Mrs Thatcher's Economic Policies 1979–1987

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Mrs Thatcher's economic policies since 1979 represent a deliberate reversal of the post-war consensus in Britain. Yet that reversal has been carried out with extraordinary caution, using the now famous step-by-step Thatcher approach. Even in 1987, eight years after its beginnings, an assessment of the Thatcher programme is difficult and must be provisional: much of it is still quite recent, much remains still to be carried out, and its intended effects are in any case long term rather than short.

This paper relies on two methods of assessment. The first is historical, using our knowledge of events, personalities and contemporaneous economic commentary. The second uses modelling work that we have been carrying out since 1976, summarized in the 'Liverpool Model' of the UK (Minford *et al.*, 1984). The two methods of analysis should be complementary; both the judgements of the first part and the econometric pseudo-precision of the second have their limitations but together allow us to reach as comprehensive an assessment as is possible at this date.

We begin with an introductory section on the political economy of the Thatcher programme. We then outline the key aspects of the Liverpool econometric model on which our empirical assessment depends. Next we describe the economic shocks to which the Thatcher programme had to respond. Against this background, we analyse three

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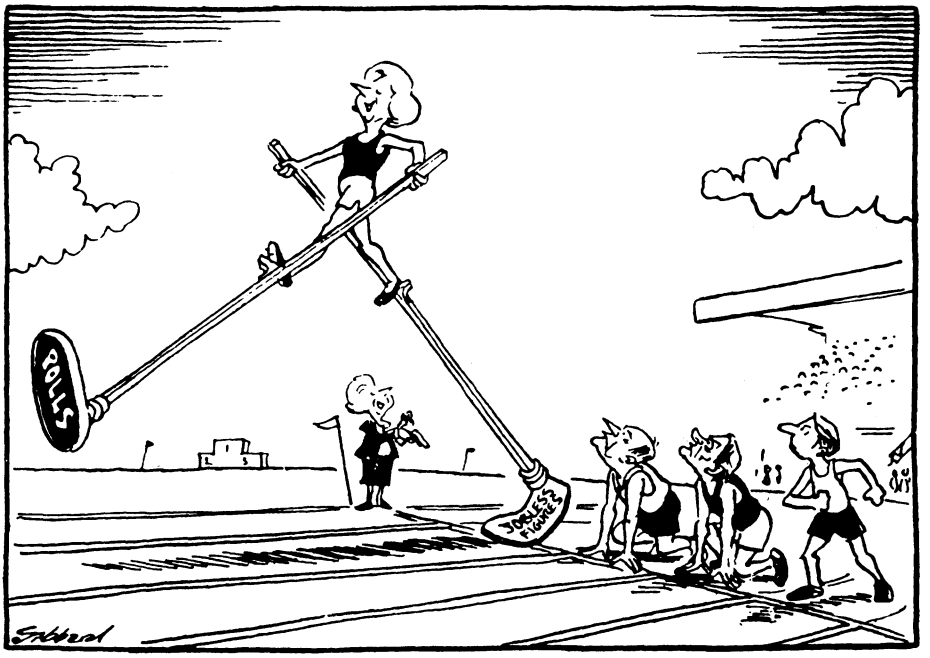
Summary

Mrs Thatcher inherited a weak economy whose poor performance she attributed to policies of cosy consensus, lax discipline, high inflation, and pervasive inefficiency. These she sought to banish forever. The authors stress the astuteness with which this radical programme was pursued. Rather than launching an immediate and grand assault on all fronts, Mrs Thatcher picked off enemies one by one, each victory consolidating her position for the next attack. Only when inflation was clearly under control could more radical supply-side measures be introduced.

Matthews and Minford argue that the recession of 1980–81 was caused not by tight domestic demand but by external and supply-side shocks. Subsequently, tight monetary and fiscal policy did have powerful effects, both in achieving rapid inflation reduction and in holding unemployment above its equilibrium level.

Once serious supply-side policies were introduced, they had a significant effect on productivity growth and on the equilibrium rate of unemployment. Matthews and Minford conclude that the latter was halved between 1981 and 1986, by which date it stood at 1.6 million or roughly half of actual unemployment. Whilst unemployment may slowly fall towards its equilibrium level, the authors do not recommend fiscal or monetary expansion to accelerate this adjustment; rather they advocate further supply-side measures and deregulation to help markets achieve this transition.

One step at a time



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central developments: the fall in inflation and its cyclical consequences; the rise in productivity growth; and the rise and disappointingly slow decline of unemployment. In the penultimate section, we draw out the implications of our analysis of supply-side policy, an important unfinished chapter of the programme. In the final section we try to bring the whole picture into focus and draw some general lessons.

1. The political economy of the Thatcher programme

Any diagnosis of the British economy in the 1970s would have identified three main diseases: chronic inflation, low productivity growth, and rising unemployment. Mrs Thatcher and her friends believed the causes to be, in order: lack of monetary and fiscal control, the excesses of union power, government intervention and taxation, and lack of incentives to take realistically-waged jobs because of social security and other welfare benefits. The Thatcher programme accordingly envisaged action on all these fronts but, before we even begin to describe that action, we must pause and recognize the enormity of the proposed task. British history since the Liberal government of Asquith in 1908 had been a steady march in the opposite direction under the banner of the 'welfare state': after the Second World War the march broke into first a gallop under Attlee, then a slow trot under the Tories, followed finally by a renewed canter under the Labour governments of Wilson and Callaghan, which Mr Heath's Tory government did nothing to slow. Mrs Thatcher inherited a starting point far from the goals she set, and a government machine, not to speak of many experienced Tory politicians, highly unsympathetic to those goals.

The first priority was the control of inflation. It was judged that a comprehensive assault on all fronts – a sort of grand '100 days' offensive – would fail by offending too many vested interests at once without producing sufficiently rapid results to impress the electorate and marshall support against the many 'establishment' voices that would seek to discredit the policies. So other objectives were largely subordinated to the defeat of inflation. For example, the required control of the budget led to higher taxes since government spending could not be quickly reduced. Union reform was soft-pedalled in a relatively mild initial Act produced by Mr Prior in 1980. State industries such as British Rail and British Steel were told to move towards eventual profitability but were not sold off. Social security benefits for the unemployed continued to be indexed and were maintained in real terms or increased (e.g. rent and rate rebates). Minimum wages were not abolished. The period from 1979 to the autumn of 1982 has to be seen primarily in terms of an inflation battle.

Table 1. Economic indicators

				Annual average	
	1973	1979	1986	1973–79	1979–86
Real growth (%)					
GDP				1.9	1.6
Manufacturing				0.4	−0.5
Services				2.0	2.4
Productivity growth (%)					
Whole economy				1.3	1.9
Manufacturing				1.5	3.4
Inflation (%)	15.8	10.5	3.4		
Unemployment (000s)	574	1,096	3,143		
Relative unit labour costs (1980 = 100)	68	79	82		

Notes: The first three columns give data at the cyclical peaks of 1973II, 1979II, and 1986IV. Unemployment for 1973 is on the old basis.

1.1. The inflation battle

During 1979–80 UK inflation increased, not least because of a doubling of world oil prices and a major increase in the VAT rate in the 1979 budget. However, by autumn 1982 the inflation battle had begun to move decisively in Mrs Thatcher's favour. Inflation fell to 5.4% by the end of 1982 and was set to fall further. Also by that autumn, the Falklands War had been fought and won. For both reasons Mrs Thatcher at last acquired a measure of security in her position as Conservative leader, previously under constant threat from Tory elder statesmen. She was ready to move the battle on to the other fronts. But first let us judge her counter-inflation strategy.

Policies of monetary control always face the difficult problem of measurement. This was compounded by financial deregulation, one area where vested interests were not strong enough to cause delay: the tax designed to limit growth of high-interest deposits (the 'corset'), exchange controls, and limits on building society banking activities were all abolished, with big effects on the long-used measure of UK money £M3. Because of its familiarity, it was natural that £M3 should be the chosen money measure. But, given these institutional changes, it was in retrospect mistaken. Confusion attended when £M3 duly overshot its target range in 1979–80. The Treasury reacted by raising interest rates sharply at the end of 1979 and holding them up through 1980. As a result, monetary conditions – as measured by the less familiar, but long reliable and institutionally unaffected, M0 or 'Monetary Base' (currency and banks' deposits with the Bank of England) – became

extraordinarily tight. M0 grew only 8% in 1980 when inflation was 18%; in early 1979 it had been growing at 13% against inflation of 10%. This extremely sharp tightening of monetary policy was not the gradualism that Mrs Thatcher intended. By inducing an exchange-rate appreciation, it contributed to the recession (though as we argue later, not nearly to the extent that is commonly supposed).

Yet, precisely because the monetary squeeze was unintended, expectations were quite unprepared for it; in fact, most people had written off the early actions of the government as unlikely to be followed through, because they were opposed by some members of the Conservative Party (especially by senior members who were in Mr Heath's government), so if anything people expected a 'U-turn' towards much looser policies. It was for this reason, the lack of credibility, that prices and wages in 1979–80 were accelerating towards 20% p.a. growth. Ironically, had Mrs Thatcher both intended a sharp monetary shock and clearly signalled that intention, the monetary contraction would have had less painful effects on output and employment and a quicker impact on prices and wages.

Such a strategy would in our view have been the optimal one. But it should be realised it was not really on the cards. Gradualism, as urged by Professor Milton Friedman, was widely accepted; neither rational expectations theorists nor Professor Hayek who supported the shock-treatment strategy had so much influence. Had Mrs Thatcher then pursued true monetary gradualism, letting M0 rise by 10–12% in 1980, progress against inflation would not have been nearly so rapid, though the recession would have been less severe; it is likely – the judgement is a political one and hard to make – that she would have produced insufficient success against inflation, her chosen target, to justify continuing with the painful medicine. As it was, the spectacle of sharply falling inflation, produced by accidental shock-treatment, served to vindicate her tough policies. It seems to us that Mrs Thatcher instinctively appreciated this; had she not found herself by accident with a tough monetary policy in 1980, to which her instincts led her to cling in spite of the unpleasant side effects, she would surely have toughened up any truly gradualist policy either then or in 1981. Our own judgement therefore is that, though originally unintended, the monetary policies as they turned out were the best of the set available. They decisively destroyed the serious inflation psychology in Britain as gradualism would never have done.

A key feature of the Thatcher anti-inflation strategy was 'parallel' reduction of government budget deficits. The reason for this 'Medium Term Financial Strategy' was to engender long-run credibility for money growth limitation. In the long run the debt-to-income ratio must

be stabilised. Otherwise, a faster-growing deficit leads either to borrowing, spiralling interest payments and insolvency, or to resort to accelerating money creation and hyperinflation. Hence in the long run the deficit must be consistent with responsible plans for borrowing and money creation if disaster is to be avoided. (An argument along these lines by Thomas Sargent and Neil Wallace, 1981, later became celebrated; but it was a key ingredient in the Thatcher strategy, an example of its formal development being Minford, Brech and Matthews, 1980).

This medium-term budgetary commitment, which of course implied also some short-term progress towards its achievement, was widely misunderstood and confused by critics with the supposed requirements of Keynesian stabilization policy. In the recession of 1980 to mid-81, Keynesians called for fiscal stimulus. It is clear, however by any measure that fiscal policy became more restrictive both in 1980 and notoriously in 1981 when the budget 'perversely' raised taxes in the very trough of the recession.

This was entirely deliberate; the cuts in deficits were intended to signal the seriousness of the government's intention to hold down monetary growth in the long term. It is even arguable that these cuts did not depress the economy further once the indirect effects of such signalling on long-term inflation expectations and long-term interest rates are taken into account. In any case, such depressing effects on output as there were seemed the necessary price of reducing long-term inflation expectations.

The success of this strategy was only partial and it was delayed. Long-term interest rates stayed high through 1980 and rose further in 1981; however in 1982 they dropped decisively by 5% p.a. This drop must have been due in some significant degree to the achievement in 1981–82 of a much reduced deficit; other factors were the fall in inflation itself and the consolidation of Thatcher's own position by autumn 1982.

Some have argued (e.g. Buiter and Miller, 1983), that the deficit was unnecessarily restrictive, on the grounds that the 'inflation-adjusted' fiscal balance was in surplus. But whatever the merits of this measure as an indicator of the effect on activity of fiscal policy – and because of the indirect effects through expectations discussed above it is a poor and even perverse indicator – this argument misses the point about medium-term strategy; in the medium term, as inflation is eliminated, the inflation adjustment is itself elminated. Thus from its medium-term viewpoint the government was bound to use the actual deficit and to push the inflation-adjusted deficit into temporary surplus.

The Thatcher government thus has stressed the medium-term targeting of fiscal policy as a back-up to counter-inflationary policy, taking very seriously the intertemporal budget constraint. More recently it has

been taken to task from an unexpected direction, for being too lax in implicitly counting oil tax and privatization revenues as permanent, by including them in their targeted variable, the PSBR. It is almost as if those who previously denied the existence of intertemporal disciplines have now been so converted to them that they are urging the wearing of a fiscal hair shirt. Buiter (1985) for example, having often castigated the government for excessive fiscal severity, stresses the need for doing the fiscal arithmetic in 'permanent' terms. In an attempt at this, Begg (1987) estimates that the current fiscal targets represent a permanent deficit for the first time for nearly two decades!

The trouble about this particular arithmetic, apart from the endemically huge margin of error in all public finance calculations, is that it leaves out of account the dynamics of policy change itself. For example, privatization is designed to raise profits and productivity in privatized industries and also in parts of the public sector over which the threat of privatization hangs; as we show below, it has had some success in this. This success is likely to encourage further reforms in such areas as health and education. These changing practices and consequential future changes in policies imply large potential revenue dividends to the public sector which should be factored in.

The Thatcher view is that good management of the public finances should certainly keep the long-term arithmetic in mind; but it should be assessed strategically. The policy of tax cuts must be carried out with the full back-up of continued public sector reform, designed to ensure that they do not have to be reversed, except under quite unforeseeable shocks; Lucas and Stokey (1983) provide the necessary framework of analysis. As for the Thatcher arithmetic so far, it appears to have kept comfortably on the cautious side of prudence on the latest figures (a 1986–87 PSBR of less than 1% of GDP).

One may criticise Mrs Thatcher's fiscal and monetary policies either for their objectives or for their efficiency. Clearly some dispute the priority attached to the cure of inflation. Surely a lower priority would have meant less (temporary) recession – virtually all the UK models concur that the effects of a tight-money episode like that of 1980 wear off within three years – but also more long-term inflation. However, the dispute is essentially irrelevant; for it is the electorate's priorities that determine those of the politicians in power. And the evidence of three elections has been that the electorate shared Mrs Thatcher's priorities.

On the issue of efficiency, we have noted the Thatcher 'mistake' of excessive monetary tightness in 1980; yet we have judged that from the viewpoint of her success in achieving low inflation it was probably a fortunate mistake. On fiscal policy there was no significant mistake. What there was – to the evident chagrin of Keynesian observers – was

a deliberate over-riding of the usual Keynesian stabilizers in the interests of reducing long-term inflation expectations. In terms of the 'implicit' model Mrs Thatcher was using, which, we suggest, is probably rather like the Liverpool Model, the policy was efficient. In sum, perhaps the moral of Mrs Thatcher's counter-inflation programme is that 'fortune favours the brave'.

1.2. The 'supply-side' programme

As noted earlier, it was not until the second half of 1982 that Mrs Thatcher had sufficient strength and confidence to launch her politically confrontational programme to improve the 'supply side'. There have been three main strands in that programme: curbing union powers, privatization and deregulation, and the reduction and reform of taxes and social security benefits. Throughout, the Thatcher political hallmark has been visible: the cautious 'step-by-step' approach under which success claimed for an initially modest reform consolidates public support for future incremental reforms. Progress as a result has often been frustratingly slow but failures, because modest and partial, have also not been fatal and the public has in the end accepted quite radical change.

We briefly consider developments in each area in turn.

1.2.1. Union reform. British trade union power has been founded primarily on legal immunity for actions inducing people to breach their contracts of employment; this immunity goes back to an Act of 1906. Because of this immunity, union-backed strikes could go ahead without the union being liable for civil damages, as provided for under the Common Law of the UK. (This legal setting is to be compared with the positive right to strike which exists in most other European countries.) The secondary source of power has been the legal recognition of the closed shop whereby all people in a plant must belong to the same union when this arrangement has been agreed between the employer and the union.

The legal complexity of this area is immense, and has become still greater after the three union reform acts introduced in this period; our comments here are necessarily brief but a fuller account of the key features is in Minford *et al.* (1985). After a feeble start in Mr Prior's 1980 Act which left union power essentially untouched, Mr Tebbit's 1982 measure dramatically changed the union environment; henceforth the unions would only have immunity for a strike on account of a dispute with their members' own employer, and then only if the issue concerned wages and conditions of work. His 1984 measure was

similarly radical, giving union members power over their leadership: now to attract immunity a strike had to be supported by a majority of the workforce voting in secret ballot.

The effects of this legislation (and the accompanying change in enforcement of existing criminal laws, especially on mass picketing) have been clear already. Several important strike attempts to prevent changes in working practices and manning levels have been decisively defeated. For example, in newspapers where the 'new' technology has finally been widely introduced; and also the famous cases of steel and coal where there have been massive redundancies. Where effects are not visible is in union wages relative to non-union; the union 'mark-up' has not apparently fallen since 1980, according to estimates extracted from the *New Earnings Survey* (see Figure 1).[1]

This may appear surprising, for one might have expected a weakening of union power to show across the board. However, on reflection it is not. The legislation preserves immunity for action on pay and conditions which is backed by the workers. Any attempt by management to cut union wages could well provoke a strike of this sort. But making workers redundant while increasing the wages of the majority for more productive working practices is a different matter. First, the majority of workers benefit and so will not back a strike. Second, a strike on such a matter would not attract immunity unless it could be shown to be based on a

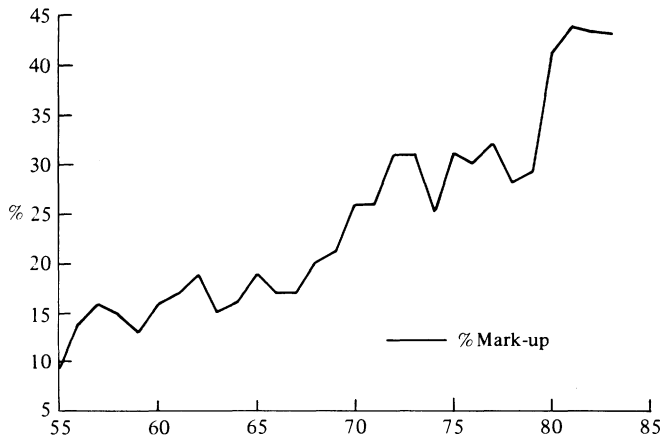

Figure 1. Union/non-union wage differential

Source: Layard *et al.* (1978), updated by Centre for Labour Economics, LSE.

[1] We should note that the level of union/non-union markup in Figure 1 is, almost certainly, too high, (see e.g. Stewart, 1983, whose estimates imply a smaller markup of 7% in 1977). It is hoped that Figure 1 is a guide to how the markup evolved over time.

genuine dispute between the firm and its workforce (not the trade union itself); this would be difficult to show when most workers benefit. Third, many firms have offered attractive redundancy terms and successfully asked for voluntary redundancies, so even those made redundant in many cases would acquiesce.

The main measures have therefore greatly increased efficiency in the use of employed resources but they have not, as was hoped from a more general limitation of union power, created jobs at those higher levels of efficiency by also reducing union wages. Rather, the increase in efficiency has, on balance, and certainly in the short run, reduced jobs. This is to be contrasted with the USA for example where weak unions have agreed to large 'give backs', reductions of wages in return for lower redundancies.

This was not intended in the original conception of union reform. However, in retrospect it was inevitable if the new laws were to be accepted by union members, a large group of workers many of whom voted Conservative in the last three elections. For these people would not be likely to accept reductions in living standards for the sake of greater job opportunities among the unemployed; true, society would be better off because the unemployed would be producing and so would not be a burden on the taxpayer, but no mechanism exists for redistributing this gain to union members.

The main hopes for jobs from union reform must in these circumstances be the greater growth of non-union firms permitted by the restraints on the closed shop and on union secondary action (often used in the past to 'black' non-union suppliers). This unfortunately is a much slower process than the direct path of union wage cuts. But there is some tentative evidence of progress in the expansion of self-employment (up 39% since 1979) and of small firms (up 10% since 1979), and in the fall in union membership from 52.0% of the employed labour force in 1979 to 43.9% in 1985.

1.2.2. Privatization and deregulation. The aim of this wideranging programme has been to increase efficiency in the use of resources by widening the scope for free voluntary exchange. Mostly this has meant increasing the power of the consumer, as with deregulation of long-distance buses. But it has also included freeing producers from legal and other limitations, such as employment protection laws and the limits on the borrowing of nationalized industries, or straight interference by civil servants in management decisions.

Deregulation is something that economists generally applaud. The list of industries successfully deregulated by the Thatcher government is dominated by service industries where restrictive practices remained

intact. The most dramatic has been the Stock Exchange voluntary reform following the withdrawal of a court action by the Office of Fair Trading; the emergence of the City of London as probably the world's leading trading centre for the mass of financial securities has followed this decision. Estate agents' and solicitors' conveyancing monopolies have also been broken. In the transport services, the long-distance bus industry has expanded sharply and cut fares steeply. There has also been a slow and cautious opening up of domestic air routes to new carriers.

Employment protection legislation has been loosened. Now firms can freely dismiss new workers in their first two years of employment. The Health and Safety at Work Act, a source of considerable burden to employers, has however not been changed; the Act was framed against the advice of the Robens Committee to go for self-regulation. Some very modest loosening of the Rent Acts occurred in the 1980 Housing Act which introduced shorthold and assured lets while making only minor changes to the fair rent and security of tenure provisions; in essence the Rent Acts remain intact.

But it is the privatization programme which has captured the greatest attention and led to emulation by other market-orientated governments (most notably and recently of course those of Mr Nakasone and M Chirac). In its own terms it has been remarkably successful, raising large amounts of revenue through asset sales, improving the efficiency of the previously nationalized sector, and, important politically, spreading wider share ownership and 'popular capitalism'. It has been attacked predictably from the left but also by free market economists who wanted more competition introduced with privatization. In fact, competition has been introduced cautiously if at all, the preferred model for the large public monopolies being regulation in the private sector (as for example with British Telecom and British Gas).

This has meant that the gains in efficiency have come from liberating producers from detailed government interference – with their capital programme, borrowing, and day-to-day decision making – rather than from consumer pressure (except that of the regulator). These gains have accordingly shown up in higher profits (Amersham) and rewards for managers and workers (British Telecom). The threat (or promise) of future privatization has also produced profit gains in other nationalised industries such as British Airways (now privatized), the National Coal Board, and British Steel; here managers and government have used the desire for privatization as an excuse for non-interference by government in 'commercial' management.

The regulatory model has the obvious drawback that private sector managers will find ways of 'capturing' the regulator or blocking it

Table 2. Privatization and deregulation: selective results

Privatization	Subsequent profit performance
British Aerospace	doubled 1981/2–1984/5
Cable and Wireless	tripled 1981/2–1985/6
Amersham International	doubled 1981/2–1985/6
National Freight Corp	nearly tripled 1981/2–1985/6
Britoil	up 40% 1981/2–1984/5
Assoc. British Ports	up 20% 1982/3–1985/6
Jaguar	up 30% 1983/4–1985/6
British Telecom	up 20% during first year
Contracting out of public sector services	**Annual savings**
National Health Service ancillary services	£24.6 m
Local Authority services	£22.4 m
Deregulation	
Transport Act (1980)	Long-distance buses. Real fare reduction of 40% 1980–83.
Transport Act (1986)	Urban bus services.
Health and Social Security Act (1984)	Abolition of opticians' monopoly in dispensing and selling spectacles.
Stock Exchange agreement	Big Bang.
Financial Services Act (1986)	Abolition of solicitors' monopoly on property conveyancing. Charges down 25%.
Other	Abolition of wage, price, and foreign exchange controls (1979).

Sources: Data on privatization taken from *Financial Times*; on contracting out from *Public Sector Review* and *Hansard.*

by failure to cooperate, for example in provision of information. As a long-term model it is therefore deficient, as has been shown by previous (mostly US) experience (see Yarrow, 1986). As a short-term model, relatively light regulation has the attractions that practical problems of ownership transfer to the private sector are minimised because the managers are fully cooperative; gains in efficiency occur rapidly and obviously (through profits); and revenue from asset sales is maximized (making tax cuts possible while long-term reforms of the public sector are put in hand).

The requirement will be to effect a transition towards competition within a reasonable period of time that does not betray those who bought shares under the current system of light regulation. With British Telecom, the growth of Mercury and developments in technology will act as an opportunity; indeed it is hard to see how competition can fail

ultimately to be intense in the telecommunications area as alternative message-delivering systems emerge. With British Gas, the transition will have to involve divestiture of showrooms, possible break-up into regional firms and the grid operated under franchise, with coal and electricity being freely competitive (no import quota on CEGB coal imports). And so on; there are ways in each case. But it is reasonable to argue that without the short-term regulatory model actually used no step at all would have been possible, in a new and politically treacherous area.

1.3. The tax/benefit system

The system the Conservatives inherited was one in which marginal tax rates (obviously the key concept from the viewpoint of incentives) were very high for two main groups; those on high and those on low incomes. The former faced high personal tax rates rising to 83% (and to 98% on 'unearned' income). The latter faced implicit rates of up to 100% or more either on the decision to work rather than to remain unemployed (the 'unemployment trap') or, if in work, working for more pay (the 'poverty trap'). The rates became so high because to the explicit marginal tax rate had to be added the withdrawal rate of benefit (for unemployment or for being a low-income worker).

In response the government has acted cautiously, reducing the top rate of personal tax to 60% and abolishing the differential rate on unearned income. It remains the case that this is an exceptionally high rate, and that the yield of the higher personal tax rates is trivial (less than £2.0 billion assuming *no* supply responses or evasion, whereas experience of abolition of the 83–98% rates is that the yield is negative, beyond the 'Laffer' point; a zero yield seems a reasonable guess allowing for evasion and supply response).

Evidence on the effects of cutting top tax rates in the US and Britain has recently confirmed this. In both countries the share of revenue contributed by top earners has increased following cuts in their top tax rates; a study of their behaviour in the US by Lindsey confirms that much of this was due to additional work effort (Lindsey, 1986). In the US this has led to the adoption of a two-tier personal tax structure with a top marginal tax rate of 33%, falling to 28% at very high incomes. In Britain the evidence only started to emerge in the past six months following a series of Parliamentary Questions by Labour politicians wishing to raise these tax rates. When correlated with the evidence from the *New Earnings Survey* and from migration statistics, the picture is an exciting one. It shows that, since the rather modest cut in the UK top rate to 60% and a rise in thresholds that has reduced the marginal

tax rates from 50% to 40% for the average earner in the top 5% of the income distribution, the net emigration of managerial and professional talent has become net immigration; and that *earned* income of top UK taxpayers has risen very sharply, almost entirely because of performance-related pay: between 1979–80 and 1984–85, this grew 121% faster than the average for Group 1 of the NES (top managers) and 142% faster for Group 2 (marketing managers and accountants). Conservative party opinion is now thoroughly impressed with the benefits of removing these high rates of tax, especially given the competitive threat from the new US tax system. There is however still a certain apprehension about how such removal will go down with the ordinary voter.

Equalizing the income distribution is clearly not an objective of this government. Indeed, the opposite is true; increased incentives are seen to work, through greater inequality of incomes both before and after tax, to generate more wealth and so also more public revenue to meet among other things the needs of a social safety net. What data we have on the distribution of income and tax revenues points to this mechanism being at work; Table 5 shows that income inequality both before and after tax has increased but so has inequality of tax revenue contributions and inequality of benefit receipts. In other words, the rich are getting richer relative to the poor, but they are contributing more revenue to the public purse, making it possible to give the poor more out of the public purse. Unless equality *as such* is an objective of policy, this would appear good for everyone.

For low incomes, the government has instituted a recent reform of the benefit system, has cut the standard rate of tax to 27%, has raised tax thresholds since 1979 by 22% in real terms, and cut employers' National Insurance contributions from 9% to 5% with lower rates still for very low incomes. The benefit reform brings down the top marginal rate in the poverty trap to around 96% but at the cost of extending this rate over a larger section of the income scale; it does so by using an idea suggested in Minford *et al.* (1983) of relating in-work benefits to net and not gross income as before. So the 'poverty trap' has been improved, but high marginal tax rates remain over a wide range of low incomes. As for the decision to work, little improvement was made; benefits for the unemployed were not cut except for young workers and the 'unemployment trap' is hardly touched. Earnings-related benefit (lasting for six months only) was eliminated in 1982; but this affected a minority of the unemployed (under 20%), all of them short-term unemployed. High unemployment in Britain is coming from those unemployed for more than 6 months; for such people the system of indefinite support and living standards above the 'poverty line' has been left untouched.

Table 3. Shares of income and tax revenue of top earners (%)

	Top 1% of earners		Top 5% of earners	
	Income	Tax revenue	Income	Tax revenue
1970–71	6.2	16.0	16.6	31.0
1976–77	5.3	11.0	15.4	25.0
1978–79	5.1	11.2	15.0	24.0
1979–80	5.3	10.4	15.6	23.4
1982–83	5.9	11.7	16.7	25.4
1984–85	5.7	11.8	17.2	26.1

There is more than a suspicion that many of the long-term unemployed are working in the 'black economy' and have little interest in rejoining the white economy. Much necessarily indirect evidence supports the former (e.g. Matthews and Rastogi, 1985; but see Smith, 1986, for a different view; and Matthews and Stoney, 1987, for a survey of Merseyside estimating the black economy at 7% of local GDP). The 1986 Labour Force Survey estimated that 1.2 million of the unemployed in the claimant count were either not seeking work or had a job (against this, another 0.8 million not claiming were estimated to be seeking work). The former head of the DE's regional fraud team in the North West has estimated that about 20% of the unemployed were working and claiming benefit; and Matthews and Stoney's 1987 survey estimates that 40% of the unemployed on Merseyside worked in the black economy.

Another area of progress has been corporate tax, where by reducing depreciation allowances (far larger than true depreciation and so a subsidy) the tax rate has been cut to 35%. Corporation tax reform has eliminated the average subsidy to capital costs, substituting an average marginal tax rate of the same order as that on labour, while evening out its incidence across industries and capital types (King, 1985); but perhaps most important of all, it has reduced the marginal tax rate on entrepreneurial activity (using available resources to yield greater profits). Similar progress both on VAT, where the idea of a large extension of the base was floated by the Treasury enabling a cut in the rate (or in personal tax rates), and on the reduction of tax relief for 'privileged' forms of saving, such as in the form of housing, pensions and endowment insurance, was very largely frustrated by special interest lobbying; only endowment insurance tax relief was ultimately abolished.

The tax and benefit system is an area where important steps have been taken but significant reforms are still awaited. Chances of these have been improved as public expenditure has come progressively

Table 4. Marginal tax rates on labour and profits (%)

	Worker on average earnings					Profit	
	VAT	Income tax	NIC(1) employee's	NIC(2) employer's	TOTAL	Standard corporation tax rate	Small company rate
1978–79	4.85	33.0	6.50	12.75	48.8	52	42
1979–80	8.25	30.0	6.50	13.50	48.3	52	40
1980–81	8.25	30.0	6.75	13.70	48.6	52	40
1981–82	8.25	30.0	7.75	13.70	49.4	52	40
1982–83	8.25	30.0	8.75	13.70	50.2	52	38
1983–84	8.25	30.0	9.00	11.95	49.7	50	30
1984–85	8.25	30.0	9.00	11.45	49.4	45	30
1985–86	8.25	30.0	9.00	10.45	49.0	40	30
1986–87	8.25	29.0	9.00	10.45	48.1	35	29
1987–88	8.25	27.0	9.00	10.45	46.5	35	27

Notes: (i) VAT calculated as % of RPI goods carrying VAT multiplied by VAT rate. (ii) Total tax rate on labour calculated as private purchasing power as fraction of employer's cash paid out:

$$1-\left[1-\frac{\text{NIC(1)}+\text{NIC(2)}+\text{INCOME TAX}}{1+\text{NIC(2)}}\right]\left[\frac{1}{1+\text{VAT}}\right]$$

(iii) Analogously, for a worker paying top rates of tax on earned income, total marginal tax rates were: 83.8% in 1978–79, 63.0% between 1979–80 and 1985–86, and 66.5% in 1987–88.

under control (Table 6), falling as a fraction of GDP since 1982–83. One of the objectives of the privatization programme is to give momentum to this process; ultimately it is possible that major areas of the public sector will be privatized on the production side with vouchers or direct income assistance replacing direct government purchase on the consumption side. Steps in this direction are already perceptible in secondary education, for example.

2. The foundations for our empirical assessment

In the previous section, we outlined the Thatcher diagnosis of the problems inherited in 1979 and the first eight years of the programme designed gradually to transform the UK economy. In particular we emphasized that this programme owed as much to political judgements about the feasible pace of sustained change as to a determination eventually to attain the economic objectives on which progress was to depend.

Table 5. Distribution of incomes, taxes, and benefits across households (%)

	% Share, by household group*				
	Bottom 20%	Next 20%	Next 20%	Next 20%	Top 20%
Income before tax and benefits					
1979	0.5	8.7	18.8	27.1	44.9
1985	0.3	6.0	17.2	27.3	49.3
All benefits					
1979	28.2	22.6	17.3	15.9	16.0
1985	29.3	25.2	16.7	14.5	14.3
All taxes					
1979	3.8	10.1	18.7	25.8	41.6
1985	3.8	9.7	17.2	25.5	44.8
Income after tax and benefits					
1979	9.1	13.1	18.3	23.6	35.9
1985	9.7	12.1	17.0	22.2	38.0

Source: CSO *Economic Trends.*

* Households grouped by distribution of income before taxes and benefits.

Whilst such judgements in political economy help illuminate the order of priorities and the sequence in which they were pursued, it is essential to complement this analysis with a more formal empirical assessment of the consequences of the Thatcher programme to date. Rather than undertake a few pieces of specific research on particular questions, we intend to unify our empirical assessment by drawing on the results of the Liverpool macroeconometric model.

To allow the reader to understand our interpretation of events within this framework, we begin by sketching the key relationships in that model. Further details are contained in the Appendix. (A fairly recent listing of the full model is contained in Minford *et al.*, 1984, and the current model listing may be obtained from the authors.)

2.1. A brief outline of the Liverpool model

The Liverpool model has been used regularly for forecasting and policy analysis since 1980. It is a broadly structural model in which demand- and supply-side relationships receive equal treatment, markets clear relatively quickly, and expectations are rational or model-consistent.

The demand side of the model is fairly orthodox and may be interpreted within familiar *IS–LM* terms. It does however incorporate fairly powerful wealth effects on the demand for goods, and expansion leads to strong crowding-out effects on both consumption and investment.

Together, the government budget constraint and the private sector's portfolio preferences imply that, in the long run, the budget deficit

Table 6. Public Expenditure by Department (% of GDP)

	1979–80	1982–83	1986–87
Social security	9.4	11.5	11.7
Health and social services	4.3	4.9	4.7
Defence	4.4	5.1	4.9
Education and science	4.3	4.5	4.2
Housing	2.2	1.0	0.7
Law and order	1.2	1.5	1.6
Transport	1.5	1.5	1.3
Trade and industry	1.1	0.9	0.4
Employment	0.6	0.9	1.0
Other	8.6	8.6	7.7
Planning total	37.6	40.2	38.2
General government expenditure	43.3	46.8	43.2

Source: *White Paper on Government Expenditure, Economic Trends Annual Supplement* (various issues).
Notes: (i) Planning total excludes privatization receipts. (ii) General government expenditure is net of privatization proceeds but includes debt interest and other National Accounts adjustments.

(the PSBR) must be financed by equiproportionate growth in the two forms of the government's nominal liabilities: bonds and money. This 'balanced finance' condition implies that in the long run the growth rate of money is equal to the ratio of the PSBR to the oustanding stock of money plus bonds. The model allows short-run deviations from balanced finance but these cannot persist indefinitely. The model treats the PSBR/GDP ratio as a random walk – current values of PSBR/GDP are assumed to continue indefinitely – an assumption consistent with postwar UK data. This ratio thus plays a key role in the model, both as a specification of fiscal policy and as the underlying determinant of monetary policy in the longer run.

Externally, the model assumes perfect international capital mobility along the lines suggested in Dornbusch (1976). Thus the real exchange rate and competitiveness depend on the current and expected future path of real interest rate differentials between the UK and the rest of the world: these determine the path along which the real exchange rate converges to its long-run level compatible with current account balance. The current account is standard, depending on domestic and foreign output and on competitiveness.

It is important to understand the supply side in the model. Output depends, through a production function, on capital and labour inputs. The capital stock, and the investment governing its evolution, depend on the internationally given real interest rate and exogenous factors

determining profitability (such as tax rates and productivity). Labour supply depends on the level of unemployment benefits, the direct tax rate, union density (the key proxy for union power in our model), and unanticipated inflation (the conventional 'Phillips curve' effect). There is a union sector with annual, non-overlapping, wage contracts, and a non-union sector where the labour market clears continuously.

This supply side is unusual among UK macro models (though it bears more than a passing resemblance to the Layard and Nickell, 1985, submodel designed to investigate the UK labour market). It remains controversial in the size of the effects attributed to welfare benefits, taxes, and union power, but these effects are well-determined empirically. Finally, note that a change in competitiveness alters the demand for labour and the product wage at any given level of domestic real take-home pay, and hence affects the equilibrium or natural levels of output and employment.

One last remark. As in other models, we assume that adjustment costs provide sluggish dynamics for real behaviour. But nominal shocks provide little additional sluggishness. Once annual nominal contracts have been renegotiated, nominal variables are almost completely adjusted. For example, unanticipated money growth of 2% this year will reduce contemporaneous real money. Except to the extent that people subsequently plan to eliminate this real change only over time, prices can be fully adjusted by next year to attain the desired level of real money.

To sum up, the Liverpool model of the UK is soundly based in standard economic theory and fits past data well. It has strong wealth effects which imply that public sector expansion quickly crowds out private sector spending; a fully specified supply side in which a balanced expansion of government spending and higher taxes have adverse long-run effects because the higher tax wedge reduces equilibrium employment and output; and relatively flexible wages and prices which translate demand expansion fairly quickly into higher inflation.

2.2. Decomposing shocks and their consequences

The evolution of the economy depends both on the course of policy and on the path of exogenous variables such as world trade. Our basic methodology is to use the Liverpool model to construct a 'base run' showing how the economy would have evolved in the absence of shocks either from policy changes or from unforeseen changes in exogenous variables. Next we calibrate the shocks to which the economy was subjected. Finally, we use the model to identify the consequences of these shocks. This will allow us to quantify the relative importance of

different shocks in causing variables such as inflation and unemployment to deviate from their path along the base run.[2]

2.2.1. The base run. The base run is the path of variables forecast by the model using information in the previous year. Exogenous variables such as world trade are extrapolated from their own past values. Many policy variables, such as taxes, benefits, and the PSBR/GDP ratio, are modelled as random walks: their forecast value is simply their own value in the previous year. The balanced finance assumption is then used to infer expected long-run growth of money (M0), on which inflation expectations depend. Thus in the Liverpool model the PSBR/GDP ratio determines inflation expectations through its effect on expected long-run money growth.

However we assume that the credibility of government plans, and hence inflation expectations, does not depend on policy announcements such as the Medium Term Financial Strategy. Rather we assume that expectations of future policy depend only on extrapolating past values of the relevant policy variable, the PSBR/GDP ratio: credibility is earned only when policy has already delivered.[3] This treatment provides rather a convincing account of how markets *actually* formed expectations during the period. Figure 2 shows the predicted values of inflation, real GDP growth and unemployment along the base run, and compares these with the values subsequently observed.

2.2.2. Identifying the shocks. Year by year, shocks are simply the discrepancy between actual values of exogenous and policy variables and their values forecast one year earlier by the model.

Table 7 shows how exogenous and policy variables are decomposed into expected and unexpected components during 1980–85. We group these variables into three headings. Domestic variables comprise monetary and fiscal policy. We distinguish long-run money growth (calculated, as described earlier, under the balanced finance assumption), short-run monetary growth, and government tax receipts as a percentage of GDP. External variables are exogenous: world trade growth, and both short and long real interest rates abroad. Supply-side

[2] For a similar approach see Artis and Bladen-Hovell (1987) and Artis, Bladen-Hovell, Karakitsos and Dwolatzky (1984).

[3] We find no empirical evidence of any effects of policy announcements on expectations during most of the period. Specifically, neither the announcements of the MTFS nor the budgetary announcement of fiscal contraction at the depth of the 1981 recession have empirically detectable effects. Only when the PSBR had actually been reduced did inflation expectations start to fall rapidly. However by the mid-1980s we began to detect announcement effects on expectations, for by then credibility had been built – the hard way. For theoretical discussion of how credibility may be created see Barro and Gordon (1983) and Backus and Driffill (1985).

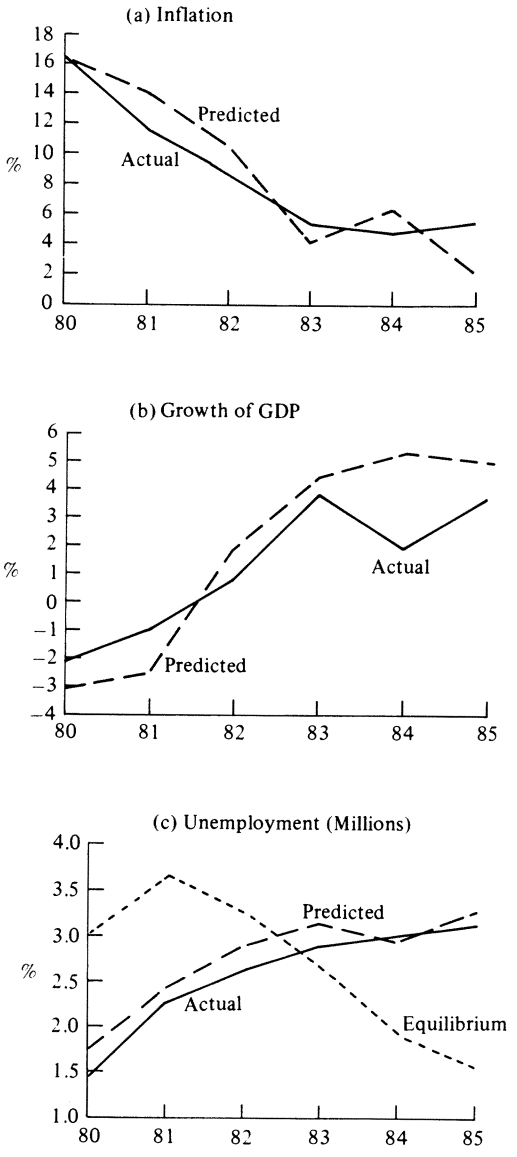

Figure 2. Predicted and actual values of inflation, GDP growth, and unemployment

variables are primarily policy variables – employers' national insurance contributions, real unemployment benefits, the average burden of direct taxes and national insurance contributions per worker, the average rate of indirect taxes, and a 1983 dummy reflecting the union reform laws – but also the unionization rate of the workforce as a measure of union power.

Table 7. Shocks during 1980–85

		1980	1981	1982	1983	1984	1985
DOMESTIC:							
M0 growth (%)	Actual	8.0	4.6	3.3	5.7	5.7	4.6
	Expected	12.8	10.6	8.4	6.4	5.1	6.3
	Shock	−4.8	−6.0	−5.1	−0.7	0.6	−1.7
Long-term growth	Actual	10.6	8.4	6.4	5.1	6.3	4.2
of money (%)	Expected	12.8	10.6	8.4	6.4	5.1	6.3
	Shock	−2.2	−2.2	−2.0	−1.3	1.2	−2.1
Govt. receipts as	Actual	28.0	29.0	33.6	31.0	31.7	31.2
percentage of	Expected	28.0	28.0	30.9	33.6	31.0	31.7
GDP	Shock	0.0	1.0	2.7	−2.6	0.7	−0.5
EXTERNAL:							
World trade	Actual	1.0	−1.0	−1.0	2.0	8.0	3.7
growth (%)	Expected	6.2	6.2	6.2	6.2	6.2	6.2
	Shock	−5.2	−7.2	−7.2	−4.2	1.8	−2.5
Foreign real short	Actual	3.4	6.0	5.0	5.0	8.0	4.5
interest rates	Expected	1.7	0.8	3.5	5.4	5.0	6.6
	Shock	1.7	5.2	1.5	−0.4	3.0	−2.1
Foreign real long	Actual	3.1	4.0	5.0	3.7	6.3	5.0
interest rates	Expected	2.2	0.6	4.1	5.3	5.0	6.6
	Shock	0.9	3.4	0.9	−1.6	1.3	−1.6
SUPPLY:							
Employers' NI	Actual	13.7	13.7	13.2	11.9	11.2	10.4
contributions	Expected	13.1	13.7	13.7	13.2	11.9	11.2
	Shock	0.6	0.0	−0.5	−1.3	−0.7	−0.8
Real unemployment	Actual	100.0	106.7	104.2	104.2	103.9	103.2
benefits 1980 = 100	Expected	98.1	100.0	106.7	104.2	104.2	103.9
	Shock	1.9	6.7	−2.4	0.0	−0.3	−0.7
Average amount lost	Actual	23.8	25.5	26.1	25.4	25.4	24.1
in taxes and NI (%)	Expected	22.8	23.8	25.5	26.1	25.4	25.4
	Shock	1.0	1.7	0.6	−0.7	0.0	−1.3
Unionization rate (%)	Actual	58.2	56.9	55.8	54.2	52.4	50.9
	Expected	56.4	58.3	57.1	56.1	54.6	53.0
	Shock	1.8	−1.4	−1.3	−1.9	−2.2	−2.1
Indirect tax rate (%)	Actual	13.6	14.5	15.2	15.2	15.2	15.6
	Expected	13.0	13.6	14.5	15.2	15.2	15.2
	Shock	0.6	0.9	0.7	0.0	0.0	0.4

2.2.3. The effect of the shocks. We are now in a position to examine the effects of the three kinds of shock, from domestic, external, and supply-side sources. These are shown in Table 8. To compute the total or joint effect of all the shocks, we compare year by year the values of variables determined by the model when we input expected policy and expected values of exogenous variables (i.e. the base run) and the values generated by the model when we input actual values of policy and exogenous variables.

To decompose the total shock into its domestic, external, and supply-side components we then input each class of shock in isolation and

Table 8. Decomposing the effects of shocks: a summary

		Effects of shocks from				Fitted value	Actual value
		Domestic	External	Supply	Total		
Inflation	80	−6.6	2.1	1.5	−1.6	16.4	16.4
(%)	81	−6.4	4.9	1.3	1.0	14.0	11.5
	82	−4.2	2.3	−0.6	−0.4	10.3	8.5
	83	−4.7	1.6	−0.4	−5.1	4.0	5.2
	84	2.7	0.8	−0.9	2.6	6.2	4.6
	85	−4.6	−0.9	−0.7	−4.4	1.9	5.3
GDP growth	80	−0.6	−2.0	−1.8	−4.0	−3.1	−2.1
(%)	81	−0.3	−3.8	−0.9	−5.1	−2.5	−1.0
	82	0.0	−2.5	0.7	−1.7	1.9	0.8
	83	−0.6	−2.0	1.9	1.4	4.4	3.8
	84	0.1	−0.4	1.4	1.0	5.3	1.8
	85	−0.2	0.4	1.2	1.1	4.9	3.7
Unemployment	80	145	80	120	323	1,750	1,450
(000)	81	185	195	180	475	2,420	2,270
	82	140	190	−50	200	2,890	2,625
	83	265	190	90	20	3,135	2,885
	84	−130	10	−200	−270	2,940	3,000
	85	190	200	−185	15	3,255	3,115
Real exchange	80	7.6	−2.7	1.2	4.2	92.1	100.0
rate	81	7.6	−6.1	2.2	1.8	103.3	100.2
(1980 = 100)	82	5.1	−3.0	1.4	0.9	102.8	96.4
	83	5.6	−1.7	0.1	−4.1	91.8	88.4
	84	−3.4	−1.5	−0.6	−3.9	85.8	82.8
	85	4.8	0.5	−0.3	5.3	87.8	83.3

Notes: (i) Effects of domestic, external, and supply shocks do not sum to total shock because of nonlinearities in the model. (ii) The base run is not shown but may be calculated by subtracting total shocks from fitted values.

examine its effect on the values of variables determined by the model. In Table 8 it will be seen that the sum of domestic, external, and supply-side shocks does not exactly equal the total shock. This is because the Liverpool model is non-linear so the effects of different shocks interact. Nevertheless, Table 8 provides a sufficiently accurate decomposition of total shocks to be a useful guide to the assessment we wish to undertake.

The column of Table 8 labelled fitted values shows the values implied by the model when actual values of policy and exogenous variables are used as inputs to the model. Comparing fitted values and actual values of endogenous variables, it is evident the model fits the data well.

Looking at the data on GDP growth, the whole period falls neatly into three phases: the recession of 1980–81 caused primarily by adverse

external and supply-side shocks; the upturn of 1982–83 in which favourable supply-side shocks more than offset further adverse external shocks; and the more solid recovery of 1984–85 in which the supply side again was the motive force. With this brief introduction, we now turn to a more detailed examination of the key issues.

3. Inflation and the business cycle

Table 9 shows that inflation was brought down by repeated fiscal and monetary shocks, which cumulatively brought down expected inflation. According to the model they did so not by reducing *actual* inflation but by reducing the PSBR/GDP ratio; this, by delivering on announced deflationary intentions, convinced markets in a ratchet-like manner. Once the PSBR/GDP ratio was down, the model indicates that markets expected it to stay down; but they would not anticipate its reduction, presumably because of fears either of a political U-turn or, at least during the early Thatcher years, of a change of government at the next election. Whilst fiscal policy was used gradually to grind down inflation expectations, monetary policy also played a role in the inflation battle. A series of (unexpectedly tight) monetary shocks meant that actual inflation was generally below expected inflation during the Thatcher years. Thus actual inflation fell both because expected inflation fell (tight fiscal policy and its effect on expected long-run monetary growth) and because actual inflation was lower than expected (tight short-run monetary policy). Table 9 shows that, but for adverse external shocks (not least unexpectedly high foreign real interest rates), inflation would have fallen even more quickly.

Notice that we do not separately identify exchange rate effects in this discussion. In the Liverpool model the exchange rate is an endogenous variable determined jointly by domestic policy and exogenous external variables. Thus, for example, the estimate of domestic shocks in Table 9 includes both the closed-economy effect of restrictive domestic policy and their open-economy effect acting through induced changes of the exchange rate.

The story of the UK recession in Table 10 may surprise some readers. Base run growth in 1980–81 would have averaged only 1.8% a year even without the change of policy introduced by Mrs Thatcher and the other adverse shocks. Table 10 shows that Mrs Thatcher's tight deflation programme contributed only a *small* part to the shocks which produced negative actual growth during 1980–81. More than half the recession was caused by external shocks – the collapse of world trade and the rise in world real interest rates. Most of the rest was caused by adverse supply shocks including increased union density and (only to a minor

Table 9. Winning the inflation battle

Annual rates %	Beginning 1980	End 1984–85	Average 1980–85
Base run (expectations)	18.0	5.0	10.1
Shocks			
domestic fiscal/monetary	−6.6	−1.0	−4.0
external	2.1	0.0	1.8
supply-side	1.5	−0.8	−0.1
Fitted model values	16.4	4.0	8.8
Actual	16.4	5.0	8.6

extent) rises in direct tax rates. The severity of the recession was thus due to an unfortunate coincidence of all three kinds of shocks, with external shocks much the most important. It cannot be said that deflationary domestic demand policies were a significant cause of the recession, though Table 10 certainly confirms the popular belief that monetary and fiscal policy were not used countercyclically to offset adverse shocks elsewhere.

The second column of Table 10 decomposes the causes of the UK recovery since 1981. Fiscal and monetary shocks together were negligible, and beneficial supply shocks roughly offset external shocks which continued to be adverse. Thus as a whole shocks were relatively unimportant during 1982–85. Rather the sources of the recovery were the end of temporarily adverse shocks and, more important, healthy growth along the base run since 1981. As in other models, the Liverpool model assumes gradual convergence to long-run equilibrium, albeit at a sluggish rate reflecting adjustment costs in the real world. Hence, beginning from a recession, in the absence of new shocks there is a period of above-average growth as market forces do their job and the economy catches up.

4. The rise in productivity

Next we turn to an analysis of productivity growth during the Thatcher years. Actual productivity is real output per person employed. The final row of Table 11 shows that actual productivity grew on average at 1.9% a year between 1979 and 1985. This represented a significant improvement over the period 1973–79 when actual productivity grew by only 1.1% a year.

Table 11 provides information on the contributory causes of productivity growth in the UK. It also displays different concepts of productivity growth based on different output measures on the one hand and

Table 10. Recession and recovery: real output growth

Annual average (%)	1980–81	1982–85
Base run (expectations)	1.8	3.7
Shocks		
domestic fiscal/monetary	−0.5	0.1
external	−2.9	−1.2
supply-side	−1.4	1.4
Fitted model values	−2.8	4.2
Actual	−1.6	2.5

Notes: (i) Again, model nonlinearities imply that the total shock is not exactly the sum of separate shocks. (ii) Actual growth in 1984 was considerably affected by the miners' strike for which no allowance is made by the model.

different measures of labour input on the other hand. Underlying productivity is equilibrium output per head of the working population. Thus as the output measure it uses potential rather than actual output, whilst as the labour input measure it uses the potential labour force. Underlying productivity neglects the effect of the business cycle on output and the effect of unemployment on labour supply and employment: it shows the wealth-creating potential of the labour force given existing supply-side constraints.

In contrast, equilibrium productivity shows equilibrium or potential output divided by equilibrium employment. It thus measures the potential effectiveness of those who will (eventually) be employed. Fitted actual productivity is the ratio of actual output to actual employment in the Liverpool model. It differs from productivity actually observed only because the Liverpool model fits the data well but not perfectly.

According to the model, all measures of productivity grew substantially between 1979 and 1985. Underlying productivity grew at 2.7% a year, and equilibrium productivity at the slightly lower rate of 2.3% because the natural rate of unemployment fell on average during the period. Fitted actual productivity grew at the intermediate rate of 2.5% a year because, as we shall see in the next section, over the period as a whole the divergence has risen between actual unemployment and its equilibrium or natural rate. This reduction in the number of workers in employment relative to equilibrium employment tends to make actual productivity grow more quickly than its equilibrium rate. It will be noticed that the model overpredicts actual productivity growth during the period, though there is no reason to suppose this affects either our estimates of the *relative* magnitude of underlying, equilibrium and actual productivity growth or the relative magnitudes of our

Table 11. Productivity growth 1979–85 (Annual average, %)

Underlying	2.7
external shocks and trend	1.2
supply shocks	1.6
Equilibrium:	2.3
external shocks and trend	0.8
supply shocks	1.6
Fitted actual:	2.5
fiscal/monetary shocks	0.3
external and supply shocks and trends	2.2
Actual	1.9

decomposition of the effects of the various shocks. Moreover subsequent events during 1986–87 suggest there has been some catching up of actual productivity towards the fitted levels implied by the model.

Table 11 shows the relative importance of different shocks. Since demand shocks have no permanent effect on the equilibrium output level – potential output depends only on the supply side – demand shocks have no effect on either underlying or equilibrium productivity growth. Table 11 shows that supply-side shocks have made a major contribution to the improved rate of productivity growth during the 1980s. Even when we turn to the model's account of actual productivity growth – where demand expansion can in principle have a significant short-run effect by boosting actual output – fiscal and monetary shocks remain relatively unimportant in understanding UK productivity growth in the 1980s.

Thus we conclude that Mrs Thatcher's programme has achieved a significant improvement in UK productivity performance, and that these benefits have been achieved primarily through the supply side. We return to this theme shortly. First it is necessary to examine unemployment in more detail.

5. The behaviour of unemployment

As in Figure 2 so in Table 12 we distinguish between actual unemployment and the equilibrium level of unemployment. Cyclical unemployment is simply the difference between actual and equilibrium unemployment. Whereas monetary and fiscal shocks can affect cyclical unemployment via aggregate demand, equilibrium unemployment is unaffected by domestic demand shocks.

Although actual unemployment rose to 3 million in the early eighties and only fell below this level in 1987, Table 12 shows the importance

Table 12. UK unemployment, 1979–85: equilibrium and cyclical (Millions of workers)

Unemployment, U	1980	1981	1982	1983	1984	1985
Equilibrium level, U^*	3.1	3.7	3.3	2.7	1.9	1.6
cumulative change from 1979 U^*	1.0	1.6	1.2	0.6	−0.2	−0.5
of which:						
external shocks	0.2	0.5	0.9	1.1	1.0	1.0
supply shocks	0.8	1.2	0.5	−0.1	−0.8	−1.2
productivity and trend	0.0	−0.1	−0.2	−0.4	−0.4	−0.3
Cyclical unemployment, $U - U^*$	−1.4	−1.3	−0.4	0.4	1.0	1.6
of which:						
fiscal/monetary shocks	0.1	0.4	0.8	1.1	1.0	0.8
external & supply shocks	−1.5	−1.7	−1.2	−0.7	0.0	0.8

of distinguishing its equilibrium and cyclical components. Beginning from 2.1 million in 1979, equilibrium unemployment rose sharply[4] to 3.7 million by 1981. Two-thirds of this increase is attributable to a deterioration of the supply side, with rising unionization and higher rates of tax and benefits. The remaining third essentially reflected the collapse of world trade which reduced the demand for labour since exporters' revenues fell for given levels of domestic real wages.

Since 1981 the story of equilibrium unemployment is very different. Although external conditions have not improved, there has been a major turn-around of the supply side. These improvements include falling tax rates and a dramatic and steady fall in unionisation. Between 1981 and 1985 equilibrium unemployment fell from 3.7 million to 1.6 million, and, arithmetically, more than the whole of this improvement was due to a better supply-side position. The significance of this change should not be underrated.

Actual unemployment has lagged persistently behind these changes in equilibrium unemployment. In 1980 actual unemployment was over 1 million below the equilibrium level: the sharp supply-side deterioration had yet to show up in job losses. The early 1980s saw actual unemployment quickly catch up with the equilibrium level which itself continued to deteriorate. We have already observed that since 1982 the equilibrium level has fallen markedly; actual unemployment has remained high. Table 12 shows that by the mid-eighties the cumulative effect of tight fiscal and monetary policy was responsible for cyclical

[4] This estimate is higher than that previously reported in Minford *et al.* (1983) partly because of data revisions and partly because the model has been amended and reestimated. It also exceeds that in Layard and Nickell (1985).

unemployment of about 1 million. Although markets had gradually adjusted to the initial tightening of domestic policy, in our earlier discussion of how the inflation battle was won we argued that further contractionary shocks to domestic policy had played a crucial role; this explains why, even by 1985–86, the cumulative contribution of fiscal and monetary shocks to cyclical unemployment remained high.[5]

In discussing the path of recession and recovery in Section 3, we argued that domestic demand policies were not a major cause of the recession of 1980–81. Similarly, Table 12 confirms that such policies were *not* the major cause of the sharp rise in actual unemployment in the early 1980s. However, tight domestic policy has been one major reason why actual unemployment has not responded more quickly to the improvement in equilibrium unemployment since 1982.

6. Supply-side policy: the consequences and the lessons

The ultimate objective of the supply-side programme is to raise the *per capita* income of the UK. This can be conveniently divided into two aspects: the productivity of the employed, and the extent of unemployment (whose productivity is zero, at least as measured in the official statistics). A fully successful programme would push productivity up to the limits set by existing technology and would reduce unemployment to its irreducible minimum (essentially the frictional unemployment of those between jobs).

There are signs of progress on the first aspect. Productivity in manufacturing has grown substantially more rapidly since 1979 than in the previous seven years. Figure 3 shows the crude figures; however, adjustment for the effects of utilization of workers and machines does not change the basic story. Muellbauer (1986) finds that the adjusted trend growth ('total factor productivity') since mid-1980 has been 2.8% p.a. (after a small drop in 1979–80) against 0.6% p.a. from end-72 to mid-79. In addition, Smith-Gavine and Bennett (1987) report that 'PUL', their index of effort per man based on work-study questionnaires, grew by a total of 3.3% between 1979 and 1986 (compared with 0.6% over the previous six-year cycle, 73–79); this contribution to utilization appears to be permanent rather than a cyclical change. Overall productivity in the economy shows a similar, though less dramatic, tendency to grow more rapidly, as we have seen and attempted to analyse.

[5] In the model, fiscal and monetary contraction affects unemployment more than output because it raises real wages and so reduces labour-intensiveness.

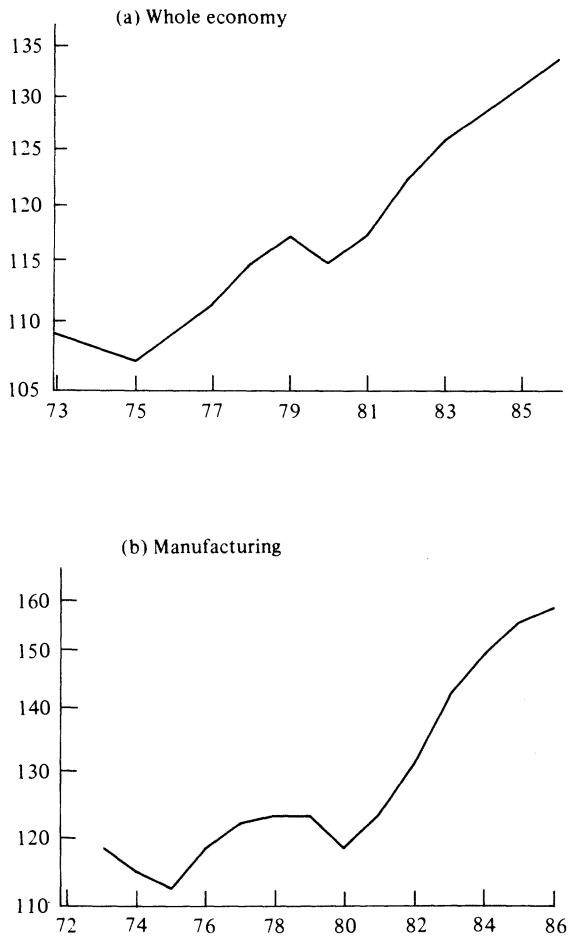

Figure 3. Real output per person in the UK (1970 = 100, Logarithmic scale)

Our report of the unemployment aspect has not been so good. Some 11.7% of the employed labour force are registered unemployed, i.e. just over 10% of the 'available' labour force. There are others who are unemployed but draw no benefits; these however are not unemployed because of any market distortion, so that no available policy measures could draw them into employment in a welfare-improving way. It is therefore the 10% (less some frictional rate) who represent the economic waste.

Roughly speaking this rate has doubled since 1979. Assuming these people are producing nothing and could be producing at average productivity, then GDP is some 5% less than otherwise as a result of this increase. However, this is an overstatement because, first, there is some evidence of part-time activity by the unemployed, some of it illegal

(Matthews and Rastogi, 1985; and ORC 1986 Survey of attitudes among the employed and unemployed) and, second, unemployment is concentrated in the lowest productivity section of the labour force (average previous earnings of the unemployed were 20% below the national average; and half of the unemployed had earnings in the lowest decile – DHSS Cohort Study of the unemployed in autumn 1978). A measure of the true welfare loss would be less again; one should value the leisure of the unemployed and also deduct associated (capital and other) costs of employment. A rough welfare measure would be to multiply the number of people unemployed by some estimate of their marginal value product (net of their existing part-time product and additional leisure), perhaps £80 per week (about half of average earnings). On this basis, the increase in unemployment since 1979 has reduced overall income by about £5 billion, just over 1% of GDP. Total present unemployment, excluding frictional, probably represents a waste around double this.

This is not in fact a very substantial waste in purely economic terms – less than half of one year's productivity growth. However, the problem is also, perhaps even primarily, a social one; whatever the evidence reviewed above may suggest about economic uses of time on the dole, and in spite of perhaps rather surprising survey evidence of the attitudes of the unemployed themselves (in the ORC 1986 survey 69% of the unemployed in an admittedly small sample said that they obtained a 'lot of satisfaction' out of life on the dole), it is obvious that the reduction of unemployment is a high social priority.

What has gone wrong? Together, reduced union power and Mrs Thatcher's incentives for efficiency have had little impact so far on the real supply price of labour, but they have sharply altered working practices, productivity, and manning levels. With external conditions and domestic policy resolutely restrictive, the consequence has been high unemployment.

Why has this unemployment not put downward pressure on real wages, increasing the quantity of labour demanded and allowing workers to price themselves into jobs? There seem to be five major explanations. First, the model suggests, as we have seen, that the adjustment lags are substantial, so that by the end of 1985 $1\frac{1}{4}$ million of supply-side induced reduction in unemployment had still to come through. Second, as discussed in Section 1, whilst weak in other respects unions remain powerful in wage bargaining on behalf of those still in employment. Second, real social security benefits for the unemployed did not fall substantially and in some instances (notably rent and rate rebates) actually increased. Third, the alternative income opportunities available to the unemployed by working in the unreported sector or 'black economy' may have increased, and there has been considerable laxity

in the public policing of such activities. Finally, housing market distortions, essentially rent controls, hamper geographical mobility which both prevents reabsorption of the unemployed in another more prosperous region and prevents regions of high unemployment exerting significant downward pressure on wages elsewhere.

Given the need to target monetary and fiscal policy on inflation reduction, adverse external conditions, and success in raising productivity growth, the failure of real wages to fall made high unemployment inevitable.

Against this background, Buiter and Miller (1983) have argued that the documented productivity improvement is substantially spurious, being achieved by 'raising the batting average by eliminating the worst batsmen'. The implication is that the low-productivity workers who lost their jobs (especially in unviable and vastly overmanned British manufacturing) would have made a greater contribution by doing some work, however inefficiently, than by doing no work at all. This view presupposes that low-productivity workers who have been laid off will not find new jobs in other industries or, alternatively, that any future demand expansion intended to restore their old jobs will immediately undo the productivity gains of the 1980s.

Put this way, it is clear that the batting analogy does not fit. Alternative uses have emerged. There has been since 1979 a substantial rise in employment outside manufacturing, largely in the services sector. Manufacturing employment has fallen by 2 million, but employment elsewhere and self-employment has risen 1.6 million; among males the offset is less good (manufacturing −1.3m., other+0.3m.), since many of the increased jobs have gone to women, whose increased participation is a major reason for labour force growth of 1.3 million over the period. There has also been a shift generally to flexi-time and part-time working and to self-employment.

It is of course true that market forces are working slowly. The cyclical unemployment shown in Table 12 remains high (though by 1987 it was falling steadily). There *is* evidence that workers are being reallocated to jobs that are viable in the long run. Productivity gains to date should be welcomed. Policy should now seek to reinforce labour market adjustment and labour mobility.

The eventual return to work by the unemployed may have some effect on aggregate productivity in the second half of the eighties. Those who had lost their jobs are on average likely to be lower-productivity workers (even in a new, viable job) than those who managed to remain in employment throughout the period. Making crude assumptions about relative productivity (for example that newly-employed workers are only three-quarters as productive as the national average), it is

possible to suggest that the batting average effects would be relatively small. This squares with the model estimates of Table 11 which show only a small disparity between equilibrium and fitted actual productivity growth during 1979–85. Thus we conclude that there has indeed been a massive improvement in UK productivity performance since the 1970s and that this judgement will not be reversed as the unemployment rate falls in the UK.

Further progress on unemployment can be made by reducing the supply price of labour or by raising its quality through retraining (so reducing its effective supply price). However, retraining is a voluntary act for which there must be adequate incentives; for example, for someone currently worth £100 per week to become worth £180 per week requires a substantial investment in human capital, which most unskilled workers have not traditionally considered worthwhile. It is a common fallacy among skilled middle class commentators that retraining, if offered, will be taken up by such workers. If unemployment benefit were to be cut or totally withdrawn, some unskilled workers would no doubt find it worthwhile to retrain; but most would simply take an unskilled job at lower wages. As a solution to current unemployment – predominantly of unskilled workers – retraining is not a promising avenue.

One is driven to conclude that the policy options, if they are to be effective, all involve hefty doses of nasty medicine; that is why politicians, even of Mrs Thatcher's 'iron' constitution, have been so reluctant to pursue them so far. To recapitulate, Mrs Thatcher could make significant and speedy progress on unemployment by adopting at least one of the following four reforms. First, she could tighten the screws on employed union workers, by banning the closed shop and withdrawing all remaining union immunities. Second, she could cut unemployment benefits. Third, she could refuse benefits to those who are found to have 'shadow' jobs and more generally all those who could get *some* ordinary job. Finally, she could eliminate rent controls to make available a greater quantity of rented accommodation in the South where vacancies are higher.

There is now a discernible change in the climate of opinion, so that some such policies may now be 'politically practicable'. One such policy is already being implemented: the Restart programme under which all those unemployed for more than a year are being interviewed and offered a government (or other) job or training place. Refusal entails the risk under present law of loss of benefits. So far there is little evidence that this aspect is being much used (Ashton, 1987); however, the Conservative Manifesto in 1987 envisaged loss of benefits for any 16–18 year olds refusing a place on the Youth Training Scheme. It also proposed that new tenancies would lie outside the Rent

Acts and that council tenants should have the right to opt out of council control.

7. Are there any general lessons?

Mrs Thatcher's government has embarked on a historic reversal of the accepted basis of post-war British economic policy. Not surprisingly the success of this endeavour is still in doubt in a variety of respects, partly because essential steps have not yet been taken and partly because others have not yet had time to take effect. Nevertheless, considering the previous record of British economic failure, the results may well constitute in the words of Walters (1985) an 'economic renaissance'.

By a curious coincidence, we began our research programme, on which this paper draws extensively, at around the same time that Mrs Thatcher, having won the leadership of the Conservative Party, set out with her closest political associates to frame her new Conservative programme, including the economic policies reviewed here. Coincidence it is; for as we have seen many of the strands in this new Conservative programme were not recognizably New Classical at all at their inception. However, the gradualist programme has evolved from its initial emphasis on the control of inflation into a wide-ranging injection of new market-based rules into British life; from these are expected, New Classical style, new and more effective modes of private sector behaviour. How far that evolution has been by accident, how far by design is a matter of fascination upon which we can only speculate; the picture we have conveyed is one in which there was an instinctive design, namely a vision of returning to a world of economic freedom, self-help and entrepreneurship, but its emergence on the ground has been in a series of *ad hoc* 'steps', each chosen to achieve tactical advance in the circumstances of the time. Nowhere is this best illustrated than by one of the biggest successes, privatization, which barely figured in the original plans and yet has now come to occupy centre stage in the Thatcherite 'policy dynamic'.

We have evaluated this programme from a sympathetic viewpoint. Our narrative has noted the successes on inflation and productivity and the relative failure so far on unemployment; it has correlated both successes and failures with the Thatcher government's policies. Inflation was brought down by tough monetary and fiscal policies. Productivity growth has been raised by curbing union power, by privatization, by deregulation, and to some extent by bringing down tax rates. Unemployment has only recently started to respond to treatment (viz. the direct intervention of the 'work test' in Restart), essentially because the government has until recently shrunk from imposing market disciplines on unemployment.

Our econometric modelling has thrown out the same general message; where it has been helpful is in attributing causes. Most notably, the rise in unemployment over the whole period 1979 to 1985 was produced in roughly equal parts by fiscal/monetary shocks and by external shocks. The equilibrium unemployment rate went up until 1981 as a result of both external and supply shocks, but from that point has steadily fallen, as the supply side has improved. *Output* fluctuations are found to depend little on fiscal/monetary shocks but rather on external shocks; this runs contrary to all earlier comment. The inflation decline is attributed to the fall in monetary growth and the effects of the falling PSBR in building credibility. Productivity growth has been importantly boosted by supply-side developments, with the 'batting average' effects estimated to be small.

What general lessons finally can we draw for economic policy analysis? The first is that modern economists should exhibit some humility in the face of the wisdom of their predecessors and of practitioners: many of them have found themselves surprised by the developments of the past eight years in the British economy. A programme of reform that would have appealed to Adam Smith and Gladstone met with a wave of often 'econometrically-based' condemnation from the current generation of academic economists.

The second lesson is that policy solutions for our economic problems are not so much difficult to identify as difficult to put into practice in a way that can be politically successful, at least in an open, sceptical, articulate democracy with many vested interests, such as Britain. The achievement of Mrs Thatcher is that she has succeeded in changing Britain, probably permanently, by a cumulative series of half-measures or even quarter-measures, where grander attempts at rapid change (notably Messrs. Wilson and Heath's trade union reforms) either never got off the ground or collapsed in the face of political pressure. Economists too must understand the policy process if they are to be effective in helping politicians to solve our problems.

The last lesson is for politicians themselves: it is that the 'politically impossible' merely takes longer but that anyone contemplating it should not delay in taking the first step. Where even modest action is taken early, as with union reform, success is possible; where it is delayed, against better judgement, until the problem has become intractable and threatening, as with unemployment, failure is all too possible. In general Mrs Thatcher's administration cannot be accused of being 'sicklied o'er with the pale cast of thought'; it is more likely to be accused of treating every day like St. Crispin's Day. But on unemployment it has been a close, eleventh hour, call; and the necessary supply-side policies are by no means yet fully in place.

Discussion

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The 1980s are exciting times for British economists, not least because they get to read papers like this one which is guaranteed to raise the average level of the blood pressure. This is probably no bad thing and so, at the outset, I must congratulate the authors for providing us with a coherent and readable account of a particular view of the 1980s in Britain.

I begin my discussion with a brief overview of Britain's economic performance since 1979 in a wider European context. Of course, Europe as a whole has performed rather miserably relative to the rest of the OECD but it seems fairer to restrict the comparison to our more immediate neighbours. Before doing so, it is worth emphasizing that Britain has had the truly enormous advantage of North Sea oil, something which receives scant attention from Matthews and Minford but which will surely figure very heavily in the deliberations of future economic historians.

Since 1979 unemployment in Britain has risen considerably more than in OECD Europe and inflation has come down further in terms of the GDP deflator although not in terms of manufacturing producer prices which are more relevant when considering our international competitiveness. Growth rates of output, measured from 1979 (pre-recession) and 1984 (post-European recession), are very similar in Britain to the European average, but this is a marked improvement relative to the previous decade when they were significantly lower. Manufacturing productivity growth has been higher in Britain and this represents quite a sharp turnaround from the previous decade. Overall productivity growth, however, shows a far less dramatic picture of relative success. Finally, it is worth noting that, in terms of labour costs per unit of output, the picture is less rosy, these having been rising in Britain since 1984 in the economy as a whole and since 1983 in manufacturing. So although we have had productivity gains, our relatively poor performance on the wage inflation front has tended to counteract this. In fact, wage inflation has remained stubbornly high since 1983, a crucial weakness.

So, overall, the key relative improvement in the British economy has come on the productivity front and, to a lesser extent, in terms of overall growth performance. Unemployment and wage inflation remain persistent and apparently intractable problems.

Matthews and Minford describe the attack on inflation in the early 1980s in graphic terms. The fundamental question is whether or not inflation could have been brought down *and* stabilized at a relatively

low level with a lower cost in terms of lost output. In my view this might have been possible with the right kind of incomes policy but, given the political map, it is hard to see how it could have been achieved by any government which had a chance of being elected. Matthews and Minford argue that the severe fiscal and monetary shocks of the period were necessary to overcome the 'inflationary psychology' and to generate credibility. Less convincingly, they argue later that these were of minor importance in generating the recession of 1980–81. This is a model-based result and I shall return to the modelling work in due course. However, it is worth noting at this point that they emphasise the role of monetary and fiscal shocks in bringing down expected inflation directly, with this feeding through to actual inflation. Their evidence for this (again from the Liverpool Model) is not very strong and I would certainly put more emphasis on the role of declining economic activity in directly affecting wage and price-setting behaviour.

Turning now to supply-side measures, the authors emphasise three areas, namely union legislation, privatization and deregulation, and reforms in the tax structure. With regard to union legislation, they argue that this has increased the power of managers thereby generating improvements in efficiency leading to the productivity improvements discussed above. On the other hand, they note that the legislation does not seem to have had much impact on pay determination. The former argument is not backed up by any detailed evidence and the alternative view that it was the dramatic increase in unemployment which weakened the union side is not rebutted.

Concerning privatization and deregulation, they point to some success in terms of efficiency gains but the evidence here is again not strong. For example, they list the improvements in profits in recently privatized companies without noting that the private sector exhibited similar profit gains over the same period. It would not be difficult to present a picture of the privatization and deregulation activity which gave a very different impression. Hard evidence in this area is currently in rather short supply.

On the tax and benefit front, they make the best of what is a rather feeble show. Marginal tax rates on average earners have been above the 1979 level throughout the 1980s except for the last year or so and the authors are reduced to making much of the impact of cutting the top rates of income tax on the pre-tax earnings of managers. These have risen sharply mainly because of the increase in 'performance-related' pay. This is adduced as evidence of a supply-side effect. In fact, of course, performance-related pay is related not to effort but to profits and the sharp increase in profits after 1981 has led to a similar increase

in pay. Whether or not profits have risen because of increased managerial effort is a question for debate, but the standard cyclical effects clearly had an important role.

Turning now to the model-based discussion, this is mainly concerned with the allocation of the various shifts in macroeconomic aggregates between the three major sources of shocks, namely monetary and fiscal shocks, world trade shocks and supply-side shocks. These generated the fall in inflation and the rise in unemployment. The relative importance of the shocks is discussed at some length. Rather than go through this in detail, I simply wish to point out that the Liverpool Model has certain curious properties which ensure that it emphasizes certain shocks at the expense of others. For example, in Figure 2(c), we find that equilibrium unemployment has fallen by around two million from 1981 to 1985 and is now about half the actual rate. Since this is a natural-rate model, we would expect the economy to be exhibiting large negative price surprises since equilibrium unemployment is so far below the actual level. Chart 2(a), however, reveals the opposite to be the case in the later years.

The model has other odd features. For example, productivity growth does not enter the model at all. This has important consequences. Because of the omission of economic growth as an explanatory variable for the trend growth in wages, the variables which pick up this effect are those that are themselves trending upwards – specifically, the unionization rate, the income tax rate, and real benefits. Therefore, these variables have an enormous impact, but this arises simply because the British economy has been growing and they are the only variables available to explain this growth. As a consequence, any allocation of macroeconomic shifts between demand and supply-side causes in the Liverpool model should be treated with extreme scepticism.

To take a second example, equilibrium unemployment depends on the rate of growth in world trade – specifically, a rise in trade of 6% per annum implies a fall in the natural rate of unemployment of 10% per annum, which seems implausible.

To conclude, therefore, we have an interesting and unashamedly partisan interpretation of the Thatcher years based on a mixture of outside evidence, prior belief and the Liverpool Model (which is, itself, rather less dependent on the data and rather more dependent on prior belief than most). The weighting of evidence and prior belief in the mixture, readers can judge for themselves. Personally, I doubt that many individuals will find their own prior judgements disturbed by the evidence presented in this paper.

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Mrs Thatcher's economic policies have been controversial and much debated. The final outcome is easily observed but any assessment must distinguish the effects attributable to policy and the effects stemming from other sources, both domestic and external. At the macroeconomic level, the authors attempt to provide a quantitative decomposition of these effects. I welcome this attempt and it is on this section of the paper that I shall concentrate my remarks.

Here a serious attempt has been made to identify the net effects of policies, with the final verdict being favourable. This is in contrast to other evaluations of Mrs Thatcher's policies, such as Buiter and Miller (1981, 1983). Two main issues arise in this context. First, since the calculations of the effects of policies are performed by means of the Liverpool Econometric Model (LEM), how reliable are these calculations in view of the model's structure? And second, given the persistent high level of unemployment, which doubled in the first few years of Mrs Thatcher's tenure, was it not possible to change the policy mix so as to reduce unemployment without jeopardizing disinflation? The answer to the second question is, of course, not independent of the answer to the first.

The authors attribute most of the disinflation success to the monetary-fiscal policy mix and the favourable effect on credibility and expectations. In order to understand this result it is necessary to have a close look at the LEM (my remarks are based on the version described in Minford, Marwaha, Matthews and Sprague, 1984). There, money growth is a function of $\bar{d}$, the cyclically-adjusted ratio of the PSBR to GDP, and of past money growth. This specification of the *policy rule*, together with the interpretation of expectations and credibility, is mostly responsible for the above cited results. According to this rule, a reduction in $\bar{d}$ immediately reduces expected money growth. All future money growth rates decline, both because $\bar{d}$ declines and because preceding money growth rates are lower. This leads to lower rates of inflation via the equilibrium condition in the money market.

In order to see the central role played by the policy rule, consider an alternative specification. Suppose the current deficits are not monetized but are financed by issuing bonds. Also suppose that the public believes that the currently observed level of the PSBR/GDP ratio is higher than the long-run level, and that the long-run deficit will be monetized. Now, if the public believes that lump-sum taxes will be used to bring the deficit down to its long-run level and there is Ricardian

neutrality, the current value of $\bar{d}$ does not matter. If, on the other hand, the deficit is expected to be brought down by expenditure cuts, or if Ricardian neutrality fails to obtain, both current and future deficits matter, and it will be necessary to model expectations appropriately. Moreover, much of the credibility debate focused on how current actions affect expected future deficits. It is, therefore, somewhat misleading to *assume* that expected future deficits are equal to current deficits and then to argue that credibility has been achieved because of a reduction in the deficit.

It is clear from this discussion that the model's specification assigns a dominant role to reductions in the budget deficit. Although I agree that budget deficits should play a major role in a sensible model of inflation, it seems to me that their role is overstated in the LEM. One would like at least to see some sensitivity analysis of the effect attributed to the monetary-fiscal policy mix and to changes in the specification of expected future deficits and their composition (taxes versus expenditures). This is especially important in view of the fact that no adjustment of the estimated parameters was made following a major policy change. Hence, the calculations are susceptible to the Lucas critique: agents may change their behaviour when policy rules change.

Apart from the reduction of the budget deficit, the other main internal driving force in this episode is the increase in real wages. This factor requires an explanation. However, given that it took place, it explains several other developments. I would like to suggest a consistent story. An increase in real wages reduces the supply of tradable and nontradable goods. If real aggregate spending does not change, the relative price of nontradables rises, the trade balance deteriorates, and the real exchange rate appreciates. These results are straightforward from standard models of the open economy.

If this description is correct, then a fiscal stimulus can raise employment, provided nontraded goods are relatively labour-intensive and have a sufficiently high elasticity of demand for labour, and provided that commodity markets are competitive. If they are oligopolistic with an approximately constant elasticity of demand, then a demand stimulus will necessarily raise employment. These points are not addressed in the paper, but they are of major importance in the evaluation of Mrs Thatcher's policies. For it is necessary to ask: was it possible to disinflate with higher employment?

In order to see that a demand stimulus can prevent mass unemployment without hampering disinflation, consider the case of Israel. From a fiscal deficit of over 10% of GDP in the first half of 1985 and an inflation rate of over 400% on a yearly basis, the budget deficit went into surplus and the rate of inflation declined to about 20% in 1986.

Although real wages declined sharply during the first quarter that followed the implementation of the stabilization programme in July 1985, it was followed by a wage explosion in 1986. Nevertheless, in 1986 unemployment was not significantly larger than in mid-1985. The reason for the lack of a major unemployment problem despite the wage explosion was the sharp increase in aggregate demand, which was driven by private consumption. In this case the stimulus to demand did not come from the budget, but rather from the private sector (government consumption had in fact declined), but aggregate spending increased nevertheless, which is the important change from the point of view of the current discussion.

The UK is not Israel, and it is not clear *a priori* that the policy mix that worked for Israel would have worked for the UK. However, recent Israeli experience demonstrates that a demand stimulus that reduces unemployment does not lead necessarily to an inflationary explosion. There also exists an interpretation of the American experience which points out that the budget-driven demand stimulus has reduced US unemployment without renewing inflation, which was controlled through monetary policy (see Blanchard, this issue). However, all these interpretations are so far unsupported by hard evidence. But so is much of the interpretation Matthews and Minford propose.

General Discussion

Several members of the Panel disagreed with the authors' claim that the Thatcher government had achieved credibility in its fight against inflation by adhering to the PSBR targets. Olivier Blanchard pointed out that the recent US experience provided a counter-example, because credibility was achieved there *after* the budget deficit had already started rising significantly. Patrick Minford argued that fiscal-monetary linkages in the UK were sufficiently different from the US to render any such comparisons irrelevant. David Currie argued that if one assumed, as the authors did, that credibility was achieved in 1982, (when long-term interest rates fell significantly) one could equally well attribute it to the fact that, for the first time, the government had achieved its target for £M3. Marcus Miller doubted that the government gained extra credibility by achieving its PSBR target if the latter were only attained through asset sales. There was little doubt that the markets believed Mrs Thatcher was determined to fight inflation, but it is more likely that the markets had been impressed by her willingness to tolerate high unemployment than by cosmetic adherence to a PSBR target.

John Kay questioned the authors' belief that policies to promote competition would follow the privatization measures that we had seen.

The government had done a 'deal' with the managers, whereby privatization was allowed to go ahead in exchange for assurances that they would not be threatened by extra competition. The notion that the government would later impose changes on companies that were now private and less amenable to pressure from the government was scarcely credible. John Kay was not convinced that privatization *per se* had produced any significant efficiency gains. It was not enough to point to an increase in profits – after all even larger increases in profits had occurred in industries that remained in the public sector (e.g. steel, coal, and until recently, airways).

David Currie said that he was unconvinced by the authors' claims for the incentive effects of tax cuts. All the microeconometric evidence on labour supply suggested that, for males, these responses were, at best, very small. John Kay questioned the appropriateness of the definition of benefits used by the authors. They had argued that the real value of benefits had increased (albeit, unintentionally) during the Thatcher years primarily because of certain specific, reimbursed expenditures. However, expenditure on these items is also reimbursed to low wage earners. One should, therefore, use an appropriate measure of the replacement ratio, (i.e. the ratio of net income out of work to net income in work). Of course, this ratio varies widely across households, but if one calculates it for a variety of households, these ratios are well below unity for the vast majority of households. All this was very important as the equilibrium rate of unemployment in the authors' model was heavily dependent on the level of benefits (with an elasticity of approximately 7!).

Marcus Miller noted that the forecasts of the exogenous variables used by the authors appeared to have certain curious properties; for example, the implied forecast errors were serially correlated. This ran counter to the assumption of rational expectations which had been made in the theoretical model. All this made one wonder about the validity of the simulation results.

Olivier Blanchard noted that the result that the equilibrium rate of unemployment was about 1.5 million below the actual level represented a significant change in the authors' previously stated position that the actual rate and the equilibrium rate were approximately equal. Did their results now imply that we should reflate the economy in order to reduce unemployment? Patrick Minford argued that any attempt to reflate the economy would be unwise because the Thatcher government would then lose its hard-won credibility, and this would lead to a resurgence of inflation. David Begg pointed out that the authors' concept of an equilibrium rate of unemployment under rational

expectations did not necessarily coincide with the popular notion of a non-accelerating inflation rate of unemployment (NAIRU) under adaptive expectations, and so the authors could be right not to be complacent about inflation just because the actual rate of unemployment exceeded the equilibrium rate.

Appendix. Further details of the Liverpool model

Confusion sometimes arises about the exact model of inflation in the Liverpool model. It is in fact entirely conventional. There is a price equation (homogeneous in costs) and a wage equation (homogeneous in actual and expected inflation through the Phillips curve effect of unanticipated inflation). Actual inflation is made determinate by fixing money supply growth and adding the *LM* curve. So inflation is money-driven but acts *through* wage/price equations under rational expectations. Some simple algebra may be helpful to clarify this. Write the model in simplified form as:

$$p = aw + (1-a)p_F + \cdots \qquad 0 < a < 1 \qquad \text{(A1)}$$

$$(w-p) = -b(p-p^e) + c(w-p)_{-1} + \cdots \qquad b, c > 0 \qquad \text{(A2)}$$

$$\Delta p = \Delta M - \Delta m \qquad \text{(A3)}$$

where p, w, M, m, are logs of prices, wages, money supply, and real money demand respectively, p^e is expected prices, p_F the log of foreign prices in sterling, and Δx denotes a first difference transformation applied to x. (A2) can also be written in the more familiar Phillips curve manner as

$$\Delta w = (1-b)\Delta p + b(p^e - p_{-1}) - (1-c)(w-p)_{-1} + \cdots.$$

If Δm is treated as fixed on some slow convergent path by the model as a whole, this three equation system can be solved for inflation Δp, for real wages, $w-p$, and for the real exchange rate, $p-p_F$.

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