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Why do so many attempts to stop high inflations fail?

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Abstract

The frequent failure of attempts to stop high inflations suggests that governments are constrained in framing effective stabilisation programmes. A model is developed in which some groups have some degree of interest in continuing inflation, and will support stabilisation only if the programme is designed so as to placate them. However this may constrain the programme to have only a small probability of success.

1. Introduction

Whilst hyperinflations have often been stopped with remarkable rapidity (Yeager, 1981), they typically emerge rather more slowly, and only after the economy has passed through a period of accelerating inflation in which there may have been several failed attempts at price stabilisation. In Bolivia inflation accelerated for five years before hyperinflationary conditions were reached in early 1985, with the annual inflation rate exceeding 100% from February 1982 onwards. A similar pattern is evident in most other extreme inflationary episodes of the last fifteen years (e.g. Argentina, Brazil, Israel, Mexico, Peru, Poland, Russia and Yugoslavia). Some observers have interpreted this as evidence that inflation has to accelerate to the point where it induces a breakdown of normal economic relationships before it is readily stopped. The Argentine Finance Minister wrote in 1985 that "moderate inflations are the hardest to stop. The best way to stop an inflation is to fall

into hyperinflation" (quoted by Webb, 1989: 73). The elimination of wage-price inertia under hyperinflationary conditions may be a relevant factor here (Kiguel and Liviatan, 1988).

The technical requirements for a successful price stabilisation are well known. It is necessary to correct the fundamentals (for example, to cut the budget deficit to a level where there is no longer a need to rely on seigniorage revenue) and to find "nominal anchors" (such as the exchange rate) that will help to crystallise an expectation of price stability (Bruno *et al.*, 1988; Dornbusch *et al.*, 1990). Yet it has been estimated that approximately two out of every three price stabilisation attempts fail (Bruno *et al.*, 1988: viii). Economists have no ready explanation for this phenomenon. Although it may be optimal to accept a small risk of failure (Dornbusch, 1991), there is no obvious incentive to announce a programme with a high failure probability, because the failure of the current stabilisation attempt would damage the government's credibility and therefore reduce the chances of success of later stabilisation attempts.

The model presented below emphasises conflicts between different interest groups as the source of the difficulties in achieving stabilisation. The underlying idea is that, although society as a whole may be better off with stable prices, some strategically-placed groups may gain from inflation because the burden of taxation is shifted, and the need to compensate these groups may place significant constraints on the formulation of a stabilisation programme. In other words, some interest groups may have an effective veto over the stabilisation programme, and the only programmes which satisfy these interest groups may be ones which are rather poor from a technical point of view and have only a low probability of success. These strategically-placed interest groups do not have political power (which explains why the stabilisation attempt is made at all) but they do have economic power, and the government's economic policy has to take this into account.

Related work, which also stresses the role of conflicting interests in policy formation, includes Fernandez and Rodrik (1991) on trade liberalisation, Dewatripont and Roland (1991) on former socialist economies and Alesina and Drazen (1991) on price stabilisation. Alesina and Drazen adopt a model of conflict from biology and apply it to the issue of two competing parties disputing over the distribution of the burden of stabilisation. At each stage each party has the choice of conceding (accepting a tax increase on its constituents) or not; if it does not concede, inflation continues. In the Alesina-Drazen model, deadlock between competing interest groups is the source of the failure to stabilise; in my model the

problem lies in the need to secure the support of a particular group who may have an interest in continuing inflation.

2. The model

The model is one of a closed economy which is experiencing high inflation because of a budget deficit which is being financed by the printing of money. Because of great uncertainty about the future course of inflation, the market for government bonds has collapsed and none are currently being sold. However, such a market potentially exists if prices can be stabilised. Consequently, there is some scope for financing a post-stabilisation budget deficit through the sale of bonds, although the willingness of the public to buy bonds clearly depends on an expectation that inflation will not return to its previous levels. This possibility means that a stabilisation attempt *may* be successful even without closing the budget deficit, so that the government may choose what size of post-stabilisation deficit to aim for, although obviously the larger the post-stabilisation deficit, the larger the probability that the required bond sales will not be forthcoming and that resort to money financing will cause the stabilisation attempt to collapse.

There are two types of agents: households and firms. Households have political power and elect the government. Firms have no political power but have economic power because they set prices, and they may choose whether they adhere to the price and wage controls announced by the government.

In the product market there is imperfect competition and firms face a fixed cost of price adjustment every time that prices change. In an inflationary environment each firm faces a trade-off between the frequency of price adjustment and the variance of its relative price about its optimum value. I assume that there is a sufficient number of firms that the aggregate price level rises smoothly, even though the price of each individual commodity rises by jumps. This implies that the relative price of each commodity oscillates over time, falling continuously between price adjustments and then jumping to its previous peak when an adjustment is made. If prices are increasing annually at the logarithmic rate λ and there are m price adjustments per year, the firm raises its prices by (λ/m) at time intervals of $1/m$, and the variance of its relative price p is equal to $\lambda^2/(12m^2)$. The frequency of price adjustments (m) will of course be chosen endogenously.

The government's stabilisation attempt is assumed to consist of two elements: a budgetary correction programme, designed to reduce the budget

deficit and therefore the dependence on the inflation tax; and a freeze on wages and prices, which is intended to create expectations of stable prices and reduce the output cost of successful stabilisation by breaking wage-price inertia. It is not material to the analysis how long the freeze continues. Two conditions will be assumed to be necessary to a successful stabilisation. The money supply must be kept under control, in order to prevent excess demand from undermining the wage-price freeze. Secondly, firms as a group must be willing to support the stabilisation attempt, for otherwise they will not adhere to the price controls and (by assumption) the stabilisation attempt will collapse. I assume that firms will support the government's policy if their profits are higher under the policy than if inflation continues, which will depend on whether their gains from the elimination of the costs of price adjustment exceed their losses from extra taxation. Thus firms are a strategically-placed group who have an effective veto over the stabilisation attempt and must be bribed for it to be successful.

The government is elected by households who hold all of the high-powered money stock and therefore bear all of the inflation tax. I assume that, if prices were stabilised and the budget deficit eliminated, not all of the increase in conventional taxation (or cuts in expenditure) would fall on households, so that households would be better off with stable prices and a balanced budget than under inflation. Consequently, the government would prefer to stop inflation.

Consider now the situation of the firm under inflation. Let the profits per unit of output of firm i, V_i, take the following form:

$$V_i = [1 - a - b(p_i-1)^2] - 2cm \qquad a, b, c, m > 0 \qquad (1)$$

Here the average price of all goods is normalised at one; a (<1) represents the cost per unit of output; and p_i the relative price of the output of firm i. The reasoning behind (1) is that profits are reduced when p_i deviates from its optimum value of unity, and there are also costs of $2c$ incurred at each price adjustment. The more frequent the price adjustments, the larger the adjustment costs, but the smaller the average deviation of p_i from unity. Firms choose the frequency of price adjustment (m) so as to maximise $E(V_i)$. Since $E(p_i)=1$,

$$E[(p_i-1)^2] = \text{var}(p_i) = \pi^2/12m^2 \qquad (2)$$

Taking expectations of (1), differentiating with respect to m and setting equal to zero, profits are maximised when

$$m^3 = b\pi^2/12c \qquad (3)$$

On substitution back into (1), we find that $E(V_i)$ is then

$$E(V_i) = 1 - a - 3cm \quad (4)$$

Since (from (3)) m is proportional to $c^{-1/3}$, profits fall as the costs of price adjustment (measured by c) increase.

Suppose that the government announces a stabilisation programme to begin immediately. This programme pegs all prices and wages for a period deemed long enough to establish the success of the programme, and also includes a series of tax increases designed to reduce the budget deficit. Suppose that the effect of these changes is to reduce the budget deficit per unit of output by A, and that the proportion borne by firms rather than households is s (>0)[1]. What happens to profits if the stabilisation succeeds? First of all, firms benefit from the elimination of price adjustment costs (m=0). It is possible that their prices could be frozen at sub-optimal levels ($p \neq 1$) because not all firms adjust prices simultaneously, but this is a minor point which we shall ignore. However firms also bear an additional burden of taxation. Thus, if the stabilisation programme succeeds (hereafter termed event S), then firm i's profits are

$$[V_i/S] = (1 - sA)(1 - a) \quad (5)$$

This is because there is an additional tax burden of sA on profits per unit of output of (1-a). If, on the other hand, the stabilisation attempt fails (event F), then the firm's expected profits depend on the subsequent inflation rate. They avoid the additional tax burden, but they continue to suffer price adjustment costs. Thus we have

$$E[V_i/F] = 1 - a - 3cm^e \quad (6)$$

where the e superscript denotes an expected value. Firm i supports the stabilisation programme and adheres to the price controls if

$$[V_i/S] - E[V_i/F] \geq 0$$

or

$$3cm^e - sA(1 - a) \geq 0 \quad (7)$$

This condition is identical for all firms. There are three factors which influence whether this condition holds:

1) the size of price adjustment costs in relation to profits per unit of output [$cm^e/(1-a)$];

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[1] In fact A need not consist entirely of explicit budgetary measures, because the budget may also benefit from the elimination of the inflationary erosion of the real value of tax liabilities caused by collection lags (Tanzi, 1991). I assume that, whatever tax increase is used, it cannot fall entirely on households. For example, even if the tax falls on household incomes, the resulting fall in expenditure may cause firms to reduce prices.

2) the size of the government's tax increases (A); and

3) the proportion of this burden borne by firms (s).

The first of these depends on the relative importance of price adjustment costs $[c/(1-a)]$ and the expected rate of inflation in the event that the stabilisation attempt fails, which determines m^e. This is likely to be correlated with the inflation rate immediately preceding the stabilisation attempt, which means that the inflation rate itself is a significant factor (I shall return to this point later). Given the values of the variables listed under (1), the firms' support for the stabilisation programme depends on the size of the adjustment effort (A) and the distribution of the burden (s). In this model a stabilisation can fail either because firms do not support it (condition (7) is not met), or because A is too small and the resulting deficit can only be met by once again resorting to the inflation tax.

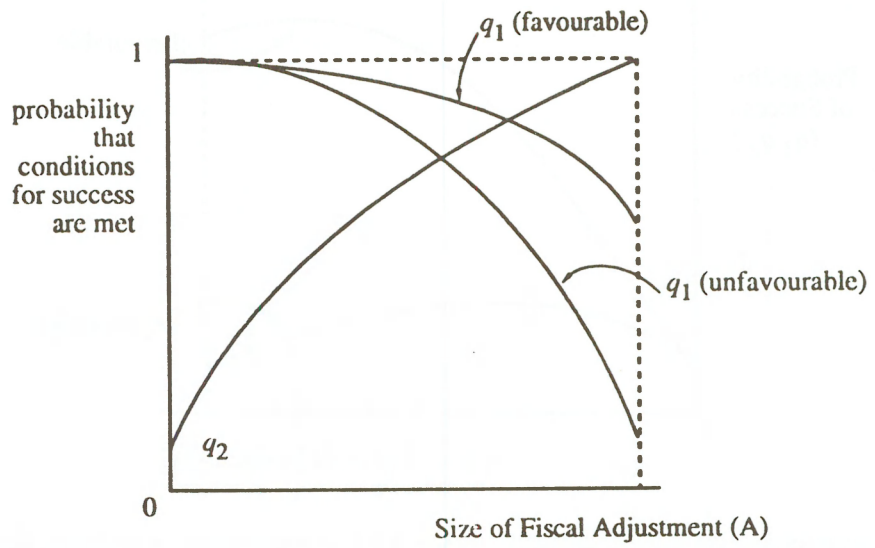
Since households are not in a position to undermine the stabilisation attempt, as firms are, the government's optimal strategy is always to minimise s and push the additional tax burden as much onto households as possible. In the extreme, if s=0, condition (7) is always satisfied. The interesting case is where the minimum attainable value of s is greater than zero, and this is what I shall assume in what follows.

Given the other parameters, the government's strategic problem is to choose the size of the fiscal package, A. If it knows the values of all parameters in (7), then it can work out the maximum value of A, A_{max}, that just satisfies (7). Suppose, however, that the government does not know the value of the term cm^e with certainty, because it is unsure of either the price adjustment costs or the rate of inflation expected in the event that the stabilisation fails, or both. Then A_{max} is not known with certainty and any given value of A has associated with it a certain probability, q_1, that condition (7) is not satisfied. This probability will be an increasing function of A.

However the government also has to consider the other way in which a stabilisation can fail: by excessive monetary growth. Suppose that the government's pre-stabilisation deficit (per unit of output) was D. After stabilisation the government has a deficit of $(D-A)$ which it needs to finance by bond sales to prevent excessive monetary emissions. I assume, along the lines of Dornbusch (1991), that the sales of government debt have some random component which is unknowable in advance, and that the probability that the government can avoid excessive monetary growth (which I denote q_2) is a declining function of the size of the post-stabilisation deficit $(D-A)$. The idea here is that the more debt the government needs to sell, the less likely it is to achieve its target. Other factors that might affect q_2, such as the

Figure 1

The Conditions for Successful Stabilisation in Relation to the Size of Fiscal Adjustment



q_1 - probability of firms' support for stabilisation

q_2 - probability of financing deficit through bond sales

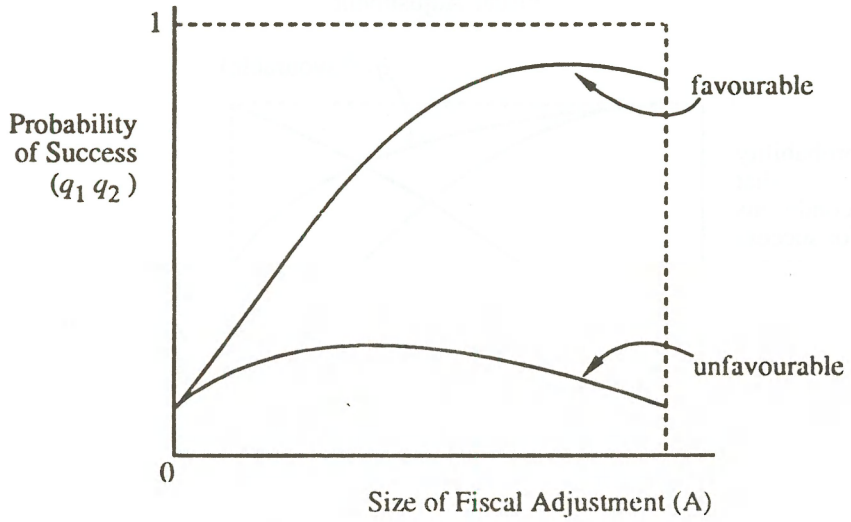
credibility of the stabilisation programme and the government's reputation, will be treated as exogenous in order to focus on the relationship between q_2 and the size of the deficit.

It is clear that, whilst the government will wish to keep A down in order to raise q_1, the desire to increase q_2 creates pressures in exactly the opposite direction. The relationship between these two probabilities (q_1, q_2) and the adjustment effort A is shown in Figure 1. If A=D, there is no need to sell any debt and therefore q_2 reaches one. The relationship between q_1 and A is depicted for two different values of s, a low (favourable) value and a high (unfavourable) value.

The problem for the government is that it faces two necessary conditions in order to achieve a successful stabilisation. It must placate firms in order to make sure that the price controls hold; and it must sell sufficient bonds to cover the resulting deficit in order to prevent the controls from being

Figure 2

Overall Probability of Success of Stabilisation Attempt



undermined by excess demand. Since these are necessary conditions, the stabilisation attempt succeeds only if both are met, which occurs with probability q_1q_2.

The government wishes to achieve price stability and so its optimal choice of A is that which maximises q_1q_2. If conditions are favourable in the sense of Figure 1 (i.e. q_1 is high for all values of A up to D), then the optimal policy may be one where the remaining deficit is small and the overall chance of success is high. However, if conditions are unfavourable, there is unlikely to be any policy which yields a good chance of success, and the optimal choice may represent a rather weak adjustment package that leaves a large deficit still to be financed. These possibilities are depicted in Figure 2.

Clearly a significant factor here is the size of the pre-stabilisation deficit (D). A higher deficit, for the same fiscal adjustment A, implies a lower q_2-line in Figure 1. The appropriate response may well be to choose a higher value of A at higher levels of D, taking greater risks that the firms will not support the stabilisation in order to reduce the risk of insufficient bond sales. However we have assumed that D is entirely covered by seigniorage revenue. This implies that D is itself a function of the inflation rate and cannot take any conceivable value. Seigniorage revenue equals the inflation tax (the

inflation rate) times the tax base, which is the real money holdings of the public. The government fixes the rate of growth of the money stock, but the public determines its real money holdings, and together these set the inflation rate. Although real seigniorage revenue increases with inflation initially, beyond a certain inflation rate it is quite likely to fall back (Bruno and Fischer, 1990). At this point the prices increase so fast against the government that its command over real resources actually shrinks as the rate of monetary growth accelerates. This implies that, once inflation passes a certain point, the real deficit (D) may actually start to decrease. This represents an upward shift in the q_2-line in Figure 1. At the same time, the costs of price adjustment to firms continues to increase with the inflation rate. Consequently, once inflation passes a certain threshold, the probability of a successful stabilisation, for a given fiscal adjustment A, starts to increase. This may help to explain why hyperinflations often appear easier to halt than slower inflations.

3. Conclusion

The frequency of failed price stabilisation attempts in high-inflation economies has long been a puzzle, given the fact that the appropriate policies for successful stabilisation are well known. In the model presented above, this is explained by the need to placate an interest group which is in a position to undermine the stabilisation attempt. If the increased fiscal burden experienced by this group is sufficiently large, this group is better off under inflation. This acts as a constraint on the government's stabilisation policy, so that the only feasible stabilisation programme may be one with only a limited fiscal adjustment, whose chance of success is relatively small. Since these constraints are altered by changes in the inflation rate, the model helps to explain why stabilisation attempts may have increasing chances of success as inflation accelerates.

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Özet

Niçin yüksek enflasyonu düşürmeye yönelik çabalar sık sık başarısızlıkla sonuçlanır?

Yüksek enflasyonu düşürmeye yönelik çabaların sık sık başarısızlığa uğraması hükümetlerin istikrar programlarını etkili bir biçimde uygulama konusunda karşılaştıkları kısıtları akla getirmektedir. Makalede geliştirilen modele göre belli grupların enflasyonun devamından çıkarları vardır ve bir istikrar programını desteklemeleri için programın söz konusu grupları memnun etmesi gerekir. Ancak böyle bir programın başarı şansı da çok düşük olacaktır.