

Submission to the House of Commons Treasury Committee

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A. Summary

1. We note that the House of Commons Treasury Committee has requested written evidence concerning policy on quantitative easing (QE), quantitative tightening (QT) and the future of the Bank of England Asset Purchase Facility³.
2. Given the scope of the questions asked by the Committee we have assembled a body of evidence to support our submission that we attach to this summary. Being aware that not everyone will have time to read that evidence, this summary refers to the main findings of our work.
3. We are of the opinion that the policy of QE used by successive Labour, coalition and Conservative governments in the UK since 2009 has been a success. This is because QE has proved that in a modern fiat money economy a central bank can create the money required to avert a financial crisis, stabilise the banking sector by providing it with the liquidity it needs to avoid failure, and inject the counter-cyclical funding an economy requires to maintain high employment when that is at risk, and that it can do all this in a

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³ <https://committees.parliament.uk/call-for-evidence/3036/>

low inflation and low interest rate environment. When a central bank cannot lower the price of money when interest rates are at or close to the Zero Lower Bound (ZLB) that bank has to raise the quantity of money, and this is what QE did.

4. We note that this success was despite there being no adequate explanation of policy on QE being made available by the Bank of England: it did instead pursue a pragmatic policy on this issue.
5. As a matter of fact, when QE was introduced in 2009 there was no clear sense from Bank of England (BoE) staff or the literature on its likely impacts or how such measures could be withdrawn. Indeed, it was unclear what should actually be bought, and whether that should be 5 year, 10 year or 30 year bonds and what their differing impacts might be.
6. Nor was there at the time that QE was introduced any serious discussion about whether or how the asset purchases to be made under that programme should or would be reversed.
7. In addition, at that time it was never made clear why so few private corporate bonds were bought when the instructions from the then Chancellor of the Exchequer clearly permitted that course of action. The Bank of England has never explained if the impact of asset purchases of private corporate bonds is the same as purchasing gilts as justification for why so few were bought. It is not clear that they know the answer. The BoE Monetary Policy Committee (MPC) was never allowed to discuss what assets should be purchased or given any justification for buying mostly medium to long gilts when in the USA the equivalent programme was buying shorter 2-3 year Treasuries that matured more quickly.
8. It is also important to note that other feasible possibilities, including purchasing student loans or mortgages, was not discussed, and yet doing so might have been just as appropriate as purchasing gilts.
9. Since 2009 little has apparently changed with regard to the understanding of quantitative easing, or indeed of quantitative tightening by the Bank of England. At the time QE was first introduced the MPC was uncertain when tightening came would rate rises precede stopping QE and/or selling off assets. There is little evidence today that these questions have been asked or answers sought, and answers remain as unknown now as in 2009 in that case. That represents a serious policy failure by the Bank of England given the sums involved.

10. All that we do know is that low interest rates and QE, which together represent loose monetary policy, were an inevitable response to overly tight fiscal policy from 2010 onwards. Austerity commenced in 2010. The large resulting cuts in public spending and increases in taxes meant that the Bank of England had to counter the consequences of that as Martin Wolf has explained in his new Penguin book *The Crisis of Democratic Capitalism* (2023). QE provided that response once rates reached the Zero Lower Bound.
11. QE countered austerity in several ways:
- a. Lower mortgage costs insulated borrowers from lower public spending.
 - b. The economic stimulus QE created countered the drag on the economy from austerity.
 - c. QE promoted inflation which partially neutered the deflationary impact of austerity. GDP growth from 2010 to 2020 was much lower than it had been in the decade 1998-2008
12. Despite these positive impacts of QE over the period 2010-2020 growth in GDP was weak. Average annual GDP growth rates from 1983-2007 averaged 2.75%. From 2010-2019 it averaged 2.0%. QE probably created much of that growth when austerity was doing its best to eliminate it.
13. What we also know is that during this period inflation was low and on a declining trend despite the fact that QE is inherently inflationary by providing an economic stimulus to an economy. Without this inflationary stimulus from QE we suggest that the Bank of England would have seriously undershot its inflation target in this period because austerity would have made that inevitable. QE was a necessary counter to a seriously deflationary -and mistaken in our view - fiscal policy run by successive governments from 2010 onwards. It concerns us that this appears to be little understood.
14. A major justification for austerity was based on claims by Reinhart and Rogoff ('Growth in a time of debt', *American Economic Review*, (2011), 101(2), pp. 573-578) that suggested that once debt:GDP ratios reached 90% or more growth slowed. Work by graduate student at the University of Massachusetts Amherst, Thomas Herndon and co-authors⁴, showed that was entirely false and there was no such cut-off in the data where growth slowed. The conclusion was famously reversed once spreadsheet errors summing columns was corrected. Reinhart and Rogoff had not added into their calculations countries that had high debt:GDP ratios that had high growth which

⁴ T. Herndon, M. Ash, R. Pollin (2014), 'Does high public debt consistently stifle economic growth? A critique of Reinhart and Rogoff,' *Cambridge Journal of Economics*, 38 (2), pp. 257-279

included several countries like New Zealand that saw high growth after WW2. This has been dubbed 'Excelgate' which has destroyed the entire economic basis for austerity.⁵

15. Equally troubling, given these observations is the fact very little is apparently known or is being said by the Bank of England now as to how QT should be done, at what speed and what the likely consequences will be.
16. So far the Bank of England has offered no coherent policy justification for QT, which we consider to be a major omission on its part that is bound to contribute to significant financial market uncertainty and even risk if this policy is continued. Indeed, it may have already contributed to the market uncertainty in September 2022 even if it was not the primary cause of it.
17. In our opinion:
 - a. QE raised GDP even if overall growth remained weak from 2010 onwards.
 - b. However, along with low interest rates, QE was not enough to lift inflation over these years due to overly restrictive fiscal policy. Inflation and nominal and real wage growth hence remained low.
 - c. QE did not contribute to the inflation that arose in 2021, which was the consequence of two external supply shocks impacting the UK economy in quick succession (Covid reopening and war in Ukraine).
 - d. The combination of QE and low interest rates for more than a decade was a major advantage for the economy as a whole, albeit that opportunity was not taken by either the government or the private sector to exploit this opportunity to make necessary investment at low cost. For example, fixed fifteen or thirty year mortgages could have been introduced, as operate in the United States, which would have reduced the impact of rising rates in 2021 and 2022 as mortgage holders came off low short fixed interest rates loans and were forced to purchase higher priced loans.
 - e. QE maintained, and has now significantly reinforced, the solvency and stability of UK banks and of the UK financial sector as a whole. QT and interest rate rises are likely to destabilise that sector, as they already are in the United States where the 16th largest bank failed in the week before submission of this report.

⁵ <https://theconversation.com/the-reinhart-rogooff-error-or-how-not-to-excel-at-economics-13646>

- f. QE kept the borrowing costs of successive UK governments low for more than a decade, encouraging their support for necessary social programmes.
18. It is however the case that QE did contribute to a significant increase in wealth inequality between 2010 and 2020 as seen in Office for National Statistics wealth data. The increase in private wealth over that period when adjusted for inflation was three times bigger than the growth in GDP. Buying assets – such as houses and equities - helped those who held assets compared to those who didn't.
19. In contrast, real wages in 2015 constant prices are, according to the latest ONS data for December 2022 based on whole economy total pay, approximately the same now as they were in July 2007.
20. As a result, the economic value of work has fallen for many people. Expressed technically, people's reservation wage has risen because jobs have become less attractive because, for example, of the chance of catching covid. There is also some evidence that some work has become harder as employers and customers have become more demanding. The solution to this is to raise the wage offer. Instead, a policy of low real wages in the public sector with spillover into the private sector has meant that the attractiveness of non-work has risen.
21. The employment rate in the UK for those 16 and over is currently 60.8%, which is down from 61.9% in January 2020. It is 71.0% for those ages 50-64 versus 72.7 in October 2019. Older workers are retiring early due to the low return from working, especially in the public sector. If wages were to rise this would attract these non-employed people back to work. QE as it was used did not address this issue which was created instead by the culture of austerity.
22. Instead, the growth in wealth inequality can be explained by the funds injected into the economy by QE being made available to the financial services sector, and most especially banks, to invest. In the tradition of UK banking, they used those funds for property backed lending, which fuelled house and land prices, and for speculation rather than investment. Financial wealth grew as a result but real investment in the economy did not. Recent evidence suggests that the UK's level of investment is amongst the very lowest in the OECD.⁶ The failure to deliver investment in real economic activity revealed a weakness in Bank of England QE policy.

⁶ [https://www.theguardian.com/uk-news/2023/jan/25/north-england-would-rank-second-worst-investment-oecd-country#:~:text=Researchers%20have%20calculated%20overall%20levels,north%20of%20England%20\(38\).](https://www.theguardian.com/uk-news/2023/jan/25/north-england-would-rank-second-worst-investment-oecd-country#:~:text=Researchers%20have%20calculated%20overall%20levels,north%20of%20England%20(38).)

23. If QE was to be redesigned to address this weakness a potential course of action would be for the funds injected into the economy to be routed via a national investment bank tasked with the delivery of a national investment programme to build a sustainable future for the UK economy. There is no reason why such a policy could not be designed and implemented.
24. If, excepting concern with regard to inequality, it can be concluded that QE was a success we can find no reason to reverse the policy of QE by the use of QT, especially in a period of a high (and rising) bank rate.
25. We are in fact of the opinion that a policy of QT would be harmful, and potentially extremely harmful to the UK economy, because:
- a. QT will require increased real (inflation adjusted) interest rates in that economy. These increases are already forecast by the Bank of England and Office for Budget Responsibility for the next few years.
 - b. Increased interest rates might mean the redirection of government expenditure from essential public services to debt servicing. This need not be the case, but in an environment where it is thought desirable to cap government spending as a proportion of GDP this outcome is likely and will be especially harmful if QT also reduces GDP growth, as we think likely.
 - c. Increased interest rates and QT are likely to reduce the household disposable income of the most vulnerable people in the UK.
 - d. QT will raise the cost of government borrowing when the UK is forecast to be in a long period of slow growth.
 - e. Higher interest rates are likely to result in rising unemployment because of pressure on employers to service debt interest obligations or because of the failure of businesses that are unable to do so.
 - f. QT will reduce liquidity within the economy at a time of financial risk, increasing the risk of economic crises arising.
 - g. The UK banking sector may well cease to have sufficient central bank reserves available to them if QT takes place and that sector may malfunction as a result.

- h. QT will almost certainly increase inequality in the UK because of the impact of high real interest rates that it is likely to give rise to redistribution of disposable income upward within the economy.
 - i. QT might increase the demand for government support for the low paid, homeless and others in the UK if they are unable to meet the financial demands it makes upon those on lower incomes.
- 26. We are also of the opinion that there is no need at this time to operate the policy of QT. That is partly because the policy of increased interest rates that it supports will be harmful to the UK economy for reason already noted. This opinion is also based upon observing experience in Japan, where QE has not proved harmful over decades of continual and continuing use.
- 27. The evidence is clear from the Silicon Valley Bank (SVB) fiasco. Over-hyped interest rates killed that bank and left government's exposed to supporting depositors whilst its capital was wiped out. Financial markets have already responded with demands for reduced interest rates.
- 28. This is analogous to what happened with Northern Rock in the UK in 2007. After deposits were rapidly withdrawn Northern Rock's website failed and thousands lined up outside branches demanding their money on 12-14 September 2007. The UK Treasury had no alternative but to guarantee all deposits to prevent a bank run on the Monday 17 September 2007 as Asian markets opened. These were the same options faced by the US Treasury that also had to guarantee deposits for the same reason. In both cases share and bond holders were wiped out. Of note in the UK is that rescuing Northern Rock did not prevent contagion as subsequently other banks that depended on wholesale money markets also failed in 2008 (Bradford and Bingley in September and Alliance and Leicester in July). It is unclear at the time of writing if contagion has been stopped. It was not in 2007.
- 29. We also think QT and the associated policy of reducing or eliminating the APF is unnecessary because:
 - a. There is no evidence that UK or other financial markets have the capacity to absorb the sale of more than £800 billion of UK government gilts either now or in the future without:
 - i. Significantly increasing in UK interest rates with all the harmful consequences already noted in this submission.

- ii. Severely limiting the ability to sell new government bonds, which would result in the imposition of a period of prolonged UK government austerity, and which might also significantly reduce the capacity of the UK government to invest, damaging the infrastructure of the economy on which the private sector depends and also leaving the country at risk of breaching its net-zero obligations.
 - iii. Severely reducing the funds available within central bank reserve accounts held by the UK's commercial banks with the Bank of England upon which balances the smooth operation of the UK banking system is now almost wholly dependent.
 - iv. Creating a recessionary economic environment which might, because of prolonged austerity, high interest rates and potentially high inflation have the risk of becoming a depression.
 - v. Creating substantial social stress and potential disorder within the UK.
- b. There is no identifiable reason for wishing to operate a policy of QT or to increase interest rates, which is the only identifiable reason for it, unless that is the desire of the government, Bank of England or both to:
- i. Reduce growth in the UK economy.
 - ii. Increase unemployment.
 - iii. Increase financial risk.
 - iv. Precipitate an economic crisis.

30. As a consequence of these observations and those in the submission that follows we recommend that:

- a. The APF be maintained at its current value, or be **increased**.
- b. That the current policy of the Bank of England to increase interest rates be reversed. Their current forecast is consistent both with cutting interest rates and/or reversing QT.

- c. That the policy of QT be abandoned.
- d. That a new QE programme of at least £50 billion a year for the next four years replace that QT policy.

31. We make these recommendations because unless they are adopted we fear that financial markets will be unable to finance the purchase of all the UK government bonds offered to them in the next few years without considerable increases in UK interest rates that will be profoundly harmful to the UK economy and the wellbeing of people in the country. The fragility of global financial markets in March 2023 is instructive.

32. As a result, in the interests of financial stability, economic growth, low inflation and stable government finances we believe that QT should be abandoned now.

33. We shall be pleased to provide further evidence to the committee if required or appear before them to give evidence in person if that is their wish.

B. Introduction

34. We note that the House of Commons Treasury Committee has requested written evidence on the following areas⁷:

- a. Have the Bank of England and the Monetary Policy Committee developed an appropriate strategy and framework for quantitative tightening? Are there any successful international or historical examples to follow?
- b. What will be the impact of quantitative tightening on inflation, the economy, households, the gilt market, and the wider financial sector? Are these impacts and any risks around them well understood? Was there an impact from quantitative easing on inequality and will there be any impact of quantitative tightening on inequality?
- c. What estimates are there of the impact of quantitative tightening on inflation and the economy in terms of an equivalent tightening of conventional monetary policy (Bank Rate in the UK)?
- d. What are the fiscal impacts of quantitative easing and tightening? What ways might there be of reducing the fiscal costs forecast to be incurred over the next few years,

⁷ <https://committees.parliament.uk/call-for-evidence/3036/>

and what would be the benefits and costs of doing so? What approach are the US Federal Reserve and the European Central Bank taking to the fiscal impact of quantitative tightening and how and why do they differ from that being taken by the Bank of England?

- e. What lessons should be drawn for the design and operation of any future rounds of quantitative easing and tightening? In particular, are there any suitable ways of reducing the fiscal impacts of any future rounds?
- f. In due course, should the Asset Purchase Facility be fully wound down, and if so, at what point?
- g. What role did quantitative easing, its timing and its interaction with wider economic policy play in the outbreak of double-digit inflation? What effects will quantitative tightening and its timing have on inflation and growth?

35. We also note that in any responses, the Committee would welcome any international comparisons or precedents for these issues.

36. This submission is prepared in response to these requests. Contact details of the authors are supplied in a footnote⁸.

C. Background data

37. Before answering the questions raised by the Committee quantitative easing (QE) and quantitative tightening (QT) need to be set in context.

38. The Bank of England has been a major participant in the market for UK government bonds since 2009, as a result of which by 2021 it owned around one third of all such bonds in issue (£875 billion by market value) as a consequence of its quantitative easing programme.

39. That programme has now, according to the Bank of England, come to an end. It is now, instead, pursuing a policy of quantitative tightening. This means it is now planning to sell the bonds that it acquired under the QE programme back into financial markets in addition to any that the HM Treasury might be planning to sell to fund its anticipated deficits.

⁸ Prof Richard Murphy may be contacted via Richard.murphy@sheffield.ac.uk and on 0777 552 1797. He may be contacted at 33 Kingsley Walk, Ely, Cambridgeshire, CB6 3BZ. Prof David Blanchflower may be contacted at blanchflower@dartmouth.edu.

40. Taking these QE and QT programmes into account average gilt sales are now expected to be as follows:

Table 1

| Period | Net gilt sales £bn | QE / QT £bn | Net gilt sales £bn | Net gilt sales as % GDP pre QE / QT | Net gilt sales as a % of GDP post QE / QT |
|------------------------|-----------------------|----------------|-----------------------|---|--|
| Average 1998 - 2008 | 16.2 | 0.0 | 16.2 | 1.09% | 1.09% |
| Average 2008 - 2020 | 88.3 | -40.2 | 48.1 | 5.05% | 2.72% |
| Average 2020 - 2022 | 245.7 | -196.5 | 49.2 | 10.78% | 2.13% |
| Average 2022 - 2028 | 104.6 | 73.3 | 178.0 | 3.92% | 6.59% |

41. As will be apparent, the planned level of gilt sales prior to taking QE and QT into account in the period 2022 – 2028 are almost double the rate in proportion to GDP of actual gilt sales net of QE / QT during the Covid era and are much above the average for the whole period from 2008 to 2020. When planned QT operations by the Bank of England are taken into account the resulting planned net bond sales are more than three times the level during the QE era and significantly more than double that during the period 2008 – 2020 on average. It is within this context that comment is made in this submission.

D. Have the Bank of England and the Monetary Policy Committee developed an appropriate strategy and framework for quantitative tightening?

42. Before discussing this we think it appropriate to place it within the context of the Bank of England’s introduction of quantitative easing in 2009 based upon the experience of Prof David Blanchflower (DB) as a member of the Bank of England Monetary Policy Committee (MPC) from 2006 to 2009.

43. As a member of the MPC DB voted for asset purchases using quantitative easing in March 2009 (£75 billion) and May 2009 (a further £50 billion). He was present for all the discussions regarding QE and notes the following likely important points on how little was known about QE when it was introduced and especially about how to reverse it:
- a. Bank of England staff were unprepared to do QE even after the failure of the Royal Bank of Scotland and Lloyds Bank in October 2008.
 - b. Importantly, the MPC were not told that these two banks had failed at that time. Blanchflower was never briefed on these bank failures and the fact that they had been rescued either during the remainder of his time on the MPC which ended in June 2009
 - c. The MPC was never asked to decide what assets should be bought using QE or in what amounts even though the MPC authorised such purchases: this was decided by the Governor – and possibly his executive team - although the MPC was never told.
 - d. The Bank apparently had no idea how often to run auctions, how much to buy at any one time, or what to buy or what the impact would be. No evidence of their this was ever presented to the MPC. No evidence was presented either on the likely impacts of a particular asset purchase.
 - e. The Bank was entirely unclear on how QE should end. There was unresolved discussion at the time about whether QE should cease, or assets sold off before interest rates were raised.
 - f. It was and is unclear what the Bank thought that the impact of QE was and is of the large stock of assets that it holds. In particular, it was not clear whether it thought that it was the stock or the change in that stock that was having impact.
 - g. There was no discussion on what to do about reinvesting maturing assets when QE began, and yet this was an issue that would clearly arise if investment was to be made in gilts. The issue was simply not addressed. This was a bigger issue for the US Fed as they purchased shorter term Treasuries and were able to adjust purchases to have differential impacts on the yield curve – Operation Twist. The MPC was not given the option on what was purchased
 - h. Little or no discussion was had on what to purchase other than gilts. A small amount of private corporate bonds were purchased but there was no discussion on any

differential impact. In principle, a central bank could as part of a QE programme buy anything including shares, student loans, mortgages, etc. The MPC did not discuss this issue but should have done. In principle a central bank could buy anything.

- i. The MPC was entirely unclear about when QE should end and when assets should be sold off i.e. about when quantitative tightening should commence, if at all.
- j. Nor was there discussion on the MPC about which assets should be sold off or at what speed and what the impacts would be if and when QT was required.

44. Based on DB's experience we very much doubt that the Bank of England has any idea what the impact of QT will be now.

45. We do however note that the Bank of England has announced⁹ its intention to stop purchasing UK government securities as part of its quantitative easing programme in August 2021. At that time the Monetary Policy Committee said:

The Committee's preference is to use Bank rate as its active instrument in most circumstances

46. They did however add:

There is uncertainty about the impact of reducing the stock of purchased assets on monetary conditions, but the MPC judges that, when conducted in a gradual and predictable manner and when markets are functioning normally, it is likely to be smaller than that of asset purchases.

47. They also said that:

[The MPC] intends that any reduction in the stock of purchased assets would happen in a gradual and predictable manner, so as to prevent disruption to the functioning of financial markets. Overall, although there is inevitably a degree of uncertainty surrounding these judgements, the MPC believes that the impact on monetary conditions of a reduction in the stock of purchased assets in such a manner is likely to be smaller than that of asset purchases on average over the past. That is for two reasons.

⁹ <https://www.bankofengland.co.uk/-/media/boe/files/monetary-policy-report/2021/august/monetary-policy-report-august-2021.pdf>

First, increasing the target stock of purchased assets may have provided a signal about the MPC's aim to loosen the overall stance of policy in the past, depressing the expected path of Bank Rate. In contrast, the MPC would not intend to use its decisions about the process of reducing the stock of purchased assets to signal a need for a higher path for Bank Rate.

Second, asset purchases have, at times, been made during periods of market stress, when their effects tend to be more powerful.

48. They added:

Weighing the above factors together, the MPC intends to begin to reduce the stock of purchased assets, by ceasing to reinvest maturing assets, when Bank Rate has risen to 0.5% and if appropriate given the economic circumstances.

49. They then noted that:

The MPC will consider actively selling some of the stock of purchased assets only once Bank Rate has risen to at least 1%.

50. The Bank of England did allow themselves room for manoeuvre within these boundaries, but this is the closest to a statement of policy on this issue that they have come, which is why we note it here.

51. The Bank of England started the process of quantitative tightening in February 2022 when it began to stop investing the proceeds of redemption of maturing bonds it held into new gilt purchases¹⁰.

52. In September 2022 the Bank of England announced¹¹ that it would begin sale of the gilts that it held, saying on 22 September 2022 (the day before Kwasi Kwarteng's autumn statement) that:

The Bank of England should reduce the stock of UK government bond purchases, financed by the issuance of central bank reserves, by £80 billion over the next twelve months, to a total of £758 billion.

53. This was decided because:

¹⁰ <https://www.bankofengland.co.uk/monetary-policy-summary-and-minutes/2022/february-2022>

¹¹ <https://www.bankofengland.co.uk/monetary-policy-summary-and-minutes/2022/september-2022#:~:text=Bank%20Rate%20should%20be%20increased,total%20of%20%C2%A3758%20billion.>

Consistent with the guidance set out in the minutes of its August meeting, and given that economic and market conditions were judged appropriate, all members of the Committee agreed at this meeting that the Bank of England should reduce the stock of UK government bond purchases, financed by the issuance of central bank reserves, by an amount of £80 billion over the next twelve months, comprising both maturing gilts and gilt sales, to a total of £758 billion.

54. Together these statements can be considered an update of the Bank of England's policy on this issue.

55. In our opinion:

- a. This disjointed collection of statements does not constitute a strategy or framework for quantitative tightening (QT).
- b. The absence of a coherent statement of policy on this issue, available on the Bank of England website, is as a serious omission on its part when forward guidance has been a part of its monetary policy for some time. The risk of misunderstanding and misinterpretation of its policy is considerable as a result and may have contributed to the monetary confusion that followed Kwasi Kwarteng's statement on 23 September 2022, delivered the day after the Bank of England committed itself to £80 billion of QT with the intention of supporting increasing interest rates, which was the precise issue that triggered the LDI pension crisis that month^{12 13}.
- c. The supposed policy adopted is self-referencing: the decision as to when to begin QT was based on a decision to raise interest rates that the MPC of the Bank of England would itself take. As such there was no independent decision criteria on this issue.
- d. The policy is contradictory. The claim was that the policy would not be used to support increasing bank base rates. However, an increase in bank base rates was the trigger for the policy. And as noted on the Bank of England website, in its explanation of QE, the following is said¹⁴:

¹² <https://www.ft.com/content/1da5c955-b6b1-4695-b61b-ef67f859aa3a>

¹³ <https://www.bankofengland.co.uk/news/2022/september/bank-of-england-announces-gilt-market-operation>

¹⁴ <https://www.bankofengland.co.uk/monetary-policy/quantitative-easing>

The process of reversing or 'unwinding' QE, either by stopping reinvestments or selling bonds, is sometimes called 'quantitative tightening', or QT. It raises interest rates and lowers inflation.

It would appear that the Bank of England does think that the policy raises interest rates and yet it says that it would not be used to support that process. It is hard to see how both statements are true. This incoherence is bound to lead to market confusion on this policy, which cannot be afforded if another LDI style episode is to be avoided.

- e. We do not as a result of these observations think that the Bank of England has a strategy or framework for QT but that it does instead have a dogmatic belief that it must reverse QE, the reason for which it has not explained.
- f. Given that so far the Bank of England has gone further with its policy of QT than any other central bank there is little comfort to be found elsewhere on this issue.

E. What will be the impact of quantitative tightening on inflation, the economy, households, the gilt market, and the wider financial sector? Are these impacts and any risks around them well understood? Was there an impact from quantitative easing on inequality and will there be any impact of quantitative tightening on inequality?

56. On their website the Bank of England say¹⁵ that:

The process of reversing or 'unwinding' QE, either by stopping reinvestments or selling bonds, is sometimes called 'quantitative tightening', or QT. It raises interest rates and lowers inflation.

57. We assume in the discussion that follows that this an honest statement of the Bank of England's belief. As a result, we use the criteria established by the Bank of England to test the hypotheses that we are being asked to consider, as a resulting using data to determine whether:

- a. QT will reduce inflation.
- b. QT will increase interest rates.

¹⁵ <https://www.bankofengland.co.uk/monetary-policy/quantitative-easing>

c. QT will have an impact on inequality.

- Will QT reduce inflation?

58. In principle QT should reduce inflation. By withdrawing funds from use within the economy, whether for consumption or investment, QT should create a downward pressure on inflation.

59. However, this need not mean that inflation will fall. If QT reduces inflation and is the reverse of QE then it follows that QE must have been inflationary. In practice, however, there is widespread evidence across many countries that the era associated with QE was also associated with declining rates of inflation. That, however, does not mean that QE produced that outcome. Instead, it countered the deflationary impact of the austerity widely implicit in fiscal policy during this period. It can in fact be argued that maintaining high levels of QE and low interest rates was a policy forced on the Bank by wrong-headed austerity that had no basis in economics. They had to pursue a policy of QE to try to force inflation up to their 2% target rate: without austerity not nearly so much QE might have been required, most especially before 2020.

60. In that case the appropriate question to ask at this moment is whether or not QT complements or challenges current fiscal policy, and therefore whether they will reinforce each other with regard to inflation, or not.

61. At present it would seem likely that QT and fiscal policy will strongly reinforce each other since government fiscal policy is strongly contractionary and is also pushing down on inflation.

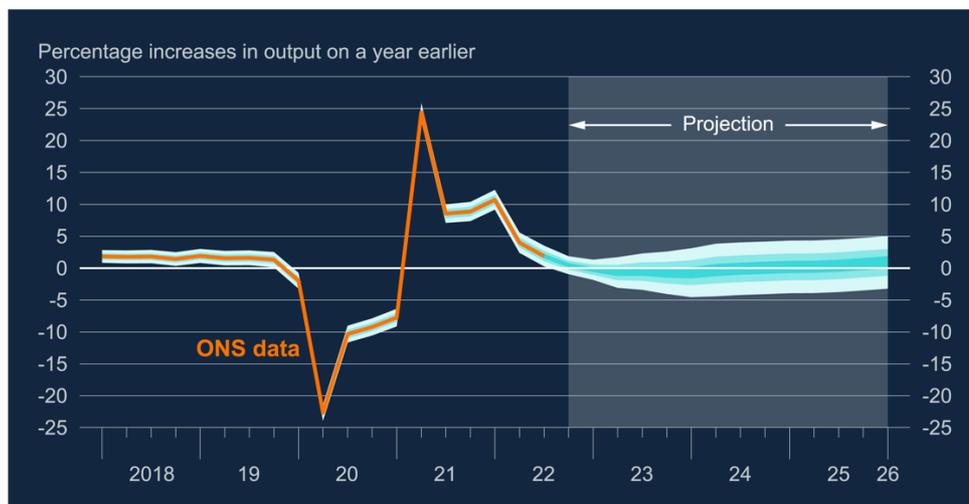
62. This contrasts with the period from 2010-2020 when fiscal policy was tight as a result of austerity. This meant that the Bank of England essentially had no ability to raise rates during this period. Every vote for a rate rise over that period was, therefore, in error. This was also the experience of other countries: Sweden and the ECB tried to raise rates and had to swiftly reverse them. The raising of rates by the Federal Reserve from 2015-2018 was also clearly an error and was reversed.

63. The claims that governments made that fiscal tightening (or austerity) was necessary in this period was based on flawed estimates by Reinhart and Rogoff that suggested that debt to GDP ratios above 90% were growth reducing. These were shown to be entirely false by Thomas Herndon. The claim was based on erroneous data produced as a result of an Excel error. Despite that austerity policies were not reversed and QE had to be maintained. It neutered some of the worst aspects of fiscal policy in this period.

64. In contrast, QT is now being planned when there are relatively high interest rates coupled with a new wave of austerity or deliberate deflationary fiscal contraction. The expectation is that inflation will decline rapidly as all three begin to impact, which QT and BoE interest rate rises are likely to have not done as yet due to timing lags.
65. The risk we now face is that current policies might, in combination, result in both a serious economic downturn and such a significant overshoot on inflation that the rate might fall well below the 2% target and even become negative, as the BoE forecasts concede is possible.
66. What we suggest as a result is that the economic basis for doing QT has not been established by the Bank of England. This is most especially the case when their most recent forecasts are entirely inconsistent with doing QT at all. They are also inconstant with raising rates. What they actually suggest is that cutting interest rates would now make sense whilst QT should be halted rather than increasing it. They may well also be consistent with doing more QE.
67. This opinion requires explanation. What we note is that at the most recent MPC meeting¹⁶ there was a vote of 7-2 to raise rates, for the ninth meeting in a row. The rate was increased to 4%, with two MPC members arguing for no change from the existing rate of 3.5%. At that same meeting the MPC produced forecasts including two charts we note below. The first is for GDP growth. It is by conventional measures devastatingly bad. Approximately no growth at all is forecast for three years with likely seven quarters of (small) negative growth. This is longer than the five quarters of negative growth after 2008.

¹⁶ <https://www.bankofengland.co.uk/monetary-policy-report/2023/february-2023#:~:text=The%20Bank%20of%20England's%20Monetary,percentage%20points%2C%20to%204%25.>

Chart 1 Forecast GDP growth



Source: MPC, as noted in text.

68. As one of us has noted, at turning points of the sort we are now witnessing likely downward revisions to GDP tend to be large, as they were in 2008 (see Blanchflower, 2022). As a result, the likelihood is that the real outcomes over the period for which the BoE MPC has prepared estimates will be worse than they suggest with a much deeper and perhaps even longer lasting recession and even less growth than zero over the coming years.
69. What is certain is that this is an unusual forecast for justifying an interest rate rise. What it suggests is required is an economic stimulus from lower interest rates, looser fiscal policy and, maybe, a return to QE.
70. The second chart that we note from the same MPC meeting is especially astonishing. Instead of forecasting GDP growth it is a forecast of CPI inflation at market interest rates. It is the job of the MPC in its mandate set by the Chancellor to return the CPI to 2% over the forecast horizon. Saying that, it cannot ever do anything about inflation at the present moment as there are lags in the time it takes for any changes in monetary policy to feed through to inflation. In that case the MPC generally is supposed to aim to get inflation back to target within around two years

Chart 2 – Expected inflation rates



71. What this chart shows is that the combination of high interest rates, expected QT and market expectations of both suggests that the MPC thinks:

- CPI will fall rapidly in 2023.
- CPI fall below the target by the end of 2023.
- By 2024 there is a significant probability of deflation.

72. This chart is inconsistent with increasing rates.

73. This chart is also wholly inconsistent with pursuing QT.

74. Instead, interest rates should be cut and QE might be used so that inflation goes up to reach the target at the forecast horizon. It is our suggestion that these forecasts justify rate cuts of at least 100bp immediately with more to come as bad data comes in.

75. Saying this, we emphasise that the MPC's policy to raise rates and move to QT seems entirely wrong-headed, not least because most of the UK's inflation has been caused by external shocks outside the MPC's remit. The right response to the points we note in the following paragraphs was for the MPC not to respond at all.

76. In our opinion, UK inflation in 2021 was caused by:

- Covid reopening without adequate planning created supply chain disruption.
- Bottled up Covid demand created short term excess demand.

- c. Inadequate energy planning for Covid reopening, especially in gas markets, creating speculative price increases by energy companies that were passed on to consumers.

77. These Covid impacts were then followed by:

- a. War in Ukraine.
- b. Disruption of energy markets in the face of anticipated (but not actual, to date) supply shortages as a result.
- c. The economic impact of sanctions.
- d. New Chinese Covid lockdowns disrupting supply chains.

78. In the UK there was also another factor, which was Brexit disruption and costs to supply chains.

79. What did not exist was any evidence that QE created the inflation we have suffered since 2021. Instead, when all these factors could have done so, the suggestion that QE created the inflation we have suffered flies in the face of all the evidence.

80. It is also important to note that inflation is now falling, as we have predicted it would for some time. There should be no great surprise to this. Inflation is a measure of the change in the price of a basket of consumer goods measured over a period of twelve months. This means that prices in a current period are compared with prices of the same basket of goods in a period twelve months previously. As a matter of fact, from March 2023 onwards price comparisons will be made between consumer prices established after the onset of war in Ukraine with other consumer prices from twelve months previously, which process will also have been set after the onset of war in Ukraine. Since that war and its impact upon energy prices has been the single most important cause of inflation in the UK according to the Bank of England, amongst others, it is inevitable that all inflation indices will fall quite rapidly from March 2023 onwards. This is in fact forecast by both the Bank of England and the Office for Budget Responsibility. It should, however, be stressed that this does not mean that real prices will fall. It simply means that the rate of change in prices will decrease, which was always going to be a near mathematical certainty given the singular external shock that war in Ukraine created.

81. Inflation inevitably falls as consumers change their purchase patterns as a result of high prices. If beef rises in price and whelks do not then people buy whelks; substitutions are possible meaning people buy cheaper options. When petrol prices rises people drive less and/or take public transport or buy more fuel efficient cars. The famous Yamarone effect is that when prices rises hit budgets mothers cut their spending on clothes to ensure money is available to buy nappies. Consumers stop buying high

priced goods and simply wait to replace them once the price falls. In fact the natural response to inflation over the last 800 years is that periods of inflation are usually followed by periods of deflation (Blanchflower and Bryson ‘Recession and deflation’, *The Review of Keynesian Economics*, 2023, forthcoming).

82. The main reason why we are now going to see big declines in inflation, as the MPC has also predicted, is also because of base effects created by the external shocks that we have noted are dropping out of the base for its calculation. There is nothing surprising about this: simple understanding of the way in which inflation is calculated and an appreciation of the cause of the recent inflation phenomena make this a forgone and inevitable conclusion in the absence of alternative significant inflationary pressures, which in our opinion do not exist.

83. We note that the same phenomena is being observed in the United States (Blanchflower and Bryson, 2023).

84. This is explained in the table below taken from the ONS¹⁷. Over the last twelve months inflation, as can be seen from the first row, rose from 5.5% in January to 11.1% in October before falling back to 10.1% in January 2023.

85. Inflation is more or less simply the sum of the last twelve monthly changes as reported in rows c and d. Each month one number is dropped and a new one is added; eleven of the twelve numbers are always already known when the inflation rate for a month is announced.¹⁸

Table 2 – CPI rates

| | Jan | Feb | Mar | Apr | May | Jun | Jul | Aug | Sep | Oct | Nov | Dec |
|--------------------------|------|-----|-----|-----|-----|-----|------|-----|------|------|------|------|
| a) CPI 2022 | 5.5 | 6.2 | 7 | 9 | 9.1 | 9.4 | 10.1 | 9.9 | 10.1 | 11.1 | 10.7 | 10.5 |
| b) CPI 2023 | 10.1 | | | | | | | | | | | |
| c) Monthly change 2022 | -0.1 | 0.8 | 1.1 | 2.5 | 0.7 | 0.8 | 0.6 | 0.5 | 0.5 | 2 | 0.4 | 0.4 |
| d) Monthly change 2023 | -0.6 | | | | | | | | | | | |
| e) Average CPI 1998-2020 | -0.6 | 0.4 | 0.3 | 0.4 | 0.3 | 0.1 | -0.2 | 0.4 | 0.3 | 0.1 | 0.1 | 0.4 |
| f) Expected 2023 | 10.1 | 9.7 | 8.9 | 6.8 | 6.4 | 5.7 | 4.9 | 4.8 | 4.6 | 2.7 | 2.3 | 2.3 |

¹⁷ <https://www.ons.gov.uk/economy/inflationandpriceindices/datasets/consumerpriceinflation>

¹⁸ This is something of a simplification as for example the 10.1% in January 2023 is in fact obtained from an index number, which in January 2023 was 126.4. That is then compared to the index number from twelve months earlier of 114.9. The twelve monthly changes reported can be summed and amount to 11.5, but the above approximates to this.

86. In January 2023 a -0.1 was dropped and a -0.6 was added, which with rounding that meant that inflation fell by 0.4 percentage points on the month.
87. Row e shows the average monthly changes for the period 1998-2020 as an illustration of what might well be expected soon. These averages suggest that they reality may well be that numbers come in much lower than those forecast.
88. Row f shows a simulation what would happen if we simply followed these average rates. CPI inflation would be 2.3% by November. There is every reason to believe however that, as occurred in 2008, that some of these numbers will be more negative. For example, from October – December 2008 there were three negative numbers (-.2; -.1 and -.4). If this was replicated inflation would be below 2% by the end of 2023
89. This forecast suggests that the Bank of England is likely to be broadly right: inflation is about to tumble. As a result, there is no justification for raising interest rates now or for a QT programme, but rather the reverse. This supports our contention that interest rates should be cut now and QE should be considered and that the Bank of England has its policy wrong.

- **QT likely means lower interest rates?**

90. The data sources used for the research that follows has been published by the government or its agencies:
- a. HM Treasury's Debt Management Office
 - b. The Bank of England
 - c. The Bank of England Monetary Policy Committee
 - d. The House of Commons Library
 - e. The Office for National Statistics
 - f. The Office for Budget Responsibility
91. Where interpretation has been required this is noted in the relevant section below, but nothing but official sources have been used in the production of this report. A detailed bibliography of sources is attached.
92. Specially, data has been extracted to show:
- a. The gross value of government bonds (gilts) issued by year. The Debt Management Office published this data for all years to 2021/22 covered by this review. Thereafter

the figure has been computed by comparing the forecast public sector borrowing requirement for 2022 – 2028 as published by the Office for Budget Responsibility in November 2022 and the forecast gilt redemptions forecast by the Debt Management Office in March 2022.

- b. The government bonds (gilts) redeemed each year. As all UK government bonds are now issued for a finite period some fall due to be repaid to those persons or institutions owning them every year. The figures for planned redemptions for April 2022 onwards were taken from Debt Management Office forecasts published in March 2022. Figures for earlier years were estimated by comparing the total figure for gilts in issue at the end of each such year as published by the Office for National Statistics in October 2022 with the value of bonds notified as issued by the DMO for each such year as advised by the Debt Management Office in its annual report to March 2022, the difference being assumed to be redemptions.
- c. Net UK government bonds issued have been calculated as the net of gross bonds issued less bonds redeemed in a year.
- d. Quantitative easing data is based on publications by the Bank of England website in December 2022 with allocation to years prior to 2020 being based on data published by the House of Commons Library in 2016.
- e. Quantitative tightening data has been based on Bank of England forward guidance statements. They have said that they wish to reduce the size of their gilt holdings and set a target of an £80 billion reduction in that total holding in the year from September 2023. It has been assumed that this level of quantitative tightening will continue per annum thereafter, but as noted below this assumption is varied in the discussions that follow.
- f. GDP until March 2022 data has been imputed from data in the Office for National Statistics public finances release for October 2022 to ensure consistency with other data used in this exercise. Forecast data from thereon from the Office for Budget Responsibility forecasts issued in November.
- g. CPI data to 2022 is that published by the ONS whilst forecast CPI thereafter has been taken from the OBR forecast of November 2022.
- h. Bank of England base rate data has been extracted from its website.

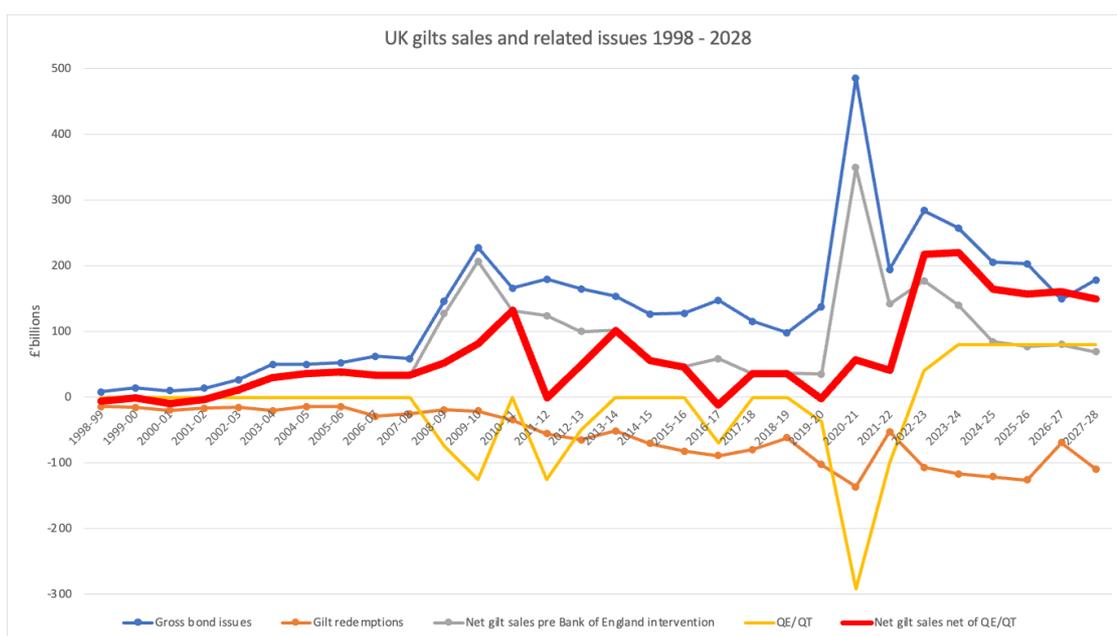
93. Except as noted no other data sources are used in the work.

94. Estimates are not adjusted for inflation as cash flows are being discussed.

95. It is assumed throughout the workings that follow that all gilt redemptions are reinvested in alternative gilt offerings, excepting from 2022 when QT operations change this assumption. The assumption is considered reasonable in London's financial markets.

96. Based upon this date the core finding of the analysis that follows is summarised in Chart 3:

Chart 3 – UK gilt sales and related issues 1998 - 2028



97. The data that supports this chart is in appendix 1. Data sources are as noted in the text.

98. This chart suggests that until 2008 modest gilt sales and steady gilt redemptions led to very low levels of net gilt sales from 1998 until 2002, with only a modest increase thereafter. Given that there were no QE or QT operations in this period net sales before and after such operations were the same and are highlighted by the bold red line on the chart.

99. From 2008 onwards gross gilt sales increased significantly over levels seen before the financial crisis of that year. However, quantitative easing had a significant impact from 2009 onwards and significantly reduced net gilt sales after taking redemptions into account. The result was that in two years (2011-12, and again in 2016-17 when a post-Brexit round of QE took place) there were net negative bond sales in the year.

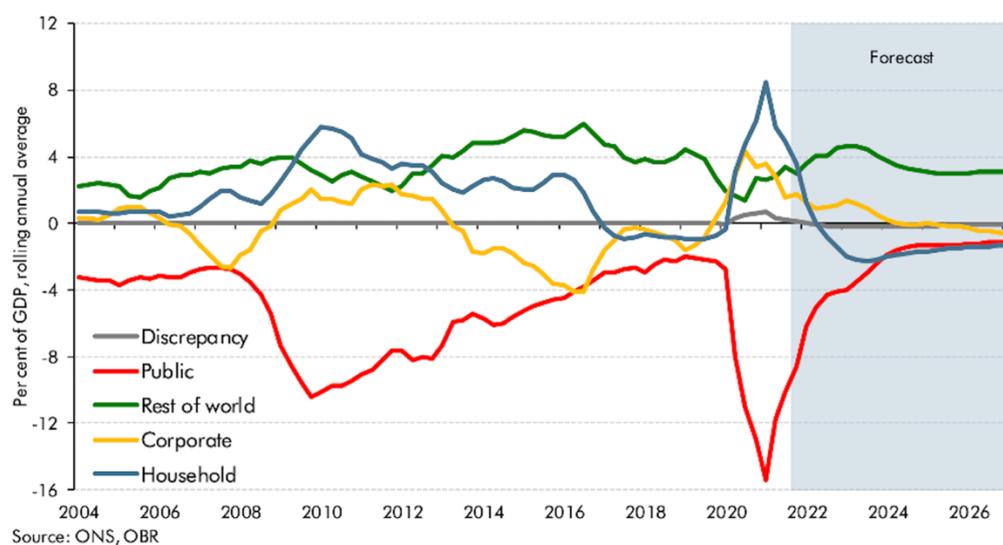
100. The Covid pandemic changed government finances considerably. Despite the claims made by the government that taxpayers paid for this crisis that was not true: gross bond sales did, at previously exceptional levels. However, QE also reached previously unanticipated levels and the net result was that actual borrowing in the two crisis years of 2020-21 and 2021-22 was an average of £49.2bn per annum, which compared favourably with the average net borrowing of £48.1 billion per annum from 2008 to 2020.
101. The exceptional period on the chart is the data for the period from April 2022 onwards. Driven by exceptional costs arising from government financial support to consumers and businesses resulting from the energy price crisis that developed as a consequence of the war in Ukraine that began in February 2022 the UK government deficit was forecast to increase in 2022-23 to £177bn, which is also assumed to be the value of net gilt sales in that year.
102. That deficit is forecast to fall after 2020-23, but average gilt redemptions from 2022 to 2028 at £108.2bn per annum are expected to be much higher than the average of £61.1 billion per annum from 2008 to 2020.
103. On top of the resulting higher than historically experienced levels of net gilt sales, the impact of QE is expected to disappear in this period (an odd exception to support solvency in financial markets in October 2022 being noted). That is because the Bank of England has announced its intention to commence active quantitative tightening operations. Passive quantitative tightening began in February 2022 when the proceeds of gilt redemptions in the portfolio held by the Bank of England ceased to be reinvested in gilts as they occurred. These combined quantitative tightening impacts are forecast by the Bank of England to be at the rate of £80 billion in the first year of that exercise and have been forecast for this exercise at the same rate each year thereafter. If that happens, then average bond sales that the financial markets will be expected to fund from 2022 until 2028 will average £178 billion per annum, which is an unprecedented sum.
104. Only in the years 2010-11 and 2013-14 have financial markets been expected to fund more than £100 billion in a year in net bond issues, and the first was almost immediately followed by significant quantitative easing. From 2022 onwards anticipated net gilt sales exceed £200 billion in some years and are £178 billion on average in the period 2022 - 2028.
105. The UK government's ability to fund its borrowing depends on what are called the sectoral balances. Sectoral balance analysis works on the basis of the accounting

identity that suggests that all borrowing must be matched by lending. If this were not the case then the principle on which double entry bookkeeping operates, which suggests that for every transaction within the economy there is a reaction, would cease to be true and there are as a matter of fact no known exceptions to this rule.

106. It follows that if the government is to borrow then there must be people willing to lend to it, albeit that those who think they are making those loans to the government are savers who think they are buying savings products (gilts and NS&I products) issued by the government.

107. The Office for Budget Responsibility usually publishes sectoral balance data with budgets and Autumn Statements. Unusually, it did not do so in November 2022. The last sectoral balance data available is from March 2022 as a result¹⁹. The forecast then was as follows:

Chart 4 – Sectoral net lending



Source, Office for Budget Responsibility, March 2022

108. It will be noted that at the time it was forecast that government borrowing would decline, considerably; that households would borrow more and then continue to do so; corporations would have a broadly net situation, and the funding for both UK household and government borrowing would come from net inflows into UK sterling savings from the overseas sector.

¹⁹ <https://obr.uk/download/economic-and-fiscal-outlook-march-2022/>

109. This forecast is clearly inconsistent with what is now known about the UK government's borrowing requirements. In March 2022 these were forecast to be £369 billion between 2022-23 and 2026-27. By November 2022, as the following table issued in November 2022 shows, the forecast had grown by £420 billion to £789 billion at an average of £158 billion per annum. This is a sum larger than the deficit contribution noted in Chart 3 which is £558bn for the same period, which sums cannot be reconciled using available data, but suggests that if anything the data used in this note might be conservative.

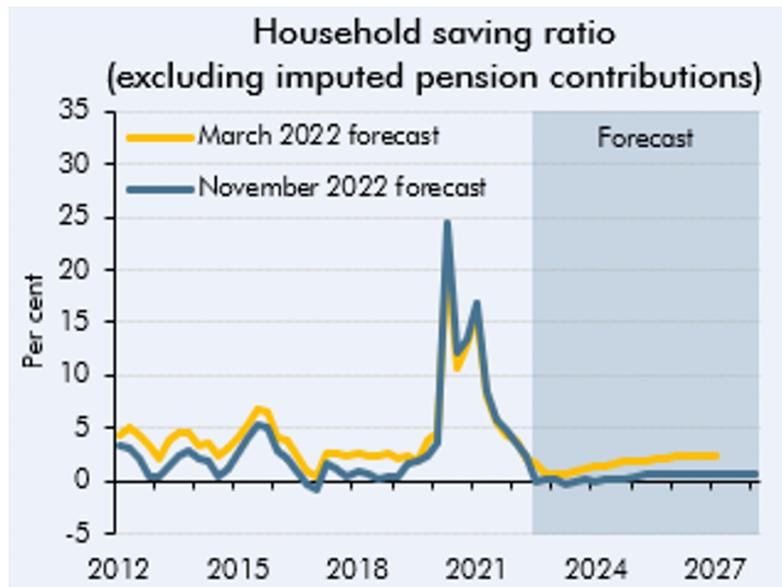
Table 3 – Public sector net debt (excluding Bank of England): changes since March 2022

| | Per cent of GDP | | | | | | |
|---|-----------------|--------------|--------------|--------------|--------------|--------------|---------|
| | Outturn | Forecast | | | | | |
| | 2021-22 | 2022-23 | 2023-24 | 2024-25 | 2025-26 | 2026-27 | 2027-28 |
| March 2022 forecast | 82.5 | 83.5 | 82.9 | 81.9 | 80.9 | 79.8 | |
| November 2022 forecast | 84.3 | 89.9 | 95.9 | 97.2 | 97.6 | 97.6 | 97.3 |
| Difference | 1.9 | 6.4 | 13.0 | 15.3 | 16.6 | 17.7 | |
| <i>of which:</i> | | | | | | | |
| Difference in nominal GDP ¹ | 0.1 | 1.5 | 3.1 | 3.2 | 3.4 | 3.1 | |
| Difference in cash level of net debt | 1.8 | 4.9 | 9.9 | 12.0 | 13.3 | 14.6 | |
| <i>Memo: PSND including Bank of England</i> | 97.4 | 101.9 | 106.7 | 105.8 | 101.7 | 100.0 | 99.3 |
| | £ billion | | | | | | |
| March 2022 forecast | 2,011 | 2,145 | 2,218 | 2,274 | 2,329 | 2,382 | |
| November 2022 forecast | 2,054 | 2,270 | 2,473 | 2,595 | 2,695 | 2,802 | 2,903 |
| Difference | 43.3 | 124.6 | 255.4 | 321.2 | 366.3 | 420.1 | |

Source: Office for Budget Responsibility, November 2022

110. What is also known from the November 2022 Office for Budget Responsibility forecast is that the household savings ratio over the forecast period is expected to be close to zero i.e. no net savings are expected, after exceptional savings during the Covid period:

Chart 5



Source: Office for Budget Responsibility, November 2022

111. Assuming no net corporate savings either (as is likely in a recessionary environment) and the implication is that all the net borrowing indicated in Chart 3 might have to come from overseas sources.
112. As a result, what this data makes clear is that the current government is forecasting that it will borrow, before either QE or QT are considered, at unprecedented rates over the next few years, which period will include almost the entire lifetime of the next parliament and whichever government is then in office. Average borrowing over this period before QE or QT are taken into account is likely to exceed £100 billion a year and is greater than in any past period. Even allowing for the impact of inflation, which the OBR forecasts suggest will be close to zero by 2024 and modest thereafter (see Chart 4, below), the result will be an unprecedented demand for government borrowing from financial markets during this period unless action is taken to address this issue.
113. That impact will likely include these effects:
- a. Sustained, higher than otherwise required levels of Bank of England base rate to maintain a sufficiently high interest rate environment to attract foreign funds into UK government bonds;
 - b. Loosening of financial regulations to allow London to become (once again) the epicentre for 'hot' funds of questionable origin, cementing its reputation as a tax

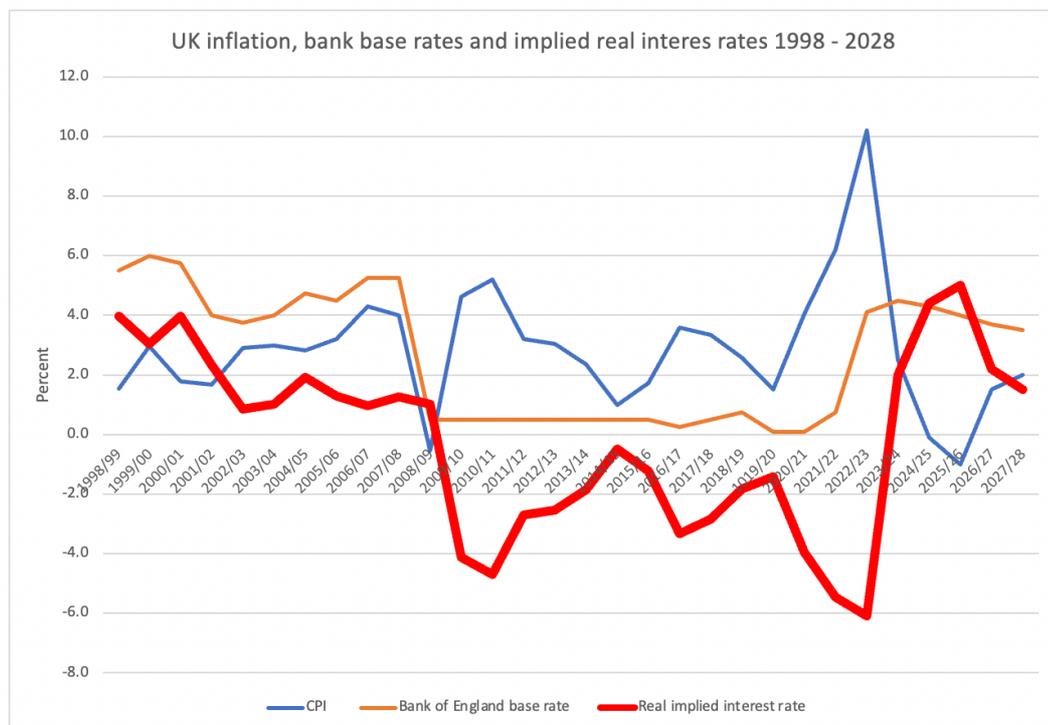
haven and creating conditions potentially similar to those that existed prior to the 2008 financial crash;

- c. Significant and continuing downward pressure on government spending plans to try to keep borrowing within indicated levels whatever the resulting impact on society. Austerity will become endemic, in other words.

114. If the Bank of England were to pursue its plan for quantitative tightening these problems would become very much worse. This is exacerbated by the fact that there is, based on the data noted, no apparent capacity for the Bank of England to seek to sell further bonds into a financial market when those markets' net willingness to provide funding to the government at interest rates that are sustainable for the rest of the economy may be limited.

115. This last point might explain the extraordinarily high net positive real rates of interest forecast by the Office for Budget Responsibility at present, which are as shown in Chart 6 which compares forecast Bank of England base rates with forecast CPI inflation rates:

Chart 6



Sources as noted in text, author calculations

116. These movements in interest rates, showing 2022 – 23 in isolation because of the exceptional inflation in that single year can be summarised as follows:

Table 4 – Real interest rates

| | CPI | Base rate | Real interest rate |
|---------------------|------|-----------|--------------------|
| Average 1998 - 2008 | 2.8 | 4.9 | 2.1 |
| Average 2008 - 2020 | 2.6 | 0.5 | -2.2 |
| Average 2020 - 2022 | 5.1 | 0.4 | -4.7 |
| 2022-23 | 10.2 | 4.1 | -6.1 |
| Average 2022 - 2028 | 1.0 | 4.0 | 3.0 |

Sources, as noted in text

117. Whilst not stated, the assumption behind this projection must be that the only way in which the exceptional rate of gilt sales, noted previously, can be sustained is by paying exceptional real interest rates to those who might acquire those bonds, many of whom will come from outside the UK.

118. The impact of these rates on households with high levels of personal debt, and most especially on households with mortgages, are impossible to overstate: in many cases these households will have unaffordable borrowing if persistent high net positive real interest rates persist at, or above, the rates noted in Chart 6, which data is summarised in appendix 2 to this note. As a consequence, high levels of personal bankruptcy might result. This in turn might lead to mortgage default and a potential banking crisis. Those seeking to rent domestic accommodation as an alternative will not find matters any better: many landlords borrow heavily to buy their property portfolios and consequently they tend to pass on rising interest costs to their tenants by way of increased rents. Those living in rental accommodation are likely to face crises of affordability as a result.

119. The impact of these high interest rate costs is likely to be seen beyond the housing market:

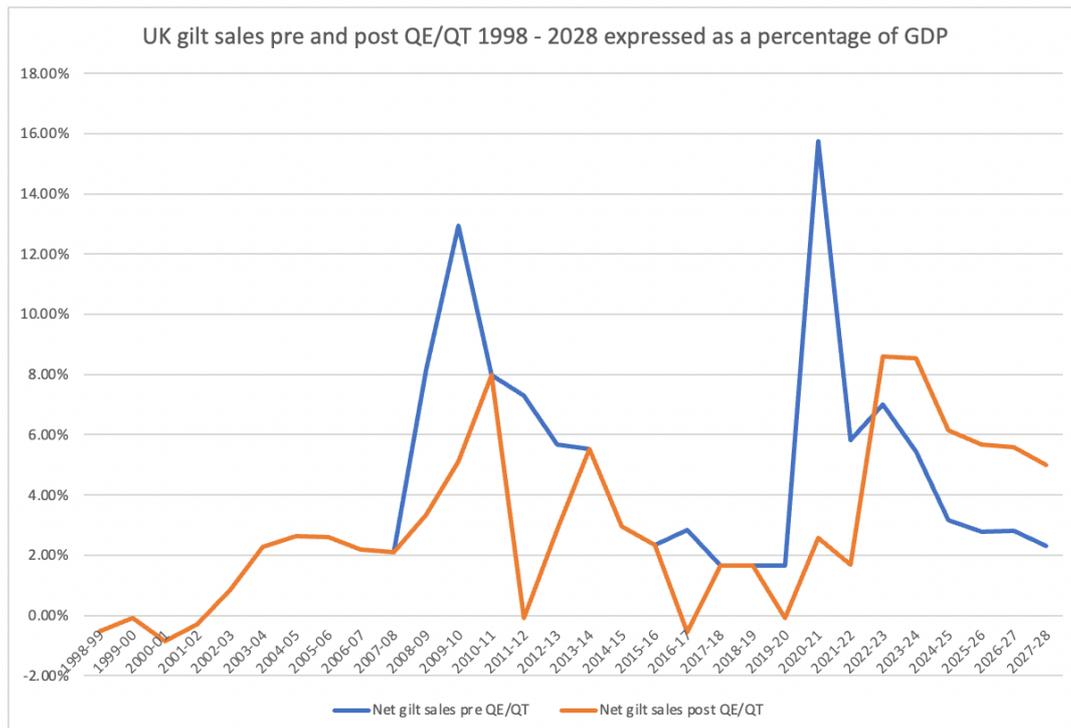
- a. Indebted households will have little or no capacity to spend on consumer goods beyond those required to sustain themselves, with significant recessionary impact on

the rest of the economy, and most especially the retail, leisure and hospitality sectors.

- b. The cost of business investment will be high. Overall rates of UK business investment were low even when interest rates were maintained at low levels from 2009 to 2021. They are now likely to fall further still, also contributing to a recessionary environment.
- c. In a recessionary environment the likelihood that government taxation revenues can be maintained at the levels forecast by the Office for Budget Responsibility in November 2022 is reduced.
- d. If governments seek to equate current (i.e. non-investment related) expenditure with taxation revenues either in a financial year or over a limited number of years, as is the currently stated aim of both the UK's leading political parties, then significant downward pressure on government expenditure will result.
- e. The consequence is likely to be a sustained recession in a situation where public services are failing.

120. The aberrational nature of what is forecast is emphasised by Chart 5:

Chart 7



Sources: as noted in text

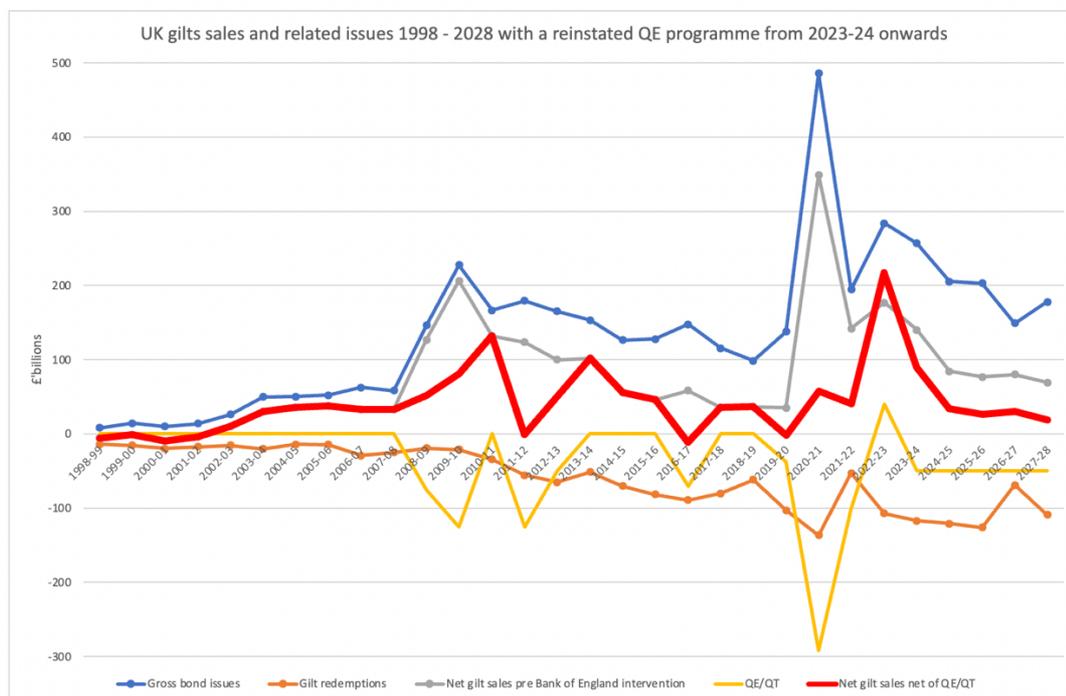
121. The persistent level of gilt sales forecast for 2022-23 onwards is unlike anything previously noted when expressed as a percentage of GDP. There is no evidence that this level of sales is sustainable if QT takes place as currently planned, and maybe in any case given the state of the economy
122. There are several ways in which the potential economic crises that the noted planned level of gilt sales might give rise to can be averted.
123. Firstly, and most obviously, the Bank of England could be instructed to end its quantitative tightening programme, whose sole purpose would appear to be to support high interest rates when the economy has no need of these and they are, instead, economically destructive. This however, may be seen as impacting the Bank's independence. There are major issues though of groupthink which need to be overcome (Blanchflower, D. and A. Levin, (2023) 'Fostering diversity of views in monetary policymaking', *Finance & Development*, IMF, March.
124. Secondly, the Bank of England could be instructed to reduce its bank base rates at the first possible opportunity²⁰. Given that the increased interest rates now being

²⁰ The Chancellor has the tacit ability to do this backed by the powers in s19, Bank of England Act 1998 to over-rule the Bank's decisions

promoted by the Bank of England are not required to address the inflation we are suffering, whose origins are in Covid supply chain disruption and energy and food price disruption created by war in Ukraine, both of which have occurred wholly outside the UK, this decrease would have little or no impact on UK inflation rates. These rates are, in any case, forecast by the OBR to fall to around zero or below by early 2024 as a likely consequence of the mathematical methods used to calculate inflation indices.

125. Third, given that the situation now faced by the UK has been created by war, and as a result the likely impact of some energy price increases will continue for some time, the current economic situation should be considered as aberrant as were the conditions in 2008 and 2020 and the use of QE to support government spending whilst simultaneously keeping interest rates low must be considered. A QE programme of £50bn a year could transform the borrowing outlook of the UK government and leave averaging anticipated borrowing at rates broadly consistent with those of the last fourteen years. Chart 9 demonstrates the impact of replacing the QT programme with a QE programme of £50 billion per annum, from 2023-24 onwards.

Chart 9



Sources as noted in text, with a QE programme of £50 billion pa substituted for the Bank of England proposed QT programme of £80bn pa from 2023-24 onwards

126. As is clear from the highlighted red line, net gilt sales to financial markets fall to the levels with which they are familiar if this QE programme is put in place. As a result interest rates could also be reduced, considerably, and most of the stresses in the UK economy could be removed as a result, with a stable economic environment being created, all as a result of this single change in policy.

127. In summary, there is compelling evidence that QT will create significant upward pressure on UK interest rates that will as a result move well out of the range to which the UK economy is used over the last decade or more with potential significant adverse consequences that we suggest should be avoided. A renewed programme of QE could achieve this goal and deliver stability for UK financial markets as a result.

- Will QT have an impact on inequality?

128. The governments preferred measure of inequality is the Gini index. It does, however, relate to income inequality and the issue of greatest concern with regard to inequality arising from QE is with regard to wealth.

129. The most recent work that we have undertaken with regard to wealth in the UK covers data published by the Office for National Statistics²¹ to 2020. There is no more recent data available. Data to support the analysis that follows also relies on GDP and GDP deflator²² data from the Office for Budget Responsibility²³.

130. Using this data, the following comparisons of wealth from the period when quantitative easing began to the latest date when information is available in 2020 can be made:

Table 5

£ billion, and percentage

| Aggregate wealth (£ billions) | July 2008 to June 2010 | April 2018 to March 2020 | Growth from 2010 to 2020 | Percentage growth |
|--|---------------------------------------|---|---|------------------------------|
| Property Wealth (net) | 3,379 | 5,458 | 2,079 | 61.5% |
| Financial Wealth (net) | 1,093 | 1,933 | 840 | 76.9% |
| Physical Wealth | 1,016 | 1,385 | 369 | 36.3% |
| Private Pension Wealth | 3,459 | 6,445 | 2,986 | 86.3% |
| Total Wealth (including Private Pension Wealth) | 8,946 | 15,221 | 6,275 | 70.1% |
| Total Wealth (excluding Private Pension Wealth) | 5,488 | 8,776 | 3,288 | 59.9% |
| GDP | 1,594 | 2,139 | 545 | 34.2% |
| Total wealth restated in 2020 prices | 10,614 | 15,221 | 4,607 | 43.4% |
| GDP restated in 2020 prices | 1,891 | 2,139 | 248 | 13.1% |

131. The increase in gross wealth noted is at almost exactly double the rate of growth in nominal GDP. When adjusted by the GDP deflator to eliminate the impact of changing prices the difference is even more stark.

²¹

<https://www.ons.gov.uk/peoplepopulationandcommunity/personalandhouseholdfinances/incomeandwealth/datasets/totalwealthgreatbritain>

²² GDP deflator data is the broadest measure of inflation produced by the Office for National Statistics and covers much more than consumer prices and is, therefore, best suited for this analysis.

²³ <https://obr.uk/download/public-finances-databank-january-2023/?tmstv=1677229972>

132. What is apparent is that wealth in the UK grew much more during the second decade of the 21st century than did income. When we know that 39.6% of all UK wealth belongs to the top 10% of wealth holders²⁴ and 60.7% to the top 20% it is apparent that this gain will be very heavily biased towards the well off in UK society and so will have increased inequality.

133. The question then arises as to whether this had anything to do with quantitative easing? The Bank of England says on its website²⁵:

When we buy bonds, their price tends to increase compared with the coupon. If the price of a bond goes up, compared with its coupon, the rate of return on the bond, or 'yield', goes down.

134. They then add:

QE increases the price of financial assets other than bonds, such as shares.

135. After this they note:

lower government bond yields feed through to lower interest rates on household mortgages.

136. It is known that there is an inverse ratio between mortgage rates and house prices, which have inflated considerably during the Covid era, as the wealth data shows.

137. It can, therefore, be unambiguously concluded that quantitative easing did increase inequality in the UK.

138. The question to then be asked is whether this process is reversed by quantitative tightening? It would be simplistic to think that this is the case. Whilst it is the case that government bond prices have been reduced (by around 12% on average) by increasing interest rates, the FTSE 100 has not been impacted in that way and is now at record high levels. Those in that market do not appear to have noticed the likely impact of QT. House price increases are also declining in rate but have yet to turn negative in the UK.

139. If markets are rational and have noted that QT is to happen and they have accurately priced that fact then we conclude that it appears that it will not have much

²⁴

<https://www.ons.gov.uk/peoplepopulationandcommunity/personalandhouseholdfinances/incomeandwealth/bulletins/totalwealthgreatbritain/april2018tomarch2020>

²⁵ <https://www.bankofengland.co.uk/monetary-policy/quantitative-easing>

impact on wealth inequality, if any at all based on these current facts. This is likely to be because even at £80 billion a year the reversal process will have a much smaller and so slower rate of impact on asset valuation than the QE programme did when it was delivered in large, intense bursts of activity.

140. Much more important is the impact of QT on income. This cannot be known as yet simply because there is no known experience of this around the world. We do, therefore, have to speculate on this. Doing so we note that:
- a. For reasons previously noted, there is no reason to think that QT will necessarily reduce inflation when the evidence is that QE does.
 - b. For reasons previously noted, there is no reason to think that QT will keep interest rates low when QE does. This assumption is supported by official forecasts, as noted, which suggest QT will support significantly increased interest rates in the UK economy.
 - c. QT is designed to withdraw money from circulation within the economy, in contrast to QE, which was designed to do the exact opposite. As a result QE was predicted to increase the rate of investment over that which would otherwise arise. It is reasonable in that case to assume QT will do the opposite.
141. There are a number of implications that arise from these observations:
- a. A reduction in investment directly reduces GDP. This tends to reduce productivity and so restricts the growth in wages in the economy, generally at cost to those who work for a living rather without necessarily reducing the return to capital, at least in the shorter term.
 - b. An increase in interest rates increases government spending on interest payments, which has been observed over the last year of more. If a government tries in that situation to maintain government spending in total the consequence is austerity with regard to other measures, reducing wages for those working for the state and reducing state benefits in real terms.
 - c. Increases in interest payments by the state reallocates the benefit of state spending from those who work for a living or who are on state benefits towards those who have wealth from which interest is earned. This has direct implication for inequality since this redistribution of the benefit of government spending

tends to be from those on low income to those with wealth, thereby increasing inequality as a result.

- d. The broader implications of high interest rates within the economy reinforces this trend because:
 - i. The cost of mortgages increases.
 - ii. The cost of unsecured borrowing increases.
 - iii. Rents tend to rise as they closely follow mortgage costs as many buy-to-let landlords are heavily geared and they seek to pass their increased costs on.
 - iv. These factors, in combination, tend to reduce the disposable income of those with borrowing, who tend to be amongst younger people and lower income earners. This will increase inequality.
 - v. The rate of defaults on borrowing tends to rise with increased interest costs, putting individuals and households in financial jeopardy, including the loss of their homes, whilst also imposing higher costs for credit in future.
 - vi. Reduced disposable income hits the income of those sectors where discretionary spending is highest, including the retail, hospitality and leisure sectors who tend to employ above average numbers of lower paid employees, putting these employments at risk.
 - vii. The cost of borrowing for small and medium sized enterprises increases resulting in a) downward pressure on wages of those employed by them, who already tend to be on lower-than-average wages b) increased risk of people being made redundant c) increased risk of business failure d) increased risk of debt default e) consequential further reductions in demand within the economy.
- e. There is also a risk of higher inflation resulting from the upward redistribution of income and wealth within the economy. If the economy slows those with increased means might compete prices for those commodities that are increasingly short supply as a result, having the perverse consequence that inflation might rise as the economy stagnates due to high interest rates.

142. We stress that these comments are speculative. We also make clear that they are based on usually observed economic reactions to the situations that we note QT might give rise to or which can be predicted as a result of it. What we can conclude is that QT is likely to increase inequality rather than reduce it. QT is not in any way the reverse of QE in that case because it has impact on incomes whereas QE had impact on wealth.

F. What estimates are there of the impact of quantitative tightening on inflation and the economy in terms of an equivalent tightening of conventional monetary policy (Bank Rate in the UK)?

143. We have provided our own best estimates in answer to this question in the preceding section and have nothing further to add here.

G. What are the fiscal impacts of quantitative easing and tightening? What ways might there be of reducing the fiscal costs forecast to be incurred over the next few years, and what would be the benefits and costs of doing so? What approach are the US Federal Reserve and the European Central Bank taking to the fiscal impact of quantitative tightening and how and why do they differ from that being taken by the Bank of England?

144. We refer you to our observations already made. However, it must be said that there is no evidence whatsoever in the United States that the federal government is engaged in ill-considered austerity as it is in the UK. In the UK from 2010 to 2020 QE had to counteract the misguided policy of austerity which slowed the economy. This meant it was essentially impossible to raise rates. Monetary stimulus was crucial to counteract – in our view - misguided deflationary fiscal policy.

145. We summarise the case for QE as being:

- a. QE provides a monetary stimulus when that is required: it disguises the injection of newly created government money into the economy in counter-cyclical fashion at a time of economic crisis. When you can't cut the price of money at the ZLB then you have to raise the quantity of money. Moreover, the ZLB has not been as critical as perhaps as had been expected as some central banks, excluding BOE and the Fed, have gone negative including ECB, and central banks of Japan and Sweden.

- b. QE when used appropriately is likely to sustain national income, employment and investment in an environment of falling inflation and low interest rates.
 - c. QE can be used to target investment for socially desirable purposes, although to date this capacity has been little utilised.
 - d. QE maintains employment incomes when they might be threatened by unemployment or underemployment.
146. The case against QE is that it increased wealth inequality in a way that has been harmful to society and this has led to unfortunate social reaction and tension within society, including the voter backlash that likely led to Brexit. Asset holders benefited at the expense of those who didn't hold assets.
147. We cannot find a case for QT at this moment and cannot as yet imagine one arising.
148. The case against QT is:
- a. It is being undertaken in a recession at the same time as fiscal policy is slowing the economy. Keynes taught that the government should not take money out of the economy in a recession.
 - b. Increased interest rates might mean the redirection of government expenditure from essential public services to debt servicing. This need not be the case, but in an environment where it is thought desirable to cap government spending as proportion of GDP this is likely.
 - c. Increased interest rates will reduce the household disposable income of the most vulnerable people in the country.
 - d. Higher interest rates are likely to result in rising unemployment. They have already caused house prices to fall and mortgage applications to decline.
 - e. Increased interest rates are likely to increase the rate of business failures.
 - f. QT will reduce liquidity within the economy at a time of financial risk, increasing the risk of economic crises arising.
 - g. QT may increase the rate of inflation in the country contrary to theoretical expectation.

h. QT will almost certainly increase inequality in the UK.

149. Fiscal costs can be reduced by operating a policy of low interest rates and by introducing further rounds of QE to handle the economic crises we now face and provide the funds for investment in sustainability now required with the UK economy. We recommend both courses of action.

150. In view of the length of this submission we do not offer comment on US Federal Reserve or European Central Bank policy here but note that both are much more appropriately cautious in their approach to this issue than the Bank of England appears to be. If you wish for further comment from us we shall be pleased to provide it.

H. What lessons should be drawn for the design and operation of any future rounds of quantitative easing and tightening? In particular, are there any suitable ways of reducing the fiscal impacts of any future rounds?

151. QE proved that in a modern fiat money economy a central bank could create the money required to avert a financial crisis, stabilise the banking sector by providing it with the liquidity it needed and inject the counter-cyclical funding an economy required to maintain employment when that was at risk, and that it could do all this in a low inflation / low interest rate environment. No evidence has yet challenged these conclusions.

152. QE failed to prevent a growth in inequality within the economies in which it was used, including within the UK, because the funds it injected into the economy were made available to the financial services sector, and most especially banks, to invest. In the tradition of UK banking they used those funds for property backed lending, which fuelled house and land prices, and for speculation rather than investment. As this submission has noted, financial wealth grew as a result, but real investment in the economy did not. Recent evidence suggests that the UK's level of investment is amongst the very lowest in the OECD²⁶. The failure to deliver investment revealed a weakness in the QE policy.

153. If QE was to be redesigned to address this weakness the required course of action would be for the funds it injects into the economy to be routed via a national investment bank tasked with the delivery of a national investment programme to build a

²⁶ [https://www.theguardian.com/uk-news/2023/jan/25/north-england-would-rank-second-worst-investment-oecd-country#:~:text=Researchers%20have%20calculated%20overall%20levels,north%20of%20England%20\(38\).](https://www.theguardian.com/uk-news/2023/jan/25/north-england-would-rank-second-worst-investment-oecd-country#:~:text=Researchers%20have%20calculated%20overall%20levels,north%20of%20England%20(38).)

sustainable future for the UK economy. There is no reason why such a policy could not be designed and implemented. If further evidence is required on how to achieve this goal we shall be happy to supply it on request.

154. We can find no reason to undertake QT and cannot therefore suggest reform to the QT programme except to suggest its abandonment for all the reason noted in this submission.

I. In due course, should the Asset Purchase Facility be fully wound down, and if so, at what point?

155. If the Bank of England Asset Purchase Facility (APF) were to be unwound all the UK government bonds or gilts now owned by it would be sold back into UK financial markets.

156. We can see no reason for a policy of QT or for winding down the APF because:

- a. There is no evidence that UK or other financial markets have the capacity to absorb the sale of more than £800 billion of UK government gilts either now or in the future without:
 - i. Significantly increasing in UK interest rates with all the harmful consequences already noted in this submission.
 - ii. Severely limiting the ability to sell new government bonds, which would result in the imposition of a period of prolonged UK government austerity, and which might also significantly reduce the capacity of the UK government to invest, damaging the infrastructure of the economy on which the private sector depends and also leaving the country at risk of breaching its net-zero obligations.
 - iii. Severely reducing the funds available within central bank reserve accounts held by the UK's commercial banks with the Bank of England upon which balances the smooth operation of the UK banking system is now almost wholly dependent.
 - iv. Creating a recessionary economic environment which might, because of prolonged austerity, high interest rates and potentially high inflation have the risk of becoming a depression.

- v. Creating substantial social stress and potential disorder within the UK.
 - vi. There is every reason to believe that winding down the APF might well put the UK into a severe depression.
- b. There is no identifiable reason for wishing to operate a policy of QT or to increase interest rates, which is the only identifiable reason for it, unless that is the desire of the government, Bank of England or both to:
- i. Reduce growth in the UK economy.
 - ii. Increase unemployment.
 - iii. Lower real wages
 - iv. Increase financial risk.
 - v. Precipitate an economic crisis.
- c. There is no known reason why the APF cannot continue as it is or be expanded. Japan provides clear evidence that this is the case.
- d. The costs of keeping a large stock of government owned assets is relatively cheap.
- e. We are aware that those promoting the reduction in the scale of the APF do so because they claim that:
- i. QE has over-promoted the role of the state within the economy. This is not true. The financial crisis of 2008 and the Covid crisis of 2020 did that. The post-Ukraine war crisis of 2022/23 now requires further government action for the same reasons.
 - ii. Governments should not finance their activities by money creation, which is what QE permits. Since, however, government money creation has existed in the UK since 1694 when the national debt was created (which broadly speaking represents net cumulative government money creation) and so far no harm appears to have arisen as a result we think this an argument that is hard to support.

- iii. QE might lead to the crowding out of private sector investment. Since, however, the hundreds of billions created by QE to date that was then made available to commercial banks has not resulted in that private sector investment we cannot see how that argument is sustainable.
- iv. QE might over-inflate the size of the state. We note the current crises in many public sector services that cannot meet demand within the UK economy and suggest that if anything the state might be too small at present as a result.
- v. QE is inflationary. We have already noted that was the point of QE – in the first place to counteract the shock to the economy from a global financial crisis. It was designed to raise asset prices which it did. That hit the UK especially hard because of its large financial sector. Subsequently QE had to continue to create inflation as government fiscal policy was disinflationary. Without QE deflation was the danger.

157. Based on this analysis we can see no reason why the APF should not be maintained as it is already or be expanded as we note might be required in this submission given the non-existent growth being forecast by the Bank of England itself and other international institutions such as the IMF. We are quite sure that there is no rational economic case for its elimination.

158. At a time of austerity in the UK, uncertainty in global financial markets and slowing economies, with markets pricing in rate cuts, this is, in our view, unequivocally not the time for QT.

Appendix 1

Data supporting Chart 3

| Year | Gross bond issues | Gilt redemptions | Net gilt sales | QE / QT | Net gilt sales | GDP | Net gilt sales as % GDP pre QE / QT | Net gilt sales as a % of GDP post QE / QT |
|---------|-------------------|------------------|----------------|---------|----------------|---------|-------------------------------------|---|
| | £bn | £bn | £bn | £bn | £bn | £bn | % | % |
| 1998-99 | 8.2 | -13.8 | -5.6 | 0.0 | -5.6 | 1,034.5 | -0.54% | -0.54% |
| 1999-00 | 14.4 | -15.4 | -1.0 | 0.0 | -1.0 | 1,087.1 | -0.09% | -0.09% |
| 2000-01 | 10 | -19.8 | -9.8 | 0.0 | -9.8 | 1,137.8 | -0.86% | -0.86% |
| 2001-02 | 13.7 | -17.1 | -3.4 | 0.0 | -3.4 | 1,176.5 | -0.28% | -0.28% |
| 2002-03 | 26.3 | -15.5 | 10.8 | 0.0 | 10.8 | 1,243.1 | 0.87% | 0.87% |
| 2003-04 | 49.9 | -20.1 | 29.8 | 0.0 | 29.8 | 1,309.1 | 2.27% | 2.27% |
| 2004-05 | 50.1 | -13.8 | 36.3 | 0.0 | 36.3 | 1,379.9 | 2.63% | 2.63% |
| 2005-06 | 52.3 | -14.3 | 38.0 | 0.0 | 38.0 | 1,456.0 | 2.61% | 2.61% |
| 2006-07 | 62.5 | -29.1 | 33.4 | 0.0 | 33.4 | 1,524.8 | 2.19% | 2.19% |
| 2007-08 | 58.5 | -25.1 | 33.4 | 0.0 | 33.4 | 1,594.2 | 2.10% | 2.10% |
| 2008-09 | 146.5 | -19.4 | 127.1 | -75.0 | 52.1 | 1,557.8 | 8.16% | 3.35% |
| 2009-10 | 227.6 | -21.1 | 206.5 | -125.0 | 81.5 | 1,594.4 | 12.95% | 5.11% |
| 2010-11 | 166.4 | -34.5 | 131.9 | 0.0 | 131.9 | 1,650.9 | 7.99% | 7.99% |
| 2011-12 | 179.4 | -55.7 | 123.7 | -125.0 | -1.3 | 1,698.2 | 7.29% | -0.07% |
| 2012-13 | 165.1 | -65.0 | 100.1 | -50.0 | 50.1 | 1,762.6 | 5.68% | 2.84% |
| 2013-14 | 153.4 | -51.5 | 101.9 | 0.0 | 101.9 | 1,845.9 | 5.52% | 5.52% |
| 2014-15 | 126.4 | -70.4 | 56.0 | 0.0 | 56.0 | 1,905.1 | 2.94% | 2.94% |
| 2015-16 | 127.7 | -81.8 | 45.9 | 0.0 | 45.9 | 1,973.5 | 2.33% | 2.33% |
| 2016-17 | 147.6 | -89.0 | 58.6 | -70.0 | -11.4 | 2,064.8 | 2.84% | -0.55% |
| 2017-18 | 115.5 | -79.9 | 35.6 | 0.0 | 35.6 | 2,140.0 | 1.66% | 1.66% |
| 2018-19 | 98.5 | -62.0 | 36.6 | 0.0 | 36.6 | 2,215.4 | 1.65% | 1.65% |
| 2019-20 | 137.9 | -102.6 | 35.3 | -37.0 | -1.7 | 2,140.2 | 1.65% | -0.08% |
| 2020-21 | 485.8 | -136.5 | 349.3 | -292.0 | 57.3 | 2,220.6 | 15.73% | 2.58% |
| 2021-22 | 194.7 | -52.6 | 142.1 | -101.0 | 41.1 | 2,439.0 | 5.83% | 1.68% |
| 2022-23 | 284.0 | -107.0 | 177.0 | 40.0 | 217.0 | 2,524.0 | 7.01% | 8.60% |
| 2023-24 | 257.0 | -117.0 | 140.0 | 80.0 | 220.0 | 2,579.0 | 5.43% | 8.53% |
| 2024-25 | 205.3 | -121.0 | 84.3 | 80.0 | 164.3 | 2,671.0 | 3.16% | 6.15% |
| 2025-26 | 202.9 | -126.0 | 76.9 | 80.0 | 156.9 | 2,762.0 | 2.78% | 5.68% |
| 2026-27 | 149.3 | -69.0 | 80.3 | 80.0 | 160.3 | 2,872.0 | 2.80% | 5.58% |
| 2027-28 | 178.2 | -109.0 | 69.2 | 80.0 | 149.2 | 2,985.0 | 2.32% | 5.00% |
| Total | 4,095.2 | -1,754.7 | 2,340.4 | -435.0 | 1,905.4 | | | |

| Year | Gross bond issues | Gilt redemptions | Net gilt sales | QE / QT | Net gilt sales | GDP | Net gilt sales as % GDP pre QE / QT | Net gilt sales as a % of GDP post QE / QT |
|---------------------|-------------------|------------------|----------------|---------|----------------|---------|-------------------------------------|---|
| Average to 2022 | 117.4 | -46.1 | 71.4 | -36.5 | 34.9 | 1,673.0 | 3.88% | 1.99% |
| Average post 2022 | 212.8 | -108.2 | 104.6 | 73.3 | 178.0 | 2,732.2 | 3.92% | 6.59% |
| Average 1998 - 2008 | 34.6 | -18.4 | 16.2 | 0.0 | 16.2 | 1,294.3 | 1.09% | 1.09% |
| Average 2008 - 2020 | 149.3 | -61.1 | 88.3 | -40.2 | 48.1 | 1,879.1 | 5.05% | 2.72% |
| Average 2020 - 2022 | 340.3 | -94.5 | 245.7 | -196.5 | 49.2 | 2,329.8 | 10.78% | 2.13% |
| Average 2022 - 2028 | 212.8 | -108.2 | 104.6 | 73.3 | 178.0 | 2,732.2 | 3.92% | 6.59% |

Data sources: as noted in the text and author calculations

Grey cells include estimated data

Appendix 2

Data supporting chart 6

| | CPI | Base rate | Real interest rate |
|---------|------|-----------|--------------------|
| 1998/99 | 1.5 | 5.5 | 4.0 |
| 1999/00 | 3.0 | 6 | 3.0 |
| 2000/01 | 1.8 | 5.75 | 4.0 |
| 2001/02 | 1.7 | 4 | 2.3 |
| 2002/03 | 2.9 | 3.75 | 0.9 |
| 2003/04 | 3.0 | 4 | 1.0 |
| 2004/05 | 2.8 | 4.75 | 1.9 |
| 2005/06 | 3.2 | 4.5 | 1.3 |
| 2006/07 | 4.3 | 5.25 | 1.0 |
| 2007/08 | 4.0 | 5.25 | 1.3 |
| 2008/09 | -0.5 | 0.5 | 1.0 |
| 2009/10 | 4.6 | 0.5 | -4.1 |
| 2010/11 | 5.2 | 0.5 | -4.7 |
| 2011/12 | 3.2 | 0.5 | -2.7 |
| 2012/13 | 3.0 | 0.5 | -2.5 |
| 2013/14 | 2.4 | 0.5 | -1.9 |
| 2014/15 | 1.0 | 0.5 | -0.5 |
| 2015/16 | 1.7 | 0.5 | -1.2 |
| 2016/17 | 3.6 | 0.25 | -3.3 |
| 2017/18 | 3.3 | 0.5 | -2.8 |
| 2018/19 | 2.6 | 0.75 | -1.8 |
| 1019/20 | 1.5 | 0.1 | -1.4 |
| 2020/21 | 4.0 | 0.1 | -3.9 |
| 2021/22 | 6.2 | 0.75 | -5.5 |
| 2022/23 | 10.2 | 4.1 | -6.1 |
| 2023/24 | 2.5 | 4.5 | 2.0 |
| 2024/25 | -0.1 | 4.3 | 4.4 |
| 2025/26 | -1 | 4 | 5.0 |
| 2026/27 | 1.5 | 3.7 | 2.2 |
| 2027/28 | 2 | 3.5 | 1.5 |

Data sources as noted in text. Grey cells are forecast data.