

The return of deflation: what can central banks do?*

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Abstract

After an absence of almost half a century, the spectre of deflation is once again haunting the corridors of central banks and finance ministries in the industrial world. While preventing or combating deflation poses some unique difficulties not present in preventing or combating inflation, deflation can be prevented and, if it has taken hold, can be overcome, using conventional instruments of monetary and fiscal policy. These include changes in the short nominal interest rate (when the zero bound constraint is not binding), the intentional depreciation of the external value of the currency, open market purchases of government securities and monetary financing of government deficits caused by expansionary tax cuts, increases in transfers or higher public spending on goods and services. Base money-financed tax cuts or transfer payments – the mundane version of Friedman’s helicopter drop of money – will (almost) always boost aggregate demand, but require coordination of monetary and fiscal policy.

Unconventional monetary and fiscal measures are also available. These include open market purchases of private and foreign securities, negative nominal interest rates (through a carry tax on currency) and temporary tax measures aimed at shifting private consumption from the future to the present, by tilting the intertemporal terms of trade. An example is Feldstein’s proposal for a cut in VAT today coupled to the credible commitment of a VAT increase in the future.

Deflation results from a combination of bad luck and poor economic management, including the failure to coordinate monetary and fiscal policy. Sustained unwanted deflation is evidence of policy failure. Both the knowledge and the tools exist to prevent unwanted deflation.

1. Introduction

After an absence of almost half a century, the spectre of deflation is once again haunting the corridors of central banks and finance ministries in the industrial world. The great deflations of the 19th century and 1930s made way for the post-World War II era of persistent inflation – low to moderate in the advanced industrial countries, moderate to high (with occasional bursts of hyperinflation) in developing and transition countries and in emerging markets. The recent renewed concern with deflation is due in part to the historical association, at least during the interwar years, of deflationary episodes with financial crises, recession, stagnation and even depression. It is also prompted by the fear that, in deflationary conditions, nominal interest rates may come close to their lower bound of zero, at which point conventional monetary policy is thought to lose most if not all of its effectiveness.

Here I define deflation to be a sustained decline in the general price level of current goods and services, i.e. a persistently negative rate of inflation. In principle, the price index is the ideal cost of living index. Real-world approximations include the Consumer Price Index (CPI) in the US, the Retail Price Indexes (RPI, RPIX and RPIY) in the UK and the Harmonised Index of Consumer Prices (HICP) in the EMU area, now called the CPI in the UK. For many practical and policy issues, the distinctions between these indices are important. For the purpose of this lecture, they are irrelevant.¹

¹ There is a widely held view that real-world price indices present us with systematically upward-biased estimates of true inflation. This is important for issues ranging from cost-of-living indexation to the choice of an appropriate inflation target by the monetary authority. A commission headed by Michael Boskin studied the CPI bias and presented the results of its report in December 1996. It concluded that that CPI inflation in the US was likely to overestimate true inflation by about 1 to 2% a year. The sources of this bias in CPI inflation identified by the Boskin Commission were: 1. substitution bias (0.2 - 0.4 points per year); 2. outlet bias (0.1 - 0.3 points); 3. quality changes (0.2 - 0.6 points); 4. new products (0.2 - 0.7 points); 5. formula bias (0.3 - 0.4 points) (see Boskin et. al. (1996, 1997)). While not every aspect of the methodology used by the Commission, or the magnitude of the bias it found, have been universally accepted, there is widespread agreement that there was a

What is important is that deflation, as defined here, refers to a declining general price level for *current goods and services*. It does not refer to asset price deflation – a fall in the prices of existing stores of value, either real or financial. Asset price movements are an important part of the transmission mechanism of monetary and fiscal policy. They also transmit other developments and shocks, domestic and foreign. They may even, when asset prices depart from fundamental valuations, be a source of extraneous shocks themselves. They often complicate the task of the monetary and fiscal authorities and prevent the simultaneous achievement of price stability, full employment and a balanced structure of production and demand. Asset price deflation may at times precede, be associated with, or even cause downward movement in the general price level of goods and services. Asset price deflation is, however, conceptually quite distinct from deflation in the sense I use in this Lecture. .

The timing of the renewal of political concern with (and scholarly interest in) deflation is not surprising. As shown in Figure 1, in Japan the central bank discount rate has been at 50 basis points or less since 1995, raising concern about the zero lower bound on nominal interest rates, at least at the short end of the maturity spectrum. Until 2003, when GDP grew at 3.1%, Japan was in a protracted economic slump, which started in 1992. Money wages have declined in four of the past five years; the GDP deflator has declined in each of the past five years and the CPI in four out of the past five years (CPI inflation in 2003 was -0.3%). Short-term nominal interest rates in Japan are near zero.

[Figure 1 about here]

A number of observers have concluded that Japan is in a liquidity trap, i.e. monetary policy of any kind is incapable of stimulating aggregate demand.

significant upward bias. Changes made since then by the Bureau of Labor Statistics have probably reduced the magnitude of the bias.

The risk of the zero lower bound becoming a binding constraint on monetary policy is (or should be) a concern also in Western Europe and in the United States. In the US, with the Federal Funds target rate in February 2003 at 1.00%, the Fed continues to show some concern about the possibility that monetary policy could become constrained by the zero lower bound on nominal interest rates. During 2003 CPI inflation was 2.3% and the real economy is once again expanding quite briskly. As early as the autumn of 1999, the Fed organised a conference to discuss the ‘zero bound problem’ and more recently its staff have produced a thorough study of Japan’s experience in the 1990s and the lessons this holds for preventing deflation.²

[Figure 2 about here]

In the euro area, inflation (on the HIPC measure) averaged 2.1 % (yoy) in 2003. At the time of writing (February 2004), the ECB’s Repo rate stands at 2.0 %. The euro is at its strongest since its introduction on January 1, 1999. The real economy in Euroland continues to be weak. This raises the question as to whether a margin of 200 basis points provides enough insurance against a slump in aggregate demand.

[Figure 3 about here]

In February 2004, the UK’s Repo rate was 4.0%, 50bps above the July 2003 trough of 3.50% (its lowest level since 1955), with HICP inflation for 2003 at 1.4%.³ The UK therefore appears to be more at risk of experiencing deflation than of hitting the zero bound for the repo rate.

[Figure 4 about here]

Are deflationary periods typically periods of stagnation and depression? The historical record suggests (and this should not come as a surprise to those who recall

² The proceedings of the conference were published as *Journal of Money, Credit and Banking* (2002).

their first lecture on identification in econometric models), that deflations have at times been associated with booms and at other times with depression.⁴ The longest deflationary episode for which we have acceptable quality data is also the one that is probably most relevant for today. It is the great deflation of the 19th century.

[Figures 5 & 6 about here]

As Figure 5 shows for the UK, the average rate of inflation over this 115-year period was slightly negative (certainly if we start our count at the end of the Napoleonic Wars) and the variability of the inflation rate was high. Figure 6 shows that the British Bank Rate did not fall below 2% throughout the 115 years preceding World War I.⁵ The UK got through a deflationary century without encountering the zero lower bound constraint on nominal interest rates, let alone any liquidity trap. The deflationary periods between the two World Wars are less relevant to our current experience. Although the failure to deal effectively with deflation no doubt prolonged and deepened the Great Depression of the 1930s, deflation then was the result of a catastrophic collapse of aggregate demand, not the cause of it.

A number of studies, both historical-descriptive (e.g. Bordo and Redish (2003), Bordo, Lane and Redish (2004)) and statistical (e.g. Atkeson and Kehoe (2004)), show that past deflationary episodes are as likely to have been periods of above-normal economic activity as periods of below-normal economic activity. In their study of deflation and growth in the US and Canada during the Gold Standard period (1870-1913), Bordo and Redish (2003) conclude that there are good and bad deflations. Good deflations occur when positive supply shocks cause potential output

³ UK HICP inflation rates are between 0.5 and 0.75% a year below its RPIX inflation rate.

⁴ The empirical correlation between deflation and real economic activity is the macro-level analogue to the empirical correlation between price and quantity in models of a single competitive market. When demand shifts, the association is positive, when supply shifts the association is negative.

⁵ The temporary collapse in the external value of the US dollar starting in 1861 reflected the exceptional circumstances of the American Civil War and its aftermath, the 'greenback period'.

to grow faster than nominal aggregate demand. They will be characterised by rising employment and output growth, robust profits and booming stock markets. Bad deflations occur when negative shocks to aggregate demand cause nominal demand growth to fall below the growth rate of potential output. They will be characterised by falling employment and output growth, weak profits and declining stock markets. Actual deflations during the Gold Standard period tended to be the product of both negative nominal demand shocks (modelled as monetary shocks) and positive supply shocks.⁶ While not part of the Bordo and Redish study, the Great Depression of 1929-33 and the post-World War I recession of 1919-21 were undoubtedly bad deflations.

2. What's special about deflation?

Can policy makers prevent deflation, or eliminate it once it has taken hold, simply by reversing the policies that have been proven to be effective in preventing or eliminating inflation? Or is there a discontinuity at zero? Some of the costs and benefits of deflation (and of eliminating deflation) are not qualitatively different from the costs and benefits of inflation (and of eliminating inflation). For instance, *menu costs* (costs of changing prices) apply symmetrically to price increases and to price cuts.⁷ Anticipated inflation causes welfare losses due to *shoe-leather costs* of cash management, if the opportunity cost of holding cash (the risk-free short nominal interest rate) increases with the expected rate of inflation. Deflation reduces the opportunity cost of holding non-interest bearing cash. The optimal quantity of money

⁶ A key identifying restriction in their trivariate (inflation, real output growth and nominal money stock growth) VAR is that, in a small open economy with a fixed exchange rate, non-monetary aggregate demand shocks have no long-run effect on the price level. This is only correct if there are no non-traded goods. If there are non-traded goods, the fixed exchange rate only pegs the long-run domestic currency price of traded goods. Any non-monetary shock to aggregate demand that changes the long-run relative price of non-traded and traded goods will have a long-run effect on the price level. The Balassa-Samuelson effect is one example.

theorem (advanced by Bailey (1956) and by Friedman (1969)) is the proposition that welfare is maximised when the opportunity cost of holding money is zero, i.e. when the risk-free nominal interest rate is zero. If welfare is maximised when the expected rate of inflation equals *minus* the short-term real interest rate (and if the short-term real interest rate is positive), the optimal monetary rule is characterised by deflation. In a Bailey-Friedman world, deflation is not a problem; it is bliss.

Unanticipated inflation redistributes wealth from creditors whose contracts are nominally denominated and not index-linked, to debtors. Unanticipated deflation redistributes wealth from (nominal) debtors to creditors. If and to the extent that higher inflation is associated with greater uncertainty about relative prices, it increases the ‘noise-to-signal’ ratio of the price signals sent and received by households and enterprises and impairs the efficiency of the price mechanism. The same applies if the rate of deflation increases in absolute value.

There are four reasons why deflation is not just inflation with the sign reversed. First, there is the problem of a zero lower bound on all nominal interest rates caused by the existence of stores of value with a risk-free zero nominal interest rate. These are coin and currency and commercial bank reserves with the central bank.⁸ The zero nominal interest rate on base money (also called high-powered money or the monetary liabilities of the central bank) sets a zero floor under nominal interest rates for all other stores of value, private and public. If, in order to stimulate demand, lower real interest rates are required but nominal interest rates are already at their zero lower bound, conventional monetary policy is powerless. Nominal interest rates are more apt to hit the zero floor when there is deflation.

⁷ Menu costs do not, of course, attach only to changes in the prices of goods and services included in the CPI or GDP deflator. They presumably apply also to changes in money wages and intermediate goods and services and even to changes in the prices of existing assets.

Second, redistributions from debtors to creditors associated with unexpectedly high deflation in a world with imperfectly index-linked debt contracts is more likely to lead to default, bankruptcy and other forms of financial distress than redistributions from creditors to debtors associated with unexpectedly high inflation. Default, bankruptcy and corporate restructuring are not just mechanisms for redistributing ownership and control of assets. These processes also destroy real resources.

‘Debt deflation’, the increase in the real value of nominal debt caused by a falling general price level, was considered an important source of financial distress by the great monetary economists of the 19th century and the first half of the 20th century (although much of this literature failed to distinguish between anticipated and unanticipated deflation). Irving Fisher (1932, 1933a) went as far as arguing that the interaction of deflation and large accumulations of private nominal debt could account for every major recession in the US. Borrowers with short-maturity nominal liabilities and illiquid and/or real or foreign currency-denominated assets are especially vulnerable to deflationary shocks. Commercial banks fit that description and the incidence of banking crises and bank defaults during the Great Depression of the 1930s and other severe recessions are consistent with a role for (unanticipated) debt deflation in the propagation of the business cycle. Homeowners with mortgages, or households with significant outstanding unsecured consumer debt, have similar vulnerabilities in their portfolios, as do highly indebted enterprises.

Third, there is a widely held view that there exists an asymmetry in nominal wage and price adjustment. According to this view, the degree of downward rigidity in some nominal prices (and especially in money wages) is not matched by a similar degree of upward nominal rigidity. This means that disinflation, the process of

⁸ There are countries where commercial bank reserves with the central bank are remunerated, sometimes with close-to-market interest rates.

bringing down the rate of inflation through a reduction in the growth rate of nominal demand, will be more costly in terms of output and employment foregone (i.e. the *sacrifice ratio* will be higher) when the inflation rate falls into the negative range than when it remains in the positive range.

Fourth, in living memory, there has been considerable experience of inflation (and even of hyperinflation), while there has been only limited experience of deflation (and none of hyperdeflation). This fourth point will turn out to be relevant also to the interpretation of the third point.

The proximate cause of deflation is the failure of nominal demand to grow at least at the rate of growth of potential output. It may, therefore, be *descriptively* correct that recent deflationary episodes have been the result of faster than expected productivity growth in some (significant) parts of the world – the USA and emerging Asia (China, India etc.) are often mentioned in this context. Even if, in an accounting sense, a reduction in inflation is associated mainly with an increase in real GDP growth driven by higher productivity growth, rather than with a reduction in nominal GDP growth, such a diagnosis does not absolve the monetary and fiscal policy authorities. Whatever the supply side of the economy may generate by way of a growth rate of potential output, it is always possible to use monetary and fiscal policy to generate any growth rate of nominal demand and, therefore, any rate of inflation in the medium term.⁹ Sustained deflation is, therefore, either a policy choice, or the result of policy failure.

This leads us to three key questions.

⁹ Governor Hayami of the Bank of Japan gets part of the way to a correct understanding of the relationship between technological change, changes in market structure, relative price changes and inflation in the following quote from a speech given at the Keizai (Economic) Club on 29 January 2002: “The recent price decline is attributable to various factors such as technological innovation, deregulation and an increase in low-priced imports. But, above all, the major factor is that Japan’s

1. Why don't we see negative nominal interest rates?

The nominal interest rate on *any* financial instrument, i , say, cannot be lower than the risk-free nominal interest rate on the safest and most liquid financial instrument (base money, that is, coin and currency and commercial bank balances with the central bank), i^M , say, that is, $i \geq i^M$. If the nominal interest rate on base money is zero, nominal interest rates in general cannot be below zero. If we wish to lower the zero floor for nominal interest rates in general, the authorities must be able to pay a negative nominal interest rate on base money. Why doesn't this happen?

Financial instruments can be divided into two categories: bearer securities and registered securities. Registered securities are financial instruments for which the identity of the owner is known to the issuer and can be verified by third parties. Bearer securities are financial instruments for which the owner is anonymous – the identity of the owner is unknown to the issuer and cannot be verified by third parties.

Paying interest at a positive or a negative rate on registered securities is a simple task. Take, for instance, checking accounts or deposit accounts. The bank knows the owner of each account. Payment of interest at any rate – positive, zero or negative – is administratively straightforward. The bank just periodically credits or debits the account.¹⁰

With *bearer* securities, paying any non-zero interest rate is not administratively trivial. If the interest rate is positive, care must be taken that the interest due is paid only once during a given payment period. Since the identity of the

economy was not able to achieve a full-scale recovery in the 1990s and that the negative output gap expanded due to lack of demand.”

¹⁰ Positive nominal interest rates on bank accounts have been common for decades. During the 1970s, the Swiss authorities taxed non-resident holders of Swiss bank accounts by paying a negative nominal interest rate. After allowing for bank fees, the net nominal rate of return on many checking accounts with a (low) positive nominal interest rate is frequently negative.

owner is unknown to the issuer, the same security could be presented multiple times during any given payment period, either by the same holder or by a sequence of different holders. The way around this is to identify, label or mark the security rather than the owner. The security in question is marked in a verifiable manner by the issuer or his agent, whenever the security is presented for payment of interest due. Historically, bearer securities had coupons attached to them, which were cut off (clipped) one at a time whenever an interest payment was made.¹¹ Other ways of identifying bearer securities as being ‘ex-interest’¹², such as stamping, or more high-tech identification methods, can no doubt be thought of.

If the interest rate on the bearer security is negative, the issuer faces the opposite problem of the holder not presenting himself to pay the issuer the negative interest due on the security. The solution is to find a way, first, of identifying the bearer security as being ex-interest and, second, of ensuring that securities that are not ex-interest are unattractive to potential owners.

The reason for the second condition becomes clear when one considers the bearer security that is of special interest to this lecture: currency, that part of the monetary liabilities of the central bank that is generally accepted as means of payment and medium of exchange in the central bank’s jurisdiction.¹³ Today, currency is fiat money. It has no intrinsic value as a consumer good, a capital good or an intermediate input other than the value of the paper it is printed on. It has value today if, and only if, the public believes it will have value tomorrow – valuable fiat money is a gigantic,

¹¹ This would be problematic for a bearer perpetuity, such as British Consols.

¹² I use ‘ex-interest’ analogously with ‘ex-dividend’ for common stock. A security is ex-interest for a given payment period if the interest due on it (positive or negative) has been paid.

¹³ The monetary liabilities of the central bank consist of currency in circulation and commercial bank balances with the central bank. Banks’ balances with the central bank are registered securities. The identity of the owner is known to the issuer. Any interest rate, positive or negative, can be charged on it with negligible administrative expense. (Sometimes, of course, currencies are accepted outside their central bank’s jurisdiction, as with the US dollar and the Euro today.)

and socially most beneficial, confidence trick. For the issuer (the central bank) to put an expiry date on a bank note would be ineffective if the public chose to ignore it. To make paying negative interest on currency possible it must be possible (a) to identify bank notes as being *ex-interest* and (b) to attach a sufficiently severe penalty to holding money that is not *ex-interest* after the date the interest is due. Fines and, in the limit, confiscation or worse would be required to enforce negative interest on currency.

The idea of taxing currency is not new. It goes back at least to Gesell (1949) and the Social Credit movement in the second and third decades of the 20th century. No less an economist than Irving Fisher (1933b) viewed the idea sympathetically. It has recently been revived by Panigirtzoglou and myself (Buiter and Panigirtzoglou (2001, 2003), and by Goodfriend (2000). Taxing currency by paying negative interest on it would be a costly administrative exercise. These costs must be set against the cost of being stuck at the zero nominal interest rate floor, or the cost of pursuing a sufficiently high inflation target to minimise the risk of the zero nominal interest rate floor becoming a binding constraint.

2. Do asymmetric, downward nominal price and wage rigidities make deflation particularly costly?

Conventional economic theory has a rather easy time explaining real rigidities, but a hard time explaining any kind of nominal rigidities, let alone asymmetric nominal rigidities. Empirically, there appear to be important nominal rigidities, but mainstream economic theory does a poor job explaining why the numéraire matters. A fortiori, mainstream economic theory has little to say about asymmetries in the incidence and/or severity of nominal rigidities. For instance, menu costs do not generate asymmetries between upward and downward price adjustments, although

they can account for the spike in the frequency distribution of individual price changes at zero. Neither do other state-contingent or time-contingent contracting stories.¹⁴

Nominal price rigidity, symmetric or asymmetric, has never been attributed to nominal asset prices, nor to the prices of freely traded homogeneous commodities. Its domain has never been argued to encompass more than the money prices of highly processed goods and services and to money wages. With nominal price cuts becoming more frequent in the low inflation environment of the last ten years (see e.g. the divergent behaviour of prices for goods and prices for services in the UK, shown in Table 1), those who argue for the importance of asymmetric downward nominal rigidity are focussing mainly on the labour markets.

[Table 1 about here]

There is no coherent theory of asymmetric nominal rigidity in the labour market. Arguments based on fairness, justice and morale miss the point, since fairness, justice and morale should concern real wages and/or relative real wages over time and across reference groups, not money wages. The observation, painstakingly documented in hundreds of interviews by Bewley (1999), that both workers and managers will strongly resist money wage cuts can plausibly be attributed to the fact that the interviewees (in the 1990s) had known only positive inflation rates during their working lives. When nominal prices and wages have on average been rising for more than forty years, a nominal wage cut is also likely to be a real wage cut. Resisting a cut in money wages is a pretty good first stab at (indeed almost certainly a

¹⁴ For instance, surveys on price setting by supermarkets and other firms show a marked bunching of the frequency distribution of price changes at zero, but such observations tell us nothing about the existence of asymmetries in the degrees of downward and upward nominal price stickiness or rigidity.

necessary condition for) resisting a real wage cut and, in decentralised labour markets, a relative wage cut.

Nickell and Quintini (2003), using a unique UK micro-data set on nominal wage changes for the period 1975-99, found that the proportion of individuals whose nominal wages fall from one year to the next is large (reaching 20% in periods of low inflation). They also found that there is evidence of some rigidity at a nominal wage change of zero. However, while this causes a statistically significant distortion in the distribution of real wage changes, the magnitude of the impact is ‘very modest’.¹⁵

The policy relevance of even this ‘very modest’ estimated impact is contingent on the degree of downward nominal wage rigidity being ‘structural’, i.e. invariant under changes in the long-run rate of inflation. With high and even moderate inflation becoming a thing of the past throughout the industrial world, any nominal rigidities and asymmetries in downward and upward nominal wage rigidity (due to memories acquired and mental reference frames constructed during inflationary episodes) will become less important as time passes. Finally, the spike in the empirical frequency distribution of contract wage changes at zero is, at most, evidence of nominal wage rigidity, not of *asymmetric* nominal wage rigidity. I conclude that, while there is convincing empirical evidence that nominal price and wage rigidities exist, there is no evidence that these nominal rigidities are asymmetric.

3. How can we disentangle the effects of monetary and fiscal policy?

The distinction between monetary and fiscal policy and monetary and fiscal policy instruments is an *unimportant* definitional issue. It sometimes gets tangled up with *important* issues involving the institutional arrangements for the decentralisation

¹⁵ Nickell and Quintini calculate that, if long-run inflation were to rise from 2.5 to 5.5% a year, the equilibrium unemployment rate would fall from around 6 to around 5.87%.

and delegation of the fiscal, financial and monetary management activities of the State, such as central bank independence (both operational independence and combined operational and target independence).

To understand the economic fundamentals that determine how monetary and fiscal policy affect aggregate demand one should think of the central bank and the general government sector as a single, consolidated unit – the state, or the sovereign. The balance sheet, budget constraint and solvency constraint that matter are the balance sheet, budget constraint and solvency constraint of the consolidated general government and central bank. This consolidation makes sense, because the central bank is generally majority owned or wholly owned by the Treasury (Ministry of Finance). Central bank profits go to the Treasury and the Treasury has an (implicit) obligation to ‘stand behind’ the central bank, that is, to recapitalise the central bank should it take a dangerous hit on its balance sheet.

When we consider the practical, operational aspects of implementing certain policies in a specific country, it is indeed helpful to consider the particular institutional arrangements in that country. Often we have to focus on the central bank as a separate agency of the state, with a distinct legal personality, charged with the management of the legal tender liabilities of the state and frequently also with the management of the official international foreign exchange reserves.

Monetary policy could be defined as ‘whatever the central bank does’, but a slightly more restrictive definition will turn out to be more useful in framing the analysis and organising the argument. I consider four potential monetary instruments: one of them unconventional, the other three conventional.¹⁶ The unconventional

¹⁶ I restrict the analysis to monetary and fiscal policy in reasonably well-functioning market economies. Quantitative credit controls and other government-imposed forms of credit rationing are not considered. Changes in deposit reserve requirements are best viewed as fiscal measures (changes in the taxation of deposit-taking activities).

monetary instrument is the nominal interest rate on base money (conventionally zero on coin and currency, but not necessarily zero on the other component of the monetary base, commercial bank reserves held with the central bank). The three conventional monetary policy instruments are: (1) the short-term risk-free nominal interest rate on non-monetary financial claims (in the UK this would be the 2-week Repo rate; in the US the Federal Funds rate, although the Fed does not peg that rate exactly); (2) the stock of base money; and (3) the nominal spot exchange rate (the relative price of foreign currency in terms of domestic currency). If there is unrestricted international capital mobility and the country is small in global capital markets, out of the short nominal interest rate, the quantity of base money and the exchange rate only one can be chosen independently by the authorities.¹⁷

In practice, countries either have a managed exchange rate (the exchange rate is the policy instrument), or they use the short nominal interest rate itself as the monetary instrument. I know of no country that uses (or used) the monetary base as the policy instrument, although in principle it is possible.

I am here defining a conventional monetary policy action as any change in the quantity of base money, in the short nominal interest rate or in the exchange rate that, at given prices and activity levels, does not change the financial net worth of the State (the consolidated general government and central bank), now or in the future. Conventional monetary policy is, therefore, a subset of the State's financial portfolio management. This includes the sale and purchase of long-dated government debt instruments, financed by matching changes in shorter-maturity instruments, and changes in the currency composition of the government's financial assets and liabilities (including sterilised and non-sterilised foreign exchange market

¹⁷ A 'small' country in a particular market is a price taker in that market. All countries, except the US, can for practical policy purposes be treated as small in global capital markets.

intervention, changes in the mix of nominal and index-linked debt, public debt retirement financed through privatisation of state assets, swaps, trading in contingent claims markets etc).

Monetary policy involves a subset of such asset swaps. For our purposes, it always includes issuance or retirement (contraction) of base money, financed through the purchase or sale of government interest-bearing debt (generally of a short maturity) or of foreign exchange reserves. Sterilised foreign exchange market intervention (purchases or sales of foreign currency with the impact on the monetary base neutralised by sales of purchases of non-monetary liabilities of the government) also are generally conducted by the central bank. Note, however, that in the UK most of the foreign exchange reserves are owned by the general government (the Treasury), although the Bank of England manages them as the government's agent. Most debt management operations not involving changes in the monetary base are no longer conducted by the Bank of England. Fiscal policy includes any change in public spending or tax rules, regardless of whether it alters, at given prices and activity levels, the sequence of net financial balances of the State.

3. Policies to stimulate demand

To guide the discussion of the conditions under which monetary and fiscal policy (conventional and unconventional) can or cannot stimulate aggregate demand, I will appeal to some well-known properties of a standard formal model of aggregate demand (see Buiter (2003a,b)). Monetary (and fiscal) policy ineffectiveness concerns the inability of monetary and fiscal policy to influence nominal aggregate demand. The precise question I will ask is how monetary and fiscal policy can be used to stimulate aggregate demand, holding constant (that is, for given) current and future

prices, wages, exchange rates, employment, output and initial stocks of financial and real assets. How the change in nominal aggregate demand is translated into changes in real GDP and/or in the general price level, depends on the details of the specification of the ‘supply side’ of the economy and is not relevant in this discussion of how policy can affect demand. All that matters is whether a given policy (or combination of policies) can boost nominal aggregate demand.¹⁸ – when policy effectiveness is in question, both higher real output and a higher price level are welcome.

The key building blocks of the aggregate demand model are as follows: the demand for real domestic output, D_H is the sum of private consumption demand for domestic output, C_H , private investment demand for domestic output, I_H , government demand for domestic output, G_H and export demand, X .

$$D_H = C_H + I_H + G_H + X \quad (1)$$

Export demand and the shares of total private consumption, total private investment, and total government spending allocated to domestic output depends on the relative price of imports and domestic goods. Holding constant total private consumption, private investment and government spending as well as the domestic currency price of exports and the foreign currency price of imports, aggregate demand for domestic output will increase when the exchange rate is devalued if the Marshall-Lerner condition is satisfied. If the initial trade balance is zero, the Marshall-Lerner conditions are satisfied if the sum of relative price elasticities of import and export demand is greater than one in absolute value. From now on, the exchange rate is treated as given.

¹⁸ In Buiter and Panigirtzoglou (2001, 2003), a simple continuous time, closed endowment economy, representing an agent version of the aggregate demand and money demand model developed here, is combined with an old Keynesian (in Buiter and Panigirtzoglou (2001)) and a new Keynesian Phillips curve (in Buiter and Panigirtzoglou (2003)).

Private investment is modelled as an increasing function of Tobin's q , the ratio of the present discounted value of future profits over the current reproduction cost of capital. Government spending is exogenous, as is export demand at a given exchange rate and domestic and foreign prices.

Total private consumption is the sum of consumption by 'Keynesian' consumers, who always spend their current disposable income and 'permanent income' consumers who smooth consumption over the life cycle by borrowing and lending freely in efficient financial markets. A fraction s of households is Keynesian. The real wage bill is W and real labour income tax payments are T . Total real consumption is C , real financial wealth is A and H is human wealth, the present discounted value of current and future labour income of households currently alive. The marginal propensity to consume out of comprehensive (financial plus human) wealth of permanent income consumers is m . The consumption function can therefore be written as:

$$C = m[A + (1-s)H] + s(W - T) \quad (2)$$

Note that private financial wealth, A , includes stock market wealth, the present discounted value of current and future profits.

Conventional monetary policy

For the moment assume that i^M , the nominal interest rate on base money, is zero and that i , the short nominal interest rate on non-monetary financial claims, is above zero. Conventional monetary policy attempts to stimulate demand through a cut in the short nominal interest rate. At given current and future expected prices, a cut in the short nominal interest rate, i is a cut in the short real interest rate, $r \equiv i - p$, where p is the rate of inflation. A cut in the short real interest rate will boost Tobin's

q because it lowers the discount factor applied to near-term future profits. It may also boost investment through other channels, such as the credit channel (including the bank-lending channel).

A lower short-term nominal interest itself may affect consumption, because the marginal propensity to consume out of comprehensive wealth, m , may depend on current and future nominal interest rates as well as on current and future real interest rates. A lower short-term nominal interest rate will also affect consumption, at given current and future prices, because it lowers the current short real interest rate. This works through three channels: (1) the substitution effect; (2) the income effect, and (3) the valuation effect. The substitution and income effects of a change in the current real rate of interest both work through m . The substitution effect of a lower real interest rate will boost current consumption. The income effect depends on whether the household is a net debtor, in which case a lower real interest rate boosts current consumption or a net creditor, in which case it lowers consumption. If the intertemporal substitution elasticity is 1, the substitution effect and income effect of a change in real interest rates cancel out and m is a constant. Valuation effects of a lower real interest rate work through A , by lowering the discount factors applied to current and future profits, and through H , by lowering the discount factors applied to current and future after-tax wages.

Cutting the nominal (and real) interest rate for just the current period is unlikely to do much for private consumption and investment demand. However, the effect is strengthened if a cut in the current interest rate leads to expectations of future cuts in nominal interest rates. None of this works, however, if the short nominal interest rate cannot be cut because it is at the (zero) floor set by the (zero) nominal interest rate on base money. In that case unconventional monetary policy is called

for. I start with the least unconventional policy: open market purchases of anything and everything.

Unconventional monetary policy

Fundamentally, as long as there is any nominal interest rate, at any maturity, that is positive, monetary policy has not exhausted its capacity to stimulate demand. The central bank can purchase government securities, long-dated and short-dated, in principle until all government interest-bearing debt is held by the central bank. It can engage in purchases of foreign exchange, sterilised or non-sterilised. It can purchase other public or private foreign currency assets. It can purchase private domestic securities, financial or real, including bonds, stocks, real estate and options. It can also ease the eligibility requirements for securities acceptable as collateral in repo operations, and it can expand the list of eligible counterparties.

Clearly, there is a downside to the central bank purchasing private securities on a significant scale. There is risk of moral hazard and adverse selection on the part of the private counterparties to these transactions. To avoid favouritism the central bank would have to “buy the market”, that is, buy a representative, value-weighted index fund. There is risk of back-door socialisation of the means of production, distribution and exchange and of central bank interference in the management of the enterprises in which they obtain a significant share holding. None of these problems apply to the public debt, however. As long as there is any public debt held outside the central bank, monetary policy is not out of ammunition.

What to do when the ‘foolproof’ way is not foolproof?

Now consider the case where nominal interest rates at all maturities, from zero to infinity, have been brought down to their (zero) floor. In this case there is no escape using conventional monetary policy, including devaluations, or even using generalised open market purchases of everything. Svensson (2000, 2003) proposes a ‘foolproof’ way out of a liquidity trap and deflation consisting of three key elements, (1) an explicit central-bank commitment to a higher future price level; (2) a concrete action (concretely a devaluation or intentional depreciation of the currency) that demonstrates the central bank’s commitment, induces expectations of a higher future price level and jump-starts the economy; and (3) an exit strategy that specifies when and how to get back to normal.

It is immediately clear that Svensson’s ‘liquidity trap’ refers to the rather benign case where only the current short-term nominal interest rate is at its lower bound.¹⁹ In that case the ‘foolproof’ way and many others would work – they would stimulate demand. My definition of ‘liquidity trap’ is rather more demanding. It refers to a situation where the current short nominal interest rate *and* current expectations of future short nominal interest rates over the indefinite future are zero, as well as current interest rates on longer-dated securities with every maturity, from zero to infinity. Under these conditions, the ‘foolproof’ way is not foolproof. Announcing a planned, expected or desired future price level (or announcing an inflation target) is spitting in the wind. There is no instrument, now or in the future, to drive the future price level (or inflation rate) to its announced target.

When all current and future short nominal interest rates and long-term interest rates at all maturities are zero, negative nominal interest rates on base money are one

¹⁹ Or at most, the current short-term nominal interest rate, current expectations of future short-term nominal interest rates over some limited period and nominal interest rates on current longer but finite maturity securities are at their zero lower bound.

way of lowering the floor for the nominal interest rates on non-monetary financial instruments. Paying a negative nominal interest rate on commercial bank balances with the central bank is administratively trivial. Paying a negative nominal interest rate on currency through a “carry tax” on currency is, as argued in Section 2 feasible but costly. If that is not possible, fiscal policy has to come to the rescue.

Fiscal policies to stimulate aggregate demand.

It is clear from the consumption function in equation (2), that a debt-financed or money-financed tax cut will always stimulate aggregate demand if there are Keynesian consumers, as these will simply consume all of their tax cut. If $s = 0$, and there are only permanent income consumers, debt-financed current tax cuts will raise aggregate consumption demand if they raise the permanent income of households currently alive (by raising H in equation (2)). This can happen, even if households are fully rational and realise that, holding constant government spending, a tax cut today must imply that the present discounted value of future taxes has gone up by the full amount of the tax cut. A necessary and sufficient reason for aggregate demand to be stimulated by a debt-financed tax cut is that the tax cut (together with the future tax increases) redistributes resources from households with a low marginal propensity to consume (the young and, a fortiori, those who have not been born yet) to consumers with a high marginal propensity to consume (the old). Only if the existing generations are linked to all future generations through an operative intergenerational motive will there be ‘Ricardian equivalence’ or ‘debt neutrality’. In all other cases, postponing taxes while keeping the present discounted value of current and future taxes constant, will boost aggregate demand.

When there is debt neutrality, debt-financed tax cuts do not boost demand. Under these conditions, a temporary increase in public spending on goods and services will boost demand. It will make no difference in this case whether the public spending increase is financed with current taxes or with future taxes (by borrowing today). The negative effect on permanent income and thus on current private consumption of the tax increase is smaller, in the short run, than the positive effect on demand of the temporary increase in public spending. A permanent increase in public spending would have no effect.

There is a non-Keynesian tax policy that could boost aggregate demand in the short run even when there is debt-neutrality. The idea (advocated by Feldstein (2003)) is to use non-lump-sum (distortionary) taxes on consumption (such as VAT) to twist the pattern of consumption over time towards earlier consumption. By cutting VAT today and raising it in the future (ensuring that the present value of current and future taxes is not affected), the intertemporal terms of trade are turned in favour of current consumption. Because the tax measure leaves the present value of taxes unchanged, the income effect of the change in the intertemporal terms of trade is (approximately) neutralised and the substitution effect boosts consumption today.

Last but not least, there is the combined monetary-fiscal policy action of a tax cut (or increase in government transfer payments) financed by issuing (printing) base money. This is the humdrum version of Milton Friedman's famous helicopter drop of money. It is different from a debt-financed tax cut, even if nominal interest rates are zero, because base money is irredeemable or inconvertible: the individual private holder views it as an asset, but to the issuer it does not constitute a liability in any meaningful sense. With zero interest bonds, the principal still has to be redeemed.

With base money, the principal is irredeemable: a £10 banknote gives the holder no claim on the issuer for anything else than the £10 banknote itself.

Therefore, if a tax cut is financed by issuing base money, and if the public does not expect the central bank to reverse this action in the future, consumption demand can increase. The magnitude of the increase is given by the marginal propensity to consume out of comprehensive wealth, m times the change in the present value of the terminal (very long run) money stock (see Buiter (2003c)).

An attractive feature of the money-financed tax cut or transfer payment is that it can bypass the banking sector completely. If sending cash by mail is deemed dangerous, households could be sent a cheque drawn on the government's account with the central bank. The cheque could be cashed at any commercial bank, post office or benefit office in the country. In a country like Japan, which until 2003 was mired in a persistent recession, the ability of the authorities to bypass the banking system when implementing a money-financed tax cut would have been especially welcome in view of the precarious state of its banking system.²⁰

How much can the central bank do on its own?

As regards open market purchases of “everything”, it may be the case that existing constraints range of financial claims the central bank can hold in its portfolio have to be relaxed. Can the central bank implement a helicopter drop of money on its own. In the UK this would mean that the Governor, Mervyn King, would send a cheque for, say, £1000 to each man, woman and child, drawn on the Bank of England. If suspicious recipients decided to save the money, more cheques could be sent out,

²⁰ Late 1989 Japan experienced the beginning of the largest stock market collapse and debt deflation in modern history. From the early 1990s until 2003, the country has experienced recession, and since 1998, deflation.

each one with a larger number of zeros before the decimal point. At some point the consumer would cry uncle and spend at least some of the money.

For better or worse, by law, central banks are not generally permitted to act as a fiscal agents capable of making transfer payments to private recipients.²¹ Implementing a helicopter money drop therefore requires the cooperation of the Treasury. The Treasury would cut taxes or increase transfer payments and borrow from the central bank to finance this. If direct borrowing by the government from the central bank is not permitted (which is the case in the EMU), then the government could borrow in the markets (issue new debt) and the central bank could buy a corresponding amount of government debt in the secondary market.

4. Conclusions

First, although preventing or combating deflation poses some unique difficulties for the monetary authorities – difficulties that are not present in preventing or combating inflation – deflation can always be prevented and, if it has taken hold, can always be overcome by co-ordinated actions of the monetary and fiscal authorities.

Second, monetary policy alone cannot always prevent or cure deflation, if we restrict ourselves to conventional monetary policy, i.e. reductions in the risk-free short-term nominal interest rate, or a devaluation of the nominal exchange rate. Monetary policy alone is *likely* to prevent or cure deflation, if one is willing to consider the monetisation (if necessary without limit) of the public debt (short, long,

²¹ In the USA, the Treasury could implement a money drop on its own, without the assistance of the Federal Reserve Board, if it were willing to issue more “Treasury notes”. So-called US notes, issued by the Department of the Treasury since the Legal Tender Act of 1862 (as gold or silver certificates) are part of the stock of US currency. Like Federal Reserve notes (authorised by the Federal Reserve Act of 1913), they are non-interest-bearing irredeemable bearer notes and constitute legal tender. They

nominal or index-linked) and/or open market purchases of a wide range of foreign and private domestic securities. If one is willing to contemplate an even more unconventional monetary instrument – the payment of negative nominal interest rates on base money through the imposition of a carry tax on currency – the zero lower bound on nominal interest rates disappears as a constraint on monetary policy.

To say that deflation can be prevented or cured using conventional monetary and fiscal policy is not to say that all the economic problems faced by the most prominent recent example of a deflation-afflicted economy – Japan – could have been solved this way. The Japanese banking sector is paralysed by a massive overhang of bad debt. Other financial intermediaries, especially insurance companies, are suffering the cumulative impact on their balance sheets of the most spectacular asset boom and collapse in modern history – the stock market and real estate boom of the 1980s and its unravelling since 1989.

Cleaning up the balance sheet of the Japanese banking sector, reducing the size of the banking sector and recapitalising key viable non-bank intermediaries will be a painful and protracted process. However, this inevitably painful structural adjustment was not facilitated by the deflationary monetary policies of the previous Governor of the Bank of Japan, Mr. Hayami.

Deflation is a problem that can be avoided. If it has taken hold, it is a problem that can be solved. A tax cut (or transfer payment) directly aimed at households and financed by increasing the stock of base money will surely boost aggregate demand. So will a base-money-financed increase in public spending.

Inflation-reducing policies involve tax increases or public spending cuts and, therefore, tend to be politically unpopular. Anti-deflationary policies involve tax cuts,

were issued until January 21, 1971. Those that remain in circulation are obligations of the U.S.

increased transfer payment or higher public spending on goods and services. They will tend to be politically popular. It is, therefore, somewhat of a mystery why a policy programme that makes economic sense and should be politically popular does not get implemented.

The clue to the mystery probably lies in the fact that, with conventional monetary policy nearly exhausted, further effective anti-deflationary policy requires the co-operation of the central bank and the Ministry of Finance in the design and implementation of a co-ordinated monetary and fiscal stimulus. Some of the central banks that acquired operational independence only recently have interpreted central bank independence to require no co-operation, no co-ordination and at times even no communication with the fiscal authorities. An atmosphere of mutual distrust between operationally independent monetary and fiscal authorities is probably the root cause of the observed failure to address the deflation problem.

Milton Friedman argued that inflation (and by implication deflation) is always and everywhere a monetary phenomenon – and he was right.²² Sargent and Wallace [1981] have told us that, in the long-run, money (and, therefore, inflation and deflation) is always and everywhere a fiscal phenomenon – and they too were right. Structuralists and political economists inform us that excessive public sector deficits are the result of unresolved social and political conflict about the size and composition of state spending and about who should pay for it. They, too, may well be right.

government.

²² 'It follows from the propositions I have so far stated that *inflation is always and everywhere a monetary phenomenon* in the sense that it is and can be produced only by a more rapid increase in the quantity of money than in output. However, the reason for the rapid increase in the quantity of money may be very different under different circumstances. It has sometimes reflected gold discoveries, sometimes changes in banking systems, sometimes the financing of private spending, sometimes – perhaps most of the time – the financing of governmental spending.' (Friedman (1973))

I would like to add to this sequence of truths the proposition that persistent unwanted deflation is always and everywhere evidence of unnecessary, avoidable macroeconomic mismanagement. Governments through the ages have demonstrated their ability to create inflation, often to undesirable and at times disastrous levels. It is hard to believe that the very simple analytics and attractive politics of making inflation have been forgotten in the new Millennium.

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Figures and Tables

Figure 1

Japan

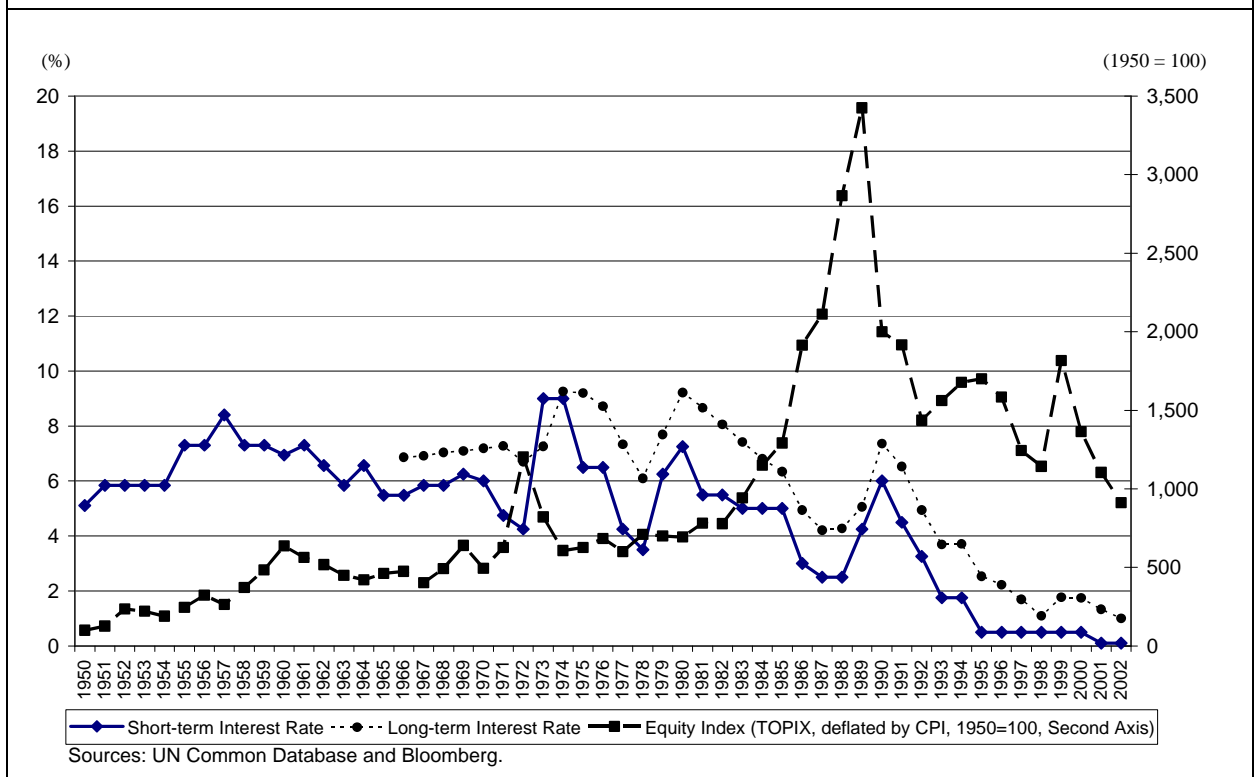
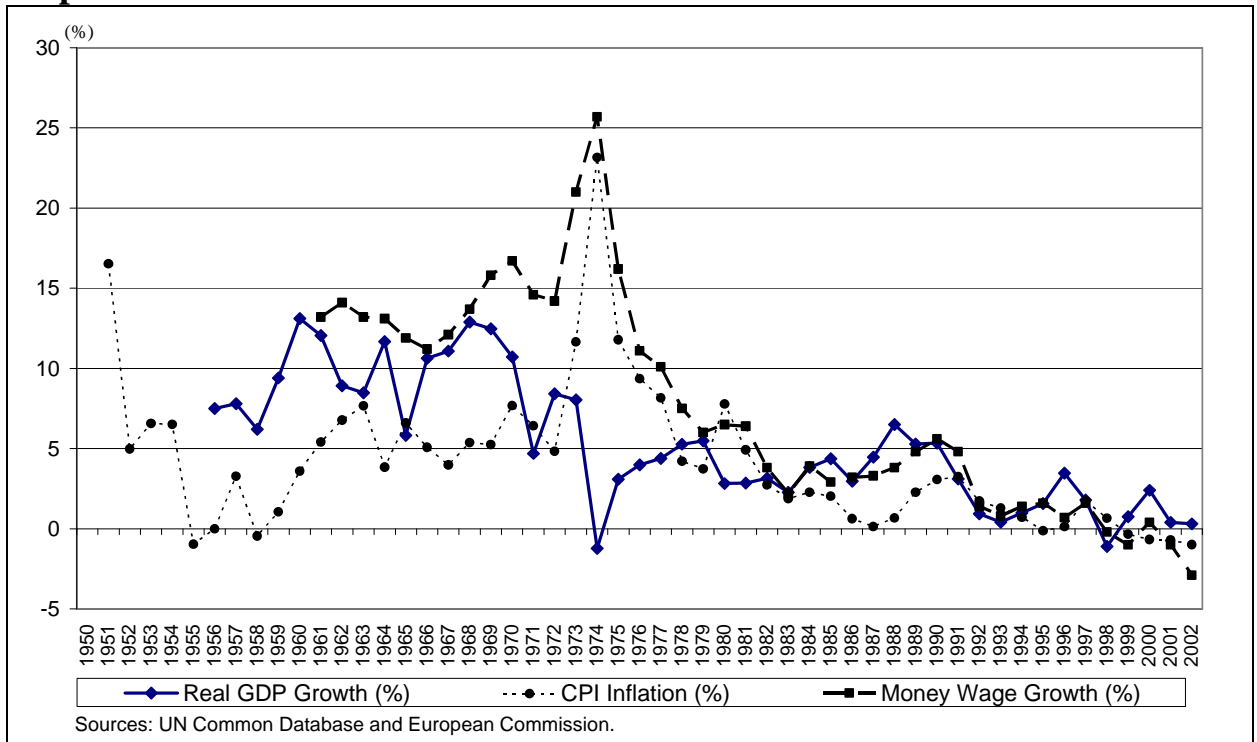


Figure 2

USA

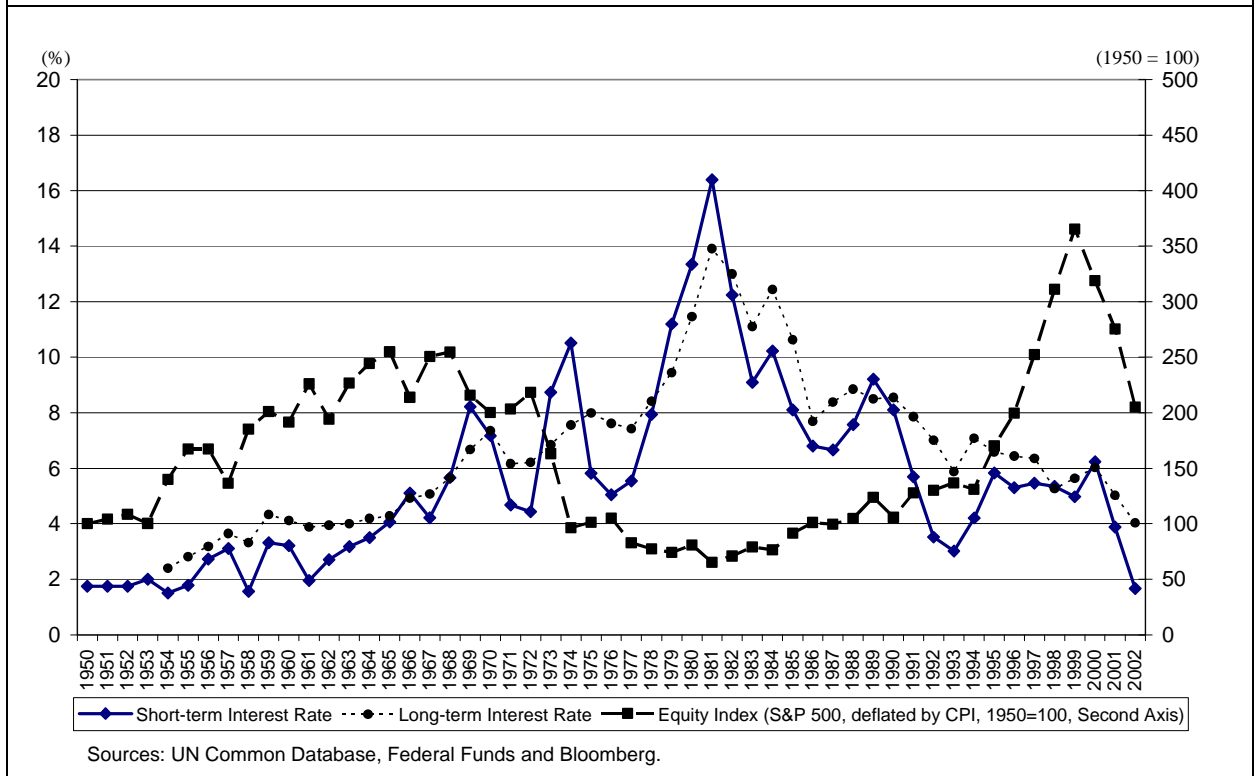
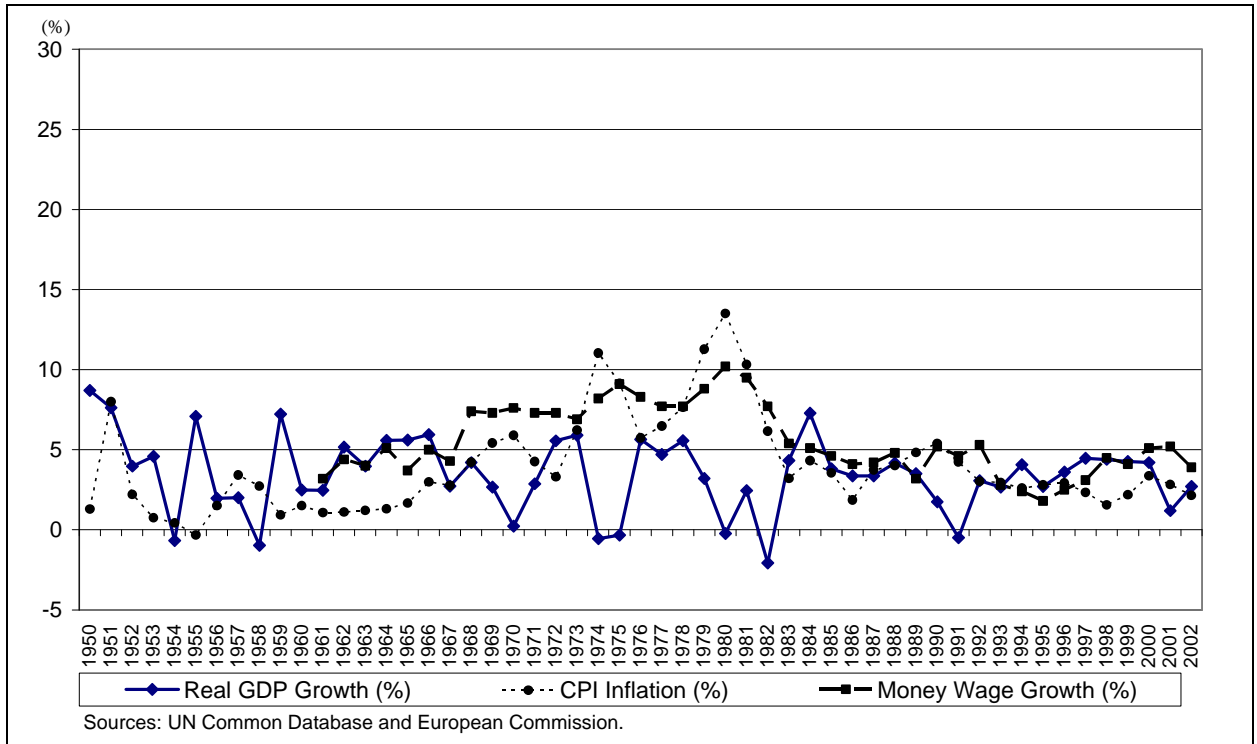


Figure 3

European Union

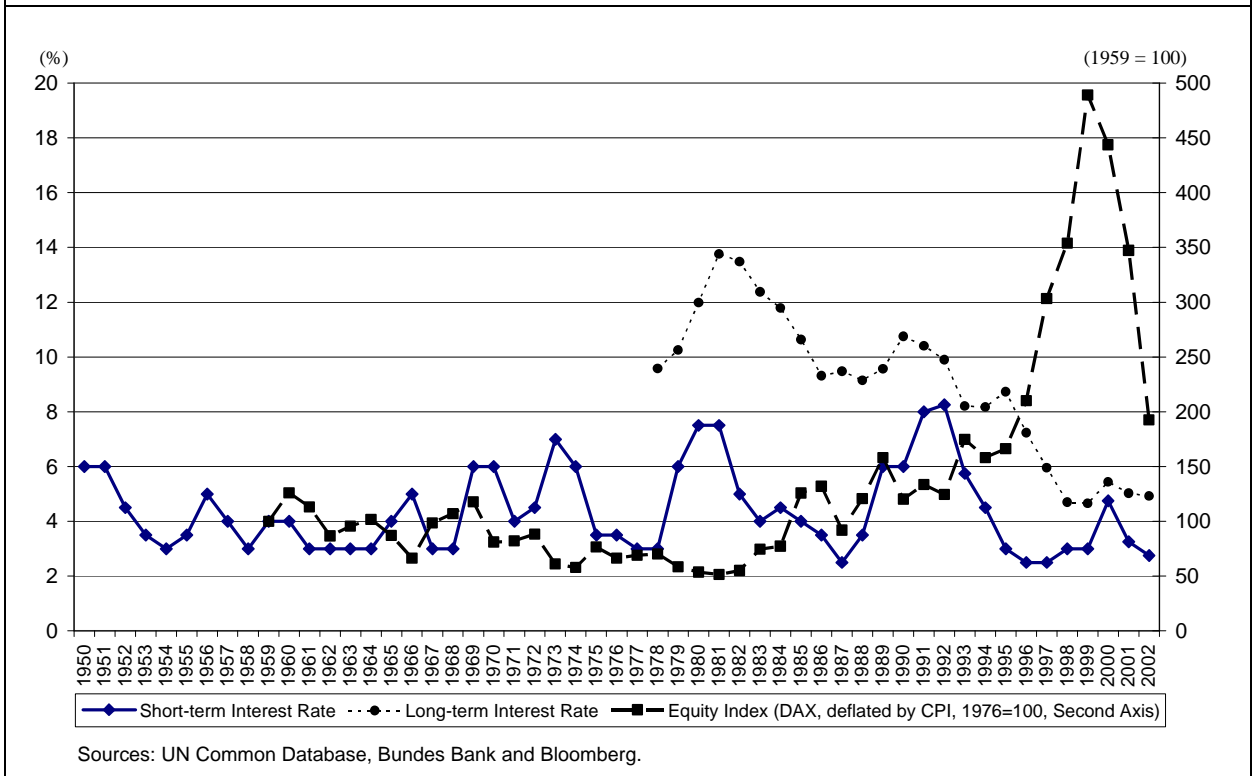
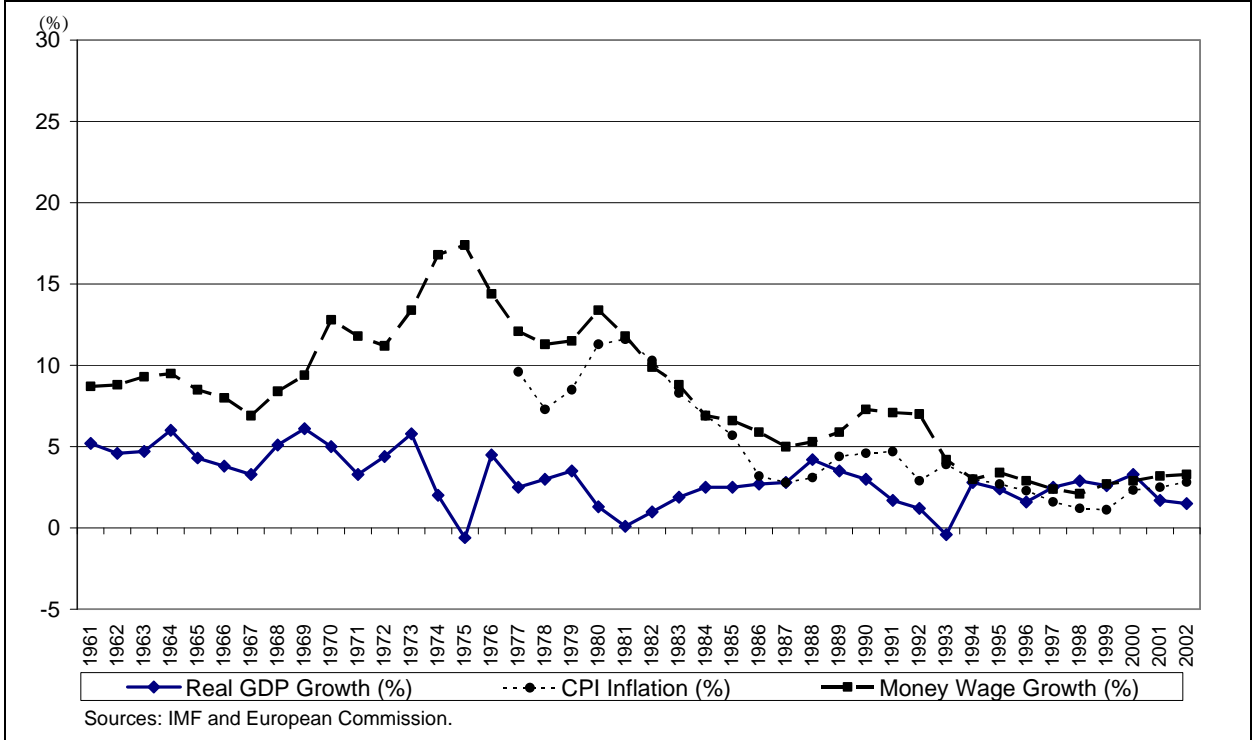


Figure 4
UK

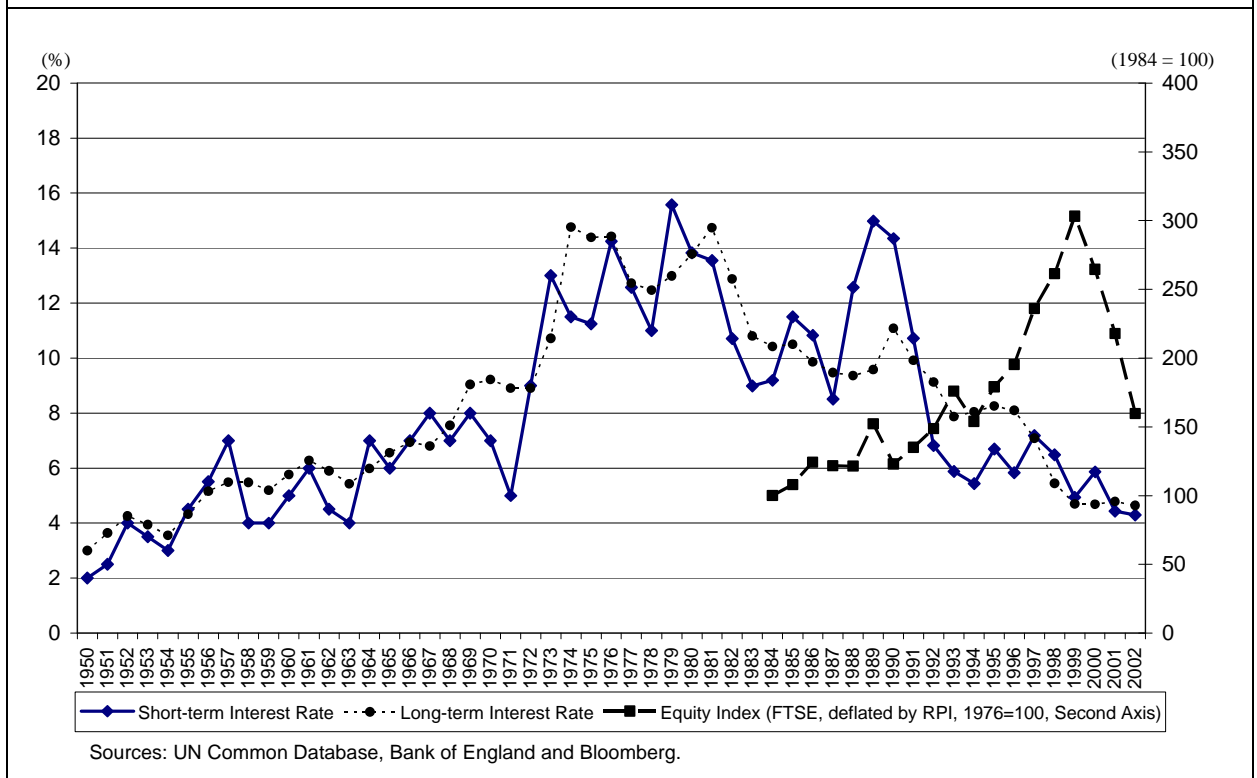
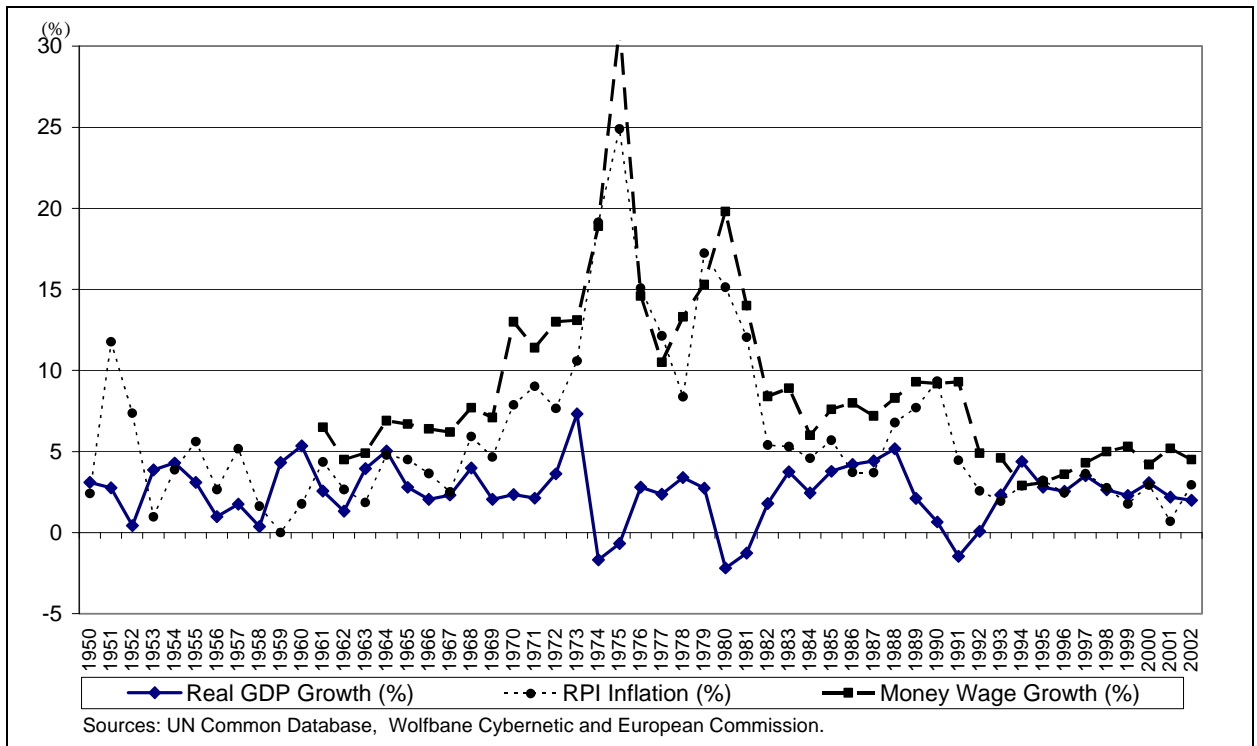


Figure 5

Price Level and Inflation, UK 1800-1914

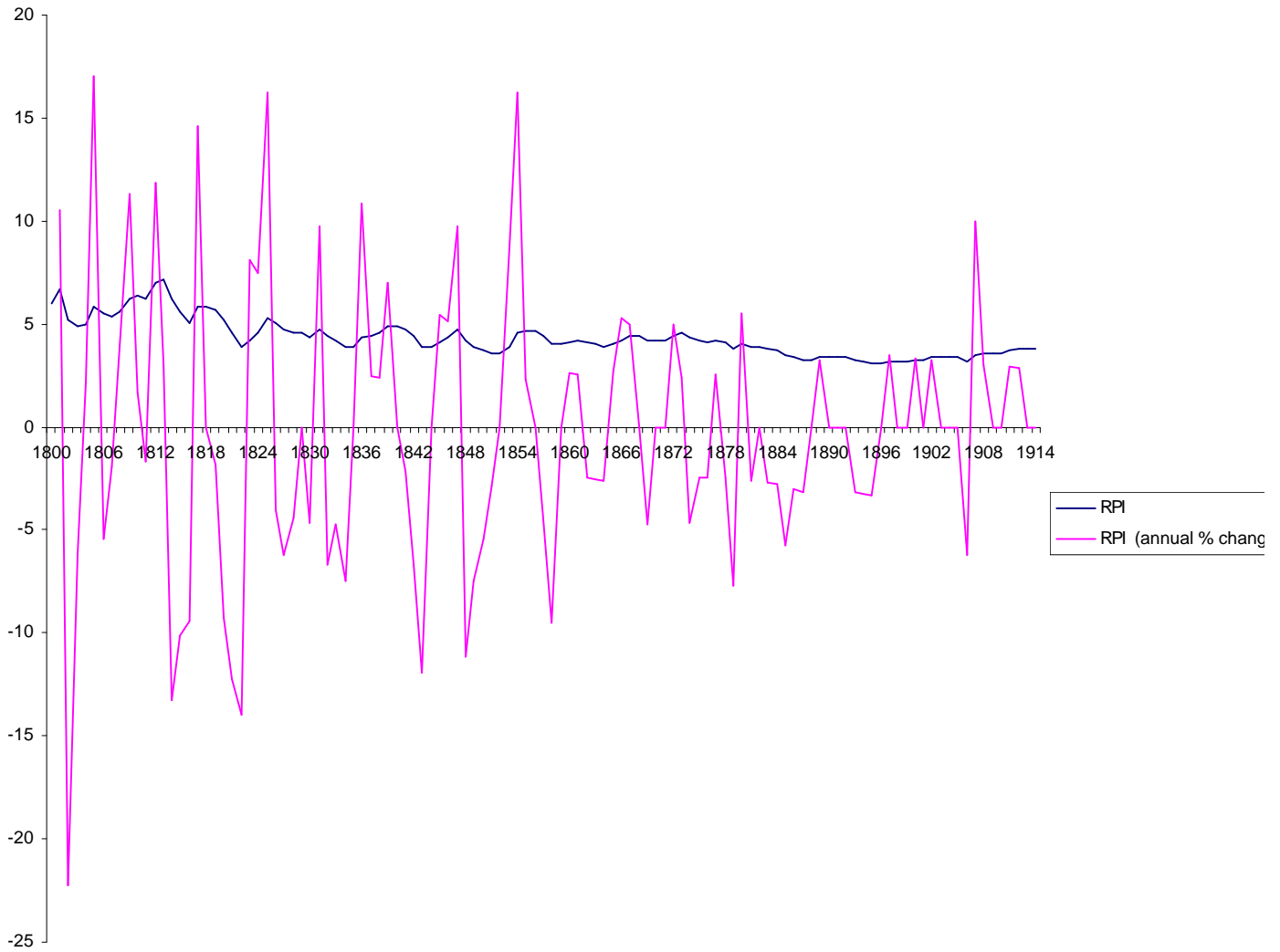


Figure 6

Bank rate, inflation and £/\$ exchange rate, 1817-1914

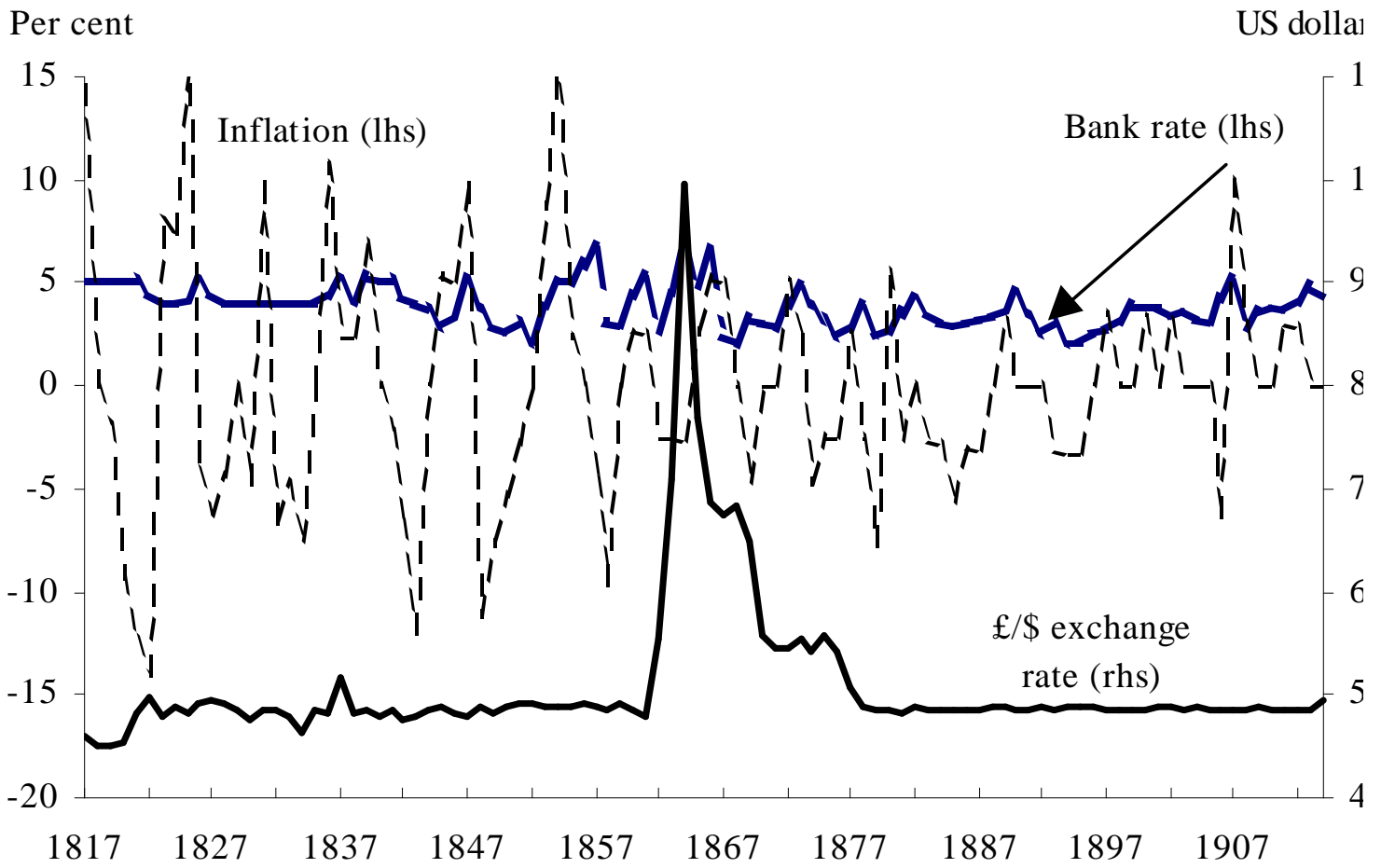


Table 1				
Total, Goods and Services Inflation in the UK				
	UK	US	Euro area	Japan
CPI inflation*	1.9	1.7	2.2	-0.9
CPI goods*	-1.1	-0.1	1.4	-1.6
CPI services*	4.6	3.1	3.3	0.0
Services - goods inflation, 1990-97	1.6	1.6	1.6	1.3
Services - goods inflation, 1990-2002	2.3	1.8	1.3	1.3
<p>* year to August 2002. Inflation rates are calculated as the total increase in the price index over the indicated period, based on monthly data , expressed as a twelve month growth rate. Sources: Table taken from King [2002]; ultimate source: ONS (for UK) and Thomson Financial Datastream for data on US, Euro Area and Japan.</p>				

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