

Box B: Inflation and public finances.

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Economists focus on ‘real’ magnitudes, or those that are measured in a way that removes the effects of inflation. Standard national accounting procedures are designed to capture both real volume measures and ‘current price’ measures by deflating nominal values by an appropriate price index. However, in the realm of public finances, there has been something of a blind spot when it comes to inflation adjustment and standard statistics do not account for the effect of inflation. At the same time, the impact of inflation can be considerable since the bulk of government liabilities are denominated in nominal terms. There is thus an ‘inflation tax’ reflected in the reduction in government liabilities in real terms (and corresponding reduction in the real value of the assets of the bond holders). The first attempt to develop a systematic framework to measure this effect was undertaken by two economists at the Bank of England in the late 1970s, Christopher Taylor and Andrew Richard Threadgold. This was at a period of high inflation when the effect of ‘inflation adjustment’ was considerable: the high inflation that took off in the mid-70s had a major impact on the government finances. In particular, the large government deficits were shown to be much smaller when accounting for the inflation tax effect.

In 2022 we find ourselves again in a situation where not only is inflation elevated but outstanding government debt is also high relative to previous decades. The most recent ONS data for public-sector net debt excluding public sector banks (PSND ex) suggested that the debt-to-GDP ratio stood at around 98 per cent at the end of September 2022. The combination of high debt and high inflation together imply that there will be a large inflation effect affecting the government deficit. There is a flow dimension to this (essentially the difference between real and nominal interest rates) and a stock dimension (the total value of assets and liabilities), which are of course linked over time. To understand exactly how this works, it is perhaps best to imagine what would happen in a fully ‘inflation adjusted’ world where inflation has no effect on real incomes and assets. If inflation was 10 per cent, then the government would pay interest on its bonds (also known as gilts) at the real rate, say 2 per cent, plus the inflation rate to make a total of 12 per cent. The flow of interest payments would then provide the same real return of 2 per cent and provide 10 per cent compensation for the fall in the real value of the bonds due to inflation. For the government to keep its real asset position unchanged, the government would also issue new bonds exactly equivalent to the 10 per cent interest payments compensating for inflation. The asset holders (firms or households) would keep their real asset position unchanged by buying newly issued bonds with the 10 per cent and keep the 2 per cent. The rate of inflation has no real effect in this framework: whether it is 0 per cent or 100 per cent, if the government and private sector behave in this way then there would be no change in the value of real assets and liabilities.

Now, there is a financial asset that behaves exactly like this and ensures that there is no inflation effect: inflation-indexed bonds. In fact, the government issues considerable quantities of index-linked gilts, whose value (both in terms of interest paid and final value) automatically adjust with inflation. Even better for the holders of these indexed gilts, they are linked to the historic RPI measure of inflation, which tends to be higher than the current standard measures of CPI and CPIH inflation. To get an idea of the importance of these indexed gilts for public finances, according to the OBR (2022), in August 2022 out of a total debt of £2,069 billion, over 25 per cent or £544 billion are indexed gilts. For these indexed gilts, the inflation adjustment is already done for us, and we can focus on the remaining government debt of around £1,500 billion.

This then raises the issue of how we treat the bonds held by the Bank of England (or more correctly the Asset Purchase Facility) resulting from quantitative easing. In fact, there may be no need to treat assets held by the Bank of England any differently to assets held by any financial intermediary or commercial bank. The Bank of England holds government bonds as assets and has corresponding liabilities which are in the most part the reserves held by commercial banks. The effect of inflation is to reduce the real value of the assets and liabilities on both sides of the balance sheet in an offsetting manner. A similar argument can be made for commercial banks: inflation will reduce the value of their nominal assets (including reserves at the Bank of England and government bonds) but also their liabilities (deposits held by firms and households). For commercial banks the two effects may not exactly offset, since the assets of banks will include items that will be affected by inflation (for example stocks and shares). However, as an approximation we can assume that inflation affects the assets and liabilities of the banking sector as a whole in a neutral manner. Thus, if

we want to ask the question ‘who pays the inflation tax’, the answer is households and firms who either own government bonds directly or hold deposits in commercial banks. Part of the deposits held in commercial banks corresponds to the gilts held by the commercial banks or Bank of England.

Now, of course, the government is not the only borrower and to tell the full story of inflation, we would need to look at how inflation affects borrowers and lenders in the private sector. For example, banks issue mortgages that are set in nominal terms and sit as assets on their balance sheet. Mortgage holders see the real value of their debt decline with inflation as savers see the real value of their savings held in the bank decline. However, the story of redistribution within the corporate and household sectors is outside the scope of this analysis; instead, we look at how inflation affects how we interpret the real value of government debt and deficits.

The magnitude of the inflation tax IT_t , is easily calculated at either the monthly or the annual frequency. The fall in the real value of the existing stock of debt is given by the inflation rate times the total stock:

$$IT_t = \frac{B_t}{P_t} - \frac{B_t}{P_{t+1}} = \frac{B_t}{P_t} - \frac{B_t}{P_t(1+\pi_t)} = \frac{\pi_t B_t}{P_t}$$

If we use the annual frequency, we have the current inflation rate of 10.1 per cent, which measures the increase in prices over the last 12 months. As a lower bound on IT_t , we could apply the simple formula to the stock of bonds as it stood 12 months ago. This is a lower bound, because of course (net) new debt is issued all the time and this will be subject to inflation once it has been issued. An upper bound would be to apply the retrospective inflation rate to the end of period total.

What we have done instead is to use the monthly frequency of inflation data and apply it to the quarterly data on debt. This allows us to get a monthly figure for the inflation tax which we can accumulate to get the quarterly value which we can link back to the public finance data on the government deficit.

Figure B1 Monthly inflation tax



Source: NIESR calculations.

Table B1 The Impact of the Inflation Tax on the Budget Deficit (£ bn)

Time	Inflation Tax (£bn)	Government Deficit (£ bn)	Inflation Tax Adjusted Deficit (£bn)
3Q 2020	6.8	-74.1	-67.3
4Q 2020	1.7	-63.4	-61.7
1Q 2021	3.6	-42.2	-38.6
2Q 2021	28.8	-60.1	-31.3
3Q 2021	17.0	-37.3	-20.3
4Q 2021	40.7	-29.2	11.5
1Q 2022	31.6	-6.8	24.8
2Q 2022	70.4	-41.8	28.6
3Q 2022	24.9	-30.6	-5.7

Source: ONS, OBR.

This analysis suggests that accelerating inflation can be relatively positive for the government fiscal position. The government's current fiscal budget deficit for the third quarter of 2022 is £30.6 billion, however a £24.9 billion inflation tax somewhat offsets the severity of the deficit and reduces it by a factor of 5 to £5.7 billion. Additionally, all the published deficits since the fourth quarter of 2021 have actually been turned into a surplus because of this inflation tax. Subsequently, the government has a lot more fiscal space for spending than appears from the published data which omits the inflation tax. In effect, inflation is rapidly reducing the real value of government debt. Since we now have low nominal interest rates and resultant negative real rates, this effect is enhanced even more.

This inflation effect is perhaps more apparent if we think in terms of the debt/GDP ratio. 10 per cent inflation increases nominal GDP much more rapidly than real growth of 0-2 per cent and has the effect of 'inflating away' the government debt to make it more sustainable than it would have been without the inflation. Since both the numerator and denominator of the debt-to-GDP ratio are nominal values, the ratio does not in itself require inflation adjusting. With 10 per cent inflation, the UK budget deficit would need to be very large to keep the debt-to-GDP ratio from falling. This means that a larger unadjusted budget deficit is sustainable compared to the case when inflation is low, as it was around the pandemic.

References

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