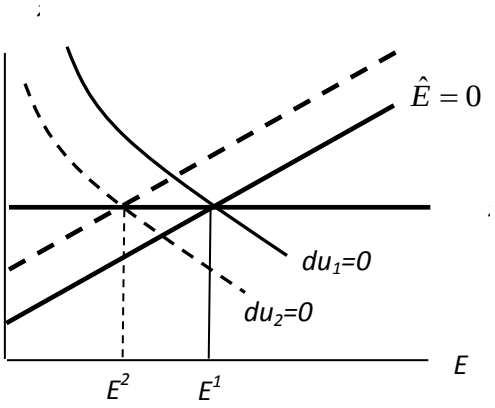
On the other hand, this rather simplified interaction between firms and governments is far from contemplating all possible scenarios associated with the specific political and institutional conditions of each country. In fact, firms may not be indifferent to the loss of international competitiveness and react by reducing the mark up factor. The latter should then be considered as a function of q — i.e. $z(q)$ with $z_q > 0$. If this is the case, then the exchange rate policy may not affect just transitional dynamics, but also the equilibrium outcomes. In the same vein, the government may selectively tax or subsidize exports and/or imports in order to redefine the configuration of prices in favor or against exporters, producers for the domestic market and workers. This kind of policy entails in practice the adoption of a system of multiple exchange rates, which strengthens the ability of the government to influence at the same time the trade balance and income distribution. Last but not least, income policies which impose restrictions to the velocity of the pass-through from the exchange rate to prices will keep ψ rather low. In this case, although equilibrium outcomes are not altered, the economy will go through longer periods of adjustment. The transitional dynamics would become more important than the attractor, reshaping the growth path and the political economy of conflicting claims in favor of income distribution.

The production structure and medium run equilibrium

The production structure influences the equilibrium position towards which the economy converges not solely in the short run, but also in the medium run. Equilibrium outcomes and the political constraints that governments face are closely associated with the parameters of the model in which the production structure is embedded.

For a given target of the profit share, the share of workers will be higher when non price competitiveness is higher (recall that the value of the parameter f_1 is a function of *h*). This allows capitalists to attain their desired target share with a lower *E* and hence with a higher σ. It also allows the government to attain external equilibrium with a lower *E*. This is shown in Figure 5, which represents the case of contractionary depreciations. A rise in *h* changes the intercept of the $\hat{E} = 0$ isocline, leading to a fall in *E*, from E^1 to E^2. As a result the utilization rate rises, as represented by the move from the iso-growth curve du_1 (full line) to du_2 (detached line, where $u_2 > u_1$). In fact, non-price competitiveness is not the only parameter that matters. A higher productivity of foreign inputs (*b*) also favors income distribution and competitiveness for a given level of *E* and π — and therefore produces a similar shift in the $\hat{E} = 0$ isocline.

Figure 5: A change in non-price competitiveness



There is another form in which the production structure impinges on the outcomes of the mode. Indeed, a constant labor share implies that the real wage increases at the same rate as labor productivity:

31) $\hat{W} - \hat{P} = \hat{a}$

A production structure which fosters faster technical change is an economy in which real wages are growing faster, even if the labor share remains constant or falls. In such an economy it is easier to arbitrate between competing claims on income of labor and capital without sacrificing equilibrium in the trade balance. A higher rate of growth of labor productivity tends to reduce the increase in prices and the wages/prices spiral that feeds inflation. For instance, in the case of contractionary depreciations, the move of the economy from point B in Figure 4 to its equilibrium value requires a time period in which inflation plus nominal devaluations exceed international inflation, with rising unemployment. Depending on the political conditions and the institutions of the labor market, it may be extremely difficult to manage such a process of adjustment. The chance that the wage-price spiral goes out of control is not negligible, especially if the pass-through from the nominal exchange rate to prices is high. Positive feedbacks in expectations (not included in the model) may indeed challenge the dynamic properties of the system and make it unstable. The political tensions produced by rising unemployment and the worsening of income distribution may not be manageable by the government.

In the case of expansionary depreciations, the move from B to the medium-run equilibrium in Figure 4 is facilitated by the fact that unemployment is falling as *E* increases. This makes exchange depreciations more palatable for workers (particularly if there is an increase in real wages associated with higher productivity growth), despite their negative impact on income distribution.

III. Monetary and fiscal policy in a context of conflicting claims

a) Real exchange rate and conflicting claims

The previous section assumed that workers accept (or have to accept) any income distribution arising out the divergence in preferences on the real exchange rate of government and firms. In many developing countries, however, unions are well organized and have non-negligible bargaining power, and/or the supply of labor cannot be considered to work à la Lewis (1954). As a result, when the firms set their mark up, unions react. Both unions and firms will seek to defend their desired share in total output and the real exchange rate will be the residual of

the conflicting claims process — *i.e.* the real exchange rate emerges out of the interplay of firms and workers, not between firms and the government.

The inflation rate can be obtained by taking derivatives of equation (1) with respect to time. To simplify and save notation, foreign inflation rate is set to zero. The domestic inflation rate is given by:

32) $\hat{P} = s(\hat{W} - \hat{a}) + (1-s)\hat{E}$

In equation (32) *s* is the relative weight of labor costs in total costs, $s = \sigma/(q+\sigma)$. The demand of nominal wages is given by:

33) $\hat{W} = \hat{P} + \hat{a} + \phi\left(\sigma^D - \sigma\right)$

There are three components in the demand for higher nominal wages: the first two terms aim to avoid any losses in labor share out of the increase in prices and labor productivity; the third term aims to raise the labor share when there is a difference between the effective (σ) and the target labor share (σ^D) desired by workers. The extent to which workers are able to bargain for (and obtain) nominal wage increases above what would be enough for them to keep their share in output (that is, any $\hat{W} > \hat{P} + \hat{a}$ or $\sigma^D > \sigma$) is given by the parameter ϕ, which measures workers' willingness and ability to do so. This parameter reflects structural or institutional features of the economy, and is therefore amenable to policy influence, at least to some extent, in the medium run.

The desired labor share is endogenous, as it depends on the demand for labor (proxied by *u*), which can be seen as a good proxy for the bargaining power of workers. In good times, it is less risky to heighten wage demands, as the economy is growing and the prospects of finding a new job elsewhere are favorable. On the other hand, when labor demand is weak and growth is feeble, unions revise downwards their aspirations and take a lower σ^D as a viable target. Therefore, σ^D will be a function of *u*, with $\sigma_u^D > 0$.[3]

[3] The degree of tightness of the labor market could also be measured by the rate of growth in employment. This may be expressed formally as follows: $\sigma^D = \chi + \lambda\hat{L}$, where χ and λ are positive parameters and $\hat{L}$ is the rate

Plugging (32) in (31):

34) $\hat{P} = s\left[\hat{P} + \sigma^D(u) - \sigma\right] + (1-s)\hat{E}$

It is straightforward that:

35) $\hat{P} = \dfrac{s\left[\sigma^D(u) - \sigma\right] + (1-s)\hat{E}}{1-s}$

Equation (34) gives the rate of inflation as a function of the nominal devaluation rate (pass-through), and the desired and effective labor shares in output. With constant foreign inflation, $\hat{q} = \hat{E} - \hat{P}$. Using this and $(s/(1-s) = \sigma/q)$ in equation (34), the following equation of motion is obtained for the real exchange rate:

36) $\hat{q} = \dfrac{\sigma\left[\sigma - \sigma^D(u)\right]}{q}$

It is assumed that the mark up is constant (i.e. firms change prices immediately in response to any change in productivity or costs), which in turn implies that the labor share only depends on *W* and *E*, which define *q*, i.e. $\sigma(q) = 1 - \left[(\bar{z}+1)/\bar{z}\right] - q/b$. The assumption of an instantaneous mark up adjustment amounts to assume that ψ is very high (more rigorously, $\psi = \infty$, i.e. the economy is always on the horizontal $\pi = \pi^D$ line).

The scenario to be considered throughout this section is one in which real depreciations hamper growth, i.e. $u_E < 0$. From these assumptions and equation (17), the utilization rate of the capital stock is a decreasing function of the real interest rate (*r*) and the real exchange rate (*q*): a higher interest rate reduces the demand for investment; and a rise in the real exchange rate implies a fall in *W* or a rise in *E* as compared to *P* (given *P** and *z*), which worsens income distribution and reduces domestic demand. Assuming a linear specification for the function $\sigma^D(u)$:

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of growth in employment given by $\hat{L} = \hat{Y}(u) - a$, where $\hat{Y}$ is the rate of growth in output — a function of *u* — and *a* is the exogenous rate of growth of labor productivity. It is straightforward that (for a constant *a*) conditions in the labor market will become more favorable to workers when *u* increases.

37) $\sigma^D = \sigma_0 + \eta u(r,q)$

Combining equations (37) and (36):

38) $\hat{q} = \frac{\sigma(q)}{q}[\sigma(q) - \sigma_0 - \eta u(r,q)]$

The partial derivatives u_r, u_q, and σ_q are all negative, with the corollary that the slope of the iso-curve $du = 0$, $d\pi / dq$, is negative.

The government uses monetary policy to correct unbalances in current account. It raises the interest rate when there is a trade deficit to attract more foreign capital (in order to finance the deficit) and reduce the rate of growth (and hence absorption). Formally:

39) $\hat{r} = \psi[m(r,q) - jq - hu^*]$

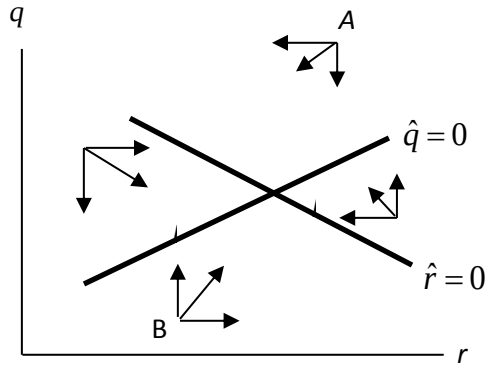
In equation (39), $m_r < 0$ and $m_r - j < 0$ (the sign of the latter is related to the Marshall-Lerner condition). Equations (38) and (39) form a dynamic system whose Jacobian is given by:

40) $$J = \begin{vmatrix} \frac{\partial \hat{q}}{\partial q} & \frac{\partial \hat{q}}{\partial r} \\ \frac{\partial \hat{r}}{\partial q} & \frac{\partial \hat{r}}{\partial r} \end{vmatrix} = \begin{vmatrix} (+)(-) & (+) \\ (-) & (-) \end{vmatrix}$$

A sufficient condition for stability is $J_{11} < 0$. A sufficient condition for $J_{11} < 0$, in turn, is $\sigma_q > \eta u_q$. This condition implies that the indirect effect (through u) of a real depreciation on workers' demands for a higher income share should be lower than the direct effect of a real depreciation on the effective workers' income share. If this restriction is not satisfied, the desired income share would be a moving target which workers would never be able to attain.

Figure 6 represents the phase diagram of the dynamic system in the case in which the stability conditions apply.

Figure 6: Monetary policy and the medium run equilibrium



The $\hat{q}=0$ isocline has a positive slope: to keep the real exchange rate stable, a high q (which means a more unequal income distribution) requires a high r (which means a higher level of unemployment). In other words, only a high unemployment would make workers accept the so low share in output implied by a high q. The $\hat{r}=0$ isocline in turn is negatively sloped: a low value of the interest rate (which heightens investment demand and growth) would be compatible with external equilibrium only if there is a high q (which sustains the competitiveness of exports).

Figure 6 illustrates the adjustment process. In point *A* the level of employment is low out of high real interest rates that constraints investments and growth. At the same time, q is high, which means a rather unequal income distribution and sluggish growth of domestic demand. Net exports are positive and this encourages the government to reduce the real interest rate to stimulate the economy and slow down the accumulation of reserves by the Central Bank. As the interest rate falls and economic activity reanimates wage demands, the real exchange rate begins to fall. The equilibrium features a better income distribution, a lower real interest rate and higher rates of capital accumulation and growth. This is a desirable path for most governments: rising growth and equality with external stability. But it is a path whose initial conditions are those of a highly depressed economy.

On the other hand, point *B* represents the opposite case, in which a low interest rate and high real wages are inconsistent with external equilibrium. Net exports are negative and the economy moves towards lower levels of activity, led by a recessive monetary policy. The

transition is particularly difficult as growth falls along with a worsening of income distribution. This initial position of the economy (*B*) is what the literature has called "exchange rate populism": the current account deficit opens room for the improvement in income distribution and consumption, which is financed by borrowing abroad. High levels of uncertainty are usually associated to low investment rate, which compromise the prospects of future growth. The distribution pattern that emerges cannot be sustained, except through a drastic reduction in the mark up, a rather infrequent prospect. If *z* is rigid, competitiveness could only be recovered by means of eroding income distribution. This is what happens as *q* goes upwards towards its equilibrium value.

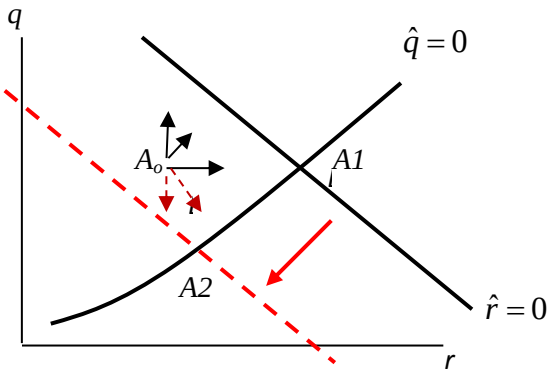
The importance of the structure of production in defining the nature of the equilibrium and the viability of the adjustment process can be seen in Figure 7.[4] A rise in non-price competitiveness shifts the $\hat{r} = 0$ isocline to the left (from the full curve to the dashed curve). As a result, external equilibrium can be obtained with a lower *r*, a lower *q* and a higher *u*. The new equilibrium (point *A*2) entails higher rates of capital accumulation and growth and a better income distribution than the old one (point *A1*).

Not only does *A*2 represent a Pareto-improvement with respect to *A*1. The adjustment process also becomes politically more viable and less vulnerable to an escalation of conflicting claims. Assume for instance that the economy is in point A_0 at the initial moment. If the economy has to move to *A1*, the traverse will require lower growth and increasing income inequality. On the other hand, if the equilibrium position is *A2*, the same initial condition will lead to a move in the opposite direction — a traverse that goes to higher growth, employment and equality. In both cases the real interest rate may rise, but the increase would be rather lower when the economy moves to point *A2* than to point *A1*. The transition associated with the new equilibrium *A2* is represented by the dashed arrows in Figure 7. This is a strong point that macroeconomic analysis frequently misses: t*o ease the problems of macroeconomic instability and the costs of the adjustment process, it is critical to have a policy for changing the structural parameters that define the medium run equilibrium of the economy.* A supply side focused on structural change

[4] Cordero (2004) allows for changes in the capital/labor ratio, while Vera (2010) discusses the impact of different trade structures on the conflicting claims dynamics and equilibrium outcomes. Cimoli and Soete (1992) and Razmi (2010) allow for the diversification of the production structure, and Razmi et al (2012) address the effect of the real exchange rate on the absorption of the labor surplus.

would make more manageable the medium run adjustments. As mentioned earlier, however, there are limits to a policy of facilitating the adjustment process through structural change. Not only changing the parameters of the system is a difficult challenge; in fact, some parametric changes may create short-run instability — such as for instance a marked increase on *k* or *b*.

Figure 7: A change in non-price competitiveness



A similar outcome to that produced by structural change raising non-price competitiveness may be obtained from a coordinated expansion of effective demand that raises *u**. An increase in *u** plays the same role as an increase in *h*, namely to shift downwards the $\hat{r}=0$ isocline. Indeed, at least a significant part of the current debate on how the weakest economies of the European Union may escape from a low-growth trap revolves around this issue. The lower *u**, the higher will be the need of either structural change or of a recessive monetary policy to restore external equilibrium.

For many observers, the problem of the peripheral European economies in the 2000s, or the Latin American economies in the 1980s, is a too high wage share or fiscal expenditure that compromises competitiveness and the trade balance[5]. This provides the rationale for the demands to reduce growth, which are intended to send a clear signal that actors will have to live "within their means" (consume less, save more). However, the same problem can be seen from a different angle. *The key challenge is the contradiction between the dismal growth of international effective demand and the intensity of the contraction in growth and wages that is*

[5] See Alesina et al (2012). The argument has been challenged by several authors: see for instance King et al (2011), Arestis and Sawyer (2011), Boyer (2012) and Perotti (2012).

needed to restore equilibrium in a poorly diversified production structure. In the case of developing economies, the intensity of the conflict in a scenario of recession is made still sharper by already very high initial levels of income inequality. For certain combinations of structural parameters and the conflicting claims dynamics, the costs of adjustment are so high that the very continuity of the policy is at risk of dismissal (and so is the political coalition in power). Economic history teaches that the "tighten your belt" policies are much more exposed to suffer dramatic changes and overturns out of political turmoil.

In the long run, only structural change cuts the Gordian knot. In the short run, in a context of unemployment, a better Pareto equilibrium will come out of boosting effective demand — by means of the coordinated expansion of the economy — than from the imposition of recessionary measures in the weakest side of the trade relation. When the option of a coordinated expansion is not available, or when expansionary measures fall short of what that is required for full recovery, countries would be inclined to engage in more active industrial and trade policies. This is why periods of very acute strains in the international economy, like the Great Depression or the Second World War, were as well periods in which developing economies more consistently sought to accomplish a thorough transformation of their production and specialization patterns. Clearly, the costs and difficulties of such a transformation are related not only to the complex domestic political economy, but to the readiness of the rest of the world to accept and adapt to changing patterns of production and trade.

Concluding remarks

The role of the production structure for growth and distribution is usually addressed in the literature from a longer run perspective. This paper discusses the role it plays in the short and medium run, looking at the transitional dynamics and equilibrium outcomes. In the medium run, the economy adjusts to comply with two equilibria, one represented by a solution to conflicting claims on income between workers and firms, and another represented by a stable current account/output ratio. The profit share, wage share and the real exchange rate adjust as the economy converges towards the medium run equilibrium. These variables are thus interconnected and define a trilemma by which it is not possible for workers and firms to attain

their desired income shares while at the same time the economy experiences external equilibrium. This often-ignored trilemma is expressed in the behavior of the different actors and their (explicit or implicit) preferences over the real exchange rate — firms adjusting the mark up factor, workers demanding and obtaining higher wages and the government adjusting the nominal exchange rate and the interest rate. Structural change allows for a way out of the trilemma as it redefines to some extent the value of the parameters of the model and makes possible higher rates of growth along with a better income distribution, both in the short run and in the medium run.

In particular, a higher non-price elasticity of demand for exports, a higher domestic share in the production of capital goods, and a higher productivity of imported inputs are critically important to attain both objectives (at least within certain limits associated with the effects of these parameters on the stability of the dynamic system). The corollary of this finding is that a better income distribution and high or full employment cannot be sustained solely by conventional fiscal and monetary policies; in fact, they require structural change — industrial and technological policies that redefine the parameters of the system as a form of reconciling conflicting claims with higher international competitiveness. The links between structural parameters and the short and medium run dynamics are an interesting form of combining the insights of Neo-Kaleckian models with those of the Keynesian literature based on BOP-constrained growth models in the Kaldor-Thirlwall tradition (which is described and evaluated in retrospect in Thirlwall, 2011). Non-price competitiveness is related to the income elasticity of the demand for exports and imports, which in turn reflect the production structure (and the associated pattern of specialization) of the economy.

Bibliography

Alesina, A., Favero, C. and Giavazzi, F. (2012) "The Output Effect of Fiscal Consolidations", *NBER Working Paper* 18336, August.

Arestis, P. and Sawyer, M. (2011) "A new paradigm for macroeconomic policy*", International Journal of Public Policy*, 7(1-3), 22-39.

Blecker, R. A. (1999) “Kaleckian macro models for open economies”, in J. Deprez & J. Harvey (eds.): *Foundations of International Economics: Post Keynesian Perspectives*, Routledge, London, pp. 116-49.

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*, Cheltenham, UK, Edward Elgar.

Boyer, R. (2012) “The four fallacies of contemporary austerity policies”, *Cambridge Journal of Economics*, 36(1), 283–312

Casetti, M. (2010) “Macroeconomic outcomes of changing bargaining relationships in open economies: the feasibility of a wage-led economy reconsidered”, *Discussion paper* 1004, University of Brescia.

Cimoli, M. and Soete, L. (1992) “A generalized technology gap trade model”, *Economie Appliquée*, 3(1), 33-54.

Cordero, J.A. (2004) “Devaluation, conflict inflation and endogenous growth in a small open economy”, *EconoQuantum*, Vol. 1 No. 1, pp. 3-15.

Frenkel, R. and Rapetti, M. (2011) “A Concise History of Exchange Rate Regimes in Latin America”, in Ocampo, J.A. and Ros, J. (2011) *The Oxford Handbook of Latin American Economics*, Oxford University Press.

King, L., Kitzon, M., Konselmann, S. and Wilkinson, F. (2011) “Making the same mistake again—or is this time different?”, *Cambridge Journal of Economics*, 36 (1): 1-15.

Krugman, P. and Taylor, L. (1978) “Contractionary effects of devaluation”, *Journal of International Economics*, 8(3), 445–456.

Lima, G. T. and Porcile, G. (2012) “Economic growth and income distribution with heterogeneous preferences on the real exchange rate”, *Journal of Post-Keynesian Economics*, 35(4), 651-674.

Mazzucatto, M. (2012) *The entrepreneurial state: debunking public versus private sector myths*, London: Anthem Press.

Ocampo, J. A., Rada, C. and Taylor, L. (2009) *Growth and Policy in Developing Countries: A Structuralist Approach*. New York: Columbia University Press.

Perotti, R. (2012) "The "austerity myth": gain without pain?", in: *Fiscal Policy after the Financial Crisis*, National Bureau of Economic Research, pp.307-354.

Rapetti, M. (2011) "Policy coordination in a competitive real exchange rate strategy for development", Working Paper 2011-09, Department of Economics, University of Massachusetts Amherst.

Razmi, A. (2010) "The exchange rate, diversification, and distribution in a modified Ricardian model with a continuum of goods", Working Paper 2010-06, Department of Economics, University of Massachusetts at Amherst.

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

Steindl, J. (1952) *Maturity and stagnation in American capitalism*. Oxford: Blackwell.

Thirlwall, A.P. (2011) "Balance of Payments Constrained Growth Models: History and Overview", *PSL Quarterly Review*, Vol. 64(259).

Vera, L. (2010) "Conflict Inflation: An Open Economy Approach", *Journal of Economic Studies*, 37 (10), 597-615.