

DEPARTMENT OF ECONOMICS WORKING PAPER SERIES

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Working Paper No: 2003-06

May 2003

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Abstract

This paper describes briefly the main alternatives to the dominant neoclassical theories of inflation, according to which inflation is always a monetary phenomenon. The model develops a cost-push approach, in which raising costs are mainly related to external constraints. Distributive conflict inflation is possible, but is not explored, in order to highlight the novelty of the model. Not only inflation is seen as resulting from balance of payments crises, but fiscal crises also are the result of the initial balance of payments crises within this framework. Fiscal deficits, and all other excess demand pressures, are absent, so that high levels of inflation are compatible with an economy that is below full employment, and stabilization is independent of fiscal adjustments.

JEL Codes: E120, E310, F310.

Acknowledgements: Paper presented at the Conference on “Post-Keynesian Economics: Theory and Policy,” May 13-14, 2001, Notre Dame University. I would like to thank, without implicating, Per Gunnar Berglund, Alcino F. Câmara Neto, Paul Davidson, Amitava Dutt, Julio Lopez, Alain Parguez, Franklin Serrano, Lance Taylor and other participants for their comments.

INTRODUCTION

Post-Keynesian authors have emphasized in the last decades that the balance of payments constitutes the main constraint to growth (Davidson, 1990). In this respect, post-Keynesians have refuted neoclassical views that assume a supply-constrained economy, and have extended Keynes's principle of effective demand into the long run. Hence, growth is seen as being demand-led. While these ideas are certainly important, post-Keynesians have neglected, for the most part, the importance of the balance of payments constraint in explanations of the inflationary phenomena.

Inflation is generally classified as being cost-push or demand-pull. Post-Keynesian authors tend to believe in cost-push inflation, whereas neoclassical authors tend to emphasize demand-pull inflation. However, the distinction is by no means rigid.¹ Keynes's inflationary gap story remains close to the notion that inflation is caused by excess demand, in particular, too much fiscal stimulus. It must be noted, however, that Keynes's discussion is mainly associated to the finance of the war effort, and should not be generalized. In peaceful times fiscal policy would impact the level of capacity utilization, rather than prices, in the Keynesian framework.

This paper describes briefly the main alternatives to the dominant neoclassical theories of inflation, according to which inflation is always a monetary phenomenon. There are three main

¹ Sraffian authors, on the other hand, have made a point of separating price and quantity dynamics. In fact, within the Sraffian approach the determination of relative prices is obtained while the level of output is given (Garegnani, 1984). The model developed in this paper will deal only with price dynamics, and hence it will assume that the level of output is fixed. However, it is important to notice that to the extent that inflation affects income distribution, it may have important effects on the level of activity.

alternative schools of thought, namely: the post-Keynesians (and Marxist), the structuralists and the inertialists or neo-structuralists.² To a certain extent, all these contributions are seen as precursors of the model developed here. The model develops a cost-push approach, in which raising costs are mainly related to external constraints. Distributive conflict inflation is possible, but is not explored, in order to highlight the novelty of the model.

PRECURSORS

According to the post-Keynesian approach inflation is the result of a conflict over the distribution of income. Rowthorn (1977) provides a possible formalization of post-Keynesian (and Marxist) views.³ In his model inflation increases profits by reducing the real purchasing power of workers, since the latter are not able to protect themselves against it. The model assumes that conflict is a direct function of effective demand, which in turn depends on the exogenous money supply. The main difference between Rowthorn's model and the conventional neoclassical story is that excess demand affects balance of power between workers and capitalists and only indirectly the price level. In the neoclassical approach demand affects prices directly.

Post-Keynesian authors have constructed conflict models of inflation in which excess demand is not a relevant component of the explanation. Further, in these models the money supply is

² The discussion is by no means conclusive. Some views are left out inevitably. Rowthorn (1977) is described as a model of both the post-Keynesian and Marxist views on inflation. This is open to criticism, but we believe that Rowthorn's emphasis on distributive conflict is characteristic of both groups. Also, the other two schools discussed are biased towards Latin American contributions. This in part reflects the belief that Latin American contributions on inflation have been quite relevant, and also, the fact that these contributions furnish the basis for the model developed in this paper. References to other schools, such as the Scandinavian and the German Balance of Payments School can be found on the footnotes.

endogenous. In other words, inflation reflects only the inconsistency of the desired mark up of firms and the target real wage that workers consider fair (Lavoie, 1992, pp. 372-421). However, most post-Keynesian models have neglected open economy considerations. Open economy matters have been central to structuralists.

Latin American structuralists also emphasize the role of distributive conflict within a cost-push approach. But, given the recurring balance of payments problems of the region, structuralist authors have paid more attention to balance of payments constraints.⁴ Juan Noyola (1956) and Osvaldo Sunkel (1958) are generally regarded as the seminal contributions to the structuralist theory of inflation. According to the structuralist view, inflation has its origins in the supply side. In that sense, excess demand caused by fiscal deficits is irrelevant. In particular, the inelasticity of food supply that results from the concentrated structure of land ownership is seen as the major cause of inflation (Cardoso, 1981).⁵

Also, the structural dependency of capital imports, and the lack of foreign reserves means that Latin American countries have recurrent balance of payments problems. Currency depreciation is endemic, with or without foreign exchange control or other types of capital control. Hence, depreciation is also seen as an essential part of the inflationary problem.

3 See also Coutts, Tarling and Wilkinson (1976).

4 On Latin American structuralists, and also the German Balance of Payments School, inflation theories, see Câmara and Vernengo (2001).

5 Canavese (1982) shows that there is a similarity between Latin American structuralists' views and the Scandinavian model of inflation. Both models can be seen as a formalization of the notion that different sectors have different rates of productivity growth. On the Scandinavian model see Frisch (1977).

In that sense, the structure of land ownership and the dependence on foreign exchange are seen as the main problems. Shocks to the terms of trade provide the spark that ignites the inflationary process. Structuralists emphasize both the shocks that initiate inflation and the propagation mechanism that maintain it alive. It must be noted that some structuralists, in particular Noyola (1956) and Furtado (1958, p. 226), argue that the propagation of inflation is the result of incompatible income claims. If after an inflationary shock a group is dissatisfied with its income share it will try to pass its losses to another group.

Further, for structuralists inflation is not a monetary phenomenon, and results from real disequilibria. Hence, monetary policy is a passive element in the inflationary process. The notion that monetary policy is passive is close to the post-Keynesian view on the endogeneity of the money supply as developed by Kaldor (1982) and Moore (1988).⁶ However, structuralist ideas have lost their appeal in the 1980s in the midst of the debt crisis and the failure of the heterodox stabilization plans.

Finally, neo-structuralists also provide an alternative view to monetarism. In particular, the Brazilian experience with indexation, and the failure of austerity measures to bring down inflation during the 1970s led many authors to argue that inflation in Brazil was mainly inertial.⁷ These authors called for a “heterodox shock” (Arida and Lara-Resende, 1985, Bresser e Nakano, 1987). Given their distrust in orthodox policies, the inertialist authors became known as neo-structuralists. However, the connection between inertialist and the old structuralists is almost

⁶ In many respects the structuralist discussion on passive money precedes the post-Keynesian discussion on endogenous money. See Olivera (1970).

⁷ Some post-Keynesians authors emphasized also the role of expectations in producing price inertia, rather than the role of contracts (Carvalho, 1993).

uniquely related to their common rejection of tight money policies. It is interesting to note that for them although inflation is essentially inertial, stability can only be achieved if fiscal balance is also present. Further, their argument assumes for the most part exogenous money supply.⁸

The failure of heterodox stabilization plans in Latin America led many neo-structuralist authors to rediscover orthodoxy. Amadeo (1994) suggests that in a wage-led economy, as many Latin American economies are assumed to be, a heterodox shock package involving wage, price and foreign exchange rate freeze and contract deindexation will increase effective demand. Rising effective demand is the result of the elimination of the inflation tax, and the fact that the redistribution of income towards workers leads to a consumption surge. As the economy is assumed to be near full employment, excess demand pulls up prices. Thus, according to this view a combination of austerity with a social compromise to reduce wage-price spirals is needed for a successful stabilization.⁹

All in all, it seems that the consensus forged in the 1990s assumes that although the heterodox views were relevant for the elimination of propagation mechanisms such as indexation, inflation is nevertheless a monetary phenomenon (Bruno, 1993).¹⁰ Moreover, one would expect that inflation by redistributing income towards capitalists would be stagnationist in a wage-led system, and stabilization would be expansionary. However, a cursory look at the data in Latin America shows that the 1990s, while providing stability, have been a second lost decade for most countries in the region (Stallings and Peres, 2000; Taylor, 2001).

⁸ Some neo-structuralists did incorporate the notion of endogenous money. See, for example, Bresser Pereira and Nakano (1987).

⁹ See Taylor (1991, pp. 99-105) for a formalization of these arguments.

The model presented below will formalize some of the structuralist views – while being consistent to the other heterodox traditions – and will show some of the reasons why stabilization has been successful in the 1990s. It will be argued that the main reason for stabilization was related to better external conditions, and that demand constraints or a social pact to restrict wages are not essential.

THE MODEL

The following model is an extension of structuralist ideas, and tries to show that stabilization does not depend on fiscal austerity. Distributive conflict may have a role, but for the most part is here relegated to a secondary plan. The main cause of inflation is a balance of payments crisis. This is seen as being consistent with the recent history of Latin America. External shocks affect the cost structure and may change the income distribution equilibrium of the economy. Wage indexation is the main propagation mechanism, however, inflation is not essentially inertial. That is not to say that formal contracts do not have a role in the inflationary process, but that for simplicity sake they can be eliminated without changing the picture significantly.

In the first place, we must look at the effects of the exchange rate dynamics. Many countries in Latin America from the 1960s onwards adopted depreciation rules to stimulate exports. Crawling pegs can have several objectives, such as keeping the trade account balanced, or keep

10 In fact some authors, such as Heymann and Leijonhufvud (1995) develop bridge models that incorporate elements of both neoclassicals and structuralists.

the real exchange rate constant and eliminate the difference between domestic and foreign inflation. We assume that the depreciation formula is given by

$$\frac{\dot{e}}{e} = \alpha \frac{\dot{p}}{p} + \beta(\bar{\varepsilon} - \varepsilon) \quad (1)$$

where the dot over the variables represents the time derivative, e stands for the nominal exchange rate, defined as the domestic price of foreign currency, p is the domestic price level, $\bar{\varepsilon}$ is the target real exchange rate and ε is the real exchange rate. The target real exchange rate is fixed by the central bank, which tries to guarantee that the real exchange rate is such that an export surplus to pay for the service of the foreign debt will always exist. Hence, when the costs of servicing the foreign debt increase the target real exchange rate will increase.¹¹

The rate of change of the real exchange rate is then given by

$$\frac{\dot{\varepsilon}}{\varepsilon} = (\alpha - 1) \frac{\dot{p}}{p} + \beta(\bar{\varepsilon} - \varepsilon) \quad (2)$$

where $0 < \alpha, \beta < 1$. In other words, the rate of change of the real exchange rate is inversely related to the rate of inflation.

¹¹ There are certainly other ways of establishing the target real exchange rate, e.g. one may assume that the central bank fixes the target as the exchange rate that would maintain the trade account balanced. The reason we chose the target as being the one that generates an export surplus sufficient to service the foreign debt, is related to the view that flow (export surplus) and stock (debt) stability is essential for policy makers. This might not always be true.

The next step is to look at the domestic price level dynamics. Real wage changes are also inversely related to the rate of inflation, since the change in the real wage can be defined as the difference between the change in the nominal wage and inflation. Also, we assume that the government imposes nominal wage increases that are proportional to the impact of domestic inflation on the nominal exchange rate. Thus, we have

$$\frac{\dot{\omega}}{\omega} = \frac{\dot{W}}{W} - \frac{\dot{p}}{p} = \gamma \frac{\dot{p}}{p} - \frac{\dot{p}}{p} = (\gamma - 1) \frac{\dot{p}}{p} \quad (3)$$

where ω is the real wage, W is the nominal wage, and γ is the adjustment coefficient and $0 < \gamma < 1$.

Further, firms determine their prices as a mark up on variable costs in the traditional Kaleckian way. This is represented by

$$p = \frac{(Wb - ep^*m)}{(1 - \pi)} \quad (4)$$

where b is the inverse of labour productivity, p^* is the price of imported goods, m is the import coefficient, and π is the share of profits in total income. We assume that the law of one price is not effective, and as a result domestic prices may differ from foreign prices. If the law of one price were effective, then we would have $p = p^*$ and either π or W would have to be endogenous. We take p^* equal to one, and assume for simplicity sake that it is constant.

Finally, the economy is divided between workers and capitalists, who try to increase their share on total income at the expense of each other. The profit share is positively related to the degree of monopoly as represented by the mark up. Hence, whenever the actual share of profits falls below the target share firms will increase domestic prices. This is represented as follows

$$\frac{\dot{p}}{p} = \bar{\pi} - \pi \quad (5)$$

where $\bar{\pi}$ represents the target profit share desired by capitalists. Also, for simplification we assume that whereas firms have the ability to impose a higher degree of monopoly, workers are relatively passive and are unable to fight reductions in their relative income share.

Equation (4) can be re-written as

$$\pi = 1 - \omega b - \varepsilon m \quad (6)$$

where all the variables have the usual meaning. From equations (1) to (6) we can derive the dynamic behaviour of the system, which sets the real exchange rate and the real wage in the economy. We have

$$\frac{\dot{\varepsilon}}{\varepsilon} = (\alpha - 1)(\bar{\pi} - 1 + \omega b + \varepsilon m) + \beta(\bar{\varepsilon} - \varepsilon) \quad (7)$$

$$\frac{\dot{\omega}}{\omega} = (\gamma - 1)(\bar{\pi} - 1 + \omega b + \varepsilon m) \quad (8)$$

Solution of the system formed by (7) and (8) is presented in figure 1. Initially assume that the real exchange rate and the real wage both rest in the ε -dot schedule. If ω increases, then π falls and for given π -bar prices will rise, pushing down the real exchange rate. In addition, assume that real exchange rate and the real wage lie in the ω -dot schedule. If ε increases, then π falls and for given π -bar prices will rise, pushing down the real wage rate. Stability requires that the ε -dot schedule is flatter than ω -dot schedule.¹²

FIGURE 1

Lets assume that an external shock affects the ability to service foreign debt, and as a result has an effect on the target real exchange rate. If the interest rate on foreign debt rises, then the target real exchange rate will have to be higher to generate a larger export surplus.¹³ Accordingly, the ε -dot schedule moves upwards and to the right and the real exchange rate depreciates. Depreciation, in turn, implies rising variable costs and a lower profit share, which leads to price

¹² We have

$$\frac{\partial \varepsilon}{\partial \omega} \Big|_{\varepsilon=0} = \frac{(1-\alpha)b}{(\alpha-1)m - \beta}$$

and

$$\frac{\partial \varepsilon}{\partial \omega} \Big|_{\omega=0} = -\frac{b}{m}$$

Simple inspection shows that both are negative since $1 < \alpha, \beta < 1$, and $b, m > 0$, which also guarantees that ε -dot is flatter than ω -dot, since $b\beta > 0$. Alternatively, we can see that the trace of the Jacobian is negative, since $(\alpha - 1)m + \beta + (\gamma - 1)b < 0$, and the determinant of the Jacobian will be positive when $\delta(m - b) - \beta > 0$, where $\delta = [(\alpha - 1) - (\gamma - 1)]$, and hence the system will be stable.

¹³ We assume that the so-called Marshall-Lerner condition is satisfied. This example is based on the Latin American debt crises. In that episode the hike on foreign interest rates forced more depreciated exchange rates in order to obtain export surpluses to serve the foreign debt.

inflation for given π -bar. Nominal wages are readjusted, but less than fully, since $0 < \gamma < 1$. Therefore, in the new equilibrium the real wage is smaller than before the external shock, as shown in figure 2. Furthermore, if the economy is wage-led, then a reduction in real wages has a negative effect on capacity utilization and the economy stagnates. In sum, the external shock leads to stagflation.¹⁴

FIGURE 2

Inflation in this model is represented by the transition between the two steady-states (E_0 and E_1). Exchange rates are depreciated to bring enough export surpluses to service the debt, and real wages are brought down. These results are in accordance with the stylised facts of high inflation and hyperinflation situations.

Stabilization in this case requires a solution for the balance of payments crises. Short run solutions may require a contraction of domestic demand. In the long run a reversion of capital flows may reduce the external pressure, and allow for a more appreciated exchange rate target. The $\dot{\varepsilon}$ curve moves inwards, and deflationary pressures are then felt. Other things equal, stabilization might have a positive effect on income distribution by allowing for a higher real wage.

Stabilization can be represented a by a positive external shock. A recession in the creditor countries that forces a reduction in foreign interest rates allows a reduction of the target real

¹⁴ The introduction of staggered price and wages adjustments would lead to inflationary inertia. Inertia and a stable adjustment process as the one presented fit the stylised facts in Latin America, where some countries suffered

exchange rate, since lower interest rates reduce the costs of debt servicing.¹⁵ This leads to an inward change of the ε -dot schedule and the real exchange rate appreciates. Appreciation, in turn, implies falling variable costs and a higher profit share, which leads to price deflation for given π -bar. Nominal wages are readjusted, but less than fully; hence the real wage is higher than before the positive external shock. Thus, initially at least the stabilization process goes hand in hand with an improvement of income distribution.

Wilkinson (2000) has suggested recently that external conditions might also be important in the explanation of stabilization in developed countries in the 1990s. For him, the fall in inflation can be explained by reductions in import prices, which redistributed resources from developing to developed countries. In addition, this for him suggests that monetary controls work indirectly on inflation by lowering economic activity and by reducing the bargaining power of the relatively weak.

Two points must be then emphasized regarding stabilization. First, progressive income distribution may very well lead to higher levels of capacity utilization and growth. However, there is no reason for higher effective demand to affect prices in the model presented. Higher effective demand will only have an impact on prices if it affects the income distribution equilibrium. Also, other macroeconomic factors may reverse the initial positive effects on income distribution and growth.

high but relatively stable inflation. We assume continuous adjustment for simplicity.

¹⁵ The US recession of the early 1990s and the lower interest rates that followed – together with the Brady Plan – are usually part of the explanation of the increase of capital flows to Latin America.

Second, and more importantly, the appreciated currency may imply that interest rates are kept high in order to attract foreign reserves, to defend the currency, on the one hand, and to close the balance of payments, on the other, since the appreciated currency leads to current account deficits. High interest rates, on the other hand, have a negative impact on debt servicing.

Increased debt servicing means, as the experience of some Latin American countries shows, that even if primary balances (excluding interest payments) are in surplus, operational balances (including real interest payments) will be deeply in red. Hence, fiscal crises are the result and not the cause of inflationary crises, and may not disappear with stabilization.

In fact, without the depreciation of the value of accumulated debt (non indexed bonds) caused by inflation, one would expect that fiscal crises get worse during the stabilization process. Also, since stabilization requires a relatively appreciated currency, which leads to current account deficits, then foreign debt also piles up. The effect is the accumulation of twin debts (foreign and domestic).

This set up imposes severe trade offs for policy makers. In particular, the central bank has to decide whether to keep a high rate of interest, in order to maintain the appreciated currency and stability, on the one hand, or to reduce interest rates, to avoid the increase of the fiscal deficit. Recent experience in Latin America shows that most Central Bankers will take the first route to its ultimate consequences, that is, to the point that no interest rate is high enough to attract capital, and the exchange rate must be floated (usually concomitantly with default).

Several other adjustments are not explored in this paper. A reduction of β , the rate of adjustment of the real exchange rate, for example, would also have inflationary consequences. Propagation mechanisms are ignored. However, the model sheds light into the dynamics of inflationary processes in the open economy, in which excess demand has no role. Further, the often-neglected role of the balance of payments in originating inflationary processes is central to this model.

CONCLUSION

The conventional view of inflation in the developed world has been based on the quantity theory of money. Post-Keynesians, structuralists and inertialists have challenged this view, and put forward a view of inflation based on distributive conflict, propagation mechanisms and balance of payments problems. This paper provides a model that emphasizes the role of the balance of payments constraint.

Not only inflation is seen as resulting from balance of payments crises, but fiscal crises also are the result of the initial balance of payments crises within this framework. It is important to note that fiscal deficits, and all other excess demand pressures are absent, so that high levels of inflation are compatible with an economy that is below full employment, and stabilization is independent of fiscal adjustments. However, this does not imply that the model has no fiscal implications. The target real exchange rate is manipulated through the interest rate. Higher interest rates needed to maintain an appreciated exchange rate impose higher debt servicing costs. Hence, this approach emphasizes the harsh trade offs imposed on central bankers.

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