

Inflation over 300 years

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In recent years, there has been a widening acceptance of the view that the primary purpose of monetary policy should be to maintain price stability, and the primary purpose of central banks should be to secure this. But what has been the history of UK inflation over the first 300 years of the Bank's existence? How has thinking about inflation developed over that period? And how has the workforce of the Old Lady herself withstood the inflationary ravages of time?



POLITICAL RAVISHMENT or The Old Lady of Threadneedle Street in danger!
Cartoon by James Gillray, published in 1797

What is inflation?

Calculating how much prices have risen during the last 300 years is a difficult task. Part of the reason for this is that the bundle of goods and services that was available in 1694 and the bundle consumed now show some important differences. Some elements are, of course, common to both—for

example, basic foodstuffs such as eggs, lamb and bread—so their prices can be compared. Potatoes, which had arrived in Britain by 1694 but were not widespread until much later (price data are available only from 1762), can be thought of as a close substitute for such foodstuffs. But it is more difficult to find seventeenth-century analogues of other elements in today's Retail Price Index (RPI). What can we

compare with the price today of a second-hand car—a second-hand sedan chair? And although we might be able to discover the relation between the ticket prices for a concert of Purcell’s music now and in 1694, we cannot compare the prices of digital compact disc recordings of his music.

To try to overcome these problems, statisticians and economists have spliced together price indices from a number of periods. This technique allows—albeit imperfectly—the weights of the goods and services included

‘Inflation means that your money won’t buy as much today as it did when you didn’t have any.’ (Anon)

in the price index to evolve over time. But although spliced indices give some indication of the broad trends in the price level since 1694, they can never be exact. There is a much wider range of goods and services today, reflecting a more developed structure of production. So food prices comprise only a fifth of today’s RPI compared with two thirds in 1694, implying that the index is now much less sensitive to certain shocks, such as the failure of the grain harvest.

There are similar problems—including difficulties over the availability of comparisons and over changes in quality—when trying to see how wages have evolved over the period. The standard of education in the population as a whole is much higher now than in 1694. And the range of skills available in the workforce is very different (there were no computer programmers in seventeenth-century England). Even over shorter periods, comparison is difficult. Would it be fair to compare the £30,000 paid to Aston Villa for their striker Trevor Ford in 1950 (that year’s record transfer) with the £2.3 million they paid for Dean Saunders in 1992?

What goes up can come down

At a best estimate, prices have risen by a factor of 67 since the Bank’s foundation in 1694. If the area of the new £50 note were increased in the same proportion, the result would be a note some 4 feet by 3 feet, necessitating cash machines the width of double-doors and vans instead of wallets (and giving a rather different meaning to the phrase ‘velocity of circulation’). Looked at another way, if the current size of the £50 note were taken to represent the purchasing power of £50 in 1694, then to reflect its real purchasing power today, it would need to shrink to smaller than a postage stamp.

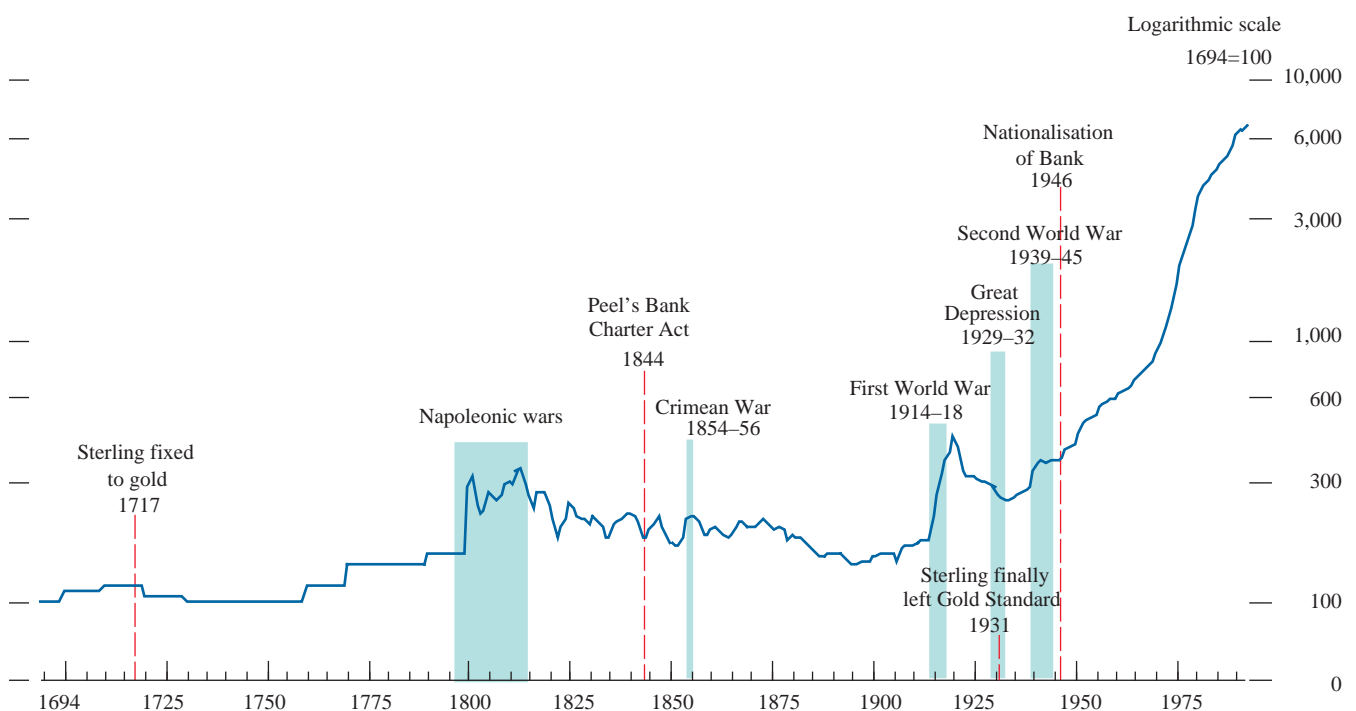
Average inflation rates^(a)

Per cent	
1900 to 1913	1.3
1914 to 1918	15.3
1919 to 1939	-1.2
1940 to 1945	4.3
1946 to 1949	2.6
1950 to 1959	4.3
1960 to 1969	3.5
1970 to 1979	12.5
1980 to 1989	7.4
1990 to 1993	5.1

(a) Geometric averages.

Experience of the general trend in prices since the Second World War might suggest that inflation is always with us. In fact, the history of the last three centuries is not one of an unbroken rise in prices, but rather of periods in which prices increased, others when they fell, and little tendency for sustained rises or falls. Indeed prices have risen more quickly in the last 50 years than in any similar period since 1694; the index of prices tripled between 1694 and 1948, but has risen almost 20-fold since. Even within the post-war period, however, the rate of inflation has varied markedly, as the table above illustrates.

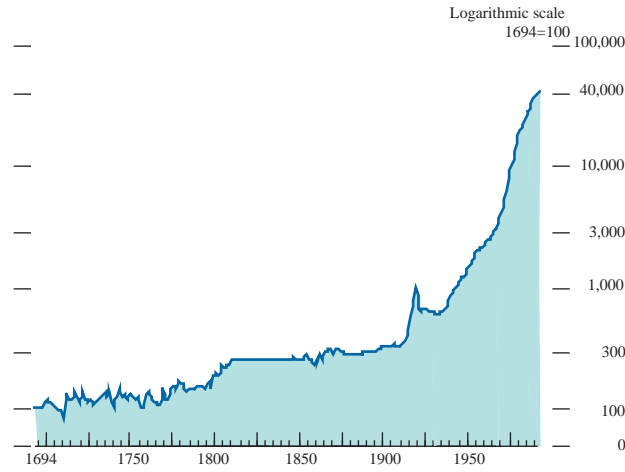
Chart 1
Retail Price Index



Wages

The profile of nominal wages over the last 300 years has been similar to that for retail prices, as a comparison of Charts 1 and 2 shows. It is notable, however, that real wages appear to have been considerably more variable in earlier

Chart 2
Nominal wages



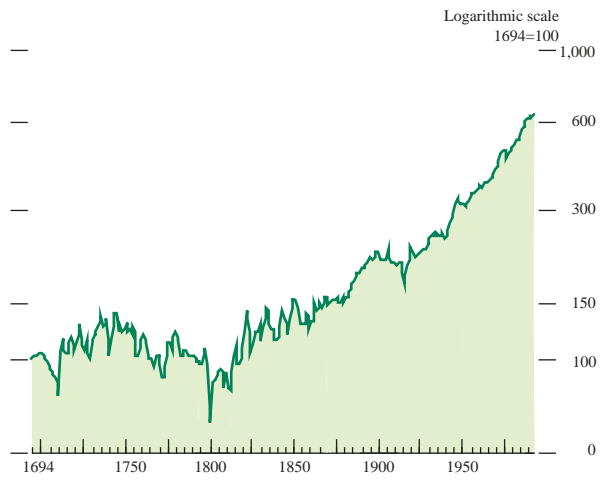
centuries than they have been in this one (Chart 3)—though precise comparisons are difficult from the available data.⁽¹⁾ It is clear also that nominal wages have risen by much more than prices. An index showing movements in builders' wages relative to a basket of consumables,⁽²⁾ set at 100 for 1694, had fallen to a low of 62 by 1801. This was in the period of the war with France, when the cost of living rose sharply (the price of the basket rose over 30% in 1800). But by 1993, the index had risen to over 600.

Bank of England staff also appeared to feel the pinch in the Napoleonic era. According to W Marston Acres: 'the increase in salaries granted by the Directors in 1800 was not commensurate with the rise in the cost of living, and it was only because of the money earned by extra work that more clerks were not in difficulties'.⁽³⁾

'When I first started working, I used to dream of the day when I might be earning the salary I'm starving on today.' (Anon)

In 1821, following five years of peace, clerks' annual increments and maximum attainable salaries were reduced; at the time, prices were falling by over 10% a year. In 1854, following the imposition of income tax⁽⁴⁾ to finance the war against Russia, clerks were moved to request that the Bank pay their tax for them. The request was initially refused, but clerks were later granted a 10% rise because of the 'high prices of provisions concurring with the pressure of income tax'—prices rose by around 16% in 1854. But by 1865 the

Chart 3
Real wages



staff were again complaining of hardship, suffering 'much difficulty in meeting their unavoidable expenses and maintaining social respectability'.⁽⁵⁾

Bank clerks—and indeed the Bank's Chief Cashier—were paid £50 a year in 1694. Increasing this in line with the 400-fold rise in the overall nominal wage index since then would suggest a figure of £20,000 today. In fact graduate entrants into the Bank currently start on a salary around 25% less than this. The Chief Cashier has done rather better.

In 1694, the Bank was cleaned by one person, Susan Bennett. The only woman employed by the Bank at the time, she was paid £10 a year. Today, the Bank employs a staff of 59 'housekeepers', whose annual salary is around 500 times that in 1694.

Swings and roundabouts

The general trend in the price index masks some very large changes in relative prices. Even over short periods, relative prices can change substantially, reflecting changes in supply and demand conditions. Since January 1987, for example, the RPI sub-index for audio-visual equipment has fallen by around 20%, while that for water charges has doubled. Over the same period, coffee prices have fallen by 1%, while soft-drink prices have risen by over 50%.

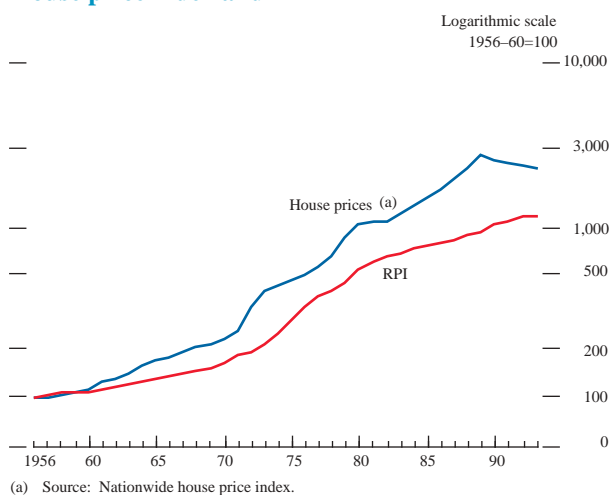
Looking at the prices of three essentials, the average price of bread in London in 1694 was 5.6d (about 2.3p) per 4lb.⁽⁶⁾ In 1894, the price was just 5.5d, though it had risen to 1s 5d (about 7p) at the time of the Napoleonic wars. In the decade from 1974 to 1984, it tripled; and by 1993, it had risen a further 60%. The retail price in London of a ton of coal rose by around 70% between 1700 and 1830, to 20 shillings. It was much the same price in 1900, rose to around 30 shillings in the 1914–18 period, dropped back to 20 shillings after the

(1) See, for example, Crafts, N F R, *British Economic Growth during the Industrial Revolution*, 1991.
 (2) Historical data taken from Phelps Brown, E H and Hopkins, S V, 'Seven centuries of the price of consumables, compared with builders' wage-rates', *Economica*, 1956.
 (3) Marston Acres, W, *The Bank of England from Within*, 1931.
 (4) Income tax was introduced in 1799 at 2 shillings (10p) in the pound. It was abolished in 1816 and reintroduced with Peel's tax legislation of 1842.
 (5) Marston Acres, W, *op cit*.
 (6) Figures taken from Mitchell, B R, *British Historical Statistics*, 1988.

First World War, and then rose to over 30 shillings during the Second. By the end of 1992, it cost £145. The *Bank of England Quarterly Bulletin* is one item to have exhibited downward as well as upward price flexibility over recent years: its price rose by a pound a year from £4 in 1981 to £6 in 1983, before being fixed at £7.50 between 1984 and 1993. It was cut to £6.50 this year—a bargain since the price includes the separate *Inflation Report*.

The Bank's old Threadneedle Street building cost £13,153 7s 9d on completion in 1734; the present Threadneedle Street building cost £5.3 million in 1939.⁽¹⁾ In the post-war period, residential property prices have risen sharply in nominal and real terms, as Chart 4 shows.

Chart 4
House price index and RPI



Inflation theories through the ages

One of the first-documented episodes of inflation occurred in ancient Rome. Between the middle of the second century AD and the end of the third, the price of wheat rose 200-fold. The inflation that this reflected was caused by the debasement of the metal currency; a succession of Emperors assumed that their personal credibility would be sufficient to maintain the value of coins even if they were reduced in size. Ordinary citizens simply joined in the practice of cutting the edges off the coins.

Following various efforts to maintain the value of the British currency in relation to the price of gold, in 1717 its value was fixed explicitly by the astronomer Sir Isaac Newton. The equivalence was maintained until 1931, except for brief periods at around the time of the Napoleonic wars and during and after the First World War. In the period of the Gold Standard, the predominant view of what determined the price level was based on the 'quantity theory'—the idea that a change in the money supply would eventually cause prices to rise in the same proportion.

W S Jevons was one of the first people to develop the concept of a price index.⁽²⁾ His work was stimulated by the fall in the value of gold, following the Australian and Californian discoveries of 1849. Jevons argued that it was crucial to 'discriminate permanent from temporary fluctuations of prices'. He also hypothesised that 'commercial tides' might be a reflection of the periodic fluctuations in sunspot activity observed by astronomers in the 19th century—but his observations on the importance of distinguishing absolute and relative price changes have proved the more robust.

'The rise and influence of central bankers and inflation has moved in tandem with a shift away from reliance on a metallic base for a currency.' (John Hartwick, *A Brief History of Price*, 1993)

The depression of the 1930s saw the main focus of economics switch towards output and employment, and away from money and prices; this was epitomised in Keynes' General Theory with its concept of unemployment equilibrium.⁽³⁾ With the re-emergence of inflation in the 1940s, however, came the Keynesian notion of an 'inflationary gap': inflation was seen as the product of an excess of desired demand over productive potential. Productive potential set a ceiling beyond which output could not rise; any excess *ex ante* demand would simply translate into inflationary pressure. This approach proved inadequate, however, to explain the coexistence of inflation and unemployment.

In 1958, A W Phillips fitted a curve through a scatter diagram of the rate of change of money wages plotted against the level of unemployment over the period 1861–1957. The curve suggested an inverse relationship between the two variables: the lower the level of unemployment, the faster the rise in wages.⁽⁴⁾ Moreover, there was a rate of unemployment greater than zero at which wage inflation was zero and the level of (frictional) unemployment was matched by the number of vacancies. As M Blaug put it: 'the old hope of simultaneous achievement of stable prices and full employment had to give way to the notion of a trade-off between price stability and full employment'.⁽⁵⁾ The trade-off mentality was born.

'The great tragedy of Science—the slaying of a beautiful hypothesis by an ugly fact.' [Thomas Henry Huxley (1825–95)]

The statistical relationship captured by the Phillips curve began to break down in the mid-1960s when inflation persisted despite a continuous rise in unemployment—the Phillips curve seemed to be shifting outwards. The main

(1) Figure quoted in *The Bank of England 1891–1944*, Sayers, R S, 1976.

(2) In *A serious fall in the value of gold*, 1863.

(3) Keynes, J M, *The general theory of employment, interest and money*, 1942.

(4) Phillips, A W, 'The relation between unemployment and the rate of change of money wages in the United Kingdom, 1861–1957', *Economica*, 1958.

(5) Blaug, M, *Economic Theory in Retrospect*, 1968.

theoretical response to this phenomenon was the expectations-augmented Phillips curve; inflation was taken to be a function of unemployment and expected inflation. In M Friedman's explanation of this theory,⁽¹⁾ there was a 'natural' rate of unemployment (determined by institutional factors) at which the Phillips curve was vertical. Any attempt by government to stimulate the economy and reduce unemployment could have an impact only for as long as employees' inflation expectations remained below actual inflation. Over time, inflation expectations would adjust and unemployment would move back to its natural rate. The theory raised the question of how expectations are formed. In the extreme case, where expectations are assumed to be 'rational', it implied that there was no trade-off between inflation and unemployment even in the short run, and that an economy remained permanently on its vertical long-run Phillips curve.

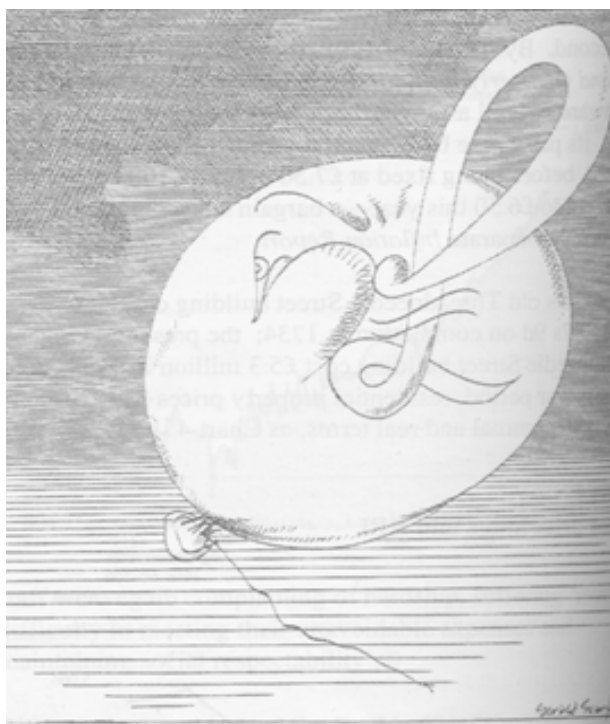
More recent work on inflation has focused on the credibility of the monetary authorities in their pursuit of anti-inflationary policies. Building on the idea that only unexpected inflation can affect growth, because expected inflation will be built into agents' decision-making processes, Kydland and Prescott developed the concept of 'time-inconsistency'.⁽²⁾ According to them, policy surprises cannot occur systematically, since agents will begin to anticipate the government's behaviour and build this into their expectations—with the result that growth will be unchanged but inflation will be higher. The way around this is for the authorities to be able somehow to offer a credible commitment not to spring policy surprises. The body of economic work developing this approach has been widely used to support the case for central bank independence.

What can we blame for inflation?

'Inflation is like sin: every government denounces it and every government practises it.' (Sir Frederick Leith-Ross, *Observer* 1957)

The years since the Second World War form the longest unbroken period of annual price rises since the founding of the Bank. The pattern in previous periods was of alternating bursts of inflation and deflation, but little tendency towards either sustained price rises or falls.

The chief exception to this was at the time of the Napoleonic wars around 1800. The wars led to a sharp rise in prices which was only reversed over the course of the following 100 years. In 1797, the war brought a suspension of specie payments—payments of gold in exchange for bank notes. The Bank was authorised to refuse to exchange because of the large payments by the United Kingdom to its allies and heavy government borrowing. Prices rose and gold commanded a premium over its quoted mint price. The Bank was accused by Ricardo and other Bullionists of over-issuing Bank notes, which they felt was prompting the



The Old NEW Face of Britain—Inflation and Falling Pound
Cartoon by Gerald Scarfe, published in 1976

pound to depreciate. Some felt in addition that the Bank was engaged in unsound banking practices that were leading to internal instability.

The Bank rejected these criticisms on the grounds that it could not over-issue notes when new issues were based on the discount of sound short-term commercial paper—the so-called *Real Bills Doctrine*. The argument was, however, flawed because the Bank issued new notes by purchasing public bonds as well as by discounting commercial bills. In addition, trading problems with Latin America in 1810 and a domestic recession in 1811 showed that many of the commercial bills were less 'sound' than they had appeared. The Bank also refused to acknowledge the underlying problem: that the heavy public borrowing associated with the war was being monetised.

In the early nineteenth century, anti-inflationary policy consisted mainly of trying to ensure that the Bank maintained its ability to redeem its promises to pay; interest rates were set at levels consistent with maintaining the link to gold. A number of 'near misses' with this policy, however, convinced Peel in 1844 to introduce the Bank Charter Act, in an attempt to check the alleged inflationary tendencies of the Bank.

In the present century, there was high inflation during the First World War—prices rose by over 100%—while output fell. Despite the large price rise, which exceeded that in the United States, the United Kingdom was determined to return to the gold standard at the pre-war parity, which it did in 1925. This meant an enormous deterioration in UK

(1) Friedman, M., 'The role of monetary policy,' *American Economic Review*, 1968.

(2) Kydland, F E and Prescott, E C, 'Rules rather than discretion: the inconsistency of optimal plans', *Journal of Political Economy*, 1977.

competitiveness, and led to a long period of deflation even before the onset of the depression in 1929–30. The experience during the Second World War was of a more moderate increase in prices, of around 30%. The difference was partly because rationing had the effect of containing measured price increases. There was also no sharp price increase once the war had ended, partly because rationing continued for several years and partly because the increase in civilian employment, as the troops were demobilised, led to an increased supply of goods and services.

A number of factors explain why earlier periods of inflation were usually temporary and later reversed. One was the source of the inflationary impetus. Higher prices were often the result of temporary disturbances, such as wars or the failure of harvests. Once peace or the harvest was restored, the excess demand for goods in terms of money subsided. The close interlinkages between different economies because of the use of a gold standard were another factor; an increase in relative prices in one country tended to produce an outflow of gold from that country, implying a monetary contraction which helped to stabilise prices.

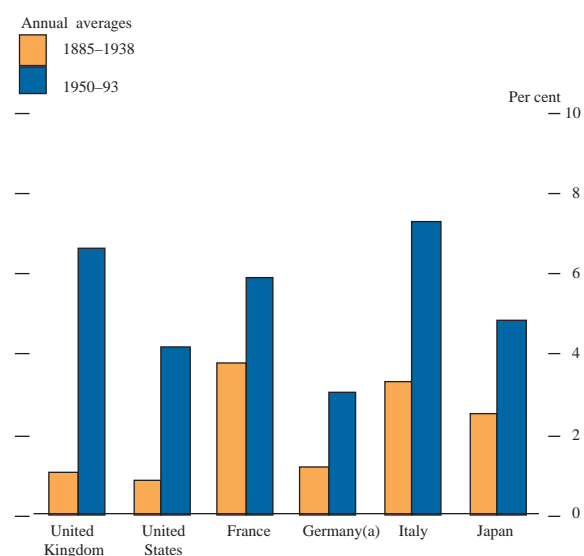
In addition, the role and behaviour of the public sector were different. The sharp increase in the level of government debt that accompanied a war was often transitory, and succeeded by a substantial fall in spending once the war had ended. After 1814, for example, government spending fell from almost 30% of GDP to around 10%.⁽¹⁾ In earlier episodes too, the link between government borrowing and inflation was partly the result of the fact that too heavy a reliance was placed on monetary financing of the government. More recently—and particularly since the 1950s—public debt has generally increased in nominal terms (if not as a proportion of money GDP). This has reflected in part the greater role given to countercyclical fiscal policy—whether discretionary or through the operation of automatic stabilisers. Furthermore, for much of the early part of the post-war period macroeconomic policies were designed to maintain the economy at a very high level of demand. This almost guaranteed that the inflation resulting from a positive output gap would persist, because policies were implemented to prevent the emergence of a large negative output gap. As a result, the average output gap remained above zero for long periods, and the rate of inflation rose.

Explanations and cures

During the first 300 years of the Bank's history, a variety of factors have been seen as contributing to the inflationary process. Some blamed the inflation of the 1970s on decimatisation in 1971—the smallest coin increased 2.4 times in value, and over time prices caught up with the change. A number of solutions have likewise been suggested to cope with inflation or to avoid it. These have varied from conventional monetary restraint (ie increases in interest rates) to price and wage controls of differing degrees

of severity. (As noted earlier, there is evidence from the earliest days that in inflationary periods the Bank's own employees were expected to exercise wage restraint.) Some periods of wider pay and price restraint appear to have had a short-term influence on inflation (for example the pay restraint of 1972–73). But the restraint has often relied on behaviour on the part of employees and firms that was not in their individual interests; in addition, it has often encouraged governments to follow more inflationary macroeconomic policies. Overall, such periods have frequently been followed by periods of 'catch up', as prices readjusted to macroeconomic fundamentals.

Chart 5
Rates of growth of consumer prices

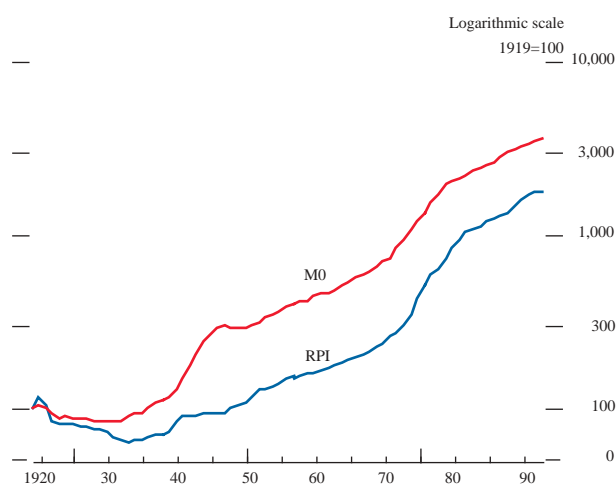


Source: *The Economist*.

(a) Excluding the years 1920–23.

Factors external to the domestic situation have also regularly been blamed for boosting inflation—not always with sound foundation. Chart 5 above, however, could be interpreted as suggesting a degree of contagion in inflation between countries. The United Kingdom has certainly not been alone

Chart 6
Narrow money and prices



(1) See Veverka, J, 'The growth of government expenditure in the United Kingdom since 1790', *Scottish Journal of Political Economy*, 1963.

in experiencing much more rapid inflation in the post-war period; the same has been seen in other major countries, though the US performance has been slightly better than the UK's in both the 1885–1938 and 1950–93 periods. Germany's inflation performance has been superior to the US's in the post-war period; but on earnings the story has been a little different, with the United States consistently exhibiting lower average growth.

Shocks affecting prices can arise from many sources. Whether or not they give rise to inflation, rather than a

change in relative prices but no change in the overall price level, depends on monetary policy. Inflation is a monetary phenomenon, and is reflected progressively in money's loss of value in terms of goods and services. Monetary growth in excess of the growth in real economic activity can occur without causing inflation, provided that the velocity of circulation of money (the ratio of nominal national income to the money stock) falls. There have, however, been almost no instances when inflation has *not* been associated with an increase in the money supply (as Chart 6 shows for the years since 1920).