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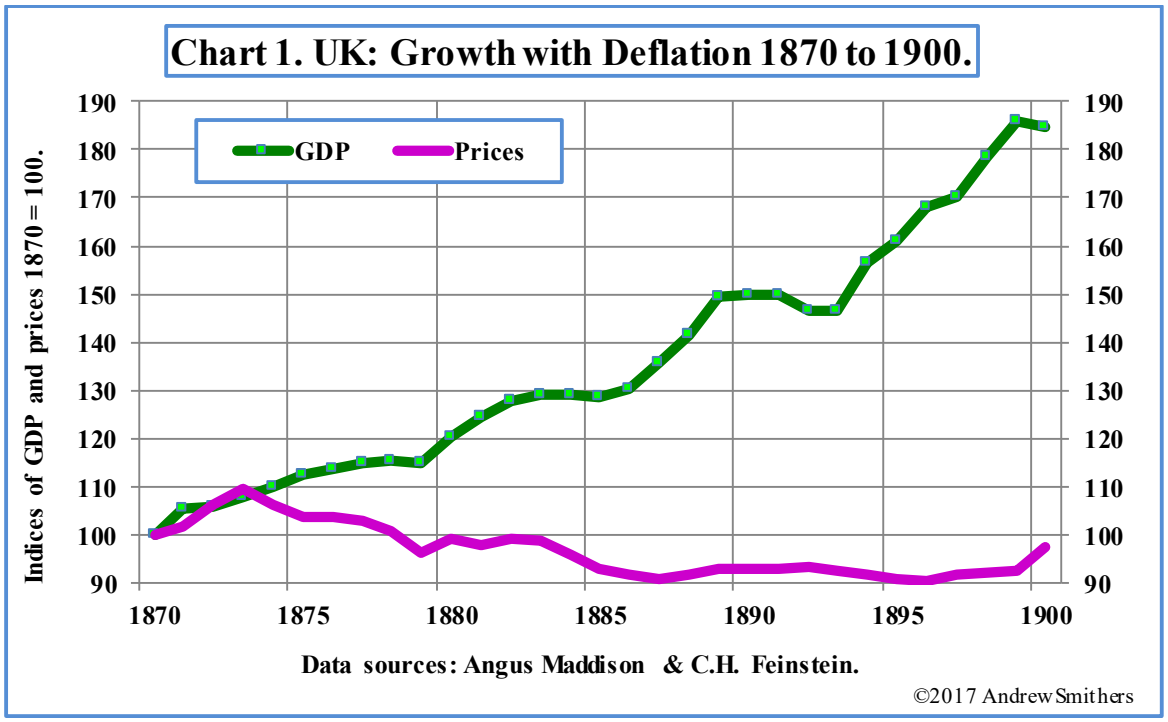
Inflation and Expectations.

Historical Background.

Expectations have had an important influence on inflation, notably in the last 30 years of the 19th Century and after the oil shock. It is likely that they are important again today, with low expectations constraining inflation in both the UK and the US.



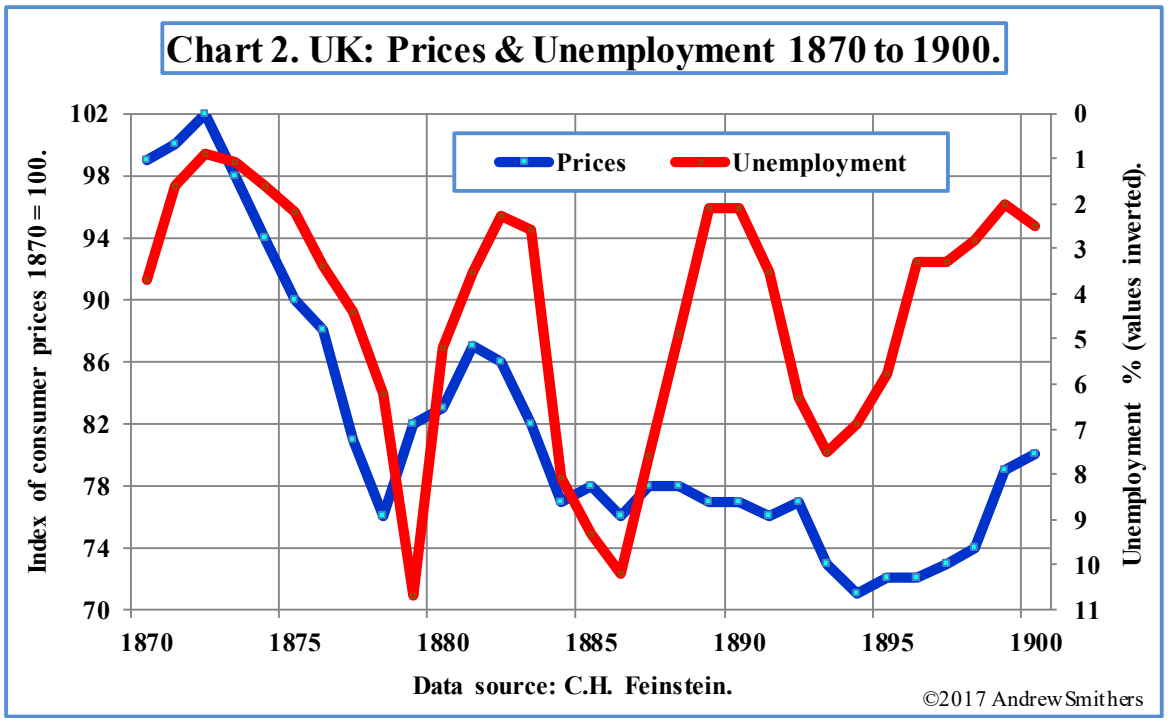
As Chart 1 shows, UK prices fell from 1870 to 1900. As Table 1 shows, this was a period of robust growth, with GDP growing more rapidly than it had over the previous 50 years from 1820 to 1870.[1]

Table 1. UK GDP and GDP per head.
(Data sources: Angus Maddison & C.H. Feinstein.)

	GDP % p.a. change	GDP per head % p.a. change
1870 to 1900	2.06	1.15
1820 to 1870	2.05	0.87

As Chart 2 shows, unemployment was very volatile from 1870 to 1900 but fell slightly over the whole period of deflation.

[1] Angus Maddison's annual data for UK and US GDP starts in 1820.



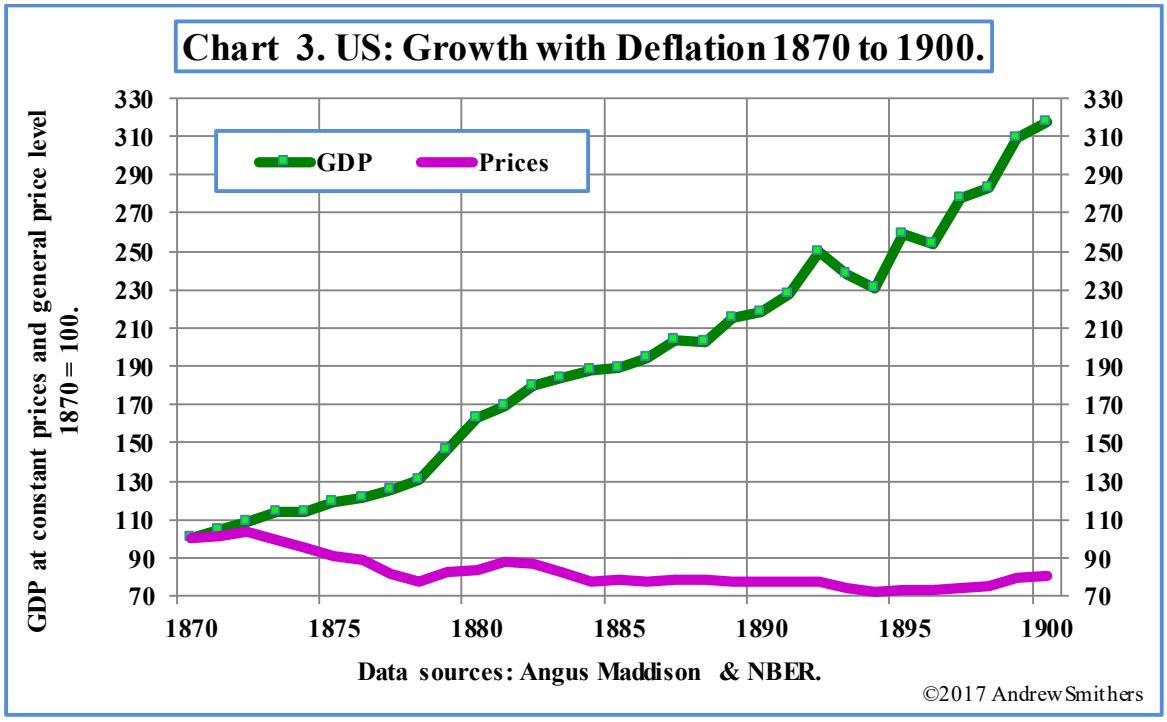
There was no apparent relationship between unemployment and annual rates of change in prices (i.e. inflation or deflation), as Table 2 shows.

Table 2. R^2 correlations between unemployment and change in prices
(Data source: C.H. Feinstein.)

Coincident	Inflation next year	Inflation in 2 years' time	Inflation in 3 years' time
0.00	0.06	0.14	0.09

In addition to unemployment and expectations, there are other influences on the price level such as international commodities and the exchange rate. But these have mostly a short-term impact and are unlikely to have had a noticeable effect over 30 years. It thus seems likely that a consistently low level of expectations was an essential factor in the prolonged fall in the price level and that this did not damage output or employment.

The situation in the US was similar, as Chart 3 shows, though prices declined more rapidly in the US, falling by 19% over the 30 years, compared with 2.5% in the UK. I have not been able to find US data on unemployment, so it is therefore possible that rising unemployment contributed to the decline in the prices. In view of the rapid rise in US living standards, however, this seems unlikely.



The total growth of the US economy was slightly slower from 1870 to 1900 than it had been over the previous 50 years, but this was more than accounted for by the slowdown in the growth of population. As Table 3 shows, the improvement in living standards, defined as GDP per head, accelerated sharply.

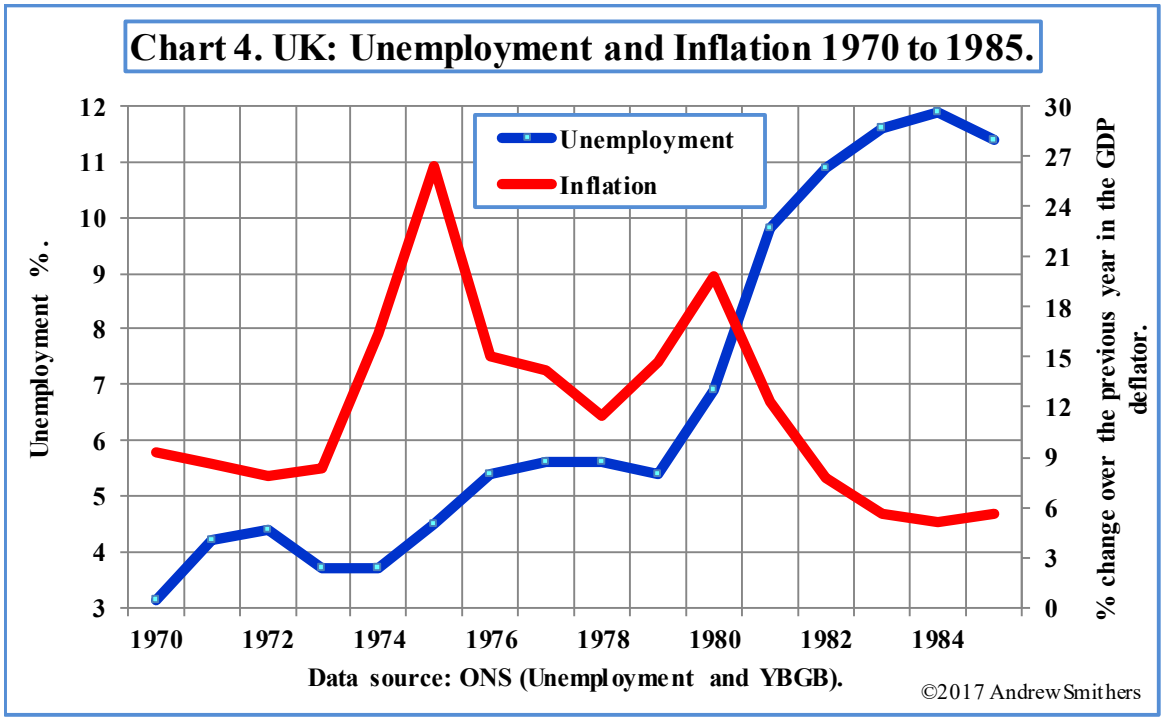
Table 3. US GDP and GDP per head (Data source: Angus Maddison.)

	GDP	GDP per head
1870 to 1900	3.93	1.73
1820 to 1870	4.10	1.18

The period from 1870 to 1900 has been termed a great depression, despite the strong rise in living standards. This was due to the sharp fall in prices, notably of agricultural commodities. This was particularly severe on the US farming population, which in 1900 accounted for 41% of all those employed, compared with 15% in the UK (1901),[2] and whose political opposition to falling prices was consequently vigorous. The fall in prices was attributed to the US adherence to the gold standard and was made famous in the rhetoric of the twice failing presidential candidate William Jennings Bryan, with his cry "You shall not crucify mankind upon a cross of gold".

After depressing inflation in the last 30 years of the 19th Century, expectations had the opposite impact after the oil shock.

[2] Data from *Historical Statistics of the United States* published by the Bureau of the Census and from C.H. Feinstein's *Statistical Tables of National Income, Expenditure and Output of the UK 1855-1965* published by Cambridge University Press 1972. No doubt the proportions employed in agriculture were even higher in the preceding 30 years, for which I have been unable to find data.



From 1970 to 1985 UK inflation was highly volatile but fell over the whole period, while unemployment, as Chart 4 shows, rose from 3.2% to 11.4%. There were periods, such as 1970 to 1973, in which inflation fell and unemployment rose and periods when they both rose together, such as 1974 to 1976 and 1978 to 1980. But the underlying change was one in which it took an exceptionally large rise in unemployment to bring inflation under control.

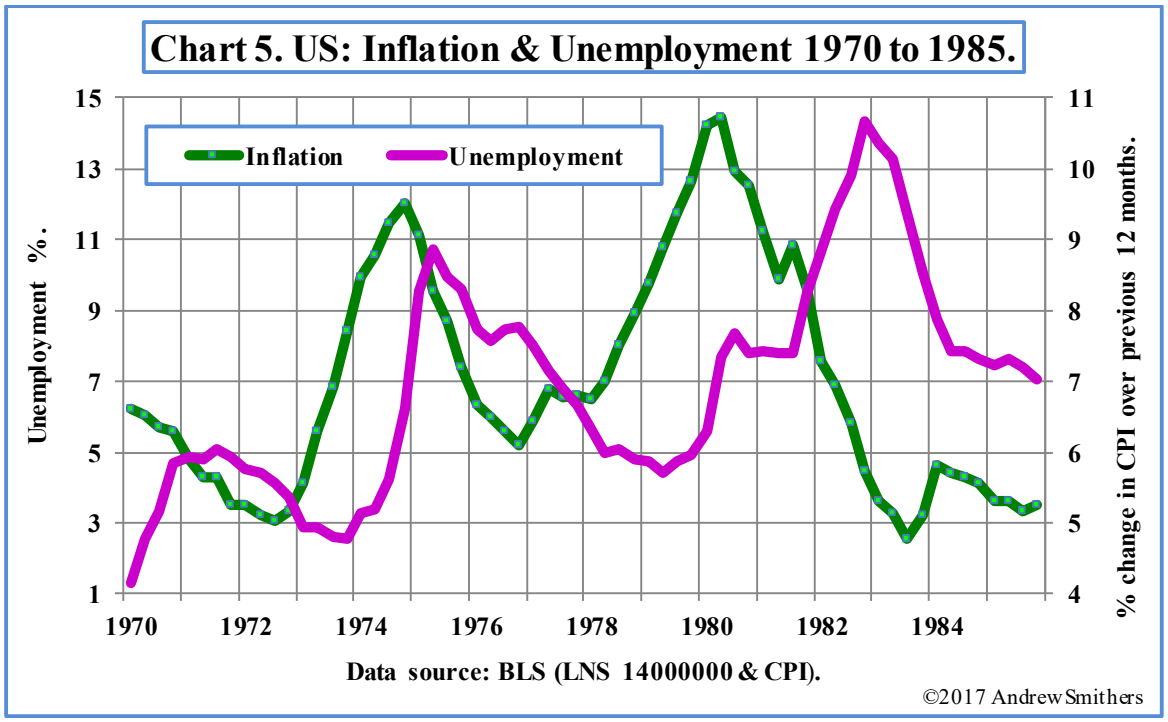
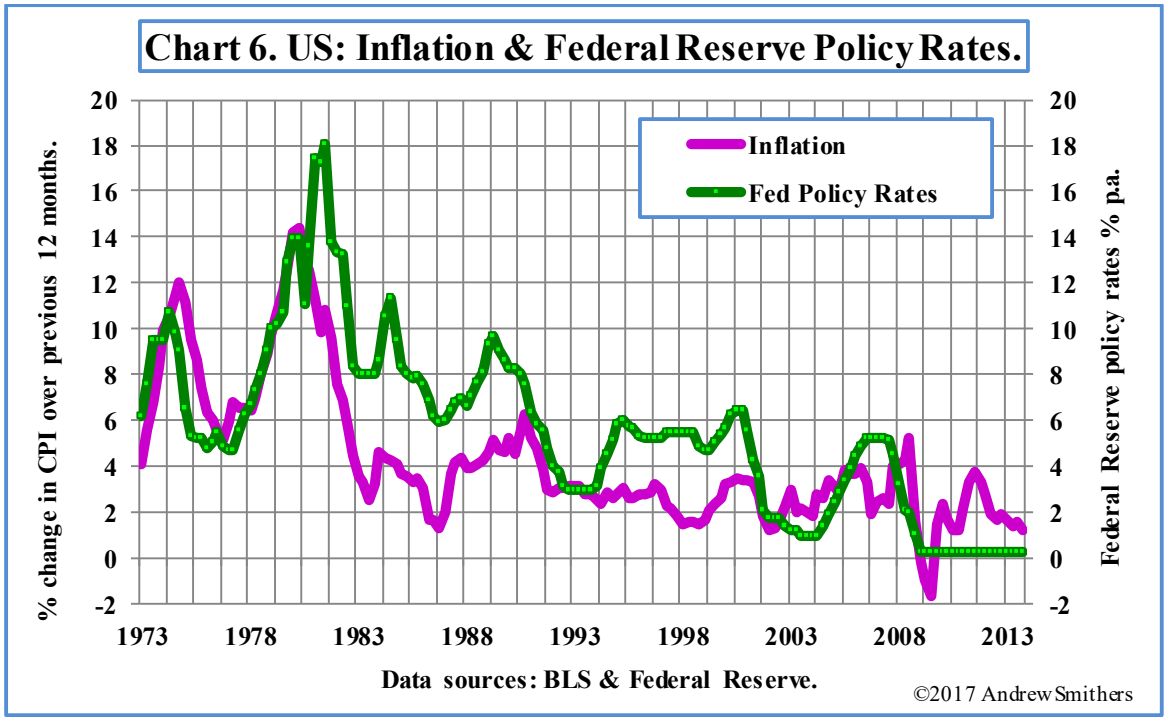


Chart 5 shows that the situation was very similar in the US over the same period.

The Volatility of Expectations.

In both the UK and the US inflation has recently been more subdued than forecasters have anticipated. The most likely reason is that expectations have remained low in a similar way to the late 19th Century. Output then grew under conditions of full employment while prices declined; today, low expectations for inflation have allowed stable prices to be combined with falling unemployment.

If unemployment continues to fall, then at some point both inflation and its expectations will start to rise. This level is unknown and another uncertainty is whether the short level of NAIRU, at which inflation starts to pick up, will be same as the minimum level of unemployment that will subsequently be needed to keep inflation from accelerating. (Short-term NAIRU is unlikely to be the same as medium-term NAIRU.)



If expectations change suddenly when inflation starts to increase, the level of unemployment compatible with stable inflation is likely to rise sharply. Unfortunately a sudden change is probable as it seems that inflationary expectations are very volatile. The Bank of England publishes estimates based on changes in the yields on nominal government bonds and those linked to inflation. These show that the expected change in inflation over the next two years moved from minus 3% to plus 3% between 1990 and 1991.[3] Changes in expectations are also volatile from month to month and rises and falls are regularly reversed quickly. We cannot therefore be sure that a marked change has occurred before it's too late for inflation to be controlled by a gentle change in monetary policy. Once started, a rise in expectations will probably

[3] See *Bond prices and market expectations of inflation* by Francis Breedon May 1995 Charts 4, 5 & 6.

need to be contained by dramatic increases in interest rates. This was the medicine applied by Paul Volcker when Governor of the Fed, as I show in Chart 6. Under his guidance policy rates rose to 18% in 1981 and remained well above inflation as it fell until 2002. The policy was successful at the cost of a sharp recession, with unemployment rising to nearly 11% in 1982.

The US economy was in far better shape in 1982 to withstand a shock increase in interest rates than it is today. Table 4 shows that both leverage and share prices are much higher today than they were in 1982, with the consequence that the economy is much more vulnerable to a sharp rise in interest rates. The danger now is that even much milder increases in interest rates than those that occurred under Paul Volcker could set off a large fall in the stock market and in the prices of other financial assets. This would cause a sharp fall in demand and profits, setting off fears, followed by the reality, of widespread debt defaults. High asset prices and debt levels render the economy today particularly susceptible to a shock rise in interest rates.

Table 4. Comparing 1982 and 2016 in the US.
(Data sources: Z1 Table D3, NIPA Table 1.1.5, Z1 Table B.102 & Stephen Wright.)

	Q4 1982	Q1 2017
Household debt as % of GDP	47%	78%
Non-financial business debt as % of GDP	53%	72%
Financial debt as % of GDP	24%	82%
Stock market value according to *q*	43% undervalued	73% overvalued

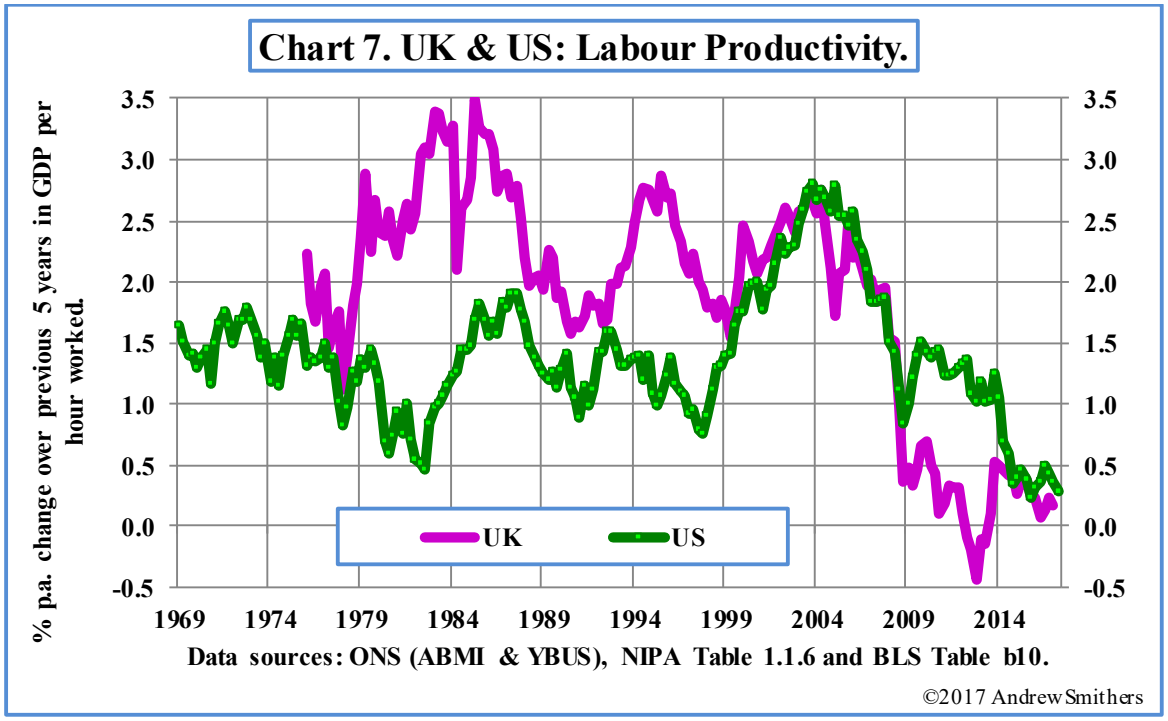
Policy with Asymmetric Risks.

Central banks aim to achieve a stable inflation rate of 2% without recessions. This may not be possible if the short and medium-term levels of NAIRU are different. Even if not impossible, it is likely to be difficult. As we have had periodic recessions without long gaps between them, history provides no sustained example of central banks' success and policy should therefore allow for the asymmetry between the risks of different errors. While acting too early or too strongly will cause unemployment to rise, this can be easily reversed by a change in policy. The consequences of delayed or weak action are more serious. Once expectations have taken off, the level of unemployment compatible with stable inflation will rise, policy will have to tighten and cannot readily be reversed, as a serious recession will be needed to bring inflation and its expectations back under control.

Central banks should therefore err on the side of tightening too soon rather than too late, but this will be difficult and unpopular for three reasons. The first is that deflation has been often but wrongly blamed for causing depressions and that a weak trend in inflation must therefore be avoided. The second is that central banks have 2%

targets for inflation. The third is that there is excessive optimism about the trend level of growth in the UK and the US.

Some economists have called for the target rate to be raised above 2%, arguing that falling inflation will lead to deflation, which caused the slump. History shows that deflation does not cause recessions, though it can be a symptom of them, but this distinction appears too subtle to be widely accepted. Public opinion, as voiced by politicians, the popular and even the financial press, is therefore likely to press for economic stimuli until prices rise to target levels, at which point unemployment may already be below the level needed to keep inflationary expectations in check once they have started to rise.



There is excessive optimism about the trend growth rate of the UK and US economies. Chart 7 shows the change in productivity, measured by GDP divided by hours worked by the non-farm population, measured over the previous 5 years. This has fallen to 0.17% p.a. in the UK and to 0.29% in the US.

Forecasts of productivity are provided in the UK by the Office of Budget Responsibility ("OBR") and in the US by the Congressional Budget Office ("CBO"). These have been falling but are still well above the rates that have actually been achieved.

Table 5. Forecasts of UK Labour Productivity by OBR and Outturn (Data sources: OBR Reports and ONS (ABMI & YBUS).		
	For 2016	**For 2020**
Forecast November 2015	1.50%	2.20%
Forecast November 2016	1.30%	1.80%
Actual for 2016	0.44%	

Table 6. Forecasts of US Labour Productivity by the CBO compared with historical outturn. (Data sources: CBO, NIPA Table 1.1.6 and BLS Table b10.)	
	For 2017 to 2027
Forecast June 2015	1.8% p.a.
Forecast June 2017	1.5% p.a.
Actual GDP at constant prices per hour over past 5 years	0.29% p.a.

Productivity is volatile, but the assumptions made for future productivity by the OBR and the CBO are, as Table 7 shows, well above the rates recently achieved using not only the past 5 but all shorter periods of years.

Table 7. UK & US: Productivity over past 1 to 5 years to latest quarter available[4] (Data sources: ONS (ABMI & YBUS), NIPA Table 1.1.6 and BLS Table b10.)		
Period	**UK (to Q1 2017)**	**US (to Q2 2017)**
Past 1 year	0.40	0.59
Past 2 years	0.32	0.14
Past 3 years	0.43	0.57
Past 4 years	0.35	0.55
Past 5 years	0.17	0.29
Average of all periods	0.33	0.43

On the basis of these optimistic estimates for productivity it is generally assumed that the trend growth rate for both the UK and the US is around 2%.[5] For example, the OBR in its March 2017 report assumes that "potential productivity growth will pick up towards its historic average in the coming years". As Chart 7 shows, this uncertain number is likely to be well above recent achievements. The CBO in its March 2017 report "projects (for the long-term) an increase in real (inflation-adjusted) potential GDP of 1.9 percent per year". I can see no justification

[4] Q1 2017 for the UK and Q2 2017 for the US.

[5] The latest OBR estimate (March 2017) for actual output for the next three years is a little below this because they expect demand to fall short of the level needed for output to match its potential.

for this optimism. As I showed in a recent paper[6], GDP growth depends on the growth of the net capital stock and, on current levels of investment, this implies trend growth rates of around 0.8% for the UK and 1% for the US. The economy could readily slow and still be growing above trend but, as expectations are high, any slowing of growth is likely to be considered as ending the need for monetary tightening.

Conclusions.

The recent tendency for inflation in the UK and US to undershoot forecasts is probably due to expectations, which are currently low. Unfortunately they appear to be extremely volatile, which renders the risks of policy errors asymmetric. Central banks should therefore err on the side of caution. This is, however, unlikely due to both public pressure and excessive optimism about trend growth rates.

There seems no immediate risk of a sharp pick-up in inflation, but a significant risk that inflation will be allowed to rise over the next one or two years well above target levels. If that occurs, the difficulty of containing the associated rise in inflationary expectations will probably require a marked rise in unemployment set off by a sharp rise in interest rates and thus lead to a deep recession.

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September 2017

[6] *Building a New Testable Model to Estimate Total Factor Productivity* by Andrew Smithers published in World Economics Vol 18 No 2 April-June 2017.