Income Distribution, Fiscal Policy and Delays in Stabilization

by

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1 Introduction.

In the last two decades the economic policy of several developing countries has often been characterized by perverse cycles of unsustainable policies and attempts at stabilization. The pattern is generally some variant of a very simple one (see Bruno et al. (1991), Dornbusch and Edwards (1989), and Sachs (1989) for informative descriptions). First, government expenditure expands sharply, beyond any level that could reasonably be sustained in the long run, causing large current account deficits and external debt accumulation. After some time, these current account deficits can no longer be financed, and the need for a drastic fiscal consolidation and stabilization becomes apparent. At this time, everyone realizes how pervasive the costs of the stabilization and how persistent the damages of the past policies are.

Why then do governments engage in such unsustainable policies, when everyone can foresee their perverse effects? More generally, why do government often wait so long before stabilizing an economy where some crucial policy variables are obviously at unsustainable levels? To an economist, these have always been uneasy questions, because the observed behavior of the policymakers seems to clash with any hypothesis of rationality on the part of the agents of the economy. Why should anyone that recognizes the long-run costs of postponing a needed adjustment not act immediately to spread such costs evenly over time? Indeed, the standard representative agent, textbook model of an open economy implies that consumption should be smoothed over time, by running current account deficits when production is below its permanent level, and surpluses when production is above normal.

It has long been recognized that delays in stabilizations can be explained in a way that is not inconsistent with individual rationality, provided one is willing to drop the assumptions of a representative agent and of a benevolent government that maximizes some social utility. Several recent contributions have formalized this basic idea by viewing delays in stabilization as the result of the interaction of two groups, each trying to
minimize its share in the costs of the adjustment.

In Alesina and Drazen (1991), each group is imperfectly informed on the costs of the adjustment to the other group. Thus, the two groups engage in a "war of attrition", each trying to wear out the opponent until it concedes. At some point, the group that stands to lose the most from a further postponement, concedes, and agrees to bear the larger part of the costs of stabilization. In Laban and Sturzenegger (1995), each group’s costs of a stabilization are known to their opponent. However, the two groups differ in their ability to adapt to the economic environment; for instance, financial adaptation allows the rich to avoid many of the costs of inflation, while at the same time it increases the costs of inflation and therefore the cost of not stabilizing to the poor. When this process has gone far enough, the best strategy for the poor is to agree to measures that stop inflation and stabilize the economy in a way that is particularly costly to them. In a similar vein, Velasco (1993) views episodes of unsustainable policies as a "common pool" problem. Fiscal policy is expansionary and debt accumulates because the two groups regard fiscal resources as a common pool and do not fully internalize the costs of financing government expenditure. However, as debt accumulates, the costs of this non-cooperative equilibrium increase, until eventually both groups agree to revert to a more responsible fiscal stance.

A common feature to all these models is that delays in stabilization are the result of the interaction of two groups. A stabilization occurs because the incentives to accept a disproportionate share of its costs evolve differently over time for the two groups. However, as Drake (1982), Haggard (1991) and Nelson (1989) - among others - have shown, the making and shifting of coalitions between different groups is often crucial in understanding these episodes. In particular, Dornbusch and Edwards (1989) and Sachs (1989) have documented how the expansions associated with the initial phases of populist experiences drew wide approval from both unions and the associations of industrialists, because of the temporary increase in real wages and profitability that they afforded. The
experience of Peru in 1985-88 provides an illustration of the process described above. In 1986, one year after the start of his populist policies, the approval rating of Alan Garcia reached 90% (Sachs (189), p. 23). Indeed, at the beginning "...the success [of the Alan Garcia experiment was] broadly based because the recovery of demand can raise firms’ profitability by raising capacity utilization. A year after the program started Garcia was celebrated by the business class for the success of his recovery strategy." (Dornbusch and Edwards (1989), p.38).

The boost to domestic demand is typically brought about via a drastic expansion in fiscal policy, particularly on transfer programs. These are often justified as ways of addressing income distribution issues that are perceived as particularly pressing. Thus "in all these [populist] experiments, governments have explicitly argued that the policies are necessary to correct glaring inequalities in the income distribution, and to raise the living standards of the poor" (Sachs (1989)).

The other side of this government induced expansion is a quick accumulation of external debt, or, equivalently, a delay in repaying an existing debt. Once again, Peru provides a stark illustration of this point. Soon after taking office, Alan Garcia limited external debt service to 10% of exports. According to Dornbusch and Edwards (1989), p. 37, this was "the most widely noted measure of the Garcia government... The policy of limiting debt service was not only an essential step on the political front. It effectively suspended the external constraint. With the foreign exchange savings resulting from limited debt service, a widening of the trade deficit became possible. Thus external constraints on growth...were suspended."

Of course, this type of expansion cannot last for long. After a certain point the external constraint cannot be overcome and a drastic reduction in demand becomes unavoidable. This induces a dramatic shift in coalitions: the business sector on one side and the unions and the poor on the other are no longer on the same side. The reason is that richer individuals, who in general own more mobile factors, can largely escape the
costs of the adjustment. "...when everything is said and done, the real wage will have declined massively, to a level significantly lower than when the whole episode began... The extremity of the real wage decline is due to a simple fact: capital is mobile across borders, but labor is not." (Dornbusch and Edwards (1989), p. 7).

Thus, in the end the expansionary fiscal policies unravel and the alliance between low-income individuals who benefit from redistribution, workers and industrialists, breaks apart. The present model aims at capturing, in a simple and stylized way, these features of the process described above. In the model, different coalitions form and change depending on the position of three groups over the degree of redistribution and the timing of debt repayment.

The logical structure of the model is very simple. A country is populated by individuals belonging to three different income classes. They must decide, by majority voting, how much of a given external debt to repay in each of two periods. In a representative agent world, exactly half of the debt would be repaid in each period, so as to smooth consumption perfectly over time. This is also the outcome in the economy studied here when the per capita income is high enough, and in a poor economy with an equal distribution of income. In all these cases the position of the "middle class" prevails, and the economy behaves like a representative agent economy, by spreading the cost of the adjustment over the two periods.

When the economy is poor and has a highly unequal distribution of income, however, the repayment of the debt is postponed entirely to the second period. Importantly, both the very rich and the very poor agents of this economy have an incentive to postpone stabilization. The former because they are mobile in the long run, and therefore can avoid paying the costs of stabilization by waiting; the latter because by postponing the repayment of the debt they can enjoy more redistribution of income in the first period, while no redistribution will be possible anyway in the second period because of the political process. Thus, in a poor economy the pattern of income distribution has important
consequences for the timing of stabilizations. This last feature is consistent with the evidence presented in Berg and Sachs (1988), who show that developing countries with more unequal distribution of income tend to accumulate larger external debts.

The outline of the paper is as follows. The next section presents the model. Section 3 briefly illustrates the solution in the case of no income dispersion. Sections 4 and 5 present the solution for the case of a rich and a poor economy, respectively. Section 6 concludes.

2 The model.

The model incorporates in a stylized way the four key features described above that give rise to the cycles of "populist experiences" and stabilization: the forming and shifting of coalitions between different groups, the role of endogenous, redistributive fiscal policy, the accumulation and repayment of external debt, and the mobility of some factors.

1. Technology and preferences.

The economy lasts two periods, 1 and 2, and produces a single good with a linear production function using labor only: \( y = \theta n \), where \( n \) denotes the amount of labor and \( \theta \) is a technological shift factor.

The utility function is of the form \( U(c_1, c_2) = u(c_1) + u(c_2) \), where \( c_j \) represents consumption in period \( j \). The function \( u(x) \) is bounded from below when \( x = 0 \). Without this assumption, an agent would be indifferent between two consumption profiles, each implying 0 consumption in at least one of the two periods, even if total consumption is higher under one profile than the other. Since 0 consumption in the second period does occur for certain agents under some circumstances, this assumption ensures that these agents still have a preference ordering over different consumption profiles.

A utility function with these characteristics is the Constant Relative Risk Aversion
utility function:

$$U_i = \frac{c_1^{1-\gamma}}{1-\gamma} + \frac{c_2^{1-\gamma}}{1-\gamma}$$  \hspace{1cm} (1)

with $\gamma$, the inverse of the elasticity of intertemporal substitution, less than 1.

Note that, for simplicity, the rate of time preference is assumed to be equal to 0.

2. Income distribution.

The economy is populated by a total mass 1 of agents, divided into three groups, A, B, and C. For convenience, each group has mass 1/3. Each member of group $i$ is endowed with $n_i$ units of labor, with $n_A < n_B < n_C$. The average labor endowment, $(n_A + n_B + n_C)/3$, is normalized to 1. Thus, if the price of the only good is normalized at 1, $\theta n_i$ is also the income of an agent of type $i$.

In solving the model, in some situations the possibility of a tie when voting on two proposals arises because each proposal receives the votes of one group, while the third group abstains or does not vote. To break these ties, I assume that group B has a mass infinitesimally larger than 1/3. This assumption has the realistic implication that the "middle class" is larger than the two extreme classes, or that at least it has more political clout.

Also, to capture in a simple but effective way the role of redistributive issues, I assume that the poor, group A, have no labor income at all: $n_A = 0$. Thus, the members of this group must rely exclusively on redistribution for their consumption. Group A therefore represents those important parts of the population whose main stake in fiscal policy is to maximize redistribution.

Note that under this assumption, given the average endowment $\bar{n}$ the values of $n_C$ and $n_B$ necessarily move in opposite directions. Moreover, it is easy to verify that an increase in $n_C$ is unambiguously associated with an increase in inequality, such as the Gini coefficient or a mean-preserving spread. In particular, I will distinguish between "high
inequality”, when \( n_B < 1 \), and “low inequality”, when \( n_B > 1 \). For future reference, note that, when \( n_B < 1 \), \( n_C \) varies between 2 and 3, and when \( n_B > 1 \), \( n_C \) ranges from \( 3/2 \) to 2.

3. Fiscal policy.
Fiscal policy consists of a single redistributive program. In period \( j \), all individuals are taxed at a proportional rate \( t_j \); the tax revenues thus collected are then redistributed lump-sum among all agents. Note that, although the tax rate is proportional, the tax \textit{cum} subsidy system is progressive.

This type of fiscal policy implies that, at any positive tax rate, an individual with above-average endowment pays in taxes more than he receives in subsidy, and therefore always prefers the lowest possible tax rate. By contrast, an individual with below-average endowment always benefits from redistribution, and prefers the maximum possible tax rate, 1.

Note that in this framework, the optimal tax rate for any individual is either 0 or 1, with a discontinuity at the average endowment. This feature of the model is a consequence of the simplicity of the setup, where taxation does not cause any distortion. It could be easily eliminated by, for instance, assuming that taxation induces distortions that are increasing in the tax rate, as in an earlier version of this paper.

4. Debt repayment.
The economy begins in the first period with a given outstanding foreign debt, \( D \). By the end of the second period, this debt must be completely repaid. The amount repaid in period \( j \) is denoted by \( R_j \). In each period, the debt is repaid by drawing on the tax revenues collected in that period; the remaining tax revenues are redistributed lump-sum. For future reference, the tax rate that raises an amount of tax revenues just equal to \( R_j \) is denoted by \( t(R_j) \).
The country is shut off from further external borrowing. This assumption is made only in order to simplify the analysis and to focus on the main point of this paper. Perotti (1994) analyses the case where official borrowing and lending are allowed. Also, private individuals cannot borrow or lend. Clearly, if private individuals could borrow and lend freely at the going interest rate, they could undo, partially or totally, the effects of official flows by generating private flows in the opposite direction. However, in most of the countries whose experience is being captured in this model, there were some restrictions on private capital flows. If these controls had some effectiveness, then private agents could no longer undo completely the effects of official policies. The assumption made here can therefore be considered as an extreme case of capital controls. Moreover, Perotti (1994) shows that, even if private agents could have access to the world credit market, the model would still generate interesting, and realistic, outcomes, such as a two-way flow of resources, with private flows going in opposite direction to official flows.

For simplicity, the interest rate per period, like the rate of time preference, is assumed to be equal to 0. This implies that there is no consumption-smoothing motive for postponing the debt repayment: under this assumption, a standard model of a small open economy would predict that a representative agent would maximize utility by repaying half of the debt in each period (e.g. Dornbusch (1983), Sachs(1982)). Thus, in this model a "delay in stabilization" occurs when less than half the debt is repaid in the first period, so that the bulk of the repayment occurs in the second period.

5. The political system.
In each period, the tax rate \( t_j \) is decided by majority voting. In the first period, all individuals also vote on the amount \( R_1 \) of the existing debt \( D \) that must be repaid. Clearly, in the second period the only policy variable that must be decided by majority voting is the tax rate \( t_2 \), since the amount to be repaid in the second period, \( R_2 \), is determined residually as \( R_2 = D - R_1 \).
Note that in this framework the issue space is bidimensional in period 1. As it is well known, in general the existence of a non-cycling majority cannot be guaranteed in this case. In this model, a non-cycling majority exists. The reason is that there are only three types of agents, and the proposals that can be voted on are the policies that maximize the utility of each type of agent. This ensures that there is always a finite number of proposals, which in turn ensures the existence of a stable winner. Notice that a necessary and sufficient condition for a proposal to be the stable winner, is to defeat the other two in pairwise comparison.

In what follows, I assume that the initial debt is such that it can be repaid all in the second period. This assumption, which will be formalized precisely in the next section, ensures that it is possible to postpone the whole adjustment to the second period. I will denote with $D_{\text{max}}$ the maximum value of the debt that satisfies this requirement.

6. Mobility.
Finally, individuals are mobile in the long run. Specifically, in the second period an individual can move abroad, where he earns an income $n_i$, $i = A, B, C$. Thus, $\theta$ can be interpreted as an index of the level of development of the home country: a value of $\theta$ greater than 1 means than the home country is more productive that the foreign country, and conversely when $\theta$ is less than 1. To be able to use the foreign technology, an individual must pay a cost $d$; hence, his consumption if he moves abroad is $n_i - d$. As a convenient simplification, I assume that $d$ is equal to the average endowment of labor of the home economy, 1. Hence, only those individuals with endowment at least as large as the average endowment will be able to pay the cost $d$ and move abroad.\footnote{Nothing substantial depends on this assumption.}

In summary, an individual moves abroad in period 2 if:

$$\theta n_i (1 - t_2) + t_2 \theta - R_2 < n_i - 1$$

In fact, the first term on the LHS represents his labor income, net of taxes; the second
term represents tax revenues (equal to the tax rate times the average income of the economy), that are redistributed lump-sum after deducting the third term, i.e. the debt repayment $R_2$. Thus, the LHS represents the consumption of the individual in period 2. The RHS of 2 represents his consumption if he moves abroad.

This completes the description of the model. Although it is extremely simple and stylized, the interaction of majority voting with labor mobility gives rise to a rich dynamics. The next section starts by studying the benchmark case of the representative version of this economy.

3 The representative agent economy.

To highlight the role of the distribution of income, it is interesting to start from the study of an economy identical to that described above, except that there is no dispersion in the distribution of income, so the all individuals have a labor endowment of 1.

In fact, the representative agent version of the model has a very standard solution. Because all individuals have an endowment of labor equal to the cost of moving abroad, their consumption if they leave is always 0. Obviously, nobody leaves in period 2. Hence, with an interest rate equal to the rate of time preference, the utility of a representative agent is maximized when consumption is smoothed perfectly across the two periods. This is achieved by repaying exactly half of the debt in each period: $R_1 = R_2 = D/2$.²

The representative agent version of the model therefore displays exactly the behavior predicted by standard models of a rational, forward-looking utility maximizer: the costs of stabilization are spread equally over the two periods. This highlights the key role of income dispersion in generating delays in stabilization in this model.

²Note also that a representative agent is indifferent to any tax rate: when pre-tax income is equal to the average, an agent always pays in taxes what he receives in subsidy, whatever the tax rate is.
4 A rich economy.

When the distribution of income is non-degenerate, and despite the simplicity of the setup, there are a large number of cases in this model, depending on the level of development of the economy, captured by $\theta$, on the pattern of the distribution of income, and on the initial value of the debt, $D$. To avoid a tedious list of all possible cases, I will illustrate the two extreme cases of a very rich ($\theta > 2$) and a very poor ($\theta < 1/2$) economy, which are all one needs to capture the main idea of the model.

The key characteristic of a rich economy is that for all initial levels of debt agents C will remain in period 2, regardless of the distribution of income. Given this, it is intuitive that a majority of agents will maximize their utility under a policy of perfect consumption smoothing, i.e. by repaying exactly half of the debt in each period.

To see all this formally, it is useful to consider two cases, depending on whether the agents with median income, agents B, have more or less than the average income.


Suppose initially that in period 2 both groups B and C stay. Since they have above-average labor endowments, both dislike taxation, and in each period they propose the lowest possible tax rate. In period $j$, this is the tax rate that is strictly necessary to raise $R_j$ in tax revenues, $t(R_j)$. Also, given that all agents are present in the economy in period 2, clearly the utility of both agents B and C is maximized when consumption is smoothed perfectly. Thus, both agents B and C propose to repay half of the debt in each period, i.e. they propose $R_1 = R_2 = D/2$ and $t_1 = t_2 = t(D/2)$. Because it has the support of both groups, this proposal wins.

It only remains to show that indeed both groups B and C will be present in the economy in period 2. To show this, note first that the only stable Nash equilibria involve either all agents of the same group leaving or all staying (see Appendix 1 for a formal proof). Given this, suppose first that all agents C have left, and recall that
by assumption the debt must be such that it can be repaid all in the second period. If agents B stay, and all debt $D$ is repaid in period 2, their consumption in period 2 is $\theta n_B - 3D$. If agents B leave, their consumption is $n_B - 1$. Let $D^{B/AB}$ denote the maximum debt that agents B are willing to repay rather than leaving the country once agents C have left, i.e. when only agents A and B are present. Therefore, $D^{B/AB}$ is defined by:

$$\theta n_B - 3D^{B/AB} = n_B - 1$$

(3)

Now suppose all agents are present in the economy. The maximum debt that can be repaid in period 2 without forcing agents C to leave, $D^{C/ABC}$, is defined by:

$$\theta n_C(1 - t(D^{C/ABC})) = n_C - 1$$

(4)

It is easy to show that, for $\theta > 2$, $D^{C/ABC} > D^{B/AB}$: in other words, if $D > D^{C/ABC}$ so that agents C leave, necessarily $D > D^{B/AB}$ and agents B would leave, too. But then no positive debt could be repaid, and therefore any debt $D$ greater than $D^{C/ABC}$ is impossible.

Similarly, following the previous notation, let $D^{B/ABC}$ indicate the debt at which agents B are indifferent between staying and leaving if all agents are present, and $D^{C/AC}$ the debt at which agents C are indifferent if agents B have left. It is easy to show that $D^{B/ABC} > D^{C/AC}$. Thus, $D$ cannot be greater than $D^{B/ABC}$, because at that debt agents B would leave, but then agents C would also leave. Again, nobody would remain to repay the debt.

The above reasoning implies that, if agents B leave, agents C leave too, and vice versa. The maximum debt must therefore be such that both agents B and C stay if all debt is repaid in the second period, i.e. $D_{max} = \min(D^{B/ABC}, D^{C/ABC})$. Because agents C are richer than agents B, they have more to lose from taxation, and therefore leave at lower levels of debt than agents B. Thus, $D^{C/ABC} < D^{B/ABC}$, and $D_{max} = D^{C/ABC}$. This implies that under any temporal profile of debt repayment, all agents will be present in the economy.
In summary, letting $\Sigma_i$ denote the proposal by agents $i$ in period 1, the proposals of the three groups are:

Agents A: $\Sigma_A$: $t_1 = 1$, $R_1 = 0$;  
Agents B: $\Sigma_B$: $t_1 = t(D/2)$, $R_1 = D/2$;  
Agents C: $\Sigma_C$: $t_1 = t(D/2)$, $R_1 = D/2$;

Clearly, the proposals of agents B and C win a majority of votes in period 1. Half of the debt is repaid in each period, and the consumption of each agent is smoothed perfectly, exactly as in a representative agent economy.


The basic difference with the previous case is that now agents B have a below-average endowment of labor. Thus, if agents C are present in period 2, the equilibrium tax rate will certainly be 1 in both periods, as both groups A and B vote for it.

As before, suppose that indeed agents C are present in period 2. Given this, agents A and B can smooth consumption perfectly and maximize utility by proposing a tax rate of 1 and by repaying half of the debt in each period. Hence, both groups propose $t_1 = t_2 = 1$, $R_1 = R_2 = D/2$. With the support of two groups, this proposal obviously prevails, and again the debt repayment is spread equally over the two periods.

To show that indeed agents C stay in period 2, note that agents B now cannot leave in period 2 because their labor endowment is below 1. Therefore, if all agents C leave, the maximum debt that can be repaid is equal to the aggregate income of agents B: $D^{B/AB} = \theta n_B/3$. On the other hand, if all agents C stay, the tax rate is 1 and their income in period 2 is $\theta - R_2$. Hence, the maximum debt that can be repaid in period 2

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3Because their endowment is below the average, in period 1 agents A propose the maximum possible tax rate, 1. Also, agents A anticipate that in period 2 the tax rate that will prevail in equilibrium will be the minimum tax rate necessary to repay $R_2$; therefore, there will be no redistribution of income in period 2, and the consumption of agents A will be 0 independently of the value of $R_2$. Given this, it is obviously optimal for agents A to propose $R_1 = 0$, so as to maximize consumption in period 1. Under this proposal, they consume $\theta$ in period 1 and 0 in period 2.
before agents C leave, $D^{C/ABC}$, is now defined by:

$$\theta - D^{C/ABC} = n_C - 1$$

For $\theta > 2$, it is easy to show that $D^{C/ABC} > D^{B/AB}$, like in the case of low inequality. Thus, $D_{\text{max}} = D^{C/ABC}$, which implies that all agents C certainly stay in period 2.

To summarize, the proposals of the three groups are:

Agents A: $\Sigma_A$: $t_1 = 1, R_1 = D/2$;
Agents B: $\Sigma_A$: $t_1 = 1, R_1 = D/2$;
Agents C: $\Sigma_C$: $t_1 = t(R^C_1), R_1 = R^C_1 > D/2$.

Clearly, the proposals of agents A and B win a majority of votes in period 1. Although now the winning coalition is different, reflecting the different distribution of income, the path of aggregate consumption and income for the whole economy is the same as in the case of high inequality. Both aggregate consumption and the consumption of each individual are smoothed perfectly, and the costs of the stabilization are distributed equally across the two periods.

5 A poor economy.

Consider now a very poor economy, with $\theta < 1/2$. Because the economy is so poor, all agents C will leave when inequality is high, i.e. when $n_B < 1$, even if the equilibrium tax rate were 0 and there were no debt to repay. In fact, when $\theta < 1/2$, $\theta n_C < n_C - 1$ whenever $n_C > 2$, i.e. whenever $n_B < 1$.

4 For any given $R_1$, in period 1 agents C propose $t(R_1)$; under this proposal, since in period 2 the equilibrium tax rate will be 1, their consumption would be higher in period 1 than in period 2 if half of the debt were repaid in each period. Therefore, they propose a value of $R_1$ that is larger than $D/2$.

5 The pattern of individual consumptions is different, though, as a consequence of the different tax policies adopted. In particular, now all agents consume the same amount, since the tax rate is 1.
An important implication is that agents A will always favor postponing the adjustment entirely to period 2. In fact, when inequality is low \((n_B > 1)\), both groups B and C (if they stay) have above-average endowments and therefore oppose any redistribution of income in period 2. When inequality is high \((n_B < 1)\), as seen above agents C will certainly leave, and again agents B will oppose any redistribution of income in period 2. Given this, the best strategy for agent A is to try and maximize redistribution in the only period when it is possible, i.e. in period 1. Thus, agents A always propose \(t_1 = 1\) and \(R_1 = 0\) in period 1.

If some other group too agrees on postponing the repayment entirely to the second period, a majority of individuals support this policy. The other group that can agree to postponing the adjustment entirely to the second period is group C. In fact, contrary to the case of a rich economy, now it is possible that \(D^{B/AB} > D^{C/ABC}\): in other words, it is possible for agents C to leave and agents B to stay. If agents C indeed want to leave, then they will propose to postpone the adjustment to the second period, so that the entire cost will be borne by agents B. The remaining part of this section shows precisely that, in equilibrium, this can occur in highly unequal societies.

1. Low inequality: \(n_B > 1\).

A complete treatment of this case requires an analysis of several subcases, depending on the pattern of income distribution. However, the outcome of all these subcases is always the same, namely that the proposal of agents B always prevails, and the economy spreads the repayment of the debt between the two periods. Only the main intuition will be presented here, while the complete formal analysis is left to Appendix 2.

Note first that, because \(n_B > 1\), the tax rate in period 2 will be the minimum required to repay the debt. In fact, regardless of whether agents C are present or not, a majority of agents have above-average endowments, and therefore dislike any taxation beyond what is strictly necessary to repay the debt.
When $n_C$ is relatively low (close to the lower bound $3/2$), $\frac{1}{2}D^{B/AB} < D^{C/ABC}$. Hence, if the debt repayment is spread equally between the two periods, agents $C$ will stay. Agents $B$ can therefore smooth consumption perfectly by proposing $R_1 = R_2 = D/2$ and $t_1 = t_2 = t(D/2)$. If agents $C$ stay, they maximize utility by smoothing consumption equally between the two periods, and therefore they too propose $R_1 = R_2 = D/2$ and $t_1 = t_2 = t(D/2)$. If they leave in period 2, clearly they maximize utility by letting all the debt be repaid in period 2, when they have left; therefore, in this case they propose $R_1 = 0$ and $t_1 = 0$.\(^6\) As shown above, agents $A$ propose $t_1 = 1$, $R_1 = 0$. It is relatively easy to show that B’s proposal defeats the other two in pairwise comparison. In fact, B’s proposal defeats A’s proposal because agents $C$ always prefer B’s proposal to the high tax rate in A’s proposal. Agents $A$ are indifferent between B’s and C’s proposals, since they get nothing under either; hence, B’s proposal defeats C’s proposal.\(^7\)

When $n_C$ is high, $\frac{1}{2}D^{B/AB} > D^{C/ABC}$. Hence, at high levels of debt it might impossible for agents $B$ to smooth consumption perfectly: if $D/2 > D^{C/ABC}$, agents $C$ will leave in period 2 if $D/2$ is repaid in each period. Thus, agents $B$ propose $R_1 = D - D^{C/ABC}$ and $R_2 = D^{C/ABC}$, and $t_1 = t(R_1)$, $t_2 = t(R_2)$, so that agents $C$ stay in period 2. Again, B’s proposal defeats the other two in pairwise comparison, for the same reasons as above.

The proposals of the various groups in period 1 can be summarized as follows:

Agents $A$: $\Sigma_A$: $t_1 = 1$, $R_1 = 0$;

Agents $B$: $\Sigma_B$: $t_1 = t(R^B_1)$, $R_1 = D/2$ or $R_1 = D - D^{C/ABC} > D/2$;

Agents $C$: $\Sigma_C$: $t_1 = 0$, $R_1 = 0$ or $t_1 = t(D/2)$, $R_1 = D/2$.

As shown above, B’s proposal always wins in period 1. Thus, when inequality is low, a poor country acts like a rich country, repaying half of the debt in each period, or it can even slightly frontload the cost of the adjustment, by repaying more than half the debt.

\(^6\)Note that this last case can occur only if $D^{B/AB} > D^{C/ABC}$.

\(^7\)Recall the $\tau_i$-breaking assumption that group $B$ is infinitesimally larger than the others, which captures the notion that the middle class is larger than the extremes or at least has more political clout.

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in period 1.

Although both groups A and C might be in favor of delaying the repayment of the debt, they disagree strongly on the tax policy. Because the difference over the tax policy is so radical, this issue is more important than any agreement they might have over the timing of the debt repayment. Therefore, the proposal of the middle class is adopted.

2. High inequality: \( n_B < 1 \).

The main difference with the previous case is that now not only agents A, but even agents B vote for a tax rate equal to 1 in period 1. This causes a crucial shift in alliances: now agents C prefer A’s proposal over B’s proposal because the two have the same tax rate, 1, but at least the former postpones the adjustment entirely to the second period, exactly as in C’s proposal. This creates a winning coalition in favor of postponing the adjustment, composed of groups A and C.

More formally, note that now agents C certainly leave in period 2, because \( n_B < 1 \) implies \( n_C > 2 \), and for these high values of \( n_C \) the maximum consumption agents C that can achieve, \( \theta n_C \), (when the tax rate is 0 and there is no debt to repay), is less than what they can consume abroad, \( n_C - 1 \). Thus, agents C propose \( t_1 = 0, R_1 = 0 \). Knowing that agents C will not be present in period 2, agents B will try to smooth consumption by proposing a larger repayment in period 1 than in period 2, so that agents C can be called on to contribute to the repayment in the only period when they are present. Hence, agents B propose \( t_1 = 1 \) and \( R_1 > D/2 \). Finally, agents A know that there will not be any redistribution in period 2, independently of the size of the repayment; hence, they want to maximize their consumption in period 1, by postponing all the adjustment to period 2, and propose \( t_1 = 1 \), and \( R_1 = 0 \).

The following are therefore the proposals of the various groups in period 1:

Agents A: \( \Sigma_A: t_1 = 1, R_1 = 0 \);

Agents B: \( \Sigma_B: t_1 = 1, R_1 > D/2 \);
Agents C: \( \Sigma_C: t_1 = 0, R_1 = 0; \)

and it is easy to see that the proposal of group A defeats the other two in pairwise comparison. In fact, A’s proposal defeats B’s proposal: both imply the same tax rate, but the former allows agents C a higher consumption in period 1 by setting \( R_1 \) at 0. A’s proposal also defeats C’s proposal, as agents B prefer the tax rate of the former, while it has the same debt repayment as the latter. Thus, A’s proposal beats the other two proposals in pairwise comparison, and it is adopted. When inequality is high, a coalition of groups A and C, the two groups at the opposite extremes of the distribution of income, is in favor of a complete delay in stabilization. The proposal of the middle class is defeated, and all the costs of the stabilization are postponed to the second period.

This feature of the model captures two important empirical regularities that were pointed out in section 1. First, it is often poor, unequal societies that have accumulated large external debts in the 70’s and 80’s (see Berg and Sachs (1988). Second, the main political support for budget deficits and accumulation of external lies mainly in a coalition of workers, low-income individuals, and the associations of industrialists.

6 Discussion and conclusions.

This paper has provided a politico-economic framework for the analysis of the phenomenon of delays in stabilization. Unlike the existing literature, it explicitly allows for the formation and shifting of coalitions between groups on the basis of their positions over the fiscal policy stance, a phenomenon that seems to be at the heart of many recent experiences of delays in stabilization. In the model, a delay in stabilization occurs when a coalition of individuals at the opposite extremes of the distribution of income initiates an expansionary fiscal policy. When the time of debt repayment comes, the interests of the two groups diverge drastically and the coalition breaks apart. Importantly, however, the two groups support the initial policy of delaying the stabilization in the full knowledge
that their interest will differ in the future. Thus, the outcome is fully consistent with individual rationality and perfect foresight.

Also, in the model a delay in stabilization occurs only in poor, unequal economies, a feature that seems to be consistent with a number of empirical studies.

From a more technical viewpoint, in this model individuals vote repeatedly over two issues. Despite this, the existence of a non-cycling majority is obtained here by virtue of two features of the model. First, all agents of the economy belong to a discrete (and small) number of classes. Second, only the preferred policies of each class are admissible proposals. This framework might prove useful for future research in the growing body of political economy, where the need to constrain voting to one issue has often proved to be particularly limiting in models that try to capture in a realistic way interactions between economic and political phenomena. As the paper show, interesting "coalitions" might emerge from this framework, where in particular the policy of the "median" voter is defeated.

Many aspects of the typical experience of delay in stabilization are bound to be missing from such a stylized model as used here. For instance, all monetary aspects, in particular the role of monetization of the initial deficits, are completely absent. However, the focus of the model is on distributive aspects and the related political process leading to the delay in stabilization. For this purpose, the use of a real model is probably a satisfactory shortcut.
Appendix 1.

This Appendix proves formally that in a rich economy with low inequality (i.e., with \( \theta > 2 \) and \( n_B > 1 \)), the only stable Nash equilibria involve either all agents of a given group staying or all leaving. To see this, note first that the tax rate in period 2 is either \( t(R_2) \), the tax rate required to repay exactly \( R_2 \), if the mass of agents B and C that stay is a majority; or 1, if the majority is composed of agents A. In both cases, the consumption of agents C decreases as the mass of agents C that leave increases, since the cost of repayment has to be spread over fewer agents. Thus, the consumption of an agent C who stays, \( \theta n_C(1 - t(R_2)) \) (when \( t_2 = t(R_2) \)) or \( \theta - R_2 \) (when \( t_2 = 1 \)), decreases as the mass of agents C who leave increases. Similar considerations apply to agents B.

For some parameter values and for some values of \( R_2 \) all agents C staying and all leaving may both be Nash equilibria. However, in this case they would be Pareto-ranked: in the former, the consumption of agents C would be \( \theta n_C(1 - t(R_2)) > n_C - 1 \), in the latter, it would be \( n_C - 1 \). Similarly, the consumption of agents B would be higher in the former equilibrium than in the latter. To avoid dealing with problems of multiple equilibria, that are not the focus of this paper, I assumethat in these cases the Pareto-superior equilibrium is selected. Thus, whenever \( \theta n_C(1 - t(R_2)) > n_C - 1 \), all agents C stay; when this inequality is reversed, all agents C leave.\(^8\) Similar considerations apply to agents B.

Appendix 2.

This Appendix proves that, in a poor economy with low inequality (i.e., with \( \theta < 1/2 \) and \( n_B > 1 \)), the proposal of agents B always wins.

First, as shown at the beginning of section 5, it is clear that agents A always propose

\(^8\)Note that there might be a third Nash equilibrium, with a mass of agents C staying such that those who stay consume exactly \( n_C - 1 \). However, unlike the other two, this third equilibrium is unstable. In addition, it is still Pareto-inferior to the equilibrium with all agents C staying.
$R_1 = 0$ and $t_1 = 1$. The proposals of agents B and C are slightly more complex. It is useful to consider two separate cases:

Case 1: $\frac{1}{2}D_{B/AB} < D_{C/ABC}$.

The distinctive feature of this case is that it is possible for agents B to repay half of the debt in each period while at the same time retaining all agents C in period 2. This means that, if $t_1 = t_2 = t(D/2)$ and $R_1 = R_2 = D/2$, all agents stay and consumption is perfectly smoothed. Clearly, the utility of agents B is maximized under this proposal.

Agents C can make one of two proposals, depending on the value of the parameters. First, their utility could be maximized under the same proposal as agents B, $t_1 = t_2 = t(D/2)$ and $R_1 = R_2 = D/2$. Alternatively, agents C might be better off leaving in period 2, in which case they would propose $t_1 = 0, R_1 = 0$, thus postponing the adjustment to the second period. \(^9\)

If agents C make the first proposal, clearly it wins because it has the support of both agents B and C. If they make the second proposal, B’s proposal still wins. In fact, when voting on B’s and C’s proposals, agents A are indifferent between the two and abstain; therefore, B’s proposal wins. When voting on A’s and B’s proposal, agents C prefer the latter. In fact, under the former their lifetime income is $\theta + n_C - 1$, under the latter, $\theta n_C (1 - t(D/2))$. It is relatively easy to show that the latter is larger than the former. \(^10\)

Since, in addition, consumption is perfectly smoothed under the latter, clearly it gives a higher utility.

Case 2: $\frac{1}{2}D_{B/AB} > D_{C/ABC}$.

Now it might be impossible for agents B to smooth consumption perfectly, because at

\(^9\)Note that this second proposal can occur only if, at the maximum debt, agents C leave in period 2, i.e. if $D_{max} = D_{B/AB} > D_{C/ABC}$.

\(^10\)To see this, notice that $n_C \leq 1/(1 - \theta)$, since this case arises only if $\theta n_C > n_C - 1$, or, equivalently, $D_{C/ABC} > 0$. 

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high levels of debt $D/2$ is such that agents C leave in period 2. It is then easy to see that
the optimal proposal for agents B is to repay in period 2 the maximum amount that
is consistent with agents C staying, and the rest in period 1. Thus, if $D/2 > D^{C/ABC}$
agents B propose $R_1 = D - D^{C/ABC}$, $R_2 = D^{C/ABC}$, and $t_1 = t(R_1)$, $t_2 = t(R_2)$.

In the same situation $D/2 > D^{C/ABC}$, clearly it is impossible for agents C to smooth
consumption perfectly, because at $R_2 = D/2$ they would leave. Therefore, their utility
is maximized at $t_1 = 0$, $R_1 = 0$. Although both agents A and C propose to postpone the
repayment completely, however, still B’s proposal wins. In fact, under both A’s and B’s
proposal agents C consume $n_C - 1$ in period 2. However, their consumption in period
1 is higher under B’s proposal. Also, as usual agents A abstain between B’s and C’s
proposals, and the former wins.
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