2023

Conflict Fuels Inflation But the Tinder Lies Elsewhere: Eclectic Structuralist Thoughts in a Developing Economy Context

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June 23, 2023

Abstract

Developing country inflation is in the headlines again. Mainstream macroeconomics typically ignores the role of conflict while non-mainstream work tends to ignore macroeconomic constraints. This paper revisits the issue employing a dependent economy framework with eclectic characteristics. Specifically, I explore the mechanisms that propagate both real and monetary sources of inflation in the presence of real wage resistance and distributional conflict. The analysis shows that the inability to pay for subsidies with taxes or bond issuance in a stylized developing economy could create a situation where a relatively small shock leads to sustained and accelerating inflation and a wage-price spiral, thanks to conflicting claims on income. Subsidies to protect consumers from external price shocks could, similarly, leave a country vulnerable to accelerating wage-price spirals as the relative price effects of a declining foreign asset position are dampened.

Distributional conflict thus plays the role of sustainer rather than the *primum mobile*. Price controls could, in theory, better enable inflation management if these do not result in redistribution towards spenders. Such controls, however, create other trade-offs for countries facing balance-of-payments fragility.

JEL classifications: E31, O23, E64, F41.

Keywords: Budget deficits, seigniorage, distributional conflict, consumption subsidies, price controls, structuralist macroeconomics.

Acknowledgement 1 *I should thank the participants of the Analytical Political Economy Workshop held on May 19-20, 2023 for their useful questions and comments.*

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1 Introduction

Low levels of institutional and economic development hinder deployment of fiscal and monetary policies in developing countries. Fiscal policy, for example, is constrained by the inability to collect sufficient tax revenues or borrow (domestically or internationally) at low rates, often forcing reliance on seigniorage revenues. This, in turn, frequently leads to balance of payments crisis and chronic or hyper inflation. Monetary policy, in the meantime, is constrained by lack of financial depth and central bank credibility, among other factors. These constraints assume added importance in periods when inflation is running hot and conflict over distributional shares becomes a more immediate concern.

Speaking of inflation, after a long time, it's back in the headlines across the world. Following decades of calm, suddenly high-income economies such as the United States and the Eurozone are faced with the challenge of suppressing inflation. Prices across many developing economies have risen even faster with inflation exceeding 80 percent in Lebanon, Turkey and Argentina, for example. Increased inflation has crucial implications for income distribution, societal welfare, and economic well-being. This is particularly true for developing countries, where most of the population has limited insurance against inflation in the form of financial wealth. The last time the world economy in general experienced a sustained bout of heightened inflation was almost half a century ago. The macroeconomic turbulence of the 1970s and 80s was followed by accelerated distributional conflict, crises, chronic inflation, and structural adjustment programs in a number of developing countries, especially following the Latin American debt crisis that began in 1982. There is a reasonable concern that something similar could play out in the post-COVID era.

I study, the interactions of distributional conflict with two other macroeconomic considerations: (1) seigniorage, i.e., the monetary financing of fiscal deficits, and (2) the current account balance in an economy that trades in international asset markets. I employ a two-sector model of a developing economy with a sector that produces tradable goods and another that produces non-tradables. The model combines elements of structuralist and more orthodox approaches. Structuralists emphasize distributional conflict (or real wage resistance) and rigidities on the output side. More mainstream approaches highlight the role of monetary aggregates, subsidies, government budget constraints, and aggregate demand.[1] Unlike the typical structuralist contribution, the present model incorporates asset markets, including foreign assets, and government budget constraints. I do not, however, incorporate the dynamics of evolving expectations and view this as an important omission that I make in the interest of greater focus on the highlighted issues.

The main conclusion of the paper is that, even in the absence of self-fulfilling expectations, distributional conflict can interact with asset market developments to generate explosive wage-price spirals and that there may be no mechanisms within the system that would significantly dampen such spirals. Although distributional conflict is not the *primum mobile*, it does provide the fuel for the spark. Price control measures and subsidies may not

[1] See, however, Lorenzoni and Werning (2023) for an interesting recent contribution that focuses on distributional conflict.

be effective in constraining the resulting inflation for long unless blanket controls across the board can be effectively maintained, with all its political and economic costs, a condition beyond the implementation capacities of many developing country governments. Other macroeconomic measures can help but both structuralist and mainstream analysis point to the gravity of the problem once the genie has been unleashed. Distributional conflict is the fuel which helps propagate and sustain inflation even though the primal force lies elsewhere.

It is important at the outset to lay out explicitly what this paper is and is not. I highlight some meta conditions that can make inflation self-sustaining with distributional conflict as the sustaining mechanism. I do not carry out an in-depth study of the primary causes of inflation or investigate in any depth the raison d'etre of the mechanisms that sustain inflation once it accelerates. As mentioned earlier, I do not incorporate expectations in any significant manner – which is a glaring omission – in order to focus on other equally important mechanisms that sustain inflation.

The next section provides a broad overview of the literature. Section 3 develops the basic framework that combines elements of structuralist and more mainstream analysis and carries out some thought experiments to explore the short-run properties of the system. Sections 4 and 5 then extend the framework by incorporating asset accumulation to analyze the feedback mechanisms that allow different shocks to generate wage-price spirals. Section 6 concludes.

2 Broad Overview of Literature

The literature that emerged from the widespread high inflation episodes of the 1970s and 1980s largely reflected the monetarist concerns with money and aggregate demand-driven inflation. Milton Friedman memorably put it in an overtly polemic phrase: "Inflation is always and everywhere a monetary phenomenon, in the sense that it is and can be produced only by a more rapid increase in the quantity of money than in output." Or as others would put it, sustained inflation is the outcome of too much money chasing too few goods.

The structuralist school, going back to early work by Sunkel (1960) and Olivera (1964), on the other hand, gives primacy of blame to price rigidities and structural bottlenecks – especially, in food production – with the supply of money passively adjusting to demand. In particular, inflation is an outcome of inconsistent claims on national income.[2]

Cardoso (1981) is perhaps the canonical analytical presentation of the structuralist approach to inflation. In the baseline version of the model, industrial prices are set as mark-ups over costs while the food sector is competitive and prices are market-determined. An increase in spending on industrial goods, brings forth greater purchasing power and demand for food. Due to the presence of supply-side bottlenecks, however, this translates into higher food prices. Workers have a target real wage; any deviation from this target sets into motion distributional conflict as workers demand higher wages to achieve their target. We have the potential for a wage-price spiral with persistent inflation. To see this, consider that there are three conditions that would be needed for the system to be in the steady

[2] See Rowthorn (1977) for an early analytical exposition, and Lavoie (2014) and Blecker and Setterfield (2019) for detailed treatments. Also, see Blanchard (1985) for a treatment in the neo-Keynesian tradition.

state, zero excess demand or supply for each good and a real wage that is at the level that eliminates distributional conflict. Since there are only two adjusting variables (industrial output and the relative price of food), this means that the system is underdetermined and we could have persistent wage and goods price inflation even if the excess demand in the goods markets is removed.

Rodriguez (1982) develops a model to incorporate key features of the Argentinean stabilization plan of 1979. The economy has two sectors, a fixed exchange rate, and endogenous money supply. Inflation in the tradable sector is determined by the international rate of inflation while non-tradable inflation is determined by adaptive expectations and the extent of excess supply/demand. Thus, the pre-determined rate of exchange rate devaluation is the main instrument of inflation control. Given this set-up, the paper explores the stability properties of the system and the short-run and steady state effects of various shocks.

Vines et al. (1989) utilizes a structuralist framework to analyze the effects of subsidies on inflation. Their economy consists of a food-producing sector (with supply rigidities) and a non-food producing industrial one. As in Cardoso (1981), the price of the industrial good is set as a mark-up over costs and there is real wage resistance. The innovation introduced by the paper is to incorporate monetarist features in the form of money creation to finance food subsidies within a government budget constraint. They find that subsidies can have ambiguous effects on inflation. On the one hand, by reducing food consumption costs, they bring down inflation in the short run. By boosting food consumption, on the other hand, they generate upward pressure on demand and prices. Over time, asset evolution comes into play and the effect of subsidies on inflation becomes more ambiguous thanks to the possibility of rising tax revenues as the industrial sector expands and to the money balance effect on demand (which operates through the erosion of the real value of assets by inflation). Thus, the presence of monetarist features is likely, but not certain, to enhance the possibility of inflation resulting from subsidies.

To sum up, the last round of high global inflation in the 1970s and 80s gave rise to a body of theoretical literature that tried to identify key sources and mechanisms underlying inflation. Now that many developing countries face another such round, it is a good time to revisit and update this literature in light of changes in the global trade and financial architecture. This paper aims to help extend the literature in this direction. Global trade liberalization and increasing tradability of agricultural products means that food bottlenecks can now be mitigated more easily through food imports. Indeed many governments have responded to recent conditions by increasingly subsidizing consumption of tradable goods such as food and fuel.[3] International financial account liberalization makes it much more important to incorporate trade in assets denominated in a foreign currency. Unlike some of the earlier literature like Cardoso (1981) I, therefore, introduce international tradabiliity as a feature of the subsidized good. This allows me to study not just the direct impact of subsidies on inflation but also that through international asset accumulation and the resulting consequences for the current account. Moreover, unlike this literature, industrial goods are treated as highly tradable so that their prices are determined in the international

[3] One study, Bril-Mascarenhas and Post (2015), reported that consumer fuel subsidies alone approach or even exceed total public expenditures on health and education programs in several developing countries.

markets. Another difference from the bulk of existing structuralist literature is that money is not passive and, given a government balance sheet constraint, issuance is employed by policy makers to finance deficits. This allows me to consider seigniorage and asset erosion effects. The presence of foreign-currency denominated assets extends the scope of existing studies to consider interactions between the current account and asset portfolios in a dynamic context. The set-up in the current paper incorporates differential saving behavior between workers and owners of capital, which assumes importance when price controls are examined. Finally, unlike some of the existing studies, including the ones mentioned earlier, I explicitly analyze the dynamics of wage adjustment and its dependence on the prevailing business cycle conditions.

I find that both monetary financing of deficits and subsidization of tradable consumption can act as background factors that provide the fuel for sustained and accelerating inflation to take off once distributional conflict gets under way. A situation could develop where there is no level of the nominal wage that is consistent with: (1) a stable money market and/or (2) a balanced current account. In the first case this instability emerges from low initial tax revenues while in the second case it originates from the subsidization of tradable consumption.

3 Basic framework

I analyze interactions between the goods and asset markets in an inflationary environment. For our purposes, it is convenient to merge the monetary and fiscal authorities into a single consolidated policy authority that carries out interventions to defend the exchange rate at any instant, and finances fiscal deficits over time. Let's consider first the market for financial assets. There are three assets: high-powered money, domestic bonds, and foreign bonds.[4] The level of high-powered money supply (M) is pre-determined. In the short-run, it is set by the consolidated authority, which adjusts the interest rate to maintain money market equilibrium. Over time, the authority issues money to finance budget deficits. The total amount of domestic bonds issued (B), which are held only by domestic residents and institutions, is constant in our time frame, indicating a government that has to resort either to seigniorage or taxes to finance new spending. This captures the relatively low level of bond market development and greater extent of seigniorage-dependence in low-income economies. In addition, the economy accumulates (decumulates) foreign currency-denominated bonds (F) through current account surpluses (deficits). These bonds, issued by the rest of the world, are divided between those held by the consolidated authority (F_g), domestic residents (F_p), and residents of the rest of the world. Table 1, with some of the notation defined further down, presents the basic accounting framework.

At a point in time, the allocation of a given wealth portfolio across foreign and domestic assets is a stock equilibrium problem. With a fixed exchange rate, E, the composition of the consolidated authority's holdings between different financial assets is endogenous. If there is excess demand for money, for instance, the authority maintains M and defends the

[4] The bonds are short term so that their capital value is essentially independent of the interest rate.

Table 1: Accounting matrix for real and financial flows

	Private sector	Consolidated authority	ROW	$\sum$
Foreign currency bonds	$\Delta(EF_p)$	$\Delta(EF_g)$	ΔEF^*	0
Cash	ΔM	$-\Delta M$	-	0
Domestic currency bonds	ΔB_p	ΔB^g	-	0
Goods	$I - S$	$G - T$	CA	0

*Superscripts denote the source of issue. "ROW" abbreviates "Rest of the world."

exchange rate by selling domestic bonds in exchange for foreign bonds such that $\Delta(EF_g) = -\Delta B^g = \Delta B_p = -\Delta(EF_p)$, and domestic wealth in private hands, W, is unchanged, as is the sum of domestic and foreign bonds in private hands.

In line with standard portfolio balance specifications, asset market equilibrium conditions are captured by equations (1)-(4).

$$M = l(i, i^*, y)W;\ l_i,\ l_{i^*} < 0,\ l_y > 0 \tag{1}$$

$$B_p = b(i, i^*, y)W;\ b_i > 0,\ b_{i^*},\ b_y < 0 \tag{2}$$

$$EF_p = f(i, i^*)W;\ f_i < 0,\ f_{i^*} > 0 \tag{3}$$

$$W = M + B + EF_p \tag{4}$$

Asset demands are homogenous in real wealth and the asset demand functions capture shares that must add up to unity ($l + b + f \equiv 1$). The signs of the partial derivatives indicate that the assets are gross substitutes; $l_i + b_i + f_i = 0$.[5] Also, given the transactions demand for money, $l_y + b_y = 0$.

The system above consists of four equations, only 3 of which are independent. With real wealth pre-determined at any instant, and as mentioned earlier, with the sum of domestic and foreign bonds being given, the varying composition on the authority's balance sheet is reflected in the private balance sheets, so that we are left with only two independent equations.[6] Plugging the definition of wealth (equation (4)) into the money market equilibrium equation yields our asset market equilibrium condition:

$$M = l(i, i^*, y)(M + B_p + EF_p) \tag{5}$$

As mentioned earlier, at any instant, the policy authority varies the composition of its balance sheets to adjust the interest rate to a level that achieves money market equilibrium.

[5] Note that, if domestic and foreign bonds were perfect substitutes, a credibly fixed exchange rate would imply, in the absence of a risk premium, that $i = i^*$.

[6] In other words, $B_p + EF_p$ is constant, and $\Delta(B_p + EF_p) = -\Delta(B^g + EF_g)$.

3.1 The Goods Market

In the analysis that follows, I will consider a two-good "dependent economy" framework. The price of the tradable good, denoted by P_T, is determined in international markets while that of the non-tradable good, P_N, is determined by domestic mark-ups and wage costs in the standard neo-Kaleckian manner. Denoting the exogenously given international price by P_T^*, the nominal wage by V, and the mark-up rate by τ,

$$P_T = EP_T^* \tag{6}$$

$$P_N = (1+\tau)V \tag{7}$$

Private sector real pre-tax income from the goods market, y is defined as:

$$y = \frac{Y}{P} \tag{8}$$

where $Y \equiv Y_N + Y_T = P_N y_N + P_T y_T$, and P is a share-weighted price index. That is, denoting the share of non-tradables by α,

$$P = P_N^{\alpha} P_T^{1-\alpha} \tag{9}$$

The consumption of the tradable good (food, fuel, etc.) is subsidized at a rate σ, which is a fixed proportion of the price. The consumer price index and the real exchange rate facing consumers can then be defined as:

$$P_c = P_N^{\alpha} \left[(1-\sigma)P_T\right]^{1-\alpha} \tag{10}$$

$$q = \frac{(1-\sigma)P_T}{P_N} = \frac{1-\sigma}{1+\tau}\frac{P_T}{V} \tag{11}$$

where the right-most expression in equation (11) employs equation (7). A higher subsidy, therefore, translates into a real appreciation (downward movement of q). Standard definitions follow for the real interest rate, r, and the profit share of value-added, Ω.

$$r = i - \pi^e,\ \Omega = \frac{\tau}{1+\tau}$$

where i and π^e are the nominal interest rate and expected inflation. I will assume that people expect the rate of inflation to move in line with international inflation over the long run, and see short-run deviations as transitory. This enables me to abstract away from expectation evolution as a driver of instability, and focus on other factors of key interest for this paper. Thus, denoting the rate of nominal devaluation by ε,

$$r = i - \varepsilon - \pi_T^* \tag{12}$$

Next, let's turn to defining consumption behavior in the goods market. Consumption in terms of the consumption price index can be specified in the standard manner as a function of

domestic consumer after-tax real income (from both goods production and financial assets) and real money balances ($m \equiv M/P$).[7]

$$P_C C_R = C = [(1-t)c(\Omega, r)y]\, P + Er^* F \tag{13}$$

where C is nominal consumption, C_R is real consumption in terms of the consumer price index, and c is the marginal propensity to consume, which is a negative function of the profit share and the real interest rate, i.e., c_Ω, $c_r < 0$. The former partial derivative captures the standard Post Keynesian assumption that the propensity to consume is lower out of profit income.

The consumption of each good, in turn, is a function of total consumption and the relative price. Assuming Cobb-Douglas preferences,

$$c_N = c_N(C_R, q) = \frac{\alpha}{P_N}\left\{[(1-t)c(\Omega, r)y]\, P + Er^* F\right\} \tag{14}$$

$$c_T = c_T(C_R, q) = \frac{(1-\alpha)}{(1-\sigma)P_T}\left\{[(1-t)c(\Omega, r)y]\, P + Er^* F\right\} \tag{15}$$

with c_{NC}, c_{TC}, $c_{Nq} > 0$ and $c_{Tq} < 0$. Note that, with utility maximizing consumers, relative consumption is a function of relative prices but aggregate output is not.[8] Moreover, the ratio of the output price index, P, to that of consumption, P_C, i.e., $(1-\sigma)^{\alpha-1}$ is a positive function of the subsidy rate.

To focus on our issues of interest, i.e., budget and current account deficits, distribution, and seigniorage, I ignore investment spending and its effect on long-run accumulation, technological progress, and growth. Suppose, therefore, that output of the tradable sector, traditionally the modern/capital intensive sector in developing countries, is fixed and represented by $\bar{y}_T$. Output in the non-tradable sector is demand-determined and produced using labor only. Assuming a fixed unit labor coefficient in the non-tradable sector (which is normalized to unity),

$$y_N = L_N \tag{16}$$

[7] I am ignoring interest payments on domestic bonds for simplicity. The strength of this assumption is mitigated by the fact that the volume of bonds is fixed, these interest payments represent within country transfers, and the key interest rate effect on consumption has already been incorporated through the marginal propensity to consume (see below).

Also, I ignore the permanent income component of consumption. In developing countries, income volatility and financial frictions mean that consumption smoothing is often an illusory option. Relevant exceptions include, of course, a large natural resource discovery that credibly raises expectations of future dividends.

[8] Using circumflexes to denote growth rates (or log derivatives),

$$\hat{y} = \alpha\hat{y}_N + (1-\alpha)\hat{y}_T$$

The government spends on both goods, as represented by g_T and g_N, defined in terms of the respective good prices. The trade balance (TB) is, by definition, domestic spending on tradables in excess of output. Employing equation (15),

$$TB = \bar{y}_T - c_T - g_T = \bar{y}_T - \frac{(1-\alpha)}{(1-\sigma)P_T}C - g_T \tag{17}$$

The expression for the current account, i.e. the trade balance plus international investment income, follows:

$$CA = \bar{y}_T - c_T - g_T + \frac{Er^*F}{P_T} = \bar{y}_T - \frac{(1-\alpha)}{(1-\sigma)P_T}C - g_T + \frac{Er^*F}{P_T} \tag{18}$$

It is time, finally to close and summarize the system through equilibrium conditions. Since I do not assume a balanced current account in the short run, there are two of these, one for the asset market (already presented by equation (5)), and the other for the non-tradable good market clearing:

$$y_N = c_N + g_N \tag{19}$$

Two variables, the short term rate i and non-tradable output L_N, adjust to simultaneously satisfy these two conditions.

I turn next to an analysis of the short-run properties of this system. Section 4 will then consider deficit financing in the presence of distributional conflict.

3.2 Preliminaries

Let's look at the short-run impacts of changes in exogenous variables in order to lay the groundwork for the dynamic analysis. Our system consisting of eqs. (5) and (19) can be summarized, after substituting from equation (14) into the latter, as:

$$H(L_N, i; \chi) = g_N + \frac{\alpha}{P_N}\left\{[(1-t)c(\Omega, r)y]\,P + Er^*F\right\} - L_N = 0 \tag{20}$$

$$K(L_N, i; \chi) = l(i, i^*, y)W - M = 0 \tag{21}$$

where χ denotes a vector of exogenous variables and parameters. Once we have solved for the equilibrium solutions for L_N and i, eqs. (17) and (18) yield the trade and current account balances.

One can use Figure 1 to illustrate the system. The $NN-$ and $MM-$curves represent the non-tradable good and money market, respectively. The slope of the latter is standard and self-explanatory. Regarding the former curve, which is a version of the standard IS-curve, consider that an increase in output in the non-tradable sector produces excess supply of goods (a version of the Keynesian stability condition). The interest rate must decline to be compatible with non-tradable sector equilibrium.

Let's put the system through its paces.

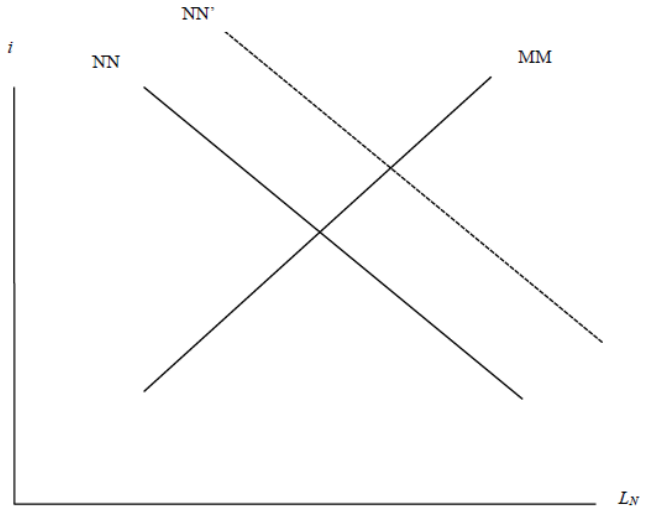

Figure 1: The goods and money markets in the short-run.

Fiscal expansion

What are the short-run effects of a fiscal expansion with the spending directed toward non-tradables (we turn to tradables shortly)?[9] This is in line with empirical evidence that government spending is typically significantly skewed toward non-tradables. The comparative static outcomes are as follows:

$$\frac{dL_N}{dg_N} = -\frac{l_i W}{\Delta_1} > 0, \; \frac{di}{dg_N} = \frac{l_y W}{\Delta_1} > 0$$

and, finally,

$$\frac{dCA}{dg_N} = -\frac{(1-\alpha)}{(1-\sigma)P_T}\frac{(1-t)}{\Delta_1}\left[c_r l_y Y - cP_N l_i\right] WP < 0$$

where $\Delta_1 = \left[\alpha(1-t)c(\Omega, r) - 1\right] l_i W - \frac{\alpha}{P_N}(1-t)c_r P l_y W > 0$ as long as the term in the first set of square parentheses is negative (which is a standard Keynesian stability condition; sufficient here but not necessary). The sign for dCA/dg_N assumes a weak interest rate effect on consumption. I'll make this assumption throughout the rest of this section whenever it helps resolve ambiguity in a comparative static sign. It is in line with a consistent finding in the literature that interest rate effects on saving tend to be much weaker in developing countries due to shallow financial markets.

[9] Here I simply assume an increase in g_N or g_T. A tax-financed increase will have qualitatively similar consequences.

In terms of Figure 1, the NN-curve shifts up and to the right. An increase in government spending creates excess demand for non-tradables. Since output in this sector is demand-driven, and increased output generates excess demand for money, both L_N and i end up higher. Higher spending turns the trade balance and the current account negative, although the higher interest rate has the opposite effect. Again, this latter effect is generally found to be small in developing countries.

How about a fiscal expansion directed toward the consumption of tradables? Now there is no direct impact on the goods market. An exactly offsetting trade and current account deficit develops, however (i.e., $dCA/dg_T = -1$).

Table 2 summarizes the comparative static results for this section and the next one.[10]

Table 2: Comparative statics

	Endogenous variables			
	L_N	i	CA	F_g
Section 3.2				
g_N	+	+	−	+
g_T	0	0	−	0
m	+	−	−	−
V	−	−	+	−
V (with price controls)	+	+	−	+
σ	0	0	−	0
P_T (with price controls)	0	0	−	0

	L_N	E	CA
Section 5			
g_N	+	−	−
g_T	0	0	−
F	0	−	+/−
V	−	+	−
V (with price controls)	+	−	−
σ	0	0	−
P_T (with price controls)	0	0	−

Increased money supply

Suppose there is a one-time increase in the money supply that is not part of an open market operation; we are considering a "helicopter drop." The direct effect on the asset market is to lower the interest rate which then boosts spending and non-tradable output. If the direct effect of increased money supply on the money market dominates, the interest

[10] The results for F_g are based on equation (3) and that $\Delta F_p + \Delta F_g = 0$ at any given instant.

rate is lower in the new equilibrium. The lower interest rate also creates more demand for money and foreign bonds, so that F_p increases at the expense of F_g. Official foreign exchange reserves have declined.

$$\frac{dL_N}{dm} = -\frac{\frac{\alpha}{P_N}\left[(1-t)(1-l)c_r yP\right]}{\Delta_1} > 0, \; \frac{di}{dm} = \frac{\left[\frac{\alpha}{P_N}(1-t)cP - 1\right](1-l)}{\Delta_1} < 0$$

Finally,

$$\frac{dCA}{dm} = -\frac{(1-\alpha)}{(1-\sigma)P_T}\left[(1-t)c_r Y\frac{\partial i}{\partial m} + cP_N\frac{dL_N}{dm}\right] < 0$$

A higher nominal wage

Notice that a higher nominal wage does not change distributional shares in our set-up where there's a constant mark-up over costs.[11] The channel through which the goods market is impacted is the rise in the relative price of non-tradables (fall in q) which shifts consumption towards tradables, and causes non-tradable output to decline. The resulting incipient excess supply of money means that i is lower as well.

$$\frac{dL_N}{dV} = \frac{\alpha\frac{C}{P_N V}}{\Delta_1}l_i W < 0, \; \frac{di}{dV} = -\frac{\alpha\frac{C}{P_N V}}{\Delta_1}l_y W < 0$$

Finally, since equilibrium income and spending are lower, the effect on the current account is positive.

$$\frac{dCA}{dV} = -\frac{(1-\alpha)}{(1-\sigma)P_T}\left[(1-t)\left(c\frac{dL_N}{dV} + c_r Y\frac{di}{dV}\right)\right]P > 0$$

Price controls through redistribution

Next, consider the case where there is an increase in the nominal wage but at the expense of profits. Specifically, the mark-up factor declines proportionately so that P_N is constant. This could be seen as a special case of price controls in the non-tradable sector. The implication is that the mark-up is now a function of the nominal wage.

$$\tau = \tau(V); \qquad \tau^{'} < 0$$

Now that the price of non-tradables and the overall price level are constant, the effect of any increase in the nominal wage works only through redistribution. Contrast this with the previous case where there were no price controls, so that an increase in the nominal wage caused a real appreciation and substitution away from non-tradables. Since workers spend a greater proportion of their income, the comparative statics are quite different from earlier. The non-tradable sector expands and the equilibrium interest rate rises. Moreover, since

[11] Although this will change once we introduce price controls in the nontradable sector.

the consumption of tradables is higher too, a current account deficit appears, in contrast to the case without price controls.

In mathematical terms,

$$\frac{dL_N}{dV} = \frac{\frac{\alpha}{P_N^2}(1-t)c_\Omega Y l_i W}{\Delta_1} > 0,\ \frac{di}{dV} = -\frac{\frac{\alpha}{P_N^2}(1-t)c_\Omega Y l_y W}{\Delta_1} > 0$$

$$\frac{dCA}{dV} = -\frac{(1-\alpha)}{(1-\sigma)P_T}\left[(1-t)\left(c\frac{dL_N}{dV} + c_r Y\frac{di}{dV}\right)\right]P < 0$$

Greater subsidization of tradable consumption

An exercise that we turn to in the next section involves controlling tradable prices through consumption subsidies. Let's first briefly consider the effects of increased subsidization in the short run. Thanks to the Cobb-Douglas specification of preferences, there is no effect on employment in the non-tradable sector or on the interest rate. Since consumption of tradables is now higher, a current account deficit develops.

$$\frac{dL_N}{d\sigma} = 0,\ \frac{di}{d\sigma} = 0$$

$$\frac{dCA}{d\sigma} = -\frac{(1-\alpha)}{(1-\sigma)^2 P_T}C < 0$$

Price controls through subsidization

Next, let's consider price controls, now in the tradable sector. Specifically, policy makers use subsidies to compensate for any increase in the international price of tradables. The implication is that σ is now a function of P_T.

$$\sigma = \sigma(P_T); \quad \sigma^{'} > 0$$

Given a constant consumer price of tradables, the overall consumer and producer price indexes too are constant. An increase in international prices, therefore, has no effect on non-tradable consumption or employment. The interest rate too is unaffected. Since the real value of foreign asset income declines, however, the current account experiences a negative impact.

$$\frac{dL_N}{dP_T} = 0 = \frac{di}{dP_T}$$

$$\frac{dCA}{dP_T} = -\frac{Er^* F}{P_T^2} < 0$$

The overall lesson is that, regardless of whether or not price controls are present, the current account ends up in deficit as a result of increased subsidies.

4 Deficit financing, seigniorage, and distributional pressures

Up until now we have examined the comparative static effects of changes in exogenous variables/parameters. Table 2 succinctly captures the results. It is time now to examine the role of income distribution and fiscal behavior in managing inflation over time.

Suppose, in standard structuralist fashion, that workers have a target real wage ($\bar{v}$) in terms of purchasing power. This target, apart from being determined by the state of technology, institutions, cultural norms, and other longer-run factors, is likely also to depend on the location in the business cycle, as captured by non-tradable sector employment in equation (22).[12] The nominal wage grows or shrinks at a rate determined by the gap between aspirations and reality as owners of capital and workers compete for their share of the pie.

$$\dot{V} = \phi \left[\bar{v}(L_N) - \frac{V}{P_c} \right] V = \phi \left[\bar{v}(L_N) - \frac{1}{(1+\tau)^{\alpha}} \left(\frac{V}{(1-\sigma)P_T} \right)^{1-\alpha} \right] V \tag{22}$$

where dots over variables represent time derivatives while ϕ is a positive parameter that captures the speed of adjustment. At any given point in time, V is predetermined. It evolves over time in response to a change in the mark-up factor, the subsidy-adjusted price of tradables, and the target real wage. Notice, in particular, that any increase in employment generates upward pressure on nominal wages. Since we know from the previous section, and again from Table 2, that increases in m and V have opposite effects on non-tradable output, and hence on the aspired real wage, the $\dot{V} = 0$ isocline is upward-sloping in Figure 2 below. Mathematically,

$$\dot{V}_V = \phi \left[\bar{v}' \frac{\partial L_N}{\partial V} - \frac{1-\alpha}{P_c} \right] V < 0 \tag{23a}$$

$$\dot{V}_m = \phi \bar{v}' \frac{\partial L_N}{\partial m} V > 0 \tag{23b}$$

The consolidated entity issues money to finance fiscal spending in excess of tax revenues. This fiscal spending consists of expenditures on both kinds of goods and subsidies. Given that $m \equiv M/P$, and employing equation (15), we get:

[12] As seen later, this does not necessarily imply procyclical real wages.

$$
\begin{aligned}
\dot{m} &= \frac{\dot{M}}{P} - m\pi \\
&= \frac{P_N g_N + P_T g_T}{P} + \frac{\sigma}{1-\sigma}\frac{(1-\alpha)}{P}C - ty - m\pi \\
&\quad \frac{P_N g_N + P_T g_T}{P} + \frac{\sigma}{1-\sigma}(1-\alpha)\left\{[(1-t)cy] + \frac{Er^*F}{P}\right\} - ty - m_0\pi \\
&= \frac{P_N g_N + P_T g_T}{P} + \frac{\sigma}{1-\sigma}(1-\alpha)\left\{[(1-t)cy] + \frac{Er^*F}{P}\right\} - ty - m_0\alpha\frac{\dot{V}}{V} \qquad (24)
\end{aligned}
$$

where π represents inflation (i.e., percentage changes in the price index). The third line linearizes the expression for inflation tax (or asset erosion) from the second line in the neighborhood of the initial position ($t = 0$), where initial inflation is normalized to zero. Finally, the fourth line makes use of the fact that $\pi = \alpha\pi_N + (1-\alpha)(\varepsilon + \pi_T^*)$, and assumes, without loss of generality, that foreign inflation is low enough to be ignored.

What does the (linearized) slope of the $\dot{m} = 0$ isocline look like? The explanation here is more involved than that for the $\dot{V} = 0$ isocline. Turns out that the answer mainly depends on the tax rate relative to subsidies. To understand why, consider that, starting from the steady state, an increase in the the nominal wage is likely to cause real money growth to turn positive since it increases the real value of government spending, lowers asset erosion (i.e., reduces inflation tax revenues), and results in lower tax revenues.[13] Next, consider that an increase in the real money supply raises spending and employment. Whether this accelerates or decelerates additional real money issuance depends on how high the resulting additional tax revenues from increased income and inflation are in the initial short-run equilibrium. If these revenues are sufficiently high, an initial increase in money issuance would have raised revenues by enough so that real money balances start declining. An increase in V is then required to reduce output and tax revenues via substitution and income effects, making the $\dot{m} = 0$ isocline upward-sloping. Alternatively, if additional tax revenues resulting from output and real money increases are low, the isocline will be downward-sloping.[14] I call these two cases, Case 1 and Case 2, respectively (see Figure 2).

Let's try to understand the mechanisms at work better by looking at the relevant mathematical expressions.

[13] The only negative effects are due to the reduction in tradable consumption owing to lower national income and an economically somewhat uninteresting valuation effect (see below for more details).

[14] See below for a more formal statement of the conditions under which this isocline assumes a negative or positive slope.

$$\dot{m}_V = (1-\alpha)\frac{P_T g_T}{P_N}\left[\frac{P_N g_N}{P_T g_T} - \frac{\alpha}{1-\alpha}\right] + m_0\alpha\frac{1-\alpha}{P_C}$$
$$+\frac{\sigma(1-\alpha)}{(1-\sigma)}\left\{(1-t)c_r y\frac{\partial i}{\partial V} - \frac{\alpha}{V}\frac{C}{P}\right\} + \Lambda\frac{\partial L_N}{\partial V} > 0 \tag{25a}$$

$$\dot{m}_m = \Lambda\frac{\partial L_N}{\partial m} + \frac{\sigma(1-\alpha)}{1-\sigma}(1-t)c_r y\frac{\partial i}{\partial m} \lessgtr 0 \tag{25b}$$

where $\Lambda \equiv \left[\frac{\sigma(1-\alpha)}{1-\sigma}(1-t)c\right] - \left[t + m_0\phi\bar{v}'\right]$ $(\gtrless 0)$ captures the net effect of an increase in national income on seigniorage revenue. This is the key variable here and can be decomposed into the terms contained in the two sets of square parentheses. The left set captures the positive effect on subsidy spending that follows from higher tradable consumption. The second set represents the reduction in money financing due to higher revenue from income and inflation taxes.

Consider equation (25a); the first term is positive since the relative share of non-tradable expenditure tends to be higher in government spending relative to private consumption spending.[15] The second term captures the positive effect on seigniorage revenue of lower inflation. The first term in the second line, the one in curly parenthesis, covers the net effect of higher tradable consumption (due to lower interest rates) and the income effect of higher non-tradable prices. Since the first effect is positive while the second is negative, the overall sign on this term is ambiguous. Finally, the last term, involves the key variable Λ. As explained earlier, this term could be positive or negative. Given the pre-dominance of positive effects, especially the direct effect on government spending, it seems reasonable to avoid a taxonomy of cases by assuming that $\dot{m}_V > 0$.

Next consider equation (25b). Again, the ambiguously-signed term Λ plays a key role. A look at this term reveals that, a high level of t and initial real cash balances (m_0) tend to make the last partial derivative negative and, therefore, have a stabilizing effect, thanks to high income and inflation tax revenues.[16] The last term on the right hand side is positive, making it likely that $\dot{m}_m > 0$. This term represents the effect of interest rate changes on tradable consumption, and can be treated as relatively small in line with the rest of the paper. In sum, $\dot{m}_m \gtrless 0$ as $\Lambda \gtrless 0$.

---

[15] That is, $\frac{P_N g_N}{P_T g_T} > \frac{P_N c_N}{P_T c_T}\left(= \frac{\alpha}{1-\alpha}\right)$.

[16] As seen in equation (25b) below, the sufficient but *not* necessary formal criteria for $\dot{m}_m$ to be positive, and hence for the $\dot{m} = 0$ isocline to be negatively-sloped is that:

$\frac{\sigma(1-\alpha)}{1-\sigma}(1-t)c > t + m_0\phi\bar{v}'$

The right hand side represents tax revenues from employment and inflation changes while the left hand side represents increased subsidy spending due to higher consumption. As discussed below, this case yields instability.

The *necessary* criteria for $\dot{m}_m$ to be negative, and hence for the $\dot{m} = 0$ isocline to be negatively-sloped is that:

$\left[\frac{\sigma(1-\alpha)}{1-\sigma}(1-t)c\right]\frac{\partial L_N}{\partial m} > \left(t + m_0\phi\bar{v}'\right)\frac{\partial L_N}{\partial m} + \frac{\sigma(1-\alpha)}{1-\sigma}(1-t)c_r y\frac{\partial i}{\partial m}$

The additional term on the right hand side of the inequality represents the effect on spending of lower interest rates. Since this effect is positive the condition for $\dot{m}_m$ to be negative – and thus facilitate stability – is more stringent, i.e., harder to satisfy.

Since the system is non-linear, we now examine its qualitative properties in more detail with the help of illustrative phase diagrams.

Case 1, shown in the left hand panel of Figure 2, is the one where, thanks to high (income and inflation) tax revenues, the own partial effects of money issuance are stabilizing (i.e., $\Lambda < 0$). This is the stable case provided that the $\dot{V} = 0$ isocline is steeper. In intuitive terms, the distributional dynamics should be relatively more sensitive than seigniorage to wage levels. The satisfaction of this condition is intuitively plausible.

Case 2 delivers a saddle point equilibrium with a negatively-sloped stable arm. This is not surprising since the own partial derivative for $\dot{m}$ is positive (i.e., $\Lambda > 0$), introducing a destabilizing force. To understand the intuition, consider a point like A that is above the $\dot{V} = 0$ isocline and to the right of the $\dot{m} = 0$ isocline. At this point, demand is high in the goods market while the real wage is lower than the level aspired to in the existing business cycle conditions. High consumption demand means high subsidy spending by the government, which, in turn, means increasing money issuance in real terms. As high demand and the gap between aspirations and reality leads to nominal wage increases, this causes substitution toward tradables and thus further monetary expansion to finance subsidies. Unlike Case 1, where an expanding economy has a large effect on tax revenues, here we get instability with rising nominal wages and money balances. A classic wage-price spiral, in other words, has now been set into motion, and there's no longer an achievable level of the real wage that is consistent with stable inflation and asset holdings. In the background, current account deficits and capital outflows lead to falling foreign exchange reserves but that's a story for another day (actually, for the next section!).

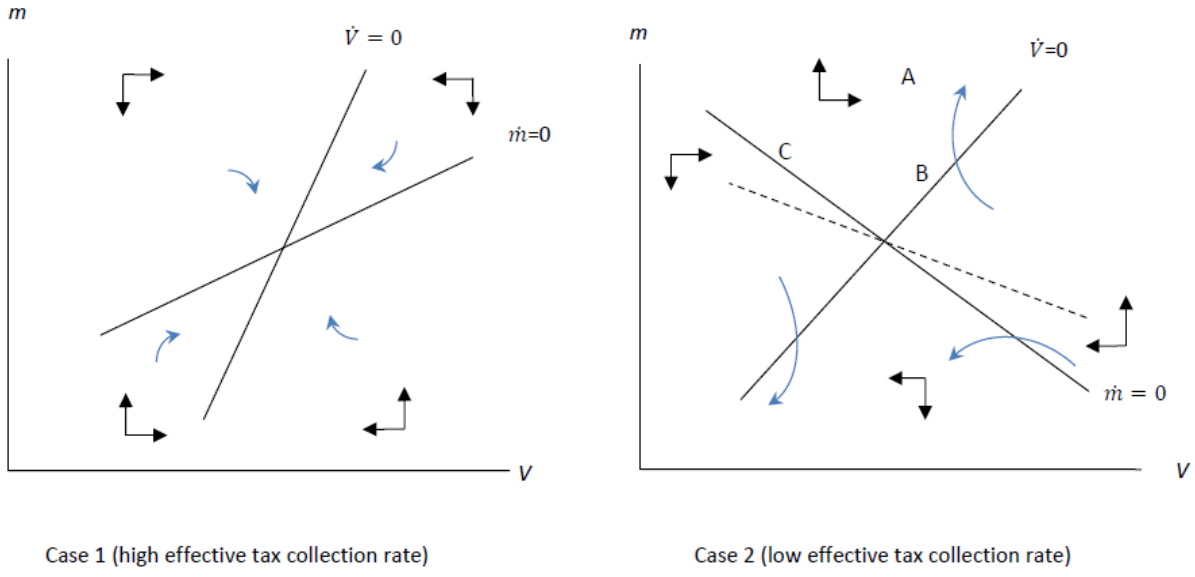

Figure 2: Money-financed deficits, conflict, and inflation

To preview a theme that will permeate the rest of this paper, the reader will notice that conflicting distributional claims are not the root cause of inflation. One way to see this is to simply notice that in Case 1 there is no persistent and accelerating inflation. To make the same point a bit differently, suppose the economy is at a point like B on the $\dot{V} = 0$ isocline (see the right hand panel of the figure). There is, at this moment, no conflict. However, revenues have been too low compared to policy makers' ambitions to spend and subsidize, so that continued monetary financing is required. Specifically, looking at equation (24), $\dot{m} = \frac{\dot{M}}{P} > 0$. As this financing continues, the non-tradable sector continues to expand, generating aspirations, conflict, and future inflation.

Next, consider a point like C that is on the $\dot{m} = 0$ isocline but not on the other one. Now $\frac{\dot{M}}{P} = m\pi$, so that momentarily there is no increase in real money balances, but rising wages immediately cause substitution towards tradables in consumption and hence increased subsidy spending. Subsidies and inflation are feeding on each other, with each sustaining the other following an exogenous causal change.

The steady state is characterized by a constant nominal (and real) wage, a constant price level, nominal money balances that grow in line with inflation, and a stable level of employment in the non-tradable sector. Let's explore a bit more whether the steady state is a meaningful construct in this case.

4.1 Fiscal Expansion

Now suppose policy makers increase their spending on goods. Again, since government spending typically falls predominantly on non-tradables (construction, public sector services, etc.), suppose that it is spending on these goods, i.e., g_N, that rises.[17]

In Case 1, where the increase in tax revenues in an expanding economy more than offsets the rise in subsidy expenditures, there is temporarily higher inflation as the nominal wage rises to the level consistent with raised worker aspirations (see the left hand panel of Figure 3). Beyond this point, real money balances continue to fall and drag employment and the nominal wage down with them as the economy approaches the new steady state. This is often *not* the case in low income countries, however, where fiscal deficits and seigniorage typically rise in the face of large public spending increases, due to limited taxing capacity and a small asset base. That scenario is captured by the right hand panel of the figure where inflation and deficit financing explode.

Why does inflation spiral out of control in Case 2? Since marginal tax revenues are small in this case, i.e., $\Lambda > 0$, the initial increase in subsidies feeds on itself as employment expands and consumption rises, along with the consumption subsidies, real money balances, and inflation.[18]

How could policy short circuit the wage-price spiral and force the economy to find a level of real wage that is consistent with stable inflation? One answer could be to take

[17] Notice that, in our set-up an incease in g_T will not affect output so that neither isocline will shift. It will, however, affect the current account, which is an issue that we turn to in detail in the next section.

[18] The external account problems that are accumulating in the background are tackled in the next section.

measures to cut the nominal wage and thus lower the price of non-tradables at time $t = 0$.[19] In other words, accompany the fiscal expansion with an initial step real depreciation. If done precisely, this could land the economy on the new stable arm that has shifted leftward following the fiscal expansion (not shown in Figure 3). From thereon, the low price of non-tradables facilitates substitution away from tradables and contributing to declining subsidies and money issuance. The economy is generating employment with an improved current account balance just as nominal wages rise. The political economy complications involved in the initial wage drop are obvious. We turn to consideration of policy-enforced redistribution shortly.

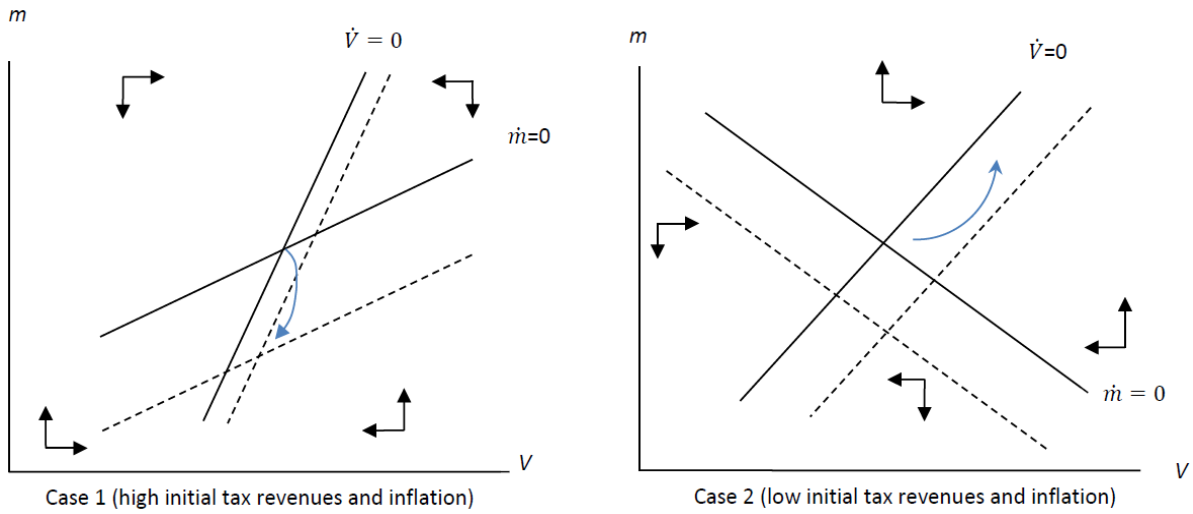

Figure 3: An accommodative fiscal expansion.

4.2 Deficit Financing with Price Controls in the Non-Tradable Sector

There would appear to be rather obvious ways to control exploding inflation. A brute force one would be to impose price controls in the non-tradable sector, and an obvious way to do this would be to employ mechanisms to put downward pressure on the mark up factor. How does that work out in our set-up?

Suppose that the downward real wage stickiness is enforced through policy. Specifically, firms are not allowed to raise non-tradable prices in the face of rising nominal wages so that their mark-up has to fall proportionately, redistributing income towards workers.

[19] In our case, this would entail departing from the assumption that V is predetermined, and to assume either that forward-looking expectations mke it a jump variable or that, in an optimal control environment, a social planner employs it as a control variable.

The first partial presented in equation (23a) now could have a different sign.[20] Intuitively, this is because an increase in the nominal wage is now *expansionary* owing to redistribution towards the group with a higher propensity to spend. The negative effects through a rise in P_N and the resulting income and substitution effects are now gone thanks to the price controls.[21] Mathematically,

$$\dot{V}_V = \phi \left[\frac{\bar{v}'}{V} \frac{\partial L_N}{\partial V} - \frac{1}{P_c} \right] V \gtrless 0$$

Let's consider the case where this expansionary effect is strong enough so that $\dot{V}_V > 0$. A new destabilizing force has been introduced into the system. The signs of the other partials in (23b), (25a), and (25b) remain unchanged under our assumptions, except for that $\dot{m}_V$ is more likely than before to be positive. Again, there are two sub-cases, with instability now more likely in both case 1 (with high tax revenue collection) and case 2 (low collection). To avoid a taxonomy of sub-cases, I focus on the case where $\dot{m}_V < 0$ and both own-partials are positive (see Figure 4).

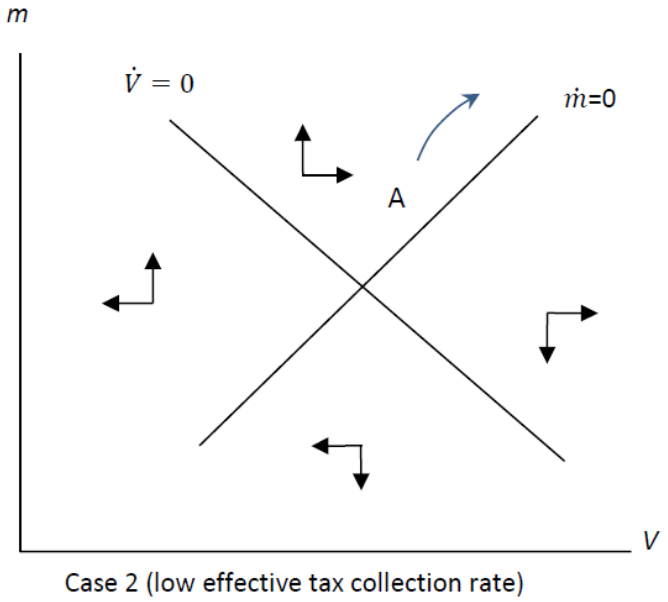

Figure 4: Controlling the price of non-tradables

To understand why instability is now the general outcome even in Case 1, it may be useful to repeat that, unlike the case without price controls (see Figure 2), now $\dot{V}_V > 0$,

[20] See the previous section and Table 2.

[21] The only negative effect left on $\dot{V}$ is the direct one of an increase in V.

thanks to the expansionary impact of redistribution towards wages. Suppose we start at a point like A that is above and between the two isoclines. The high wage now means that there is upward pressure on employment, and hence on aspirations that simultaneously exists with rising real money balances to finance consumption subsidies that, in turn, put upward pressure on seigniorage finance in the absence of adequately higher revenues. Both processes, i.e., rising wages and rising money balances exacerbate the excess demand in the goods market and exert upward pressure on inflation. There is a self-perpetuating cycle of higher wages boosting the economy which then further boosts wages and consumption as inflation spirals out of control.

In sum, an exploding wage-price spiral is now a possibility, even in the case where tax revenues are high enough to make $\dot{m}_m < 0$. This possibility is only further enhanced in Case 2 (where $\dot{m}_m > 0$). Once the system has been displaced from its initial steady state, the dynamics render it essentially impossible to find another steady state where stable inflation and money balances exist with a real wage that satisfies worker aspirations.

4.3 Subsidies as an Instrument of Price Controls

What if the price controls are in the tradable sector? With a fixed exchange rate and internationally-given tradable prices, this is only possible here by using subsidies to offset increases in P_T. Thus, σ is now a function of P_T, with policy makers lowering it proportionally in response to an increase in international tradable prices, thus keeping the consumer price index (but not the producer one) constant.

Since, unlike price controls on non-tradables, there is no redistribution of purchasing power between savers and spenders, that channel is now closed, and we are back to the basic dynamic set-up that preceded the previous sub-section.[22]

What are the effects of a situation where an international shock raises the prices of tradables? The answer takes us back to Figure 3. Since an increase in the international price of tradables leaves output unchanged when the shock is offset by subsidies, the $\dot{V} = 0$ does not shift. The other isocline, on the other hand, shifts left as long as the direct effect of increased subsidization on tradable consumption exceeds the valuation effect on real government consumption. In Case 1, as a result, we get a stable outcome with higher money balances and an unchanged real wage, while Case 2 yields a wage-price spiral and accompanying instability.

In the larger scheme of things, and given our set-up, exploding inflation is less likely in the case where controls target the consumer price of tradables rather than that of non-tradables. Intuitively, this is because in the former case, controls do not redistribute income and, therefore, do not have an independent effect on aggregate demand. Put differently, the case where the tradable good price is controlled is more likely to coincide with a real wage that minimizes conflict and coincides with stable inflation and seigniorage financing over time.

There is a general lesson here. Controls are likely to enable inflation management better if these do not result in redistribution towards spenders.

[22] Also, the signs for the partials in eqs. (23a), (23b), (25a), and (25b) now apply again.

It is important to keep in mind, however, that greater stability comes at the expense of the external account since domestic consumption of tradables is now putting increasing pressure on the balance of payments in the background. This is an issue that we turn to in the next section.

5 Reactive Subsidization of Tradable Consumption

So far I have occasionally dealt with the current account-related consequences of various developments, while ignoring the asset market implications of international financial flows. These implications, in turn, have an impact on the goods market, setting up interesting feedback mechanisms, in order to study which, I simplify along a different dimension by ignoring the government's budget constraint. The key role in this section will be played instead by consumer price subsidies for tradables. Such subsidies are common in developing countries, especially in the face of significant international shocks. I assume that policy makers react, likely for political economic reasons, to keep the consumption price of tradables constant. In other words, σ is now endogenous, and $\frac{d\sigma}{dE} = \frac{1-\sigma}{E}$.

Consider an economy that is open to international financial flows. Domestic assets are imperfect substitutes for foreign assets so that risk-adjusted domestic returns are determined abroad.

$$i = i^* + \varepsilon + x \tag{26}$$

where x is the risk premium on holding domestic assets. Unlike the previous section, let's consider a flexible exchange rate regime in order to highlight the interactions of exchange rate changes with conflict and the foreign asset position. Thus, $\Delta F_g = 0$, and $\Delta F = \Delta F_p$. Continuing to assume, for simplicity, that people expect inflation to converge over time to the international level, and further that exchange rate expectations are static (so that $\varepsilon = 0$), the real interest is now given by:

$$\begin{aligned} r &= i^* + \varepsilon + x - \pi^e = i^* + \varepsilon + x - \varepsilon - \pi_T^* \\ &= r^* + x \end{aligned} \tag{27}$$

The short-run system, consisting of eqs. (5) and (19) earlier, can now be written in modified form as:

$$T(L_N, E; \chi) = g_N + \frac{\alpha}{P_N}\left\{[(1-t)c(\Omega, r)y]\, P + Er^*F\right\} - L_N = 0 \tag{28}$$

$$K(L_N, E; \chi) = l(i^* + x, y)W - M = 0 \tag{29}$$

Throughout, I will assume that the country is a net creditor in international markets, i.e., $F > 0$. Before I turn to the dynamics, let's gain some intuition by putting the system through its paces again.

Figure 5 illustrates the short-run set-up while the lower half of Table 2 summarizes the comparative statics. The continuous lines in Figure 5 illustrate the linearized system with the TT and KK curves representing the goods and asset market equilibria, respectively. A higher level of nontradable sector employment generates excess supply – a depreciation is required to boost income from foreign assets and generate the spending that removes this excess supply. Turning to asset market equilibrium, a higher level of L_N generates demand for money. An appreciation is required to reduce wealth and remove this excess demand.

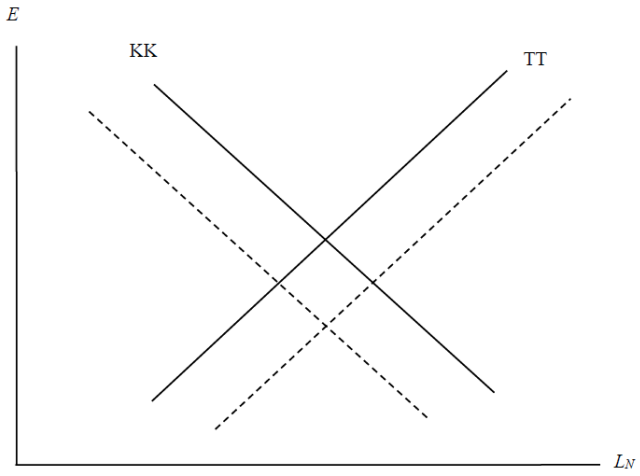

Figure 5: An increase in the holdings of foreign currency assets

Starting with a positive net foreign asset position ($F > 0$), how does an increase in the (net) domestic holdings of foreign bonds affect the endogenously adjusting variables (which are now L_N and E)? The exchange rate jumps down (appreciates) proportionally to the increase in F leaving demand for non-tradables unchanged. Both curves in Figure 5 shift as shown by the dash lines. The level of employment is the same as before in the new short-run equilibrium. Mathematically,

$$\frac{dL_N}{dF} = 0, \; \frac{dE}{dF} = -\frac{E}{F} < 0$$

What if the government increases spending on non-tradables. The excess demand created leads to expansion of the non-tradable sector and a real appreciation. The TT-curve shifts right and, in mathematical terms:

$$\frac{dL_N}{dg_N} = -\frac{lF}{\Delta_2} > 0, \; \frac{dE}{dg_N} = \frac{P_N l_y W}{\Delta_2} < 0$$

where $\Delta_2 = -\left[(1-\alpha(1-t)cPl) + \alpha r^* l_y W\right] F < 0$.

How about an increase in the nominal wage? Since the price of non-tradables increases, the income and substitution effects reduce non-tradable consumption and employment. The

resulting excess supply of money (excess demand for foreign bonds) requires a depreciation of the domestic currency to clear the asset markets. The goods market curve (TT) in Figure 5 shifts leftward.

$$\frac{dL_N}{dV} = \frac{\alpha\frac{C}{P_N V}}{\Delta_2} lF < 0,\ \frac{dE}{dV} = -\frac{\alpha\frac{C}{P_N V}}{\Delta_2} l_y W > 0$$

What if the effect of rising wages on non-tradable prices is neutralized by putting downward pressure on mark-ups? As in Section 3.2, and for the same reason, i.e., redistribution towards spenders, the effect on non-tradable employment and output is the opposite of that in the absence of price controls. The exchange rate appreciates.

$$\frac{dL_N}{dV} = \frac{\frac{\alpha}{P_N^2}(1-t)c_\Omega yP}{\Delta_2} lF > 0,\ \frac{dE}{dV} = -\frac{\frac{\alpha}{P_N}(1-t)c_\Omega yPl_y W}{\Delta_2} < 0$$

Consumption subsidies as price control devices

As alluded to earlier, this section will highlight the background role of consumption subsidies in setting off sustained inflation. In preparation for the dynamic analysis in the next section, therefore, let's now carry out a key thought experiment. Suppose policy authorities, acting perhaps in response to political pressures, neutralize international tradable price increases by endogenously adjusting consumer price subsidies. Since the relative price shock is neutralized, there is no substitution effect on non-tradable employment, and hence no impact on the exchange rate. Subsidies increase consumption of tradables through income and substitution effects – the consumption price of tradables has declined relative to the producer price – so that there is a negative impact on the current account. This effect will play a central role in the dynamics of the next sub-section.

5.1 Beyond instantaneous impacts

Over time, current account imbalances would affect the asset and goods markets through changes in the holdings of foreign assets. Once again, I will analyze in a framework where distributive conflict plays a key role in mediating these interactions. Equation (22), in other words, remains applicable. Also, recall that P_C is now being held constant through subsidies.

$$\dot{V} = \phi\left[\bar{v}(L_N) - \frac{V}{P_c}\right]V = \phi\left[\bar{v}(L_N) - \frac{1}{(1+\tau)^\alpha}\left(\frac{V}{(1-\sigma)EP_T^*}\right)^{1-\alpha}\right]V \tag{30}$$

The equation of motion for foreign assets follows from equation (18).[23]

[23] Recall that the net foreign asset position is the accumulated stock of all past current account balances. That is,

$$F(t) = \int_{-\infty}^{t} CA(s)ds$$

$$\dot{F} = \bar{y}_T - \frac{(1-\alpha)}{(1-\sigma)EP_T^*}\left\{\left[(1-t)c(\Omega, r^* + x)y\right]P + Er^*F\right\} - g_T + \frac{r^*F}{P_T^*} \tag{31}$$

The $\dot{V} = 0$ isocline is now vertical. Since non-tradable employment is independent of F and σ, and since the price of tradables is being held constant through subsidies, there is only one level of the nominal wage consistent with satisfied distributional aspirations. The slope of the $\dot{F} = 0$ isocline, on the other hand, is negative. The depreciation induced by an increase in wages has to be offset by the appreciation induced by an in increase in foreign asset holdings. In mathematical terms,

$$\dot{V}_V = \phi\left[\bar{v}'\frac{\partial L_N}{\partial V} - \frac{1-\alpha}{P_c}\right]V < 0 \tag{32a}$$

$$\dot{V}_F = \phi\bar{v}'\frac{\partial L_N}{\partial F}V = 0 \tag{32b}$$

$$\dot{F}_V = -\frac{(1-\alpha)}{(1-\sigma)P_T}\left\{r^*F\frac{\partial E}{\partial V}\right\} < 0 \tag{32c}$$

$$\dot{F}_F = \frac{r^*}{P_T^*} > 0 \tag{32d}$$

The system delivers a negative root and a positive one. To illustrate the saddle path instability, consider Figure 6. Suppose the system is at point A (a one time permanent increase in fiscal spending on non-tradables will place the system there). At this point, the wage is lower than the aspired level for the given level of employment, putting upward pressure on V. At the same time, there is a current account deficit, so that F is in decline. As the net foreign asset position declines, this puts further downward pressure on income from international assets, further worsening the current account. Further, the depreciation that follows loss of foreign assets magnifies the upward pressure on wages. We have rising nominal wages, falling employment, and a self-reinforcing decline in foreign assets. Again, once the system has been displaced from an initial steady state, there is no longer an achievable level of real wages that is consistent with stable inflation and current account balances.

What if tradable consumption were not being subsidized. Now the own effect of a change in the net foreign asset position is highly likely to be stabilizing. Mathematically,

$$\dot{F}_F = -\frac{1-\alpha}{(1-\sigma)\,EP_T^*}\frac{C}{F} + \frac{r^*}{P_T^*} > 0$$

Notice that a negative term is now added to the expression for $\dot{F}_F$ in equation (32d). What explains this increased likelihood of stability? Intuitively, an increase in F now has a stabilizing effect on the current account. Why? Because the resulting appreciation is not offset by subsidization and, therefore, has a stabilizing negative effect on the current account via increased consumption of tradables.

To understand the intuition better, suppose again that expansionary fiscal policy places the system at a point like A, where there is a current account deficit, deteriorating net foreign asset position, and rising wages. The resulting depreciation, now that we do not have offsetting subsidization, shifts consumption away from tradables, which dampens the current account deficit. This relative price adjustment is what pushes the system towards stability. Again, the political economic complications are broadly obvious if complicated.

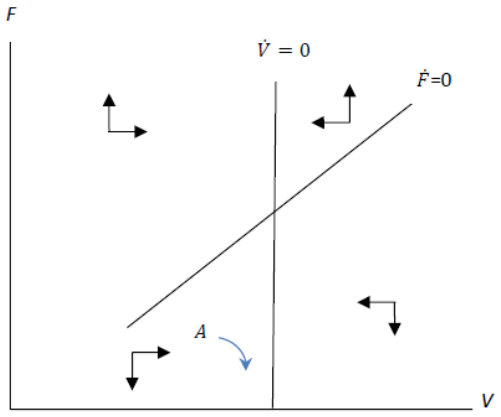

Figure 6: The role of endogneous consumption subsidies

Before we conclude, let's briefly return to Section **??**, where we explored the consequences of controlling the price of non-tradables. The same logic applies here; the resulting redistribution towards spenders following an increase in the nominal wage will now tend to make the own partial derivative $\dot{V}_V$ positive, which further pushes the system toward instability. The intuition is the same as before: in the current set-up, controlling non-tradable prices shifts income towards spenders.

6 Implications and Concluding Remarks

Distributional conflict is making a comeback in discussions of inflation, even though mainstream economics has largely underplayed this aspect in the past. Even taken on it's own terms, however, the argument makes a case for conflict as a propagating mechanism, rather than a primary cause. This paper has analyzed two empirically relevant sources of weakness that leave a stylized developing economy vulnerable to inflation-accelerating distributional conflict: (1) continuous money-financed deficits, (2) subsidization of tradable consumption in the presence of supply-side rigidities in the tradable sector. The external shock that exacerbates these feedback mechanisms may be real or monetary. In either case, conflict acts as the sustaining fuel, which once set alight by an extraneous development, could endogenously spiral out of control with or without monetary accommodation. Price controls and other measures can be employed but create other potentially destabilizing trade-offs related

to external account sustainability, differential saving behavior between earners of profits and wages, and political economy considerations. Putting an end to this coordination game will generally require a credible external intervention.

In the case of (at least partially) forward-looking variables such as inflation, one would want to incorporate the role of expectations. This glaring omission in this paper helps maintain focus on the core themes. Incorporating this crucial ingredient is unlikely to dilute the core lesson here. Conflicting claims perpetuate inflation, and addressing distributional issues is crucial in countering persistence: the trigger, however, typically reflects built-up weaknesses that lie elsewhere.

One may, finally, argue that phenomena such as monetary accommodation and subsidization may themselves be manifestations of deeper problems related to state capacity and political instability. While these issues are beyond the scope of this paper, which addresses the conflicting claims argument for inflation as it is typically framed, they suggest ample room for interesting future extensions and contributions.

7 Appendix A

This Appendix presents the detailed mathematical results from the main text in cases where they were not provided earlier.

Section 4.1

The partials corresponding to the dynamic system (22)-(24)are:

$$\dot{V}_{g_N} = \phi \bar{v}^{'} V \frac{\partial L_N}{\partial g_N} > 0$$

$$\dot{m}_{g_N} = \Omega \frac{\partial L_N}{\partial g_N} + \frac{P_N}{P} + \frac{\sigma(1-\alpha)}{1-\sigma}(1-t)c_r y \frac{\partial i}{\partial g_N}$$

Section 4.3

$$\dot{V}_{P_T} = \phi \bar{v}^{'} V \frac{\partial L_N}{\partial P_T} = 0$$

$$\dot{m}_{P_T} = -(1-\alpha)\frac{g_T}{P}\left(\frac{P_N g_N}{P_T g_T} - \frac{\alpha}{1-\alpha}\right) + \frac{1-\alpha}{(1-\sigma)P_T}\left[(1-t)cy + \alpha\left(\frac{Er^* F}{P}\right)\right]$$

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