

ITALY: THE REAL EFFECTS OF INFLATION AND DISINFLATION

by

Francesco Giavazzi
and
Luigi Spaventa

This paper has been presented to the "Economic Policy Panel" in Torino, on October 20, 1988, and will appear in issue no. 8 of Economic Policy. The authors are grateful to Charles Wyplosz and Fabrizio Barca for discussions, to Stefano Fantacone for research assistance, and to the Istituto Centrale di Statistica for helping with the data.

1. Introduction

The Italian economy has often puzzled foreign observers over the past fifteen years.

In the early 1970s supply shocks caused huge domestic and external imbalances which made Italy a lost cause in the view of many. But the recovery of output was stronger and the turn-around in profitability happened earlier than in other "healthier" countries (Figure 1), while a record investment boom occurred at the end of the decade. In the early 1980s, with inflation accelerating, belated acceptance of EMS discipline was used to enforce stabilization.

It may be expected that the output costs of disinflation would offset the gains of the earlier boom, so that the inflationary spell would leave output unaffected in the long run. This however was not the case. There was a recession, but it was short and relatively mild. Since 1983 output and investment have grown at rates higher than (or as high as) in other major European countries, while the inflation differential with respect to Germany narrowed considerably (Table 1). In terms of output, Italy has clearly outperformed other European economies in the period 1976 to date.

But there is another side to this picture: high fiscal deficits have been a permanent feature of the period and public debt has steadily mounted to record levels.

In this article we attempt to interpret these developments. In our interpretation, some implications of which are perhaps of more than local interest, we stress the role of policies throughout the period--both in the earlier phase of surprisingly quick recovery after the shocks and in the later phase of relatively costless disinflation (1). Two entirely different strategies

were followed in the two phases, as witnessed by the behaviour of inflation, of the exchange rate, of monetary aggregates and of real interest rates. We argue however that the two strategies were consistent in their succession and that they can both be fitted into a coherent design (though policy makers may not have been wholly aware of it at the time): *"Par ma foi! il y a plus de quarante ans que je dis de la prose sans que j'en susse rien"* said M. Jourdain to his professor of philosophy.(2)

On the whole we find that Italian policies have gone beyond simply postponing the output cost of adjustment to the supply shocks; it is not simply a matter of paying later what other countries had paid earlier. Rather, the sequence of policies affected, and in our view improved, the outcome. A comparison with Britain, where the situation was in manyways similar but the policies followed were different, is instructive and can be conveniently summarized by Figures 1 and 2. Italy chose to burst firms' profitability first, tolerating inflation--even letting it increase considerably. As a result investment soared, creating the conditions for the deep structural adjustment in industry. Instead Britain, which faced similar inflation pressure, elected to deal with it first, which resulted in sagging profitability and investment. The structural adjustments required by the supply shocks thus occurred in the context of major hardships, as indicated by the growth performance shown in Table 1. With comparable initial conditions and final outcomes (in terms of output and inflation), Italy has over the whole period created more income and presumably enjoyed higher welfare.

This leaves an important issue open: the question remains whether this favourable outcome was obtained at the expense of high deficits and mounting debt. If so, if the cost of the relatively good performance of the economy was the build-up of debt to the present high levels, there would still be a bill to

settle and the story would look much less successful. While fully recognizing the relevance of the problem, however, we shall argue that its origins cannot be imputed to the policies we discuss in the paper: the debt issue has a history of its own, quite unrelated to the policies we examine.

In the next section we shall first consider the shocks of the first half of the 1970s and the problems facing policy makers of the time. We shall show how a mix of inflation, currency depreciation and supply side measures can provide a second-best solution in a regime of downward rigidity of real wages and we shall see how this solution was applied in the case of Italy. Section 3 deals with the return to the straight and narrow path traced by EMS discipline: a more conventional story in a way, but one which must account for the lower output cost of Italian disinflation. In section 4 we explicitly examine the debt issue, and we make our point by simulating the path of debt growth under an alternative set of policies in the earlier period. In the last section we shall draw some conclusions from our analysis.

Note on the data used in this article

Italy's national accounts recently underwent a very thorough revision which affects not only the levels but also the time profile of the relevant variables. The revision aims to include in the accounts previously unrecorded activity, as emerges from census data and from a more comprehensive definition of employment. Employment is now defined in terms of "units of labour", which, unlike previous data, include part-time and irregular work, standardized for the time actually worked, while excluding workers on subsidized lay-off (Cassa Integrazione).

The statistical material presented in an earlier version of the paper was based on the old national accounts. The new data strengthen, if anything, the evidence in favour of our arguments. Whenever possible, however, we have chosen to present our statistical material and our computations with reference both to the old (o.n.a. in the tables) and to the new (n.n.a.) data, as the latter are not yet published in international sources. Notes to the tables warn when only old data are used, because the new ones are not yet available.

2. The shocks and the policy response

2.1 The shocks and the problems

In the early 1970s supply shocks affected all European economies. The rise of nominal wages and of the nominal cost of labour per unit of output accelerated in all major countries, and more so in Italy and the UK. Fast growth of output, while offsetting to some extent the consequences of rising wages, was accompanied by a hike in raw materials prices. The short-run effects on profit shares varied across countries, depending on the extent to which an inflationary response was tolerated.

Between 1973 and 1974 the oil shock affected Italy more than other countries due to a greater dependence on imported oil (Table 2). The additional "oil bill" (higher cost of imported oil minus additional exports to oil producers) was greater in Italy than elsewhere (with the exception of Japan).

The analysis of this kind of shocks is by now familiar (see for example Bruno and Sachs, 1985). To avert negative effects on output, downward flexibility of real incomes, and in particular of real wages, is required. Wage indexation will raise inflation, while higher demand will not restore the previous level of output unless real wages decline. Stagnation or recession cannot thus be avoided by expansionary policies, nor by exchange rate depreciation, which, in an indexed economy, will feed right back onto prices. The situation will improve with time only if the pressure of unemployment removes the rigidities in the labour market and real wages decline. Rapid substitution of capital for labour may restore the output level in spite of rigid real wages, but at the cost of higher unemployment.

Nowhere in Europe were real wages flexible in this period. In Italy however the rise in nominal labour costs was greater than elsewhere and accelerated precisely in connection with the oil shock. An increase in formal indexation was

agreed upon in 1975; over and above, high wage increases were requested, and granted, in a situation of widespread labour unrest; rigidities in the use of labour increased (3).

Tables 3 and 4 show the extent of the problem. In Table 3 we compute the contributions of labour costs, profit margins and of the terms of trade between materials' prices and output prices (assumed to be exogenous) to the change in the price of manufacturing output (see note to the table). In 1974 the terms of trade factor is responsible for almost four percentage points of the price rise: even in that year, however, the contribution of labour costs was of almost 16 points. In spite of this, accomodating monetary policy (in a situation of excess demand) allowed a rise of profit margins and of the profit share. In the two following years labour costs rose even faster and were responsible for almost the entire rise of output prices, while the profit share fell brusquely.

Table 4 provides comparisons with other European countries (with manufacturing value added rater than output). In 1974 nominal labour costs rose in Italy much faster than anywhere else, though high inflation allowed a temporary decline in real labour costs. In the following two years the nominal cost of labour per unit of real value added rose faster also beacuse of a disappointing performance of productivity: a higher rate of inflation (17-18%) was not sufficient to prevent a rise in real labour costs and a sharp decline in the profit share (Table 5).

Domestic inflation was accompanied by huge external deficits. Between 1974 and 1976, Italy had to make recourse to the EEC support arrangement and to an EEC recycling loan, to an IMF stand-by arrangement and to the IMF oil facility, to a swap of gold for currency with the Bundesbank and to a swap arrangement with the Federal Reserve. There were repeated currency crises and the exchange market had to be closed for over a month at the beginning of 1976.

In short, up to 1976-77 Italy displayed the symptoms predicted by theory for an indexed economy hit by a supply shock. Few at the time would dispute the conclusions of the 1977 OECD Survey of Italy (OCDE, 1977):

"At the beginning of 1977, the situation of the Italian economy remains precarious. There is general agreement in the country on the need to implement an effective stabilization program...[But] no lasting agreement has been reached ...on the choice of a method to stop the incomes-prices spiral...The sacrifices implied by the indispensable austerity measures risk to be ineffective if a pace of inflation of the order of 20% is going to persist for long. Radical stabilization measures are inevitable to avoid that domestic inflation and currency depreciation reinforce each other and that the adjustment of the current balance... is only transitory. Considering the nature of the disequilibria...they will not however be sufficient to bring the economy back onto a path of balanced growth."

The IMF staff's analysis prepared for the second stand-by arrangement in the spring of 1977 criticized deficient policies; stated that "another year of low growth...is inevitable if Italy is to break free from constrictions...that presently hamper economic policies"; and expressed "the belief that the nature of the disequilibrium... is such that correction in a short period of time is not possible" (4). In the OECD's view, unless the indexation mechanism was profoundly changed, policies of demand management could achieve stabilization only at the expense of employment and investment, while exchange rate depreciation would cause an increase in inflation.(5)

These views should be compared with the picture of the period 1977-80 which emerges from charts 1-2 and tables 1-4. There was a strong recovery of output, led by exports and strengthened by an investment boom. Output grew faster than elsewhere; more important, the turn-around in profitability and in the wage gap (however measured) occurred in 1978 - much earlier than in other countries (6). The real labour cost fell substantially in Italy, but rose elsewhere - in low inflation Germany and in high inflation Britain. Inflation in Italy declined

somewhat but remained far higher than elsewhere; gross nominal wages kept rising at over 20% and nominal exchange rate depreciation continued.

The recipes recommended by international organizations were followed to a very limited extent: thus, why did their dire predictions not come true? To what extent were inflation and depreciation instrumental to a relatively favourable and largely unexpected outcome? We shall now try to answer these questions.

2.2 Subsidies, taxes, and depreciation

We intend to show how an unconventional mixture of subsidies and exchange rate depreciation can be used in an indexed economy hit by a supply shock to yield the following results: a favourable effect on the supply side, by restoring profitability; a favourable effect on the demand side, by inducing a real depreciation and thus stimulating exports; additional revenues to finance the subsidies. We shall first tell the story in general terms (a simple formalization appears in the appendix.) We shall then turn to some evidence to see how the story applies to the Italian case.

A simple parable

Suppose a country produces a manufactured good with a linear technology, by means of labour and imported "oil". Assume first that this country only trades with the oil exporter, exchanging its output for oil. There is now a sudden rise in the real oil price. Wages are fully indexed on the home produced good: real wages are unaffected by the shock, the impact of which is only and fully felt by profit margins. With fully indexed wages, the size of the fall in real margins is independent of the price rise, so that inflation is by itself wholly ineffective. The fall in real margins will probably depress investment and cause a slump.

Thus at the macro level there is nothing that the government can do. The government could however decide to enact a "supply-friendly" policy--in short subsidize a recovery in margins. Typically, this can be done by reducing the wedge between the take-home pay and the cost of labour for the enterprise: either by lowering taxes on employees--if they accept a corresponding reduction of their gross wage--or, more directly and more safely, by reducing social security contributions, which is equivalent to granting a subsidy proportional to the wage. The counter-indication for a revenue reduction or for a subsidy arises from their cost for the budget. How can the government avoid the cost for the budget without having to ask Parliament to raise taxes to subsidize profits (a difficult proposition in a pre-Thatcherite era)?

The answer depends on the regime of personal income taxation. With a proportional income tax the answer is negative: if the increase in nominal incomes is in line with the rate of inflation, real revenues remain the same, while the increase of nominal revenues must be used to finance the nominal increase of an unchanged initial real expenditure. Suppose instead that the income tax is progressive, with tax brackets fixed in nominal terms. If tax rates rise with the rise in income, no matter whether nominal or real, we introduce another non-indexed variable in the system, besides profit margins. This is an important change, for real revenues now depend on the price level. As long as only the gross wage is indexed or, more generally, as long as wage earners do not pass on to higher wages an increase in taxation due to inflation, a price rise provides the government with an increase in real revenues, which can be used to subsidize profits (more elegantly, to cut social security contributions). In principle, supposing only for a moment that it can fully control the rate of price rise, the government could set the latter at a level such that the increase in real revenues is enough to finance a subsidy

sufficient to offset the fall in real margins caused by the shock with full gross wage indexation. Note, again in principle, that, to insure a permanent rise in real revenues through progressive taxation, what is required is not an increase in the rate of inflation, but a one-shot price rise, which is sufficient to allow a permanent rise of real tax rates.

Suppose now that the home country also trades with another industrial country where we suppose for simplicity (but without loss of generality) that prices are fixed. Home wages are now indexed on a basket of home produced goods and of imports from the other industrial country and their change will depend on domestic inflation and on the change in the nominal exchange rate. Since wages do not fully reflect domestic inflation, an increase in domestic prices, for a given nominal exchange rate, lowers the product wage at a constant consumption wage. An increase in the price level can thus be used to raise real margins: the cost is a real exchange rate appreciation, and thus a loss of competitiveness and export demand.

Here again subsidies can be used to restore real margins to their pre-shock level; to pay for the subsidies, however, the increase in the price level must be accompanied by a depreciation of the nominal exchange rate, so as to keep the real exchange rate constant. Moreover, just as there is a level of subsidies that allows to keep real margins constant with a constant real exchange rate, higher subsidies allow to achieve the same recovery of margins and a real depreciation. With real depreciation subsidies will of course be higher, and to pay for them nominal depreciation and inflation will have to be correspondingly higher. In short, as is shown in the Appendix, there is always a combination of subsidies and nominal depreciation which insures the constancy of real margins and whatever target of the real exchange rate the authorities decide to pursue.

We note that real depreciation is a desirable target in this context. The

subsidy required to keep real margins constant is being financed at the expense of disposable wage income. The virtuous supply-side effect of subsidies could thus be offset by a fall in demand induced by the fall in households' disposable income. Real depreciation serves to replace consumption with exports and to sustain the level of demand and, at unchanged real margins, of investment.

Once more, we stress that, to achieve the desired outcome, what is required in principle is a one-shot change in the nominal exchange rate and in prices (and a one-shot real depreciation, if the latter is desired). This is important, not because the engineering of a one-shot price rise is a realistic possibility, but because it shows that the story does not require complete absence of money illusion for gross wages and, at the same time, persistent money illusion for the net wage. It is sufficient to perform the trick once, even if wage earners react later by requiring some form of indexation for the net, as well as for the gross wage--which they can do by asking the government to index the tax rate. The only condition is that if they ask for, and obtain, such indexation, this regards the future and not the past.(7)

The strategy in Italy

We are well aware that reality is far more complicated than any simplified parable can tell. First, as is to be expected, in the true story there is not a once-and-for-all jump in prices but persistently high inflation. Second, though inflation does help the budget, it is hard to think that policy-makers consciously plan inflation to raise extra revenue. Extra revenue is a welcome bonus, but monetary accomodation finds other likely justifications: for example, as we shall discuss later, in the need to finance a large budget deficit. Third, by assuming that the tax system is the only source of non-neutrality in the economy, we have neglected more traditional channels, as for example price

stickiness. Finally, even within the period considered in this section, changes in unions' behaviour, as well as important structural differences in the pattern of reactions of enterprises were certainly relevant.

Still, the purpose of parables is not to provide an exhaustive picture of reality, but to draw attention to one of its many relevant aspects by neglecting others, and we believe that our parable captures a crucial feature of the Italian recovery of the 1970s.

In Table 6 we provide evidence on the relevance of the reduction of the wedge between the gross wage and the cost of labour in the period under consideration. Before 1977, and after 1980, the cost of labour for enterprises rose slightly faster than the gross wage. Between 1976 and 1980, instead, the average annual growth of the former was far below that of the latter: this allowed the all in real unit labour costs.

The reduction of the wedge was the result of a generous cut of social security contributions paid by enterprises and of an agreement with the unions to remove indexation from the funds set aside for severance indemnity (8). The ratio of contributions to gross wages fell by ten points between 1976 and 1980.

In spite of subsidies, the budget deficit as a ratio to GDP did not increase in the period: as revenues rose more than expenditures net of interests, the primary deficit actually fell between 1974 and 1980. We are not implying that a budget problem did not already exist at the time. The size of the deficit was already a prominent issue, on which we shall return in section 4. We only maintain that the dynamics of revenues was not affected by the cut in social security contributions, as the rise in direct taxes provided plenty of room for the subsidies.

Table 7 shows how the major source of rising revenues was the joint operation of steeply rising marginal tax rates--introduced with the 1974 tax

reform--and of high inflation: fiscal drag was responsible for an almost 9 points rise of the tax burden on industrial workers between 1974 and 1980, only a fraction of which was offset by discretionary measures of opposite sign. The inflation-induced increase in the average tax rate was such that the wedge between the cost of labour for enterprises and the take-home pay actually increased in the period, in spite of the substantial cut in contributions.

There was in short a redistribution from wages to industrial profits by means of increased taxation of labour incomes induced by inflation rather than legislated by Parliament. Inflationary accommodation provided a way to offset the consequences of the nominal wage shock. The unions were not wholly blind to what was happening, but the compensating discretionary measures which they managed to obtain never affected the structure of marginal tax rates, which was the source of the fiscal drag. They opened their eyes fully in later years, when the "restitution of the fiscal drag" became a major issue of conflict with the government. The structure of income taxation remained unchanged until the early 1980s when it was made less progressive, and deductions for dependent labour income were repeatedly increased. Today a repetition of past history, and the use of inflation to raise tax revenues, would no longer be possible (9). Learning by the unions took however a long time, and that time was sufficient to undo the effects of a nominal wage shock on the distribution of disposable income (10).

The fall in real unit labour costs in 1977-80 was greatly helped by the reduction of the wedge, and hence by subsidies. But an acceleration in productivity growth (Table 4) was at least as important. There certainly are several factors accounting for the behaviour of productivity. Thus, in 1977 the unions agreed to remove some restrictive practices and to allow a more efficient use of equipment. The increase in flexibility within firms did not however

remove the very relevant obstacles to firing and lay-offs. In this situation, there is little doubt that a recovery of demand and output was a necessary condition for faster productivity growth and for exploiting the new machinery installed in the 1973-74 investment boom. The recovery was led by exports which grew at an average real rate of over 9 percent between 1976 and 1980.

Figure 3 shows the real effective exchange rates of the lira computed using manufacturing wholesale prices and unit labour costs. Between 1975 and 1978, the nominal depreciation resulted in large real depreciation. The trend reversed in 1979, when Italy joined the EMS. The gap between the real exchange rate based on wholesale prices and that based on unit labour costs widened until 1981, providing further evidence of the recovery in margins.

Table 8 compares the relative export performance (growth of exports minus growth of export markets) in Italy and in the UK, where the real exchange rate appreciated since mid-1977. The differences, as well as the strengths of Italy's export drive in 1977-79 are remarkable. The boom of domestic demand and real appreciation account for the turn-around in export performance in 1980. A large part of the explanation of the difference between the British and Italian experiences can be traced back to the evolution of their effective exchange rates. Figure 4 illustrates the large appreciation of sterling which is in sharp contrast with the quasi-stability of the lira during the period 1976-81.

To what extent was the fall of the lira a conscious decision by the Italian monetary authorities? The answer is different for the two episodes of sharp depreciation: the first half of 1976 and 1978. In 1976 the fall of the lira was not planned; it resulted from a semester of extravagantly expansionary monetary policy, which caused accelerating inflation, and a deterioration of the current balance. Speculation against the lira then forced the authorities to close the exchange markets and turn to the IMF for a stand-by arrangement (which was never

used).

By the end of 1977, however, the current account was in balance and there were massive capital inflows. Still the exchange rate was not allowed to appreciate: quite on the contrary the authorities pursued a (this time) deliberate policy of guided real depreciation inspired by several motivations. First, in order of time, there was the need to replenish foreign exchange reserves. Second, a falling dollar at the end of 1977 provided the opportunity of coupling an appreciation vis-a'-vis the major import currency with further depreciation against the stronger currencies of Italy's export markets in Europe. Third, the Italian monetary authorities, having more fears than enthusiasm for the EMS, thought it wise to set some more depreciation aside in the second half of 1978 and in early 1979.

The wisdom of this policy of deliberate depreciation has later been explicitly or implicitly questioned (11). It has been maintained that stricter exchange rate discipline would have lowered inflation without affecting the growth performance in the long run. The Governor of the Bank of Italy faced this issue at that time and gave the following answer:

"Though aware of its role in shaping the dynamics of prices, we guided the external value of the lira so as to permit a growth of exports setting the premises for a recovery of accumulation and of employment less conditioned by the external constraint". [Banca d'Italia, 1979]

We agree with the Governor. Depreciation and subsidies were part and parcel of the same strategy employed to pull the economy out of the low growth-rising cost trap into which it had fallen with the oil shock. Real wage flexibility was perhaps a first best solution: but this counsel of perfection was followed nowhere in Europe. In view of the growth and investment

performance the Italian second-best solution does not appear to be inferior to the strategies followed in other countries.

Cost and price inflation was lower in Germany, but so was productivity and GDP growth. Cost inflation was almost as high as in France and the UK, but profit margins were squeezed in both countries, because of lower price inflation in France and recession of output and productivity in the UK. In Italy, the earlier recovery in profit margins and in demand sparked off an investment boom in industry, at unprecedented rates, which lasted for two years (12). In contrast, in the UK, a country similar to Italy for the conditions prevailing in the labour market, the strategy followed was to let the hardship of recession and unemployment take care of the problem: growth and investment did eventually resume, but, as we shall stress later, at greater cost in terms of output and capacity.

3. Back to the fold: the output cost of the disinflation

With 1980

"there came to an end a two-year period in which the real growth rate of GDP and private consumption neared 10 percent, that of investment in machinery and equipment 30 percent....: such ratios are twice or three times as high as in the OECD area. The Italian economy surpassed all other countries in the pace of growth of income and even of employment, but paid the price in terms of external imbalances and inflation". [Banca d'Italia, Annual Report, 1981).

To put the the fiscal non-neutrality at work and pay for the subsidies a jump in the price level is in principle sufficient; but inflation is seldom a stable process: the rate of price increase accelerated from 11 percent in the winter of 1979, to 25 percent in the fall of 1980. More important, considering that in March 1979 Italy had joined the European Monetary System, the inflation differential relative to Germany widened: from 12 percent in 1979 to 16 percent in 1980. One may be led to conclude that the output cost of reducing real wages

had only been postponed. Waiting might have made the bill even higher: by 1980 not only high inflation was built into the wage-price mechanism and in expectations, but the real wage problem was coming right back as unions realized to what extent they were cheated by the fiscal drag.

The surprising part of the story is however the mildness of the Italian recession during the disinflation. Between 1980 and 1987 the inflation differential relative to Germany fell from 16 to 4.5 percent, but the economy kept creating jobs. It is instructive to compare the path of prices and output in the British and in the Italian disinflations. The amount of the disinflation was almost the same: the difference is in the timing and in the output cost. An almost equal reduction of the inflation differential vis-a'-vis Germany took three years in the U.K. but twice as long in Italy. The output cost was however very different.

Model-free estimates of the output cost of a disinflation, such as for example "sacrifice ratios", are often difficult to interpret because they lack a theory predicting what the path of output and employment would be in the absence of the monetary contraction. We present in Table 9 two different measures of this cost in Italy and in the UK. It is difficult to interpret the actual numbers, but we think that the consistent ranking they provide gives useful information on the relative cost of the Italian disinflation.

The first set of numbers measures how much unemployment it takes to bring inflation down by one percent. For example a ten percent reduction in inflation that is achieved in four years, and is associated with an increase in unemployment of one half of one percent per year (say from 5 in year 1 to 5.5 in year 2, to 7 in the last year), corresponds to a sacrifice ratio of $1/2 = (.5*4+.5*3+.5*2+.5*1)/10$. (13) An alternative measure uses output gaps, computed as deviations of real GDP from its (linear) trend growth rate between 1970 and

1987. For each of the two countries the interval over which the sacrifice ratio is computed ends when the inflation differential relative to Germany stabilizes. We show two different measures of the reduction in the inflation differential-- and therefore also of the sacrifice ratio: the absolute fall in the differential, and its percent reduction relative to the initial level. The latter accounts for the fact that squeezing inflation by 1 percent is harder at single-digit inflation levels than it is at double-digit inflation.

The output cost was lower in Italy. The superior performance of Italy emerges from the output gap measure. This is in our opinion a better measure since cumulated unemployment (for which Italy did not do better than the UK) tends to penalize countries, such as Italy, where disinflation is slower, by attributing the *persistence* of unemployment to the disinflation. The difference would be much larger if the reference were actual output rather than the deviation from trend, as trend growth is 3.1 percent in Italy, and 1.7 percent in the UK.

But why was disinflation relatively costless? We first deal with two possible answers. One points to the European Monetary System: the new exchange rate regime, by shifting expectations, has improved the output-inflation tradeoff. An alternative view points to the active role of government in reducing the sacrifice ratio, and is based on the observation that between 1980 and 1985, out of 535 thousand new (net) jobs created in the entire economy, 400 thousand were new government jobs. In our opinion both interpretations overlook the supply side of the story, which is crucial to account for the low output-cost of Italian disinflation. We first deal with those two views; we shall then turn to the supply side.

3.1 Credibility and the EMS

Bringing inflation down requires a change in inflationary expectations on the part of price setters. To convince price setters that an announced contraction will be lasting and credible, and to gain reputation, monetary authorities can proceed in two ways. The reputation that a central bank needs to bring down inflation can be obtained in two ways. The first is by showing that, even in the depth of a recession, the announced monetary targets are not reneged. The recession will come because the monetary contraction needed to disinflate is imposed on an economy where inflation expectations are high, and because the very fact that the monetary authority sticks to the announced contractionary path comes to private agents as a surprise.

Alternatively, monetary authorities can seek to influence expectations with some institutional reform, such as a change in the exchange rate regime.⁽¹⁴⁾ Can the transition from flexible to fixed exchange rates bring about an improvement in the output-inflation tradeoff, and facilitate the disinflation effort? Suppose a country decides to peg its exchange rate passively to another country, whose monetary authorities enjoy a reputation as credible inflation-fighters. By "passive peg" we mean that the former country's monetary authorities, after announcing the exchange-rate parity, simply accommodate the other country's monetary policy, without attempting to influence its choice of targets. In the private sector wage and price setters will appraise the credibility of this institutional reform in terms of the probability they assign to the consistent pursuit of the announced exchange rate target on the part of the authorities. If, and only if, the target is a credible one, expectations will adjust and the process of disinflation will be eased.

In summary, the argument that joining the EMS has helped Italy in the disinflation efforts of the 1980s rests crucially on the assumption that

exchange-rate targets are more credible than monetary targets. The way to assess the empirical relevance of this argument is to test the hypothesis that the decision to join the EMS has produced a shift in expectations. The empirical evidence is consistent with the hypothesis that a shift in expectations did occur, but suggests a long lag between the start of the EMS and the effect on expectations (15): in Italy the shift in expectations is estimated to have occurred in the first quarter of 1985--six years after the start of the EMS; in France in March 1983; in Ireland in the Fall of 1982. The timing of these shifts suggests that the the turn-around in expectations was induced by some specific set of measures which signalled that there had been a change in policy regime: the turn-around in macroeconomic policies of the first Mitterand government in France, and a similar policy turn-around in Ireland in the summer of 1982 (16). As for Italy, in 1984 the government, by decree, set a ceiling to wage indexation limited to that year. By itself this measure would have a very small effect on inflation. But the opposition and the more militant union called for a national referendum and were defeated. This defeat, and an unusual display of firmness on the part of the government, affected expectations far more than the measure in itself (17). EMS membership might have helped by providing a justification for unpopular polices, but the data strongly suggest that the the new exchange rate regime did not automatically produce an improvement of the output-inflation tradeoff. Governments had to prove that they were prepared to bear the cost of unpopularity before price-setters became convinced that the committment to the new monetary targets was lasting.

3.2 Fiscal accomodation

Disinflation has important implications for the budget: it reduces the portion of the deficit that can be financed by printing money; it raises real

interest rates and adds to the cost of servicing the public debt. Disinflation therefore requires a shift not only in monetary policy, but also in fiscal policy: failure to adjust fiscal policy to the new monetary conditions may results in the build-up of a debt problem.

Accompanying disinflation with fiscal contraction, on the other hand, may worsen the recession already induced by the slowdown in money growth: in the short run an improvement in the structural budget balance may be more than offset by the effects on the budget of the rise in unemployment.

Between 1980 and 1982 the British disinflation was accompanied by a sharp turn-around in the structural budget balance. Italy followed an opposite course of action. There was no adjustment in fiscal policy, as by 1986 the primary deficit ratio was still at its 1980 level. But the path of fiscal policy may have affected the output cost of disinflation, which was preceded by a sharp fiscal expansion, between 1980 and 1981, only partly reversed in the following period (Between 1979 and 1981 indexation for public sector's salaries was increased, pensions were raised and so were tax deductions and family allowances, while generous increases were granted to civil servants with the payment of substantial lump-sum advances. The result was a jump in the Treasury cash requirement in 1980 and in the primary deficit ratio in 1981.)

The difference with the UK appears clearly from Table 10. Between 1980 and 1982 the UK structural balance improved by 5.4 percent of GDP, while in Italy (on old national accounts) it worsened by 2.4 percent. The Italian fiscal expansion of 1980-81 was superimposed to a situation which was already one of excess demand: it thus raised the inflation peak and caused a large external imbalance. This worsened the initial conditions of the disinflation. We have no estimate of the extent to which this initial fiscal impulse sustained demand in the following years. It is probable that the output cost of disinflation

would have been higher had Italy followed the path of British fiscal policy. But the crucial point is how much this contributed to the build-up of public debt, which in the long run is the true cost of delaying adjustment by means of fiscal expansion. We shall address this question in the next section.

Whatever the contribution of fiscal accomodation to disinflation, we surmise however that the crucial factor of the low cost of Italian disinflation must be sought on the supply side of the story.

3.3 The timing of the supply squeeze

In order to break the inflation inertia it was necessary to convince firms that they could no longer rely on a depreciating exchange rate and on subsidies: to preserve their profit margins they should now cut costs and exploit to the best the investment made earlier.

At the macro level the change was signalled by a tightening of monetary policy and a sharp rise of interest rates. Next, it was necessary to convince firms that they could no longer rely on a depreciating exchange rate and on subsidies: to preserve their profit margins they should now cut costs and exploit to the best the investment made earlier. The authorities let the real exchange rate of the lira appreciate substantially: realignments in the EMS, though frequent, always fell short of the cumulated inflation differential (18).

Next the generous subsidies which had lowered the cost of labour earlier now came to an end: the wedge between the cost of flabour and the gross wage increased again (see Table 4). Help to industry however did not come to an end. Subsidies to reduce the cost of labour were replaced by provisions for firms planning to increase productivity by rationalizing, and reducing, the use of labour. State intervention to finance lay-offs (Cassa Integrazione) due to restructuring and early retirement schemes encouraged labour shedding, and made

it possible to by-pass the staunch opposition of the unions to outright firing of industrial workers (19). Between 1980 and 1984 the number of hours paid through this system (at 80-90 % of the ordinary wage) increased by three times.

The attitude of firms changed, and so did that of the unions, threatened by sticks and lured by a few carrots. In deciding on lay-offs, which were often preliminary to a loss of the job, enterprises discriminated against more militant workers. In 1984 there was the decree on indexation which we have already discussed. Carrots were provided by a clumsy but not ineffective version of tax-based incomes policy, whereby tax concessions to offset the fiscal drag were granted in exchange for wage moderation. The result was a far greater flexibility in the use of the work force and fast increase in productivity.

This policy was effective. But its effectiveness depended crucially on the fact that it came after the early recovery in margins, investment boom and modernization of equipment.

Once exchange-rate accommodation came to an end and competitiveness started to fall, profit margins were squeezed. But as the squeeze came at a peak of the profit rate, there was room to reduce margins without turning them negative. The outcome was strong pressure on firms to adapt to the new monetary regime, but few bankruptcies and plant closures. This, in our opinion, is the explanation for the low output cost of the Italian disinflation. In the UK, at the start of the disinflation, profit margins were at an all-time low. As the pressure from the real appreciation mounted, along came bankruptcies and plant closures: these are partly irreversible decisions that imply permanent dissipation of physical and human capital.

The role of the initial level of profits in determining the output cost of the disinflation provides a good example of *hysteresis*--namely of the

possibility that temporary fluctuations may have long-lasting effects on the economy. This point, which to the best of our knowledge has never been documented, obviously deserves more careful empirical investigation. Yet the lesson seems to be that exerting pressure on the supply side may be an effective way to speed up the adjustment of prices and wages--in the sense that it may reduce its output cost-- provided it comes at a time when firms are ready to bear a squeeze on profits.

4. Is debt the price?

In the mid-seventies the ratio of public debt to GDP was below 50 percent; it has now surpassed 100 percent. High debt levels are not unusual in Europe. But contrary to other countries where debt is also high--Belgium for example--Italy still runs primary deficits close to 2 percent of GDP: there is yet no sign of the primary surpluses necessary to service the debt and stabilize its ratio to GDP.

Though Italian government debt is almost entirely held domestically, so that a problem of solvency in the strict sense does not exist, the fear of financial instability is widespread, as signaled for example by the inability of the Treasury to lengthen the maturity of the debt (20). This section deals with the sources and the prospects of the Italian debt problem. The obvious question is whether the smart policies of the seventies and early eighties have simply postponed the bill, that now falls due in terms of an unsustainable path for public debt.

Italy is not new to high debt levels. Since 1861, the date of birth of the Italian state, the ratio of public debt to GDP has grown beyond 100 percent already three times: in the early years of the new nation (1861-1910), and at the time of the two world wars (see Figure 5 (21)). The three episodes of debt

stabilization that followed each surge of the debt ratio, correspond to three different ways to reduce a high debt ratio. Between 1900 and 1910 it was the rapid growth of real income which stabilized the debt to GDP ratio. After each war, on the contrary, debt was reduced through some form of repudiation: a forced consolidation in 1926, and inflation in 1946-47. After World War II there was a 20-year period of debt stability which ended in 1969. In only three years, between 1970 and 1973, the ratio of debt to GDP jumped from 33 to 50 percent. These are the years when Italian public finances went out of balance. Never since have they recovered. The most recent growth of the debt to GDP ratio occurred in a period of peace and is thus more similar to the 1880-1910 episode. It is interesting to note that the only case of debt growth which has not resulted in some form of repudiation is precisely this peacetime 1880-1910 episode.

In order to understand what happened in the early seventies we show in Figure 6 the contributions of the primary deficit and of debt service to the growth of public debt (22). In the 1960s stability of the debt level was guaranteed by the combination of moderate primary deficits and interest rates lower than the growth rate of the economy. Between 1970 and 1973 the primary deficit increased from 4.3 to 8.3 percent of GDP: this increase was not cyclical (1973 was a boom year with 7 percent real growth), but was caused by a structural jump in public expenditure not matched by a corresponding change in tax revenues. The early seventies were a period of big social reforms: an extension of the years of compulsory schooling, a reform of the health-care system, the decision to link pension benefits to earnings, rather than to contributions, etc. The gap that those social bills opened in public finances is documented in Table 11: it has never since been closed. In the mid-seventies the tax base was widened through a major tax reform: between 1973 and 1985 the

combination of a larger tax base, higher tax rates and inflation raised revenues from 29 to 41 percent of GDP: enough to cover the increase in expenditure over the same period (also approximately equal to 12 percentage points of GDP); but not enough to close the gap opened in the earlier period. Thus for 15 years (1973-1985) the primary deficit fluctuated between 5 and 8 percent of GDP.

Once a gap between expenditures and revenues is opened, the subsequent growth of the debt ratio depends on the real interest rate and on the growth rate of the economy. As shown in Figure 6, just when primary deficits increased, inflation turned the stock of debt into an asset rather than a liability, as nominal interest rates fell much below the growth rate of income and helped to stabilize the debt ratio. Though low real rates were not special to Italy in the seventies, there is evidence that exchange controls allowed the Italian authorities to keep domestic rates below the level they would have reached otherwise: between 1974 and 1983 onshore rates were on average 350 basis points lower than the corresponding offshore rates.

The ability to raise revenue through the seigniorage attached to money creation is another way to slow down the growth of marketable debt. As shown in Figure 7, seigniorage revenue contributed 2-3 percentage points of GDP per year throughout the late seventies (23).

Figure 8 provides a rough estimate of the path of the debt ratio under an alternative story of greater monetary virtue in the 1970s and less fiscal profligacy in the early 1980s. Had Italy followed a low-inflation since 1976, domestic interest rates would have been at the (covered) level of international rates: the lower line is drawn by simply adding the difference between the offshore and the onshore rate to the average interest rate on public debt. If we also assume that seigniorage was kept at only one percent per year over the period, we obtain the upper line. To take care of the fiscal expansion in 1981,

we have subtracted 1 percent of GDP from primary deficits in the years 1981-83: adding this assumption to the other two, we obtain the middle line. In the three simulations, primary deficits (except in 1981-83 for the third case) and the growth rate of nominal income are unchanged relative to history (24). The purpose of this exercise is only to show that the policies discussed in this paper were not by themselves responsible for the growth of debt and that more conventional policies would have been more costly in terms of debt .

In the last few years the safety nets which sterilized the effects of fiscal imbalances on debt in the 1970s have been removed: the need to set monetary policy consistent with German targets, and financial liberalization, have cut seigniorage and made it impossible to control real rates. Italy now faces the effects of the fiscal imbalance created in the early seventies. Revenues will have to increase: this, however, is the delayed price to be paid for the social reforms of the early 1970s, not for the supply friendly policies of the late 1970s nor for the policies which later reduced the cost of disinflation.

5. Conclusions

In the troubled period of the 1970s, characterized by several shocks and a complete lack of wage flexibility, recourse to conventional policies would have implied a prolonged period of depression and postponed supply-side adjustment. Less inflation and greater exchange-rate stability would have been the prize, but a costly one in terms of output, and particularly in terms of investment. Instead, the Italian response to the oil shock was at odds with this conventional wisdom. Inflation was used to give government the means to boost profit margins. Despite a fairly complete system of wage indexation, inflation worked through the non-neutrality of the income-tax system, and some degree of

real wage myopia of the trade unions. That route could, however, not be pursued for too long because its costs were rising and its benefits were declining, particularly as inflation almost went out of control. EMS membership marked the watershed and precipitated the change, but a change was unavoidable anyhow. Disinflation was not achieved by conventional means either, as the change in monetary regime was not accompanied by a consistent change in fiscal policy. It might have been expected that the retribution for profligacy would be high. This was not the case, however. The earlier recovery of margins and the investment boom eased the consequences of monetary and exchange-rate discipline; with high profit margins and the new capital stock installed, pressure could be exerted on industry to cut costs and adapt quickly to the new regime without undue sacrifices in output.

As of 1989 Italy has solved most of its macroeconomic problems, save one. It is our view, however, that the debt problem does not originate in the particular set of policies reviewed in this paper. The primary budget deficit was promptly and widely increased between 1970 and 1973, and never reduced since. Yet, it has not further deteriorated either; the explosive growth of the debt to GDP ratio is a consequence of this early increase in the primary deficit, combined with high real interest rates. Undoubtedly, the primary deficit must now be turned into a sizeable surplus and this may well provoke some severe macroeconomic hardship: this, however, will be the price to pay for the 1970-73 period, and not for the policies discussed in this paper.

The Italian experience raises a number of questions about the timing of stabilization policies after a major supply shock. One important result is that, in spite of indexation, inflation may be an effective policy instrument and that disinflation may be relatively painless. Timing seems, however, essential to success. The comparison with the British case is illuminating in

this respect. With compressed profit margins, adjustment in Britain took partly the form of plant closures, thereby dissipating physical, and possibly human capital. By boosting profit margins first, and subsequently imposing adjustment, Italy never underwent the massive wave of plant closures observed in the UK. Adjustment is a slow process as firms' strategies are limited by the speed at which labour markets can absorb large-scale restructuring: the timing and the sequence of policies are thus essential to make sure that temporary fluctuations do not have long-lasting effects on the economy.

APPENDIX

In this appendix we formalize the parable of section 3.1 in the text. Let m be nominal margins. ω is the nominal wage, v is the real price of materials. Nominal margins are equal to the price minus variable costs, so that:

$$p = \alpha\omega + m + \beta vp$$

We now define real wages, real margins and real value added per unit of output, respectively equal to:

$$\tilde{\omega} \equiv \omega/p, \quad \tilde{m} \equiv m/p$$

The economy is hit by a terms of trade shock equal to v . Wages are indexed. We shall consider two cases. In the first the economy only trades with the oil exporter at given relative prices, and wages are indexed to the price of domestic output. In the second the economy also trades with another industrial country, and wages are indexed to a basket of domestic and foreign final goods.

Case 1

As $w/w = p/p$, after an increase in the relative price of materials real margins fall by:

$$\dot{\tilde{m}} = -\beta \dot{v}$$

There is a progressive tax on labour incomes with elasticity $\eta > 1$.

Nominal revenues per unit of output are:

$$t = \alpha \tau \omega_t^\eta, \quad \eta > 1$$

Initially the government finances a given level of expenditure raising taxes on labour income in the amount:

$$\alpha \tau \omega_0^\eta$$

The net revenue per unit of output after a price rise is:

$$\alpha \tau \{ [\omega_0 (1+\pi)^\eta] - \omega_0^\eta (1+\pi) \}$$

where $\pi \equiv \dot{p}/p$.

The government now grants a subsidy s_t per unit of output in the form of a percent contribution, σ , on the wage per unit of output:

$$s_t = \sigma \alpha \omega_t = \sigma \alpha \omega_0 (1+\pi)$$

Let $\omega_0 = 1$, and let the net revenue from the price rise be fully devoted to subsidies: the contribution on the wage that can be financed is:

$$\sigma = \tau [(1+\pi)^{\eta-1} - 1]$$

Consider now a country with fixed real wages that wants to grant a subsidy

such as to bring real margins back to their pre-shock level. We can compute by how much the price must rise to finance such a subsidy. The subsidy required is:

$$s = p \beta \dot{v}$$

i.e.

$$\sigma = (\beta \dot{v}) / (\alpha \tilde{\omega})$$

The price rise required to finance the subsidy is:

$$(1+\pi)^{\eta-1} = (1/\tau) [(\beta \dot{v}) / (\alpha \tilde{\omega})] + 1$$

where

$$\pi = (1/\tau) [(\beta \dot{v}) / (\alpha \tilde{\omega})] \text{ for } \eta = 2.$$

Similarly we could compute price rises to finance any other recovery of margins--for example to bring real margins back to the level they would have been in the case of fixed nominal wages and nominal margins.

Case 2

Wages are now indexed to a basket of home and foreign final goods:

$$\dot{w}/w = \lambda (\dot{p}^*/p^* + \dot{e}/e) + (1 - \lambda) \dot{p}/p,$$

where p^* is the foreign currency price of foreign final goods, and e is the nominal exchange rate with the other industrial country. We shall assume for simplicity that $\dot{p}^* = 0$. The rate of inflation now is:

$$\pi = \frac{(\dot{m}/m)\tilde{m} + \alpha \lambda \tilde{w} (\dot{e}/e) + \beta \dot{v}}{\tilde{m} + \alpha \lambda \tilde{w}}$$

The change in real margins is:

$$\begin{aligned} \dot{\tilde{m}} &= \tilde{m} (\dot{m}/m - \pi) = \\ &= \frac{\alpha \lambda \tilde{w} (\dot{m}/m - \dot{e}/e) - \beta \dot{v}}{\tilde{m} + \alpha \lambda \tilde{w}} \tilde{m} \end{aligned}$$

The change in real margins now depends on the change in nominal margins, so that there exists a rate of inflation such as to prevent a fall in real margins. That rate of inflation, however, causes a real appreciation in the home country for the dynamics of the real exchange rate is given by:

$$(\dot{e}/e) - \pi = \frac{\tilde{m} (\dot{e}/e - \dot{m}/m) - \beta \dot{v}}{\tilde{m} + \alpha \lambda \tilde{w}}$$

If $(\dot{m}/m) = (\dot{e}/e) + (1/\alpha\lambda\tilde{w}) \beta \dot{v}$, as required to keep real margins constant, the real exchange rate will appreciate by $\beta\dot{v}/\alpha\lambda\tilde{w}$.

Subsidies are now used to restore profit margins preventing a real appreciation (or even engineering a real depreciation); the nominal exchange rate will have to move to provide the inflation sufficient to finance the subsidies.

The real exchange rate will remain constant (or depreciate) depending on:

$$m/m \leq \dot{e}/e - (\beta \dot{v})/\tilde{m}$$

Substituting this expression in the equation showing the dynamics of real margins, we obtain the subsidy required to keep real margins unchanged:

$$s \geq p\beta\dot{v}$$

The inflation rate is:

$$\pi \leq \dot{e}/e$$

where the inequality signs hold if the target is a real depreciation.

To finance the subsidies it is necessary that:

$$\sigma = \tau [(1+\pi)^{\eta-1} - 1] \geq (\beta \dot{v})/\alpha\tilde{w}$$

Consider for simplicity the case $\eta = 2$: then the rate of depreciation required to finance the subsidies is:

$$\dot{e}/e \geq (1/\tau) (\beta\dot{v}/\alpha\tilde{w})$$

By granting subsidies and suitably changing the nominal exchange rate it is always possible to keep real margins constant and achieve any desired value of the real exchange rate.

Notes:

(1) Our emphasis on the role of policies implies that we consider the popular explanation of Italian growth in terms of the strength of Italy's underground economy wholly unsatisfactory. The possibility of evading rules imposed by the tax authorities or the Labour Office may be relevant in other contexts, but can hardly account for the reaction of the economy to wage and oil shocks or to the imposition of EMS discipline.

(2) The role of policies in the first period is stressed by Graziani and Meloni [1980], CER-IRS [1986, ch.1], Barca [1987], Cipolletta [1986], Calcagnini et al. [1987]. Andreatta and D'Adda [1986] provide an opposite, and critical appraisal of policies in that period.

(3) "The increase of rigidities and the diffusion of distortions in the field of employment and wage costs have been of paramount importance. The mobility of active population between sectors and enterprises seems to have decreased... Restrictive manpower practices, with unfavourable effects on productivity [are widespread]. At the same time wage costs have tended to rise considerably, so much that it is sometimes difficult to forecast their evolution... More recently the rules on cost-of-living indexation have been aligned ... to the most favourable conditions. Within each sector pressures have increased to extent to all firms wage conditions and concessions granted by those with the stronger financial situation." [OCDE, 1977].

(4) See Spaventa [1983].

(5) OCDE [1977]. An economy with full indexation is modelled by Modigliani and Padoa Schioppa [1977], to reach similar conclusions.

(6) See Bruno [1985] and United Nations [1988].

(7) Another problem may arise from the presence of a Tanzi-Olivera (more correctly Bresciani-Turroni) effect. The latter however concerns situations of persistence hyperinflation, and not of one-shot price rises.

(8) Indexation on this funds was subsequently reintroduced in 1982.

(9) In 1988 the government agreed to a *de facto* lagged indexation of personal taxation, by giving a pledge to cut taxes on labour income so as to offset the previous year's fiscal drag above 2 percent inflation.

(10) The consequences of inflation were not confined to those on tax revenues, as inflation also provided a powerful help to enterprises by eroding the real value of their outstanding debt contracted at fixed nominal interest rate. A measure of this effect is the size of the inflation correction of the reported net liabilities of the enterprise sector, which also shows the redistribution from households to firms and which in the period under consideration was as high as 5 percent per year on average (see Ministero del Tesoro, 1977). Another measure is the difference between gross operating margins and margins net of *real* interest payments: the latter's rise is far steeper than that of the former (see Banca d'Italia, 1983).

(11) See especially Andreatta and D'Adda [1986].

(12) The Governor of the Bank of Italy provided a vivid picture of the boom in his 1981 Report:

"First exports, then private consumption pulled the economy out of the recession in te course of 1978. Consumption kept growing in the first half of 1979. [...] The dynamics of exports and consumption sparked a strong recovery of investment, especially in machine and equipment, in the second half of 1979. [...] For nine months since the beginning of the expansionary phase gross domestic product grew at an annual rate of 10 percent". [Banca d'Italia, 1981]

Investment growth was accomodated by monetary policy and negative real interest rates. The nature of investment varied with the size of firms [see Barca and Magnani, 1985a, b; Barca, 1987; Himler and Milana, 1983]. Investment contributed to the increase of capacity in the smaller enterprises, whereas it was mostly devoted to rationalization and substitution in the larger ones. Smaller enterprises grew in number and expanded in all sectors. Scrapping and disinvestment were important for larger enterprises: the techniques used in the new plants appear to be both labour and capital augmenting, and there is evidence of a decline in their capital/output ratio.

The analysis of a Bank of Italy sample (Barca and Magnani, 1985b) shows that between 1977 and 1982 there occured a remarkable shortening (2.5 years) in the average life of equipment, which had instead remained more or less constant in the previous decade. This matches some evidence of a younger average life of equipment in Italy than in other countries (Bank of England, 1988, and Chan-Lee

and Sutch, 1985).

(13) This measure of the sacrifice ratio is computed for example in Sachs and Wyplosz [1986].

(14) The arguments discussed in this section are developed more fully in Giavazzi and Giovannini [1988; and 1989, chpt.5] where the empirical results to which we refer are also reported.

(15) The results are presented in Giavazzi and Giovannini [1988] who examine how the relation between price and wage inflation and output has shifted after the start of the EMS in five European countries.

(16) The French and Irish experiences are discussed in Sachs and Wyplosz [1986] and Dornbusch [1988], respectively..

(17) For an account of these events and for an estimate of the shift in expectations see also Gressani et al. [1988].

(18) The rise of the dollar mitigated the rise of the real effective exchange rate which was half as large (+ 7%). For an analysis of the role of a real appreciation in enhancing the credibility of a disinflation, see Giavazzi and Pagano [1988].

(19) Between 1980 and 1985 while employment in larger enterprises, which made far greater use of the lay-off and early retirement provisions, fell by more than 21%, industrial action, as measured by the number of hours lost for

strikes, declined by 80 percent--from 75 million hours lost in 1980 to 16 million in 1985.

(20) On the management of the Italian debt see Giavazzi and Spaventa [1988].

(21) Figure 3.2 reports data on total public sector debt, including debt held by the central bank.

(22) The measure of the primary deficit reported in Figure 3.1 is the Public Sector Borrowing Requirement net of interest. The contribution of debt service to the growth of public debt is $(i-n)b$, where i is the average nominal interest rate on public debt, n is the growth rate of nominal GDP, and b is the ratio of debt to GDP.

(23) Most of this revenue, as discussed in Giavazzi [1988], is accounted for by the level of bank reserves, much higher in Italy than elsewhere in the industrial countries.

(24) In these simulations "debt" is the marketable debt of the state sector.

References

- Andreatta, N. and C. D'Adda [1985], "Effetti Reali o Nominali della Svalutazione? Una Riflessione sull'Esperienza Italiana dopo il Primo Shock Petrolifero", Politica Economica, 1 (April.)
- Banca d'Italia [1981], "Costi e Profitti nell'Industria in Senso Stretto; Un'analisi su Serie Trimestrali 1970-80", Bollettino.
- Banca d'Italia [1983], "Costi e Profitti nel Settore Industriale: Aggiornamenti e Revisioni Metodologiche", (a c. di G. Bodo and I. Visco) Supplemento al Bollettino, XXXVI, 7.
- Bank of England [1988], "Trends in Real Rates of Return", Quarterly Bulletin (August.)
- Barca F. [1987], "Sviluppo e Ristrutturazione delle Imprese Industriali: Le Due fasi: 1978-80 e 1981-85", Banca d'Italia, mimeo.
- Barca F. and M. Magnani [1985a], "Ristrutturazione e Disinvestimento Anticipato nella Medio-Grande Industria Italiana", Banca d'Italia, Contributi all'Analisi Economica, 1.
- Barca F. and M. Magnani [1985b], "Nuove Forme di Accumulazione nell'Industria Italiana", Banca d'Italia, Temi di Discussione, no. 52.
- Bruno, M. [1985], "Aggregate Supply and Demand Factors in OECD Unemployment: An Update", NBER Working Paper no. 1696.
- Bruno, M. and J. Sachs [1985], Economics of Worldwide Stagflation. Cambridge (Mass.): Harvard University Press.
- Calcagnini, G., I. Cipolletta e A. Heimler [1987], "Ristrutturazione e Adattamento dell'Industria Italiana", Economia Italiana, 3.
- CER-IRS [1986], Quale Strategia per l'Industria? Bologna: Il Mulino.
- Chan-Lee, J.H. and H. Sutch [1985], "Profits and Rates of Return in OECD Countries", OECD, Economics and Statistics Department, Working Paper no. 20.
- Cipolletta, I. [1986], "L' Industria Italiana negli Ultimi 15 anni: Il ciclo delle Interpretazioni", in I. Cipolletta (ed.) Struttura Industriale e Politiche Macroeconomiche in Italia. Bologna: Il Mulino.
- Dornbusch, R. [1989], "Credibility, Debt and Unemployment: Ireland's Failed Stabilization", Economic Policy, 8.
- Giavazzi, F. [1989], "The Exchange Rate Question in Europe", Commission of the European Communities, Economic Papers

- Giavazzi and Giovannini [1988], "Can the EMS be Exported? Lessons from Ten Years of Monetary Policy Coordination in Europe", CEPR Discussion Paper no. 285.
- Giavazzi, F. and A. Giovannini [1989], Limiting Exchange Rate Flexibility: The European Monetary System. Cambridge (Mass.): MIT Press.
- Giavazzi, F. and M. Pagano [1988], "The Advantage of Tying One's Hands: EMS Discipline and Central Bank Credibility", European Economic Review, 32 (5).
- Giavazzi, F. and L. Spaventa [1988], High Public Debt: The Italian Experience. Cambridge (UK): Cambridge University Press.
- Graziani A., and F. Meloni [1980], "Inflazione e Fluttuazione della Lira", in G. Nardozzi (ed.), I Difficili Anni '70. Milano: Etas Libri.
- Gressani, D., L. Guiso and I. Visco [1988], "Disinflation in Italy: An Analysis with the Econometric Model of the Banca d'Italia", Journal of Policy Modelling, 10, (2).
- Heimler, A. and C. Milana [1984], Prezzi Relativi, Ristrutturazione e Produttività: Le Trasformazioni dell'Industria Italiana. Bologna: Il Mulino.
- Ministero del Tesoro [1987], Ricchezza Finanziaria, Debito Pubblico e Politica Monetaria, Rapporto della Commissione di Studio Nominata dal Ministro del Tesoro, Roma.
- Ministero del Tesoro [1988], Direzione Generale del Debito Pubblico, Il Debito Pubblico in Italia: 1861-87. Roma.
- Modigliani F. and T. Padoa Schioppa [1977], "La Politica Economica in un'Economia con Salari Indicizzati al 100 o piu'", Moneta e Credito, 30, 117 (March.) Translated in "The Management of an Open Economy with "100% plus Indexation", Essays in International Finance, no. 130. Princeton: Princeton University Press.
- OECD [1977], Economic Survey of Italy.
- Pagano, M. [1989], "Monetary Policy, Capital Controls and Seigniorage in an Open Economy: Discussion of A. Drazen", in A. Giovannini and M. De Cecco (eds.) A European Central Bank? Perspectives on Monetary Unification after Ten Years of the EMS. Cambridge: Cambridge University Press.
- Sachs, J., and Wyplosz, C. [1986], "The Economic Consequences of President Mitterand." Economic Policy, 2.
- Silvani, M. [1985], "Dipendenza Energetica, Struttura Produttiva e Composizione del Commercio Estero", in F. Onida (ed.) Innovazione, Competitività e Vincolo Energetico. Bologna: Il Mulino.

- Spaventa, L. [1983], "Two Letters of Intent: External Crises and Stabilization Policies: Italy 1973-77", in J. Williamson (ed.), IMF Conditionality. Washington: Institute for International Economics.
- United Nations Economic Commission for Europe [1988], "Wage Rigidity in Western Europe and North America", Economic Survey of Europe: 1987-88.

Table 1

Indicators of Performance

(average annual growth rates)

	1977-80	1981-82	1983-87	1977-87
<u>Gross domestic product</u>				
France	2.8	1.5	1.6	2.0
Germany	2.9	0.4	2.2	2.1
UK	1.1	-0.1	3.3	1.9
Italy (o.n.a.)	3.3	-0.2	n.a.	n.a
(n.n.a.)	4.3	0.6	2.6	2.9
<u>Gross fixed capital formation</u>				
- total:				
France	1.7	-1.6	0.3	0.5
Germany	4.6	-5.0	1.8	1.5
UK	-0.4	-2.3	4.4	1.4
Italy (o.n.a.)	3.6	-2.3	n.a.	n.a
(n.n.a.)	4.2	-3.7	2.8	2.1
- machinery and eq.:				
France	2.8	-0.8	1.7	1.7
Germany	6.9	-5.5	4.5	3.4
UK	3.5	-4.8	6.2	3.1
Italy (o.n.a.)	5.7	-3.4	-	-
(n.n.a.)	9.1	-4.4	5.7	5.0
<u>Private consumption deflator</u>				
(difference with Germany)				
France	6.2	6.8	4.1	
UK	9.4	4.6	2.9	
Italy(n.n.a.)	12.3	12.2	7.7	

Sources: European Economy; for investment: OECD, Quarterly National Income Accounts, 3, 1988.

Table 2

<u>Indicators of Oil Intensity</u>				
	France	Germany	UK	Italy
Share of oil consumption on industry's energy consumption (1974)	51.2	36.9	45.8	56.5
Direct and indirect requirements of imported oil for 100 lire of final demand (1975)				
- manufacturing	0.583	0.762	1.077	1.125
- total economy	3.274	2.757	4.572	4.642

Source: Silvani [1985].

Table 3

Contributions to the Average Annual Change of Output Prices in Manufacturing(a)

	<u>1974</u>	<u>1975-76</u>	<u>1977-79</u>	<u>1980</u>
Labour costs (b)	15.8	16.7	10.3	9.8
Profit margins (b)	8.9	2.4	4.7	7.3
Terms of trade	3.8	-1.7	-0.1	0.7
Residual	0.9	-0.2	-0.1	0.2
Rate of change of output prices	29.4	17.2	14.8	18.0
memorandum items:				
Rate of change of input prices	37.2	14.9	14.6	21.2
Shares on value of output				
- labour	-2.8	3.4	-2.0	-1.6
- profits	0.9	-1.6	2.2	1.2
-external inputs	1.9	-1.8	-0.2	0.4

(a) o.n.a. Value added at factor costs.

(b) Adjusted for self-employed and for subsidized lay-offs.

Sources: Authors' computations on data from Banca d'Italia [1983]. See also Sources for Table 4.

Technical note to Table 3:

Let q be manufacturing output and p its price. Then $pq \equiv W + \Pi + M$, where W are gross wages, Π gross profits and M the value of inputs external to the sector. Let low-case letters denote ratios to output, and let α and β be respectively the labour and the external inputs per unit of output, and p_M be the price of external inputs. Then:

$$p = \alpha w + \pi + \beta p_M$$

If the terms of trade, p_M/p , are set exogenously and letting $\gamma = (1 - \beta p_M/p)^{-1}$, the reciprocal of the share of value added on the value of output,

$$p = \gamma(\alpha w + \pi)$$

and

$$\dot{p}/p = \gamma (\alpha w/p) \dot{w}/w + \gamma (\pi/p) \dot{\pi}/\pi + \dot{\gamma}/\gamma$$

Table 4

Labour Costs in Manufacturing

(annual compound rates of change)

	1974	1975-77	1978-80	1981-85
<u>Nominal cost of labour per employee</u>				
France	12.6	17.9	14.0	10.4
Germany	11.6	9.2	6.2	5.1
UK	15.6	20.5	15.6	10.3
Italy (o.n.a.)(a)	25.8	22.5	16.9	16.3
(n.n.a.)(b)	26.1	21.9	17.6	16.3
<u>Real value added per person employed(c)</u>				
France	2.6	4.3	3.4	3.0
Germany	2.7	4.8	0.5	3.4
UK	1.8	1.4	-1.3	5.8
Italy (o.n.a.)(a)	4.0	1.5	5.1	3.4
(n.n.a.)	3.6	3.0	5.8	4.3
<u>Nominal cost of labour per unit of real value added</u>				
France	9.7	13.0	10.2	7.2
Germany	8.7	4.2	5.7	1.6
UK	13.6	18.8	17.1	4.2
Italy (o.n.a.)(a)	20.9	20.7	11.2	12.5
(n.n.a.)	21.7	18.4	11.1	11.5
<u>Real labour cost per unit of real value added(d)</u>				
France	-5.1	3.0	0.1	-1.7
Germany	0.4	0.5	2.2	-1.6
UK	10.1	-1.4	1.7	-2.2
Italy (o.n.a.)(a)	-6.2	2.4	-3.3	0.7
(n.n.a.)	-3.1	1.8	-1.6	-0.1

Notes to Table 4.

(a) The o.n.a. data on dependent employment and on total employment are corrected for dependent workers on subsidized layoffs.

(b) Units of dependent labour.

(c) Employees plus self-employed. For Italy (n.n.a.) total labour units; value added at market prices.

(d) value added at market prices deflator.

Sources: Commission of the European Communities, Directorate General for Economic and Financial Affairs, "Indicators of Profitability, Capital, Labour and Output", [1988], mimeo. For Italy, number of workers on subsidized layoffs: authors' estimate (ratio of number of subsidized hours to yearly contractual hours) on data from Banca d'Italia, Annual Report, various issues, and Barca [1987].

Table 5

Changes of Adjusted^a Gross Profit Shares in Manufacturing

	1973-74	1974-77	1977-80	1980-85
France	+1.5	-6.3	-0.8	+4.2
Germany	-0.2	-0.8	-4.4	+3.3
UK	-5.0	+2.3	-4.3	+8.4
Italy (o.n.a.)	+2.6	-5.2	+7.9	-2.5
(n.n.a.)	+1.8	-3.1	+4.6	+0.1

(a) Shares on value added at factor costs adjusted for imputed income of the self-employed.

Sources: see Table 4.

Table 6

Italy: The Wedge and the Cost of Labour in Manufacturing

	1977-80	1981-85		
<i>Annual Rates of Change</i>				
<u>Gross wage per employee</u> (o.n.a.)(a)	20.4	15.6		
(n.n.a.)	20.6	16.0		
<u>Nominal cost of labour per employee</u> (o.n.a.)(a)	17.6	16.3		
(n.n.a.)	17.6	16.3		
<u>Real gross wage per unit of real value added</u> (b) (o.n.a.)	0.1	0.1		
(n.n.a.)	1.3	-0.3		
<u>Real cost of labour per unit of real value added</u> (b) (o.n.a.)	-2.2	0.7		
(n.n.a.)	-1.2	0.1		
<i>Ratios</i>				
	1976	1977	1980	1985
<u>Difference between labour costs and gross wage to gross wage</u> (c)(o.n.a.)	47.5	38.2	33.9	38.1
(n.n.a.)	53.6	43.3	39.1	41.0
<u>Social security contributions paid by employers to gross wage</u> (n.n.a.)	39.3	34.4	29.7	31.8

Notes to table 6:

- (a) Corrected for workers on subsidized lay-offs (only for the o.n.a.).
- (b) Value added at market prices and value added at markets prices deflator; adjusted for self-employed.
- (c) The two major items of the difference are the funds set aside for severance indemnity and the social security contributions paid by employers.

Sources:

Istituto Centrale di Statistica, Annuario di Contabilita' Nazionale; Banca d'Italia, Annual Report; Centro Europa Ricerche, Rapporto, no. 6, 1987.

Table 7

Taxes on Labor Income

(Changes of direct tax ratios on dependent labour income)
(percent of gross wage)

	1974-77	1977-80
- total	+2.8	+4.6
due to:		
- rise in real income	+1.3	+0.4
- discretionary changes	-2.5	-0.7
- fiscal drag	+4.0	+4.9

Source: Centro Europa Ricerche, Rapporto, no. 4, 1984.

Table 8

Relative Export Performance in Italy and in the UK (a)

	Italy (o.n.a.)	United Kingdom
1976	+0.9	-2.0
1977	+2.6	+3.0
1978	+5.0	-4.5
1979	+0.4	-5.0
1980	-4.7	-8.5

(a) Growth rate of exports minus growth rate of export markets for manufactures.

Source: O.E.C.D., Economic Outlook, various issues, and Istituto Centrale di Statistica.

Table 9

The Output Cost of Disinflation

	UK (1980-83)	Italy (1980-87)
<i>Reduction in the (CPI) inflation differential relative to Germany:</i>		
(a) percentage points	10.0	9.0
(b) percent of the initial level	84.4	67.2
(c) Cumulated Output Loss:	11.7	5.6
(d) Cumulated increase in unemployment	21.2	17.6
<i>Sacrifice Ratios:</i>		
output gap measure:		
(c)/(a)	1.08	0.62
(c)/(b)	0.14	0.08
unemployment measure:		
(d)/(a)	1.96	1.96
(d)/(b)	2.45	2.62

Sources. Inflation: OECD, Economic Outlook. Cumulated output loss: sum of deviations from trend GDP growth (loglinear trend 1970-87). Cumulated increase in unemployment: sum of yearly changes in the OECD standardized measure of unemployment: UK, OECD Economic Outlook; Italy, Banca d'Italia, Annual Report, 1988.

Table 10

	Change in Structural Budget Balance (percent of GDP)						
	1980	1981	1982	1983	1984	1985	1986
United Kingdom	+1.1	+2.9	+1.4	-1.3	-0.5	+0.5	-0.3
Italy(o.n.a.)	+1.0	-3.4	0.0	+2.2	-0.3	-0.9	+0.6

Source: OECD, Economic Outlook. A positive sign indicates a move toward fiscal restriction.

Table 11

The Source of the Italian Debt Problem
(public sector, percent of GDP, n.n.a.)

	1970 (level)	1970-73 (change)
Revenues	29.2	-0.5
Expenditure net of interest	33.5	+3.5
- purchases of goods and services		+1.2
- wages and salaries		+0.4
- pensions and other soc. transfers		+1.3
- other items		+0.6

Source: Ministero del Tesoro, Direzione Generale del Debito Pubblico,
Il Debito Pubblico in Italia: 1861-87. Roma, 1988.

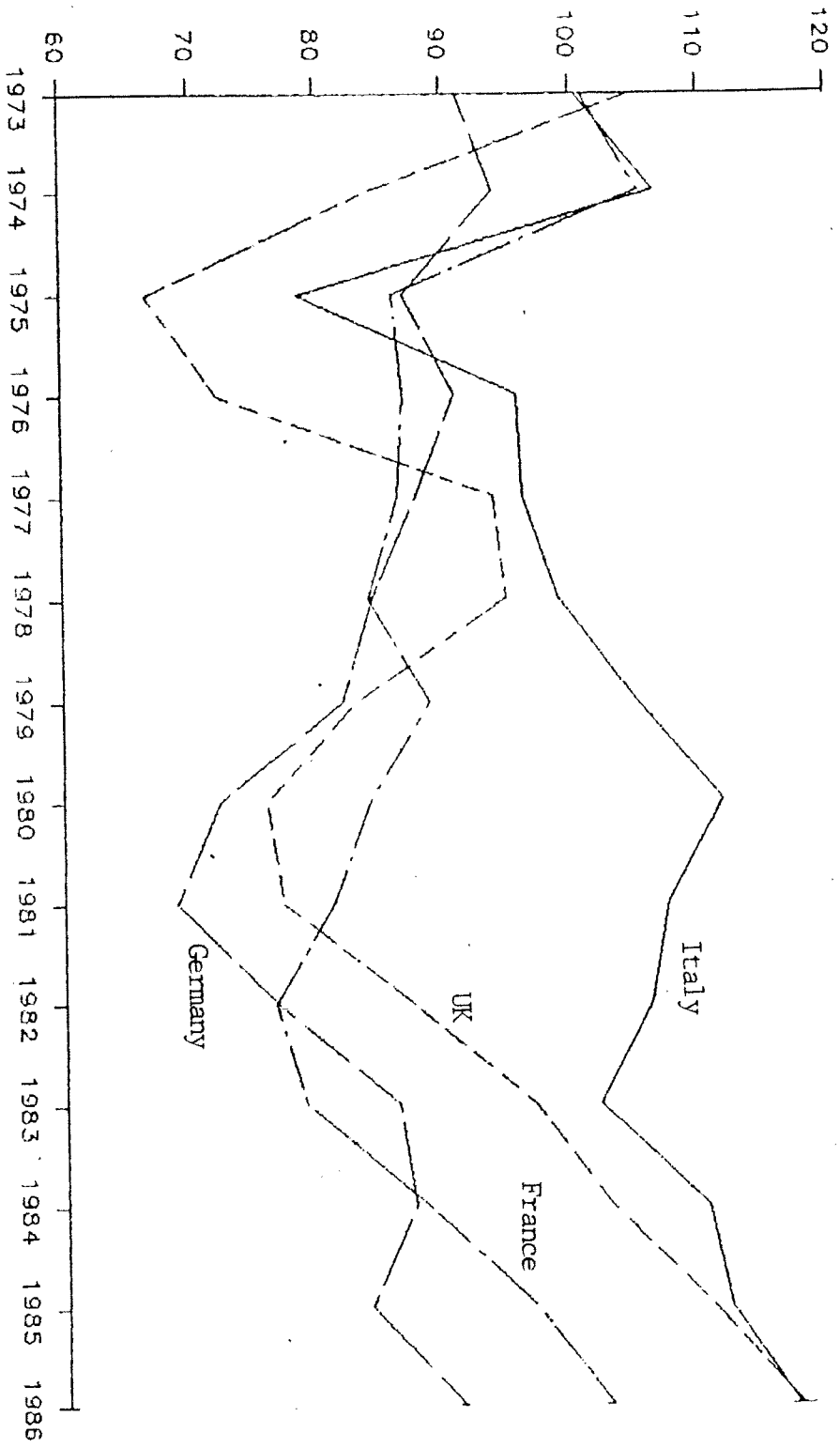


Figure 1. Gross profit shares

Source: See Table 4.

Note: Shares in value added at factor costs adjusted for imputed income of the self-employed.

% per annum

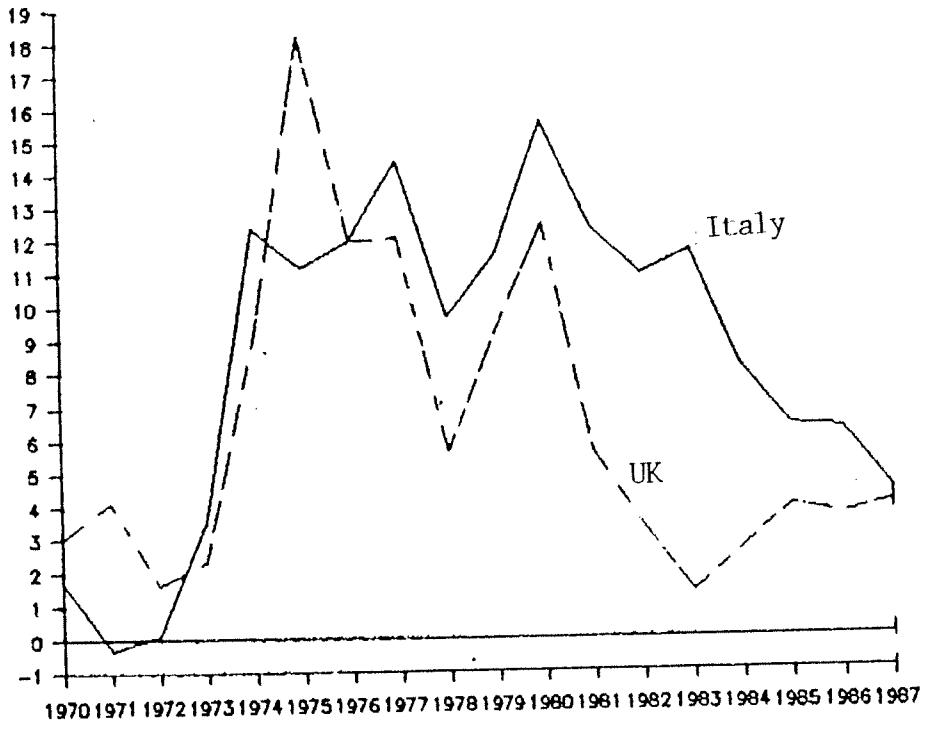


Figure 2. Inflation differentials with Germany (consumers' prices)

Source: OECD, Economic Outlook

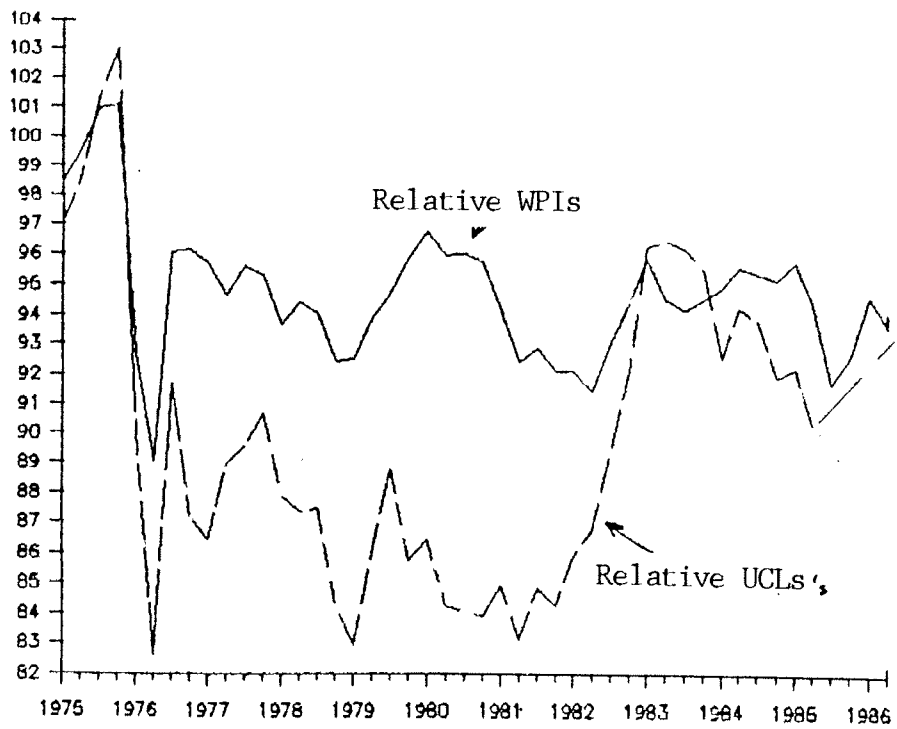


Figure 3. Italy: real exchange rates (indice: 1975-100)

Source: IMF, International Financial Statistics, Supplement on Price Statistics, 1986.

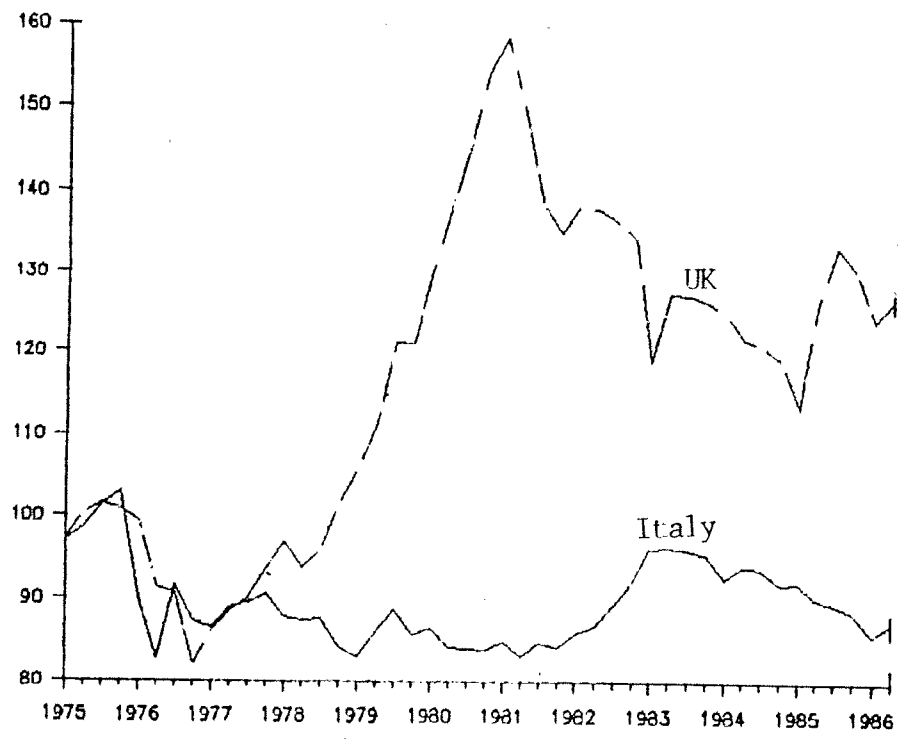


Figure 4. The real exchange rate in a disinflation (relative unit labour costs)

Source: IMF, International Financial Statistics, Supplement on Price Statistics, 1986.

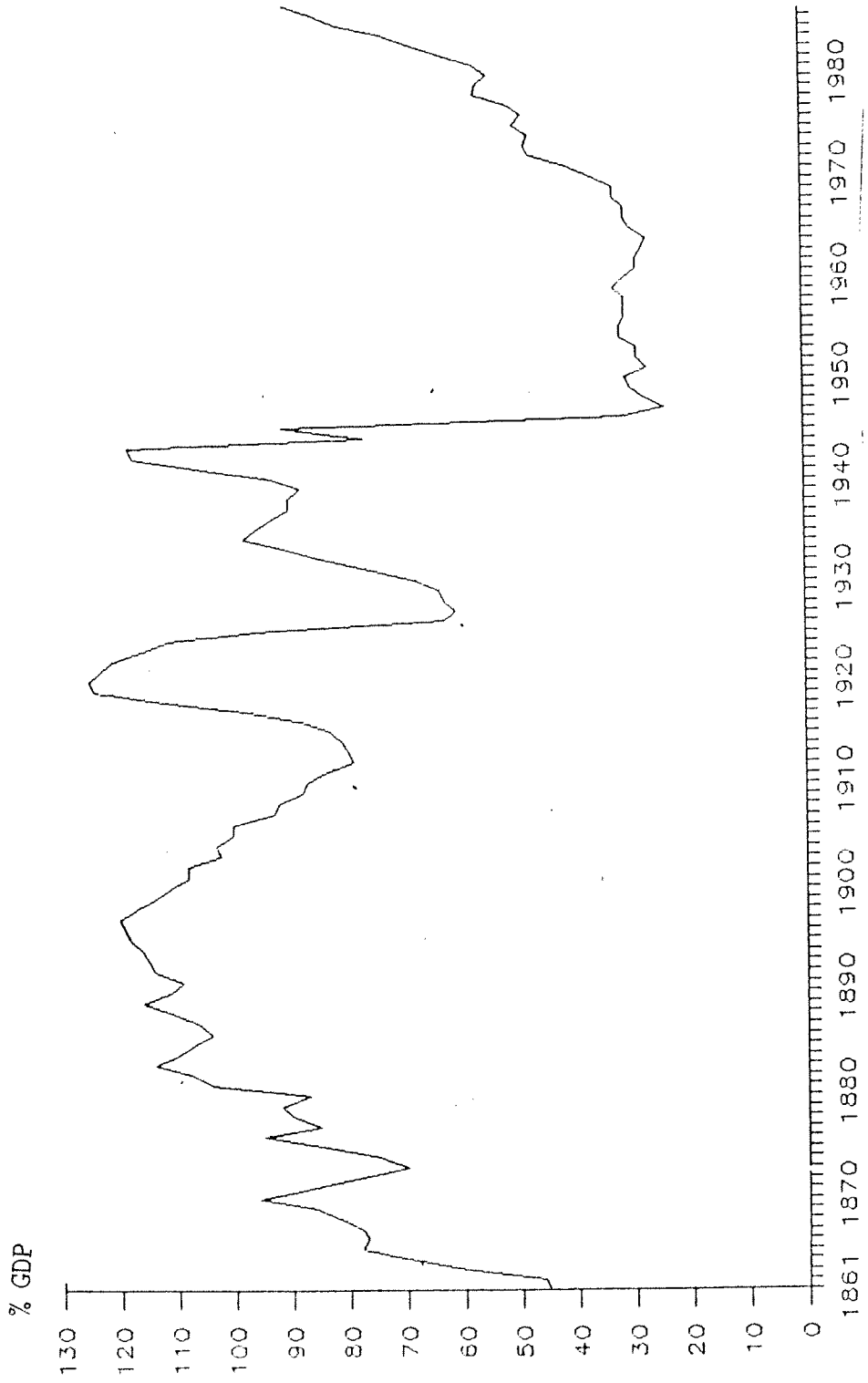


Figure 5. The Italian public debt (% of GDP)

Source: Ministero del Tesoro (1988).

Note: Total public sector debt including debt held by the Central Bank.

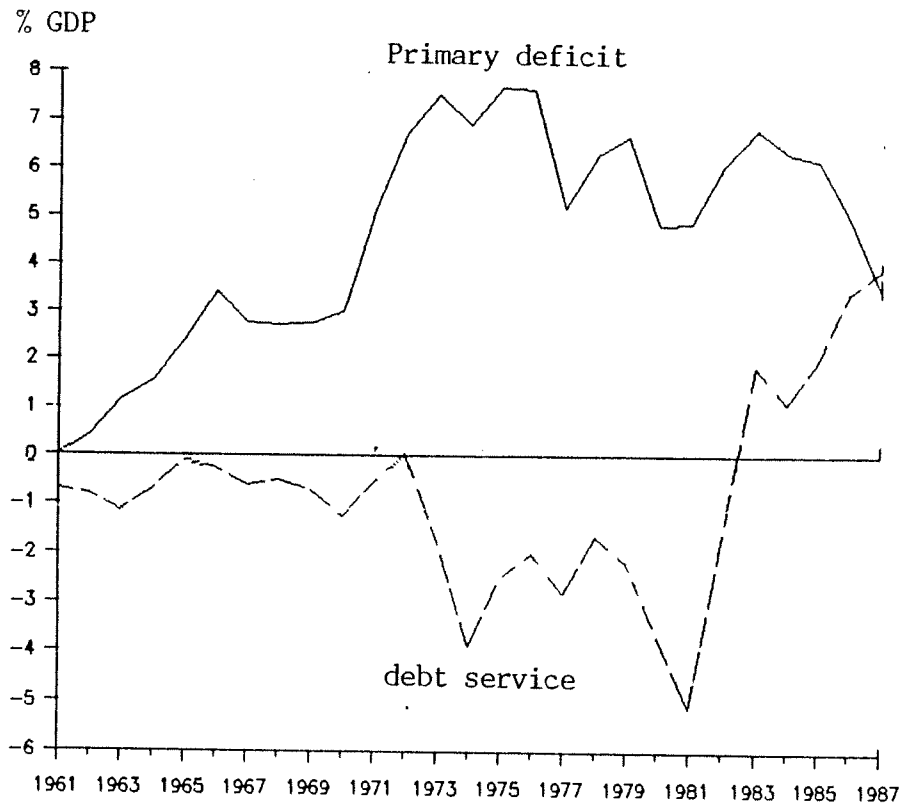


Figure 6. Primary PSBR and debt service (% of GDP)

Source: Ministerio del Tesoro (1988), and authors' calculations.

Notes: The measure of the primary deficit reported in Figure 6 is the Public Sector Borrowing Requirement net of interest. The contribution of debt service to the growth of public debt is $(i-n)b$, where i is the average nominal interest rate on public debt, n is the growth rate of nominal GDP, and b is the ratio of debt to GDP.

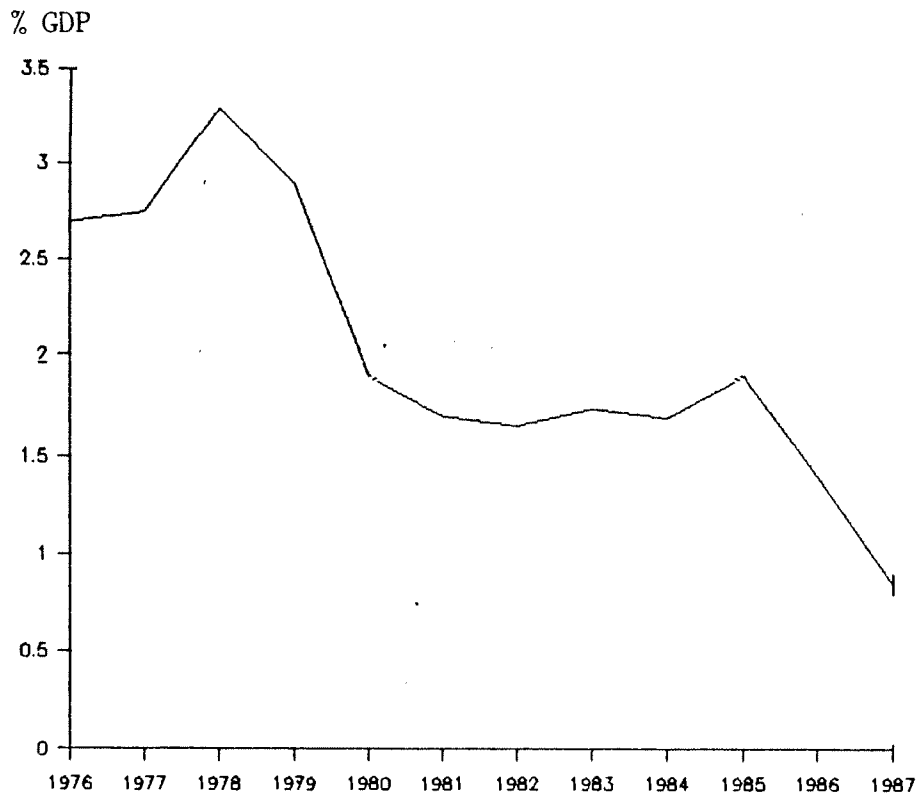


Figure 7. Seigniorage (% of GDP)

Source: Pagano (1989).

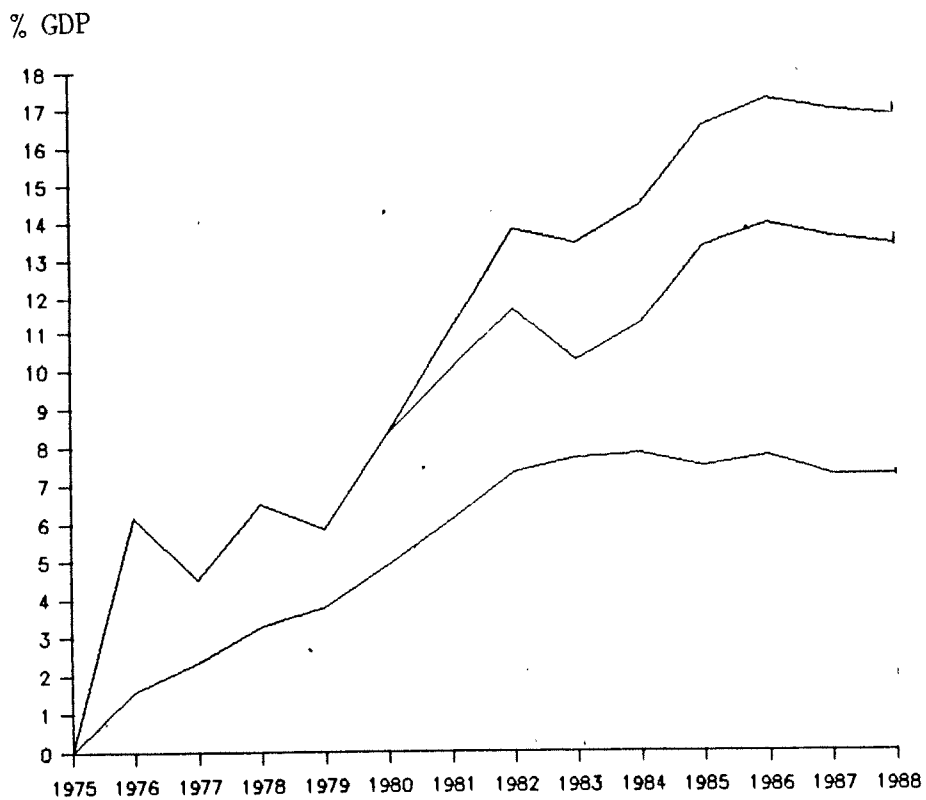


Figure 8. Alternative debt paths (difference from actual debt as % of GDP)

Note: In these simulations 'debt' is the marketable debt of the state sector.