Europe Economics

Did Liz Truss Crash the Economy?

Europe Economics

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Summary

- In this paper we consider three key questions:
  - What is an economic crash?
  - Did the UK economy crash following the administration of Prime Minister Liz Truss and in particular the so-called "mini-Budget" of 23 September 2022?
  - Even if they would not be characterised correctly as an "economic crash" or "crashing the economy", to what extent could Liz Truss or the mini-Budget be deemed causally responsible for the enduring economic consequences (if any) of the financial market volatility of late 2022?
- Although there is no precise technical definition of the term "economic crash" there is a general understanding about what such a scenario entails that can be inferred by considering historical events often described as "economic crashes". From these cases we can infer that on the most natural understanding of the term, tor an event to properly be described as an "economic crash", economic output must
  - Fall;
  - do so by a significant amount; and
  - stay down for some period of time.

  This will typically be associated with large falls in the value of shares and bonds, widespread bankruptcies (or at least a number of bankruptcies in very major institutions) and usually widespread unemployment (where by "unemployment" we mean workers not working, whether or not they claim benefits).
- We also consider possible extensions and looser interpretations of the term "economic crash". Economists might accept that there has been an "economic crash" if there is a material and sustained loss of wealth, even if output did not fall or did not stay down. Non-economists might perhaps regard anything that resulted in large and sustained losses in what they think of as the "economics" parts of the economy — especially the finance sector — as an "economic crash".
- It is clear that there was no economic crash in or following the period of the Truss Administration, on any of these understandings of the term.
  - Economic output did not fall. It did not even decelerate relative to its previous trend or to prior expectation. Quite the reverse, GDP growth was its fastest for some considerable time in the month and quarter following the mini-Budget, when prior Bank of England forecasts had been that there would be a contraction that quarter and indeed for six consecutive quarters — which did not in the event happen.
  - There was no rise in unemployment, which stayed at or about historic lows.
  - There was no sustained loss of wealth.
  - The financial market volatility of September/October 2022 had no material enduring economic impacts. Gilts yields fell back. The value of sterling on international currency exchanges recovered. There was no sustained material impact on mortgage rates. And the Bank of England made a profit on its intervention in financial markets in September / October 2022 not a loss, so there was no enduring fiscal impact either.
- The above points establish that there was no economic crash during or following the administration of Liz Truss. The third question concerns the role of the mini-Budget or "Liz Truss" more broadly in the financial market volatility of September / October 2022, whether or not that period could reasonably be described as having "crashed the economy". Whereas we consider it clear that any politically neutral

economist would agree that it is not true that Liz Truss or the mini-Budget "crashed the economy", when it comes to the contribution of Liz Truss and the mini-Budget to the financial market volatility of September / October 2022, we accept and acknowledge that other economists have offered alternative views, in good faith based on their own economic analysis, to those we argue for here.

- That notwithstanding, in our view it is implausible that Liz Truss or the mini-Budget played a significant causal role in the financial market volatility of September / October 2022. The argument that it was the mini-Budget rests on two factors:
  - Timing, namely that the period of volatility occurred almost immediately following the mini-Budget
  - Financial and economic commentary at the time attributed it to the mini-Budget
- Both of these cases are weak. The weaker of the two is the timing argument. In fiscal terms, almost everything in the mini-Budget of 23 September 2022 had been announced in advance — in the cases of the most fiscally significant measures, weeks and months in advance. If the argument is that we should assume that what happens in financial markets immediately following a measure's announcement is the metric by which the impact of that measure should be assessed, then the answer, for almost everything in the mini-Budget, was that it had virtually no impact at all. The main spending measures were announced weeks before, on 8 September 2022. The main tax measures were announced and debated throughout the summer, during the Conservative leadership campaign. The total fiscal impact of measures newly announced in the mini-Budget was no more than around £1bn to £5bn per annum — or 0.04 to 0.22 percent of GDP. This is vastly too small to be a potential candidate to explain the financial market movements of September / October 2022.
- Financial and economic commentary can be a better basis for drawing conclusions, but analysis done whilst rapidly-moving financial market events are in process is notoriously poor, because the true factors are often not transparent to commentators at the time. This is particularly true when the highest-profile commentators are experts in macroeconomic analysis but the true factors are microeconomic and regulatory in nature.
- The contention that Liz Truss or the mini-Budget caused the financial market volatility of September / October 2022 conceives of that volatility as being a form of sovereign debt crisis. The idea is that the measures announced in the mini-Budget, along perhaps with other political factors such as a perceived "side-lining" of macroeconomic disciplining mechanisms such as the OBR, led to concerns about UK sovereign debt. But this characterization of the crisis is demonstrably wrong. A sovereign debt crisis entails concerns about the possibility of government default on its sovereign debt. In a country such as the UK that prints its own currency and issues its sovereign debt in that currency, such default can take two forms: failure to make coupon payments; or raising debts in nominal terms then allowing inflation to be much higher than promised, inflating away the real value of such debts. That means that any sovereign debt crisis in the UK will be associated with a rise in inflation expectations. There was no rise in inflation expectations during the September / October 2022 market volatility. Therefore we can state, decisively, that it was not a sovereign debt crisis.
- Instead, the market volatility of September / October 2022 was the result of flaws in the management by UK pension funds of liability-driven investment (LDI). Indeed, economists commonly now refer to the period as the "LDI crisis" (e.g. that is how the period is referred to by the IMF).
- The flaws in question arose because, under a scenario in which interest rates were rising rapidly without there being a corresponding rapid increase in real economy growth (the scenario that was occurring through much of 2022 and had commenced well before Liz Truss became Prime Minister), the derivatives used by pensions funds engaged in LDI (which were about 60 per cent of private sector defined benefit pension funds) would require rapid posting of additional collateral (a process termed "rebalancing") in response to even modest gilts market volatility (e.g. the modest volatility that is typically associated with any Budget or similar Fiscal Event). But the cumbersome nature of the specific arrangements in which pension funds were involved meant the only way they could obtain such

collateral was by selling gilts. So modest falls in gilts values (inducing yields rises of the sort typical for Fiscal Events, but also potentially induced by other market movements such as the Bank of England not raising rates as rapidly as markets expected or a re-evaluation of the Sterling-Dollar exchange rate in a strong dollar phase) would be magnified greatly into a hugely larger spike.

- The LDI crisis would thus always have happened at some point, as rates rose. Furthermore, broadly similar financial disturbances occurred in other countries as rates rose — e.g. the banking crises in the US and in Switzerland of early 2023.
- It is by no means clear that the mini-Budget was even a trigger for this volatility. But if it was, that would not make it the cause of the volatility any more than the heat of the sun would be the cause of an over-inflated balloon's bursting, even if it was that heat that was the final trigger for the pop.
- This view is by no means contrarian. For example, a recent Bank of England working paper has estimated that of the the total "spike" component of the 30 year yields rise during the LDI crisis, which it estimates at 103 bps, around two thirds was the result of what it terms "liquidity after solvency hedging trading", which is its term for LDI-related trades.
- Thus, in conclusion:
    - The economy did not crash, by any understanding of an "economic crash" that economists would normally recognise.
    - The financial volatility of late 2022 did not create material enduring economic effects that could be understood as "crashing the economy" even by some very loose understanding of that term.
    - Even in respect of the period of financial volatility itself (which was manifestly not a crashing of the economy), it is implausible that the mini-Budget played a significant role other than as a component of a trigger. The crisis was demonstrably not a sovereign debt crisis. Rather, it was a consequence (perhaps even a consequence that was inevitably going to occur at some point) of the normalisation of interest rates in an inflationary (rather than improving real growth) environment, given the liquidity vulnerabilities of LDI pension funds.

1 Introduction

There is a claim repeated frequently in the UK press, on social media and by political figures, that "Liz Truss crashed the economy". In this report we have been asked to consider three questions relevant to this issue.

1. What is an economic crash?
2. Did the UK economy crash following the administration of Prime Minister Liz Truss and in particular the so-called "mini-Budget" of 23 September 2022?
3. Even if they would not be characterised correctly as an "economic crash" or "crashing the economy", to what extent could Liz Truss or the mini-Budget be deemed causally responsible for the enduring economic consequences (if any) of the financial market volatility of late 2022?[1]

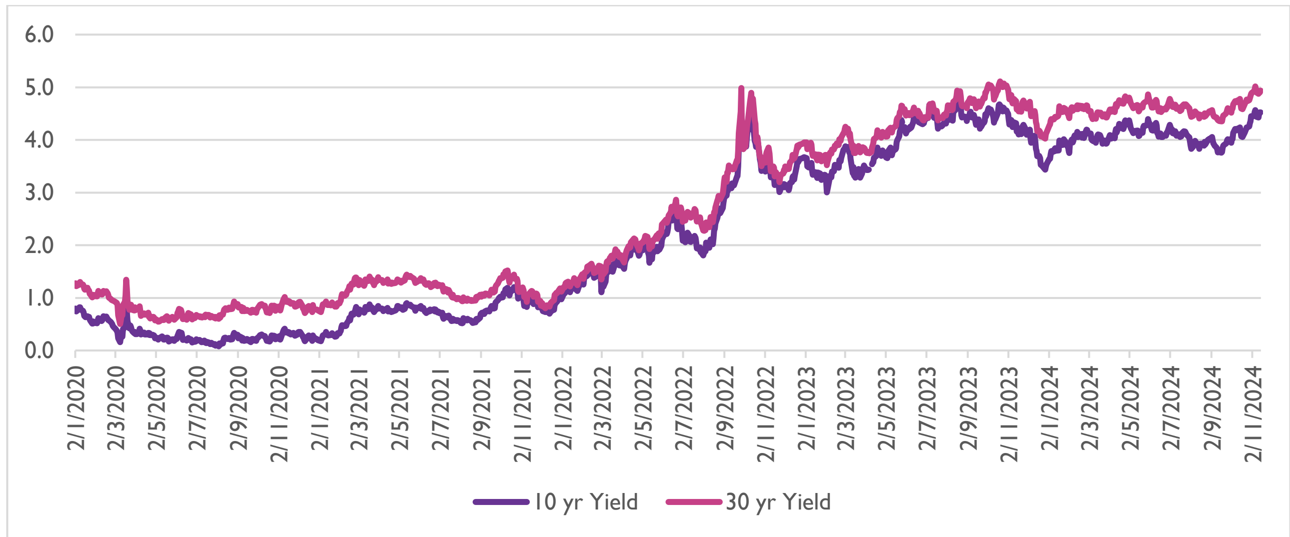
1.1 UK financial market movements in September / October 2022

Central to any analysis of the economic implications of the Truss administration (which lasted from 6 September 2022 to 25 October 2022) are the unusually marked movements in gilts markets and in parts of the UK foreign exchange market, in particular the Sterling-US Dollar exchange rate, in late September and early October 2022. The considerable bulk of these occurred in the three weeks following the "mini-Budget" of 23 September 2022. The end of the crisis period is usually deemed to coincide with the end of emergency bond purchases by the Bank of England, which occurred between 28 September 2022 and 14 October 2022, though 14 October was also the date on which Kwasi Kwarteng was dismissed as Chancellor of the Exchequer and some key elements of the mini-Budget were reversed. Further falls in gilt yields occurred on 17 October as the new Chancellor, Jeremy Hunt, reversed further mini-Budget measures and gilts fell again when Rishi Sunak took over as Prime Minister.

In any chart of 10 and 30 year bond yields in recent years, the September / October 2022 period of volatility is quite visible, as we can see below.

[1] We note that there are two ways the answer to this third question could be "No": (i) There could have been no enduring economic consequences of the volatility of September/October 2022 (which we detail below); (ii) Liz Truss could have been not causally responsible for the volatility of September/October 2022. The structure of this report reflects those two possibilities.

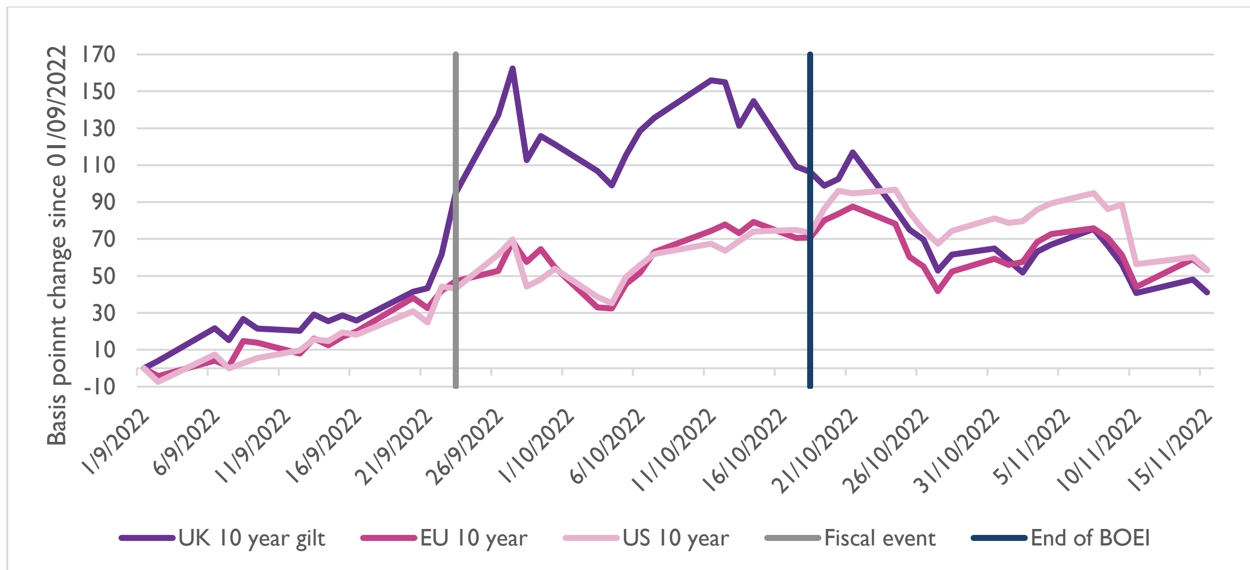
Figure 1-1: UK government bond yields (%)



Source: Thomson Reuters

Let us focus in upon the period from the start of September 2022 to the end of the year, and look at 10 year government bond yields, expressed in terms of the change from their rate on 1 September 2022, for a number of different countries, to explore to what extent the UK movements reflected international financial market developments and to what extent they were UK-specific.

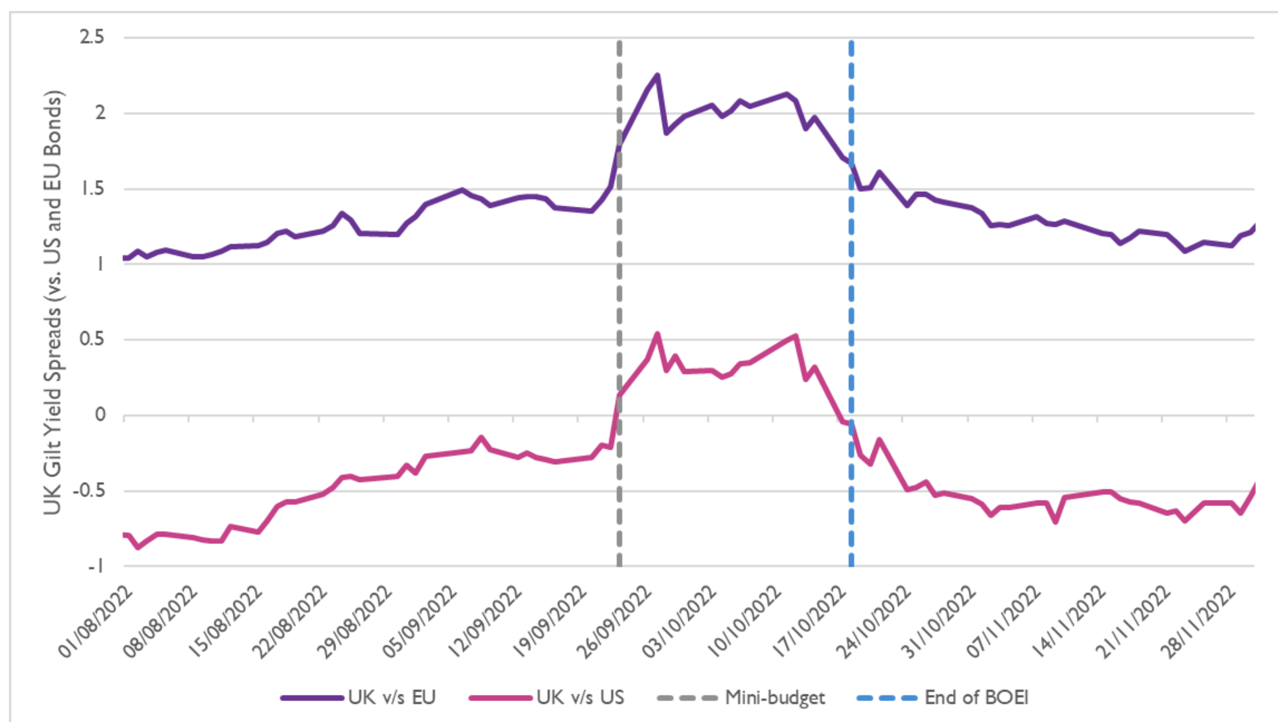
Figure 1-2: Evolution in government bond yields in late 2022, UK, US and EU, 10 year



Source: Europe Economics analysis

In the second chart, UK 10 year government bond yields are expressed in terms of the difference between them and the yields on US and EU government bonds.

Figure 1-3: Spreads of UK government bonds vs US and EU government bonds



We can see from the charts that UK gilt yields rose very sharply in the period following the mini-budget on 23 September 2022, in a period in which, although there were rises, US and EU yields rose by much less. The periods surrounding Budget statements and similar Fiscal Events in the UK are often characterised by some financial market volatility. Movements in gilt rates of up to 30 basis points are not unusual. Movements of up to 50 basis points have been recorded in the past (e.g. 2009), and in the run-up to and period following the October 2024 Budget the trough-to-peak movement in 10 year gilt yields has, at the time of writing, been around 80 basis points.

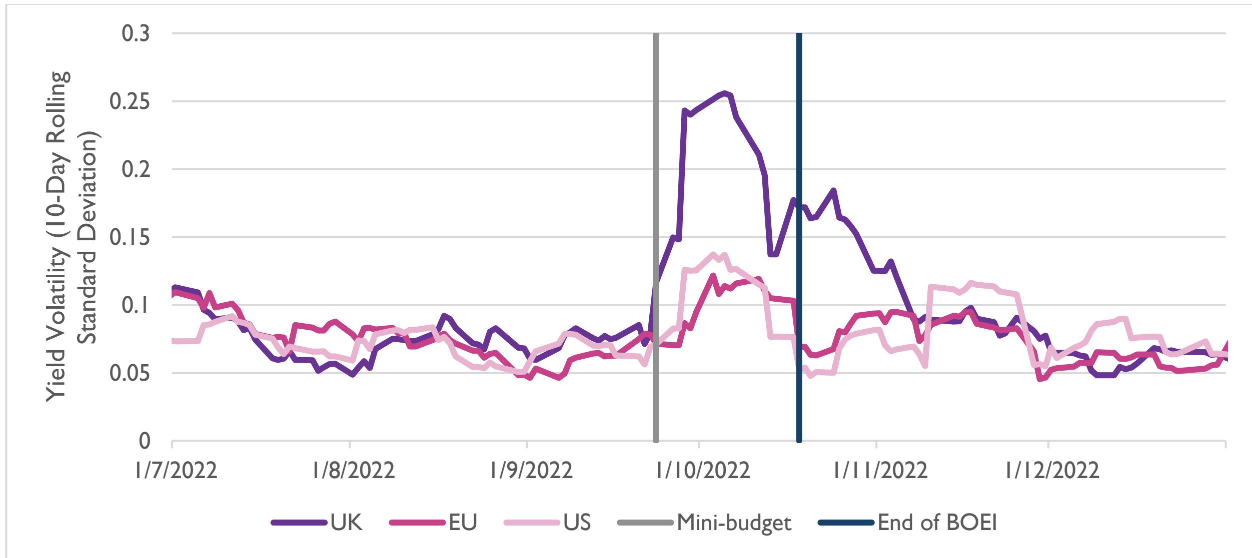
Initially, on Friday September 23rd, the reaction fell within the normal range — around a 30 basis points rise on the first day. After the weekend, however, matters rapidly deteriorated. On Monday 26th there was a further rise of about 50 basis points. On the Tuesday there was a rise of 67 basis points. Thus, over a three day period, yields on 30 year gilts rose by some 140 basis points, the highest in the period immediately surrounding a UK Fiscal Event for many decades.

The Bank of England was informed that, as a consequence of these large movements (for reasons we shall explore later[2]) a number of pension funds were at the point of needing to be wound up the following morning. Late on the morning of 28 September the Bank announced a temporary emergency bond buying programme, which lasted until 14 October 2022, whereafter, as we can see from chart, the UK yields gradually returned to pre-crisis levels, and dropped below US yields in mid-October, eventually dipping below those in the EU at the end of October / start of November.

The next chart exhibits market volatility directly, rather than yields, in the form of the 10-day rolling standard deviation of yields for UK, EU, and US 10-year government bonds.

[2] See Section 4.3ff.

Figure 1-4: Volatility in bond yields, UK, US and EU

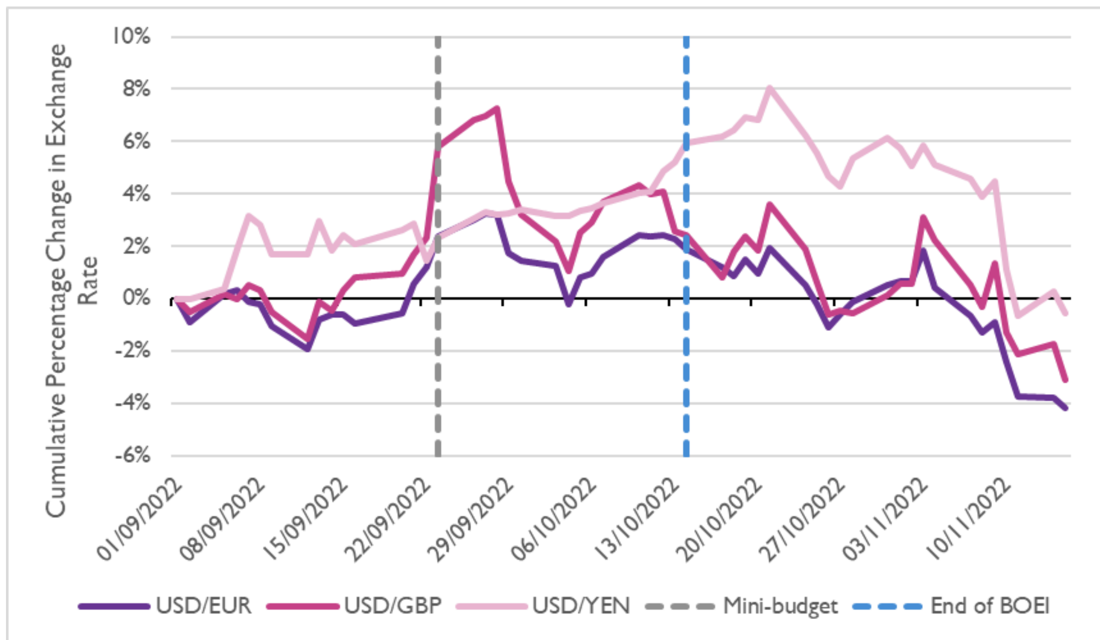


Source: Europe Economics analysis

This illustrates two features of particular interest. The period of the post-mini-Budget crisis involved a material rise in volatility in the UK and EU as well as in the US— this was not a UK-specific event. However, the rise in volatility in the UK was much greater than the rises in the US and EU.

In addition to movements in gilts markets, the other major financial markets exhibiting unusual movements in this period were foreign exchange markets. We see that in the following chart, which shows the cumulative percentage change in the US dollar (USD) exchange rate against the euro (EUR), sterling (GBP), and yen (JPY), with each change measured relative to a starting point of 1 September 2022.

Figure 1-5: Movements in the value of sterling, the euro and the yen relative to the dollar in late 2022



Source: Europe Economics analysis

A number of features come out of this graph. First, the US dollar had significant periods of appreciation against both sterling and the yen. Indeed, the peak cumulative change over the period in the dollar-yen exchange rate was greater than that in the dollar-sterling exchange rate. Second, the peak of the cumulative

change in the dollar-sterling exchange rate occurs relatively early in the crisis period, roughly corresponding to the peak in gilt yields and at the point at which volatility approached its peak. Shortly thereafter, the dollar-yen line crosses the dollar-sterling line (i.e. the cumulative appreciation in the dollar relative to the yen overtakes that relative to sterling). Third, by the end of October, sterling had strengthened relative to the dollar back to beyond its start-September value.

2 What is an “economic crash”?

2.1 The most natural understanding

There is no precise technical definition of the term “economic crash”, but there is a general understanding amongst economists about what such a scenario entails. A number of historical events are described as “economic crashes” and from them we can gain a strong sense of what the scenario is understood to involve.

For example, there is a set of events often described as the “Indian Economic Crash of 1865”. At the end of the US Civil War, Indian stocks that had risen strongly as a consequence of speculation about the results and implications of the Civil War experienced large falls as the ending of the war triggered a large fall in the price of cotton. An iconic example was the 96 percent falls in shares in the Back Bay Reclamation (an area of land reclaimed from the sea off what is now the Mumbai coast). Many merchants went bankrupt. Output fell. And these events triggered a large fall (around 21 percent) in the population of the city (then called Bombay).

There are a number of other events given the name “crashes”. These include the Wall Street Crash of 1929, the Black Monday Crash of 1987, and the late February to early April 2020 crash in world stock markets as financial markets adjusted to the onset of the Covid Pandemic. Even though these events are not per se *economic* crashes they do illustrate how economists understand the term “crash” and what must be involved for an event to be properly described as a “crash”.

As illustrated in the examples above, an “economic crash” must have a number of features to be properly described as such. Economic output must:

- fall,
- do so by a significant amount, and
- stay down for some period of time.

This will typically be associated with large falls in the value of shares and bonds, widespread bankruptcies (or at least a number of bankruptcies in very major institutions) and usually widespread unemployment (where by “unemployment” we mean workers not working, whether or not they claim benefits).

2.1.1 To be a “crash” the fall must be sustained

One important feature to note about a “crash” is that the result is sustained. After the “Wall Street Crash” of 1929 the value of the Dow Jones Index (the standard metric of US stock prices) did not return to its peak value of 3 September 1929 until 1954, 25 years later. In the case of the “Black Monday” crash of 19 October 1987 (which affected all 23 major world markets), UK stock prices fell to 36 percent below their pre-crash peak by November, did not start to recover until 1989, and it wasn’t until 1991 that stock prices achieved a sustained rise above their 1987 peaks.

If, by contrast, prices of stocks and bonds fall by 5 percent one day then rise 6 percent the next, economists would not describe that as a “crash” but, instead, as a “period of volatility”, or perhaps even a “period of temporary volatility” or a “blip”.

In the case of an “economic crash”, then as well as the contraction in economic output being large it would have to be sustained. In the United States, for example, there are not-infrequent “government shutdowns” when legislation required to finance the federal government budget is not passed before the beginning of

the next fiscal year. Three significant government shutdowns of the past 30 years include a 21 day shutdown in 1995-6, a 16 day shutdown in 2013 and a 35 day shutdown in 2018-19. Federal outlays are of order 20-30 percent of US GDP. So government shutdowns mean that output drops, and for the period of the shutdown that drop is significant. Yet none of these periods of government shutdown is described as an "economic crash", because (*inter alia*) the loss of output was temporary.

Mere volatility — whether in the form of output falling and rising back or financial market prices going down and up — is not a "crash".

2.2 Potential extensions

One possible extension of an "economic crash" would be any event that caused widespread financial distress — and thus perhaps a loss of wealth, even if there were not a loss of output. Suppose, for example, there were a sudden crash in the value of UK land. In principle one could imagine that not being associated with a loss of output, since it was not a matter of businesses shutting down or consumption and investment dropping, except insofar as the lost value of land might have financial consequences that would spill over into output loss.

Thus, one could imagine an extension of the concept whereby a loss of *wealth* might be regarded as an "economic crash".

2.3 A loose understanding

The above definitions, in terms of lost output and employment, lost wealth and financial distress, would be the natural ways for economists to understand the term "crashing the economy" or an "economic crash". Perhaps, however, one could imagine non-economists not thinking in these terms. They often conflate economic and financial factors. So perhaps, in addition to lost output, employment or wealth, they might regard anything that resulted in large and sustained losses in what they think of as the "economics" parts of the economy — especially the finance sector — as an "economic crash".

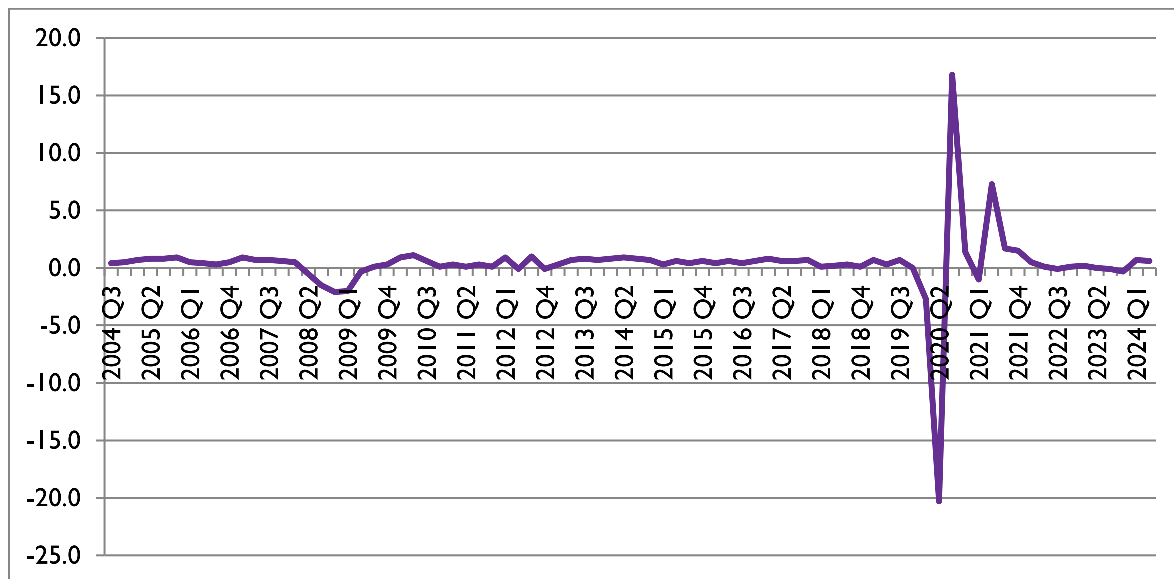
3 Did the UK economy crash during or following the financial events of late 2022?

There was no economic crash in late 2022, according to any reasonable understanding of that term that economists would recognise. Economic output did not fall; neither was any pre-existing trend or expectation of rapid economic growth reduced to merely nugatory growth.

3.1 Evolution of GDP during 2022 and 2023

The standard measure of GDP growth used in the UK is the seasonally-adjusted change in real GDP from one quarter to the next quarter.[3] In the graph below we exhibit real GDP growth on this measure for the past 20 years (2004Q3 to 2024Q2).

Figure 3-1: Quarter-on-quarter change in UK real GDP, 2004Q3-2024Q2 (%)

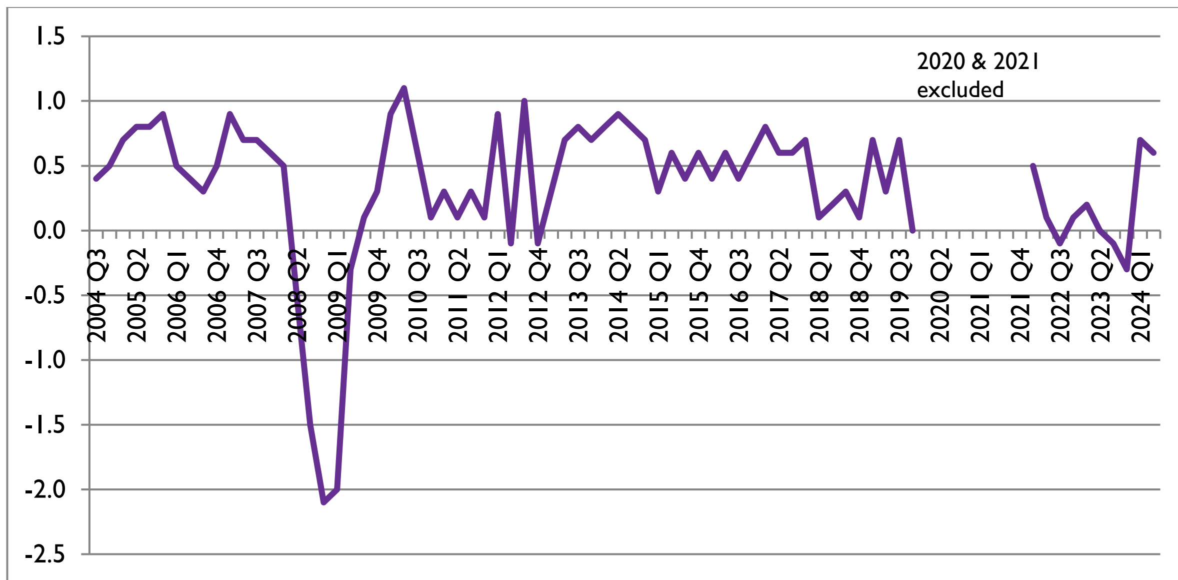


Source: ONS

The graph is clearly dominated by the movements during the COVID-19 pandemic and associated lockdowns. We re-present the graph excluding the years 2020 and 2021.

[3] Specifically, this is the so-called "chained volume measure", seasonally adjusted.

Figure 3-2: Quarter-on-quarter change in UK real GDP, 2004Q3-2024Q2 (%), excluding 2020 and 2021

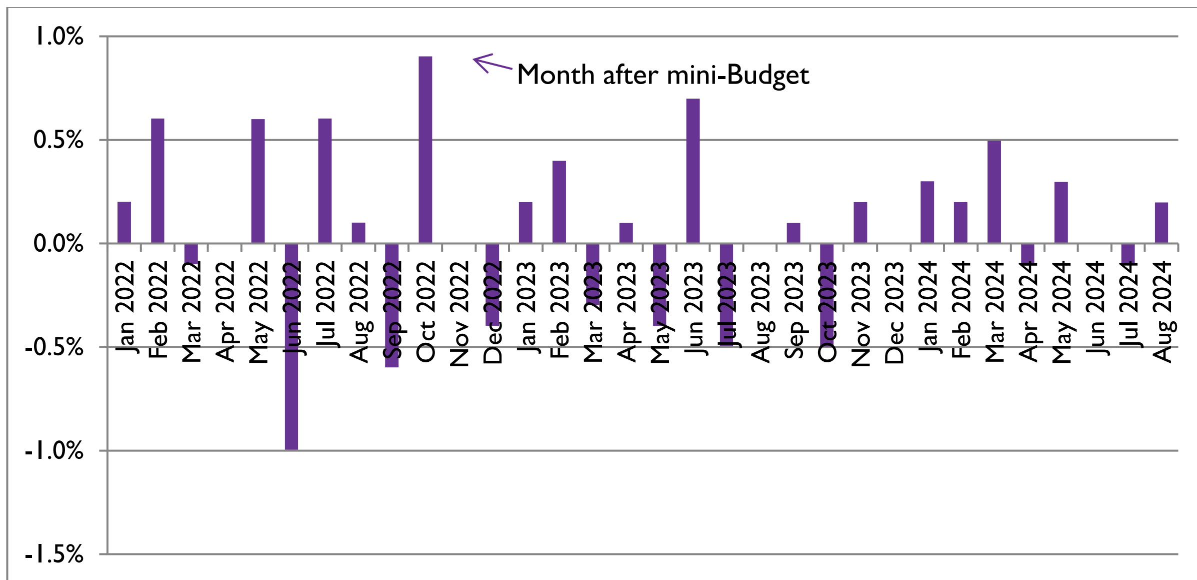


Source: ONS

Now the most visible feature of the graph is the Great Recession of 2008-09. The mini-Budget of 2022 was on 23 September 2022, right at the end of the third quarter. In the quarter following the mini-Budget the economy grew, rather than contracting. And it was also not the case that although the economy grew it grew much slower than it had been expected to do so (e.g. reflecting some pre-mini-Budget trend). As we can see in the graph, prior to the mini-Budget the economy was contracting and growth had been falling away over the previous three quarters (from 0.5 percent in 2022Q1 to -0.1 percent in the quarter at the end of which the mini-Budget occurred. If we have included the final two quarters of 2021 (1.7 percent in 2021Q3 and 1.5 percent in 2021Q4) that extended falling away of growth would be more visible.

We can see more detail on this in the following figure, which presents the Office for National Statistics' monthly GDP series. This series is volatile, as can be seen, and is not regarded as as definitive an indicator of what is happening to growth as the quarterly series. Nonetheless, for completeness we note that on this metric, also, there is no basis whatsoever for claiming the mini-Budget was associated with an economic crash. The month following the mini-Budget actually exhibited the fastest monthly growth since the end of the COVID-19 pandemic (0.9 per cent).

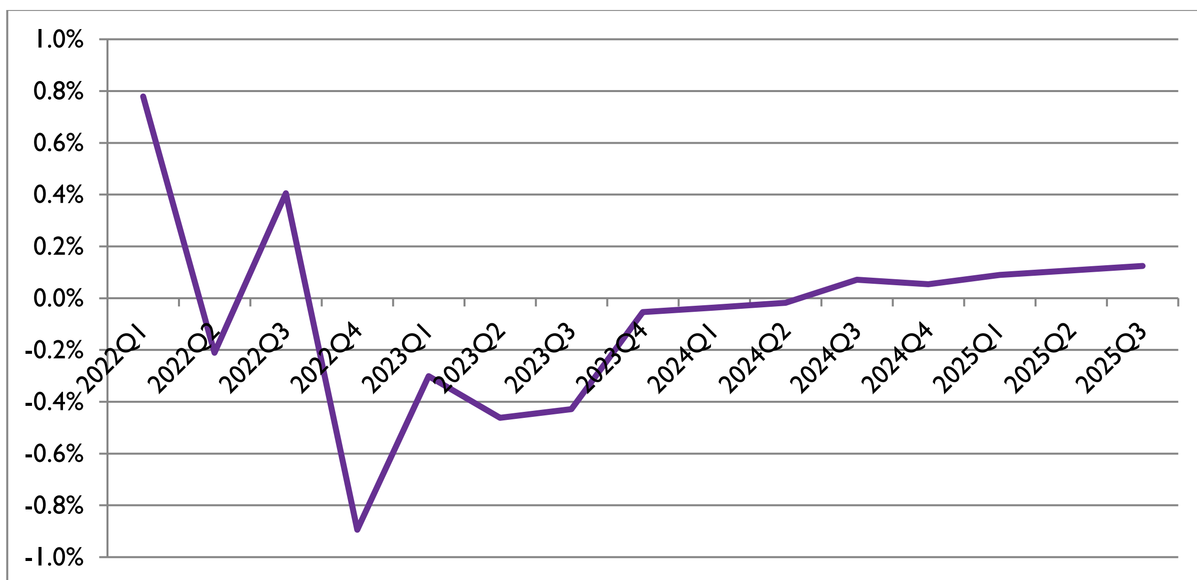
Figure 3-3: Monthly UK GDP



Source: ONS

Thus GDP growth was not reduced following the mini-Budget. Furthermore, the mini-Budget's policies were partly a response to prior weak growth. A few weeks before the mini-Budget, on 4 August 2022, the Bank of England released its quarterly Monetary Policy Report (the final such release before the mini-Budget). This forecast the following path for UK real GDP growth.

Figure 3-4: Bank of England forecast for real GDP growth, 4 August 2022

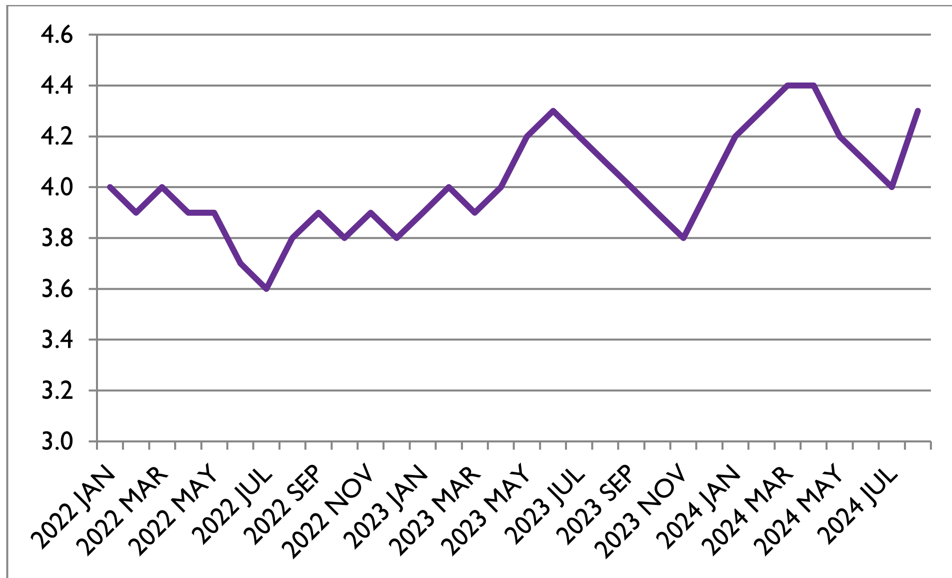


Source: Bank of England

We can see there that the Bank at that time believed real GDP had returned to growth in Q3 (wrongly, as it turned out) but that thereafter there would be a sustained period of contraction — six consecutive quarters of contraction, a longer period of contraction even than the 5 consecutive quarters of 2008Q2-2009Q2.

A similar pattern emerges when we consider unemployment.

Figure 3-5: UK Unemployment (%)



Source: ONS

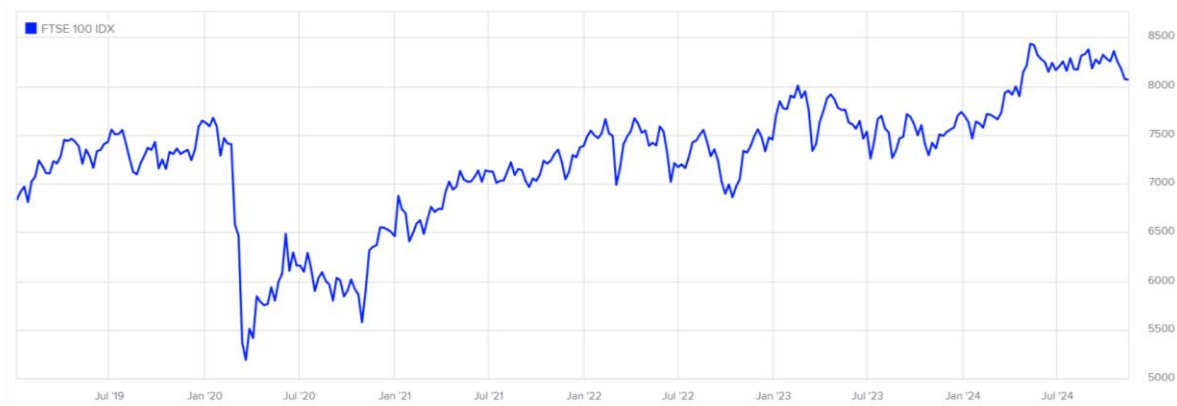
The period as a whole involved unemployment that was very low by historic standards (e.g. unemployment was 12 percent in the mid-1980s, 9 percent in the early 1990s and over 8 percent in the early 2010s). But even in the context of such low unemployment, there is no evidence of any impact of the Truss administration. Unemployment was rising from July to September 2022, and actually fell marginally in the month following the mini-Budget before reverting to its September level in the following month.

Thus, insofar as the UK's growth path changed at all after the mini-Budget, it was in the direction of growth accelerating when it had been expected to decline. The UK economy did not crash following the mini-Budget.

3.2 Was there a loss of wealth?

The two most straightforward indicators of whether wealth was lost are stock market prices and house prices. In the following graph we see the standard FTSE100 index measure of the stock market.

Figure 3-6: UK FTSE100 index



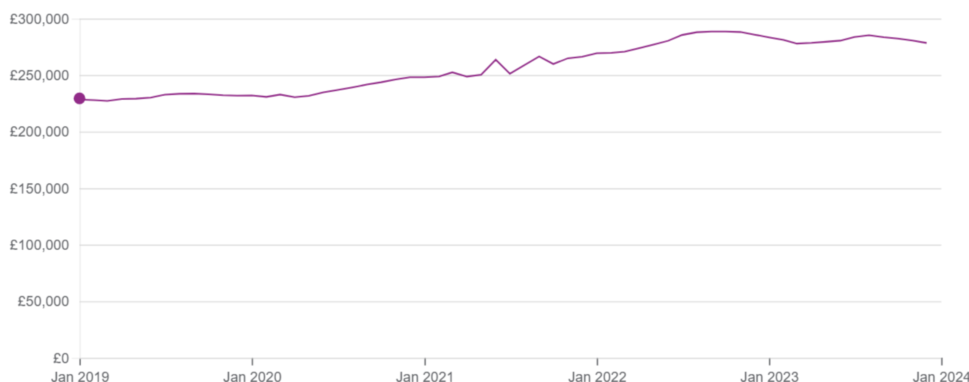
As at **15.11.24 16:06:37 GMT** - All data delayed at least 15 minutes

Source: London Stock Exchange

We can see from that graph that there was a fall in the stock market in September/October 2022, but that that fall was very modest, well within the normal ups and downs of the market over the period, much less than other larger recent falls (e.g. during Covid) and rapidly reversed.

Next we show house prices, on the Land Registry series.

Figure 3-7: UK average house price



Source: Land registry

We can see there that house prices did in fact peak in late 2022, unsurprisingly given the rapid rises in interest rates that had started a few months earlier and persisted until mid-2023.

We can see the annual percentage change in that period, within a longer term perspective.

Figure 3-8: Annual percentage change in house prices, 1990-2024

Source: Land registry

Thus whilst it is true that house prices fell from late 2022, those falls were very modest by the standards of "house price crashes" of the past, indeed being much more like the occasional dips in prices we see in non-crash periods such as the late 1990s or early 2010s. Prices rapidly recovered, and these movements are not even described as a "house price crash" let alone constituting a broader "economic crash" in the form of a crash in the value of wealth.

3.3 Did the financial market volatility in September / October 2022 have enduring economic impacts of a scale sufficient to be deemed an economic crash?

The next question is whether, even if the economy as a whole could not reasonably be argued to have crashed from late 2022 onwards, could there be deemed to have been an "economic crash" if one were to use that term much more loosely, to refer to a crash not in the economy (not in output or in the number

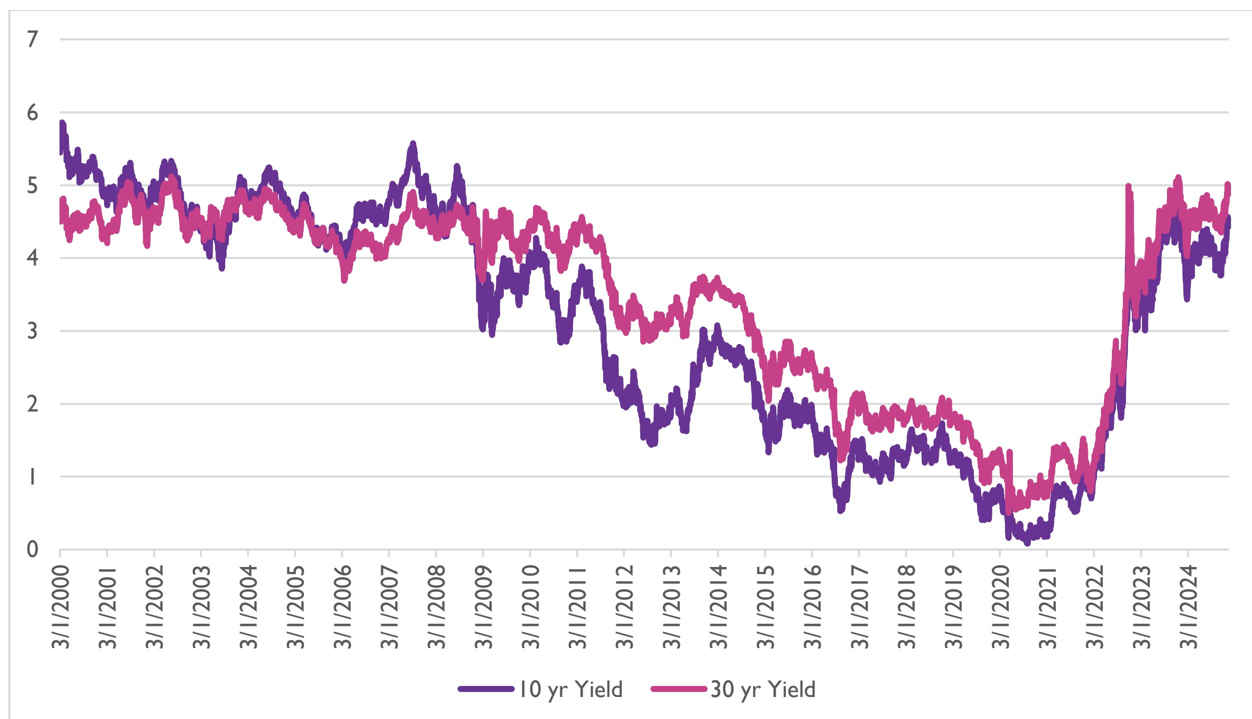
of people in work) but, rather, a crash in "economic-type" parts of the economy such as the finance sector or financial markets.

The answer is once again no. There was volatility in certain UK financial markets in late 2022, and that volatility included falls in prices for a period, but those falls were far smaller than the scale to which the term "crash" is normally applied and they would not, in any event, count as a "crash" because they were rapidly reversed. The correct term to apply — the term any politically neutral economist studying these financial market events would usually use to describe market movements in that period — would be that they were a period of "temporary volatility" or at most a "crisis".

As *Financial Times* journalist Chris Giles put it[4]: "The UK-specific spike in borrowing costs triggered by the "mini" Budget lasted only until late 2022" — a point we saw in Section 1.1, with UK yields dropping below US yields in mid-October 2022, and below those in the EU at the end of October / start of November. Giles also notes that "sterling recovered even faster" — again as we saw in Section 1.1, where we showed that the movements in the dollar relative to the yen overtook those relative to sterling early in October, by the end of October / start of November the sterling-dollar exchange rate was back to its start-September level, and in the latter part of November the pound had actually materially appreciated vs the dollar, relative to its start-September level.

To subsequent economic conditions thereafter, as Giles put it, "Truss is an irrelevance." For example, consider gilt yields, as exhibited in the following chart.

Figure 3-9: UK gilt yields, 2000 onwards (%)

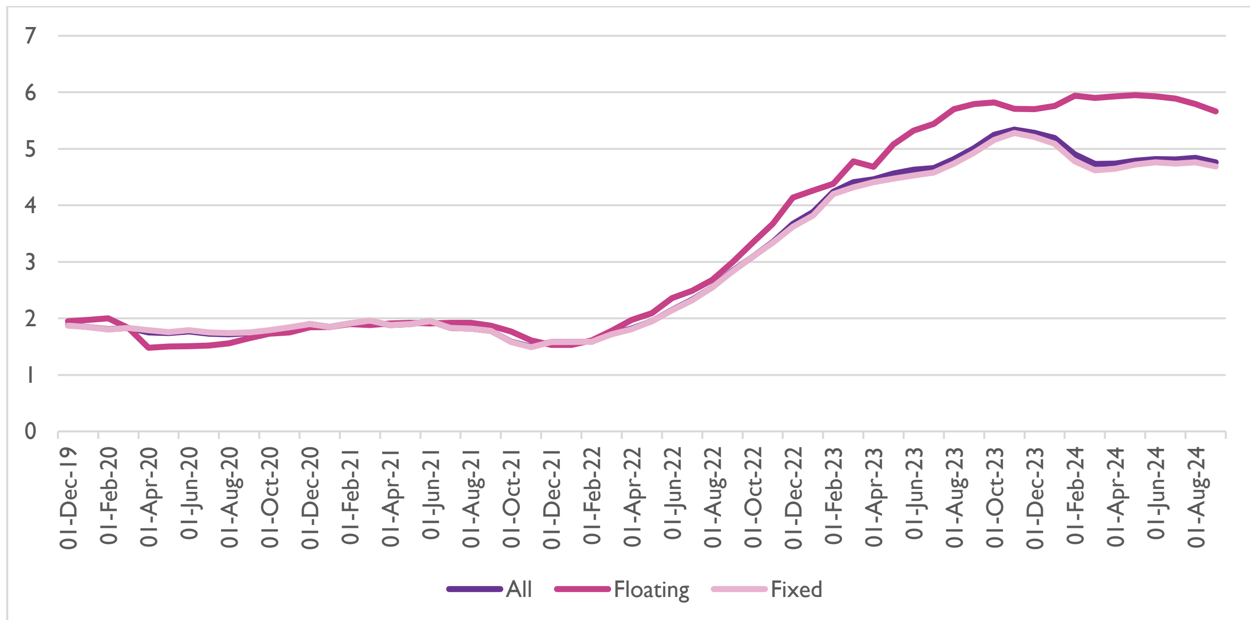


We can see the September / October 2022 yield spike in these data. But it is clear that subsequent gilt yields were not materially affected by that spike. Yields were rising as policymakers responded to inflation and as rates returned to historically more normal levels following the extraordinarily low levels seen in the 2010s.

4 Giles, C., "The true economic consequences of Liz Truss", *Financial Times*, 1 March 2024.

One area where the impacts of "Liz Truss" are often alleged to be significant is mortgage rates. But we can see no evidence of that in the overall data. In the chart below we exhibit the average mortgage rate on all newly-extended mortgage loans, and broken down by fixed and variable. We can see that the period of volatility in September / October 2022 was not associated with any significant dislocation. Rates simply rose reflecting the general rise in interest rates over the period, as the Bank of England responded to high inflation. By contrast with the period of the Truss administration, the end of the phase of Bank of England interest rate rises in late summer 2023 is clearly visible, with a hump in the chart.

Figure 3-10: Average mortgage rates for new loans



Notes: Monthly average of UK resident banks' sterling weighted average interest rate, loans secured on dwellings, new advances to Individuals and individual trusts (in percent) not seasonally adjusted
Source: Bank of England

We shall also see, in Section 4, that the intervention by the Bank of England to calm financial markets in late September and early October 2022 did not produce lasting losses — on the contrary, the Bank exited its intervention with a profit.

4 The role of the mini-Budget in financial market volatility in September / October 2022

We have seen that Liz Truss did not crash the economy, by any reasonable understanding of the term "crash the economy" that any politically neutral economist would recognise, for the straightforward reason that the UK economy did not crash. Output did not fall — indeed, the rate of output growth rose after the Truss premiership, when there had been expected to be six quarters of contraction. Unemployment did not rise.

Even by a much looser understanding of "economic crash" whereby a crash in the "economic-type parts" of the economy — particularly the finance sector — is deemed an "economic crash" even if the economy overall does not crash, there was no "economic crash", because the financial market events of late 2022, though material at the time, did not endure and did not have enduring effects on the economy.

In this section we shall move on to consider whether even the temporary volatility of September / October 2022 (which we have already demonstrated cannot be characterised as being or causing a "crashing of the economy") can correctly be causally attributed to the mini-Budget or to "Liz Truss" (understood to include not only Truss herself, her Administration and their policies, but also the criticisms of her by Conservative MPs, the loss of Conservative MPs support for her and her subsequent resignation)

One point to emphasize at the outset is that whereas it is our view that no politically neutral economist could reasonably conclude that Liz Truss or the mini-Budget "crashed the economy", economists could and do differ on the extent to which they apportion causal responsibility to the mini-Budget specifically, or to "Liz Truss" for the financial market events of late 2022. In this section I shall argue that the mini-Budget played only a relatively minor role in that period of volatility, but we accept that other economists have offered alternative views in good faith based on their own economic analysis. Related to this, however, we do believe that, even if some economists had expected, during the period of volatility, that there would be enduring economic impacts that could be attributed to Liz Truss or the mini-Budget, no reasonable economic analysis conducted subsequently could conclude that, insofar as the financial market events of late 2022 were argued to have had any enduring and significant economic impacts, those can be (to any significant extent) causally attributed to Liz Truss or the mini-Budget.

Thus, although economists could reasonably differ about to what extent "Liz Truss" or the mini-Budget were causally responsible for financial market volatility in late 2022, it could not now reasonably be claimed that "Liz Truss" or the mini-Budget had any significant *enduring* financial or economic impact that could reasonably be described, even loosely, as "crashing the economy".

4.1 The argument that the mini-Budget and "Liz Truss" were causally responsible for the financial market volatility of September / October 2022

The contention that the mini-Budget and "Liz Truss" (in some sense) were causally responsible for the financial market volatility of September / October 2022 rests on two factors:

- Timing — the considerable majority of the movements in gilts yields and in the value of the pound occurred after the date of the mini-Budget.
- Economic and financial commentary during the period of volatility — a significant portion of which attributed it to the mini-Budget and related actions (such as the Chancellor's interviews after the mini-Budget dismissing the initial market reaction as inconsequential and saying he intended to announce further tax cuts later).

Let us discuss these in turn.

4.1.1 Timing

The timing argument is very simple. It notes that the main movements in gilts and foreign exchange markets occurred in the three weeks following the mini-Budget, with movements before that time being much more normal. The contention is that we should therefore assume that the mini-Budget (potentially along with the political turmoil that followed) was the main cause of those movements.

Timing is a natural and intuitive indicator of causation, because that is the way we often see causes work in everyday life. The cricketer strikes the ball with the bat and then immediately thereafter the ball flies towards the boundary. But it has long been recognised that in economic and financial analysis this can be naïve. Large sudden movements in financial markets can occur without any clear cause on the day — the 1987 Stock Market Crash was a particularly famous example of this, giving rise to a number of economic and financial models to explain how large market movements don't need a proximate cause or even trigger.[5] When there is a clear single cause it can often have its main effect through being anticipated in advance or only start to have an effect after a lag. Furthermore, events and states can interact, such that the trigger for an event may play little if any causal role in bringing the event about. Think, for example, of a balloon that has been over-inflated and continues to be further over-inflated. That balloon might be burst by the heat of the sun coming out, but its bursting was not really caused by the sun's heat. The bursting was inevitable given the over-inflation and the sun's heat would not have burst it without the over-inflation. The sun's heat was merely an incidental trigger. Economic and financial events that trigger market movements may be incidental in that same way — merely crystallising what was inevitable anyway.

In the case of the mini-Budget, the timing argument is particularly weak — indeed, if anything, a proper consideration of timing suggests it is implausible that the mini-Budget could have been the main cause of the economic volatility of the weeks that followed it. The key reason why the timing argument actually goes the other way is that, by fiscal scale, almost nothing announced in the mini-Budget was new. If the claim is that financial markets should be expected to react, immediately afterwards, to fiscal policy announcements, then financial markets should have adjusted before the mini-Budget — as regards the majority of the measures, in terms of fiscal impact, weeks or months before the mini-Budget. The measures announced in the mini-Budget that were actually new were of vastly too small a scale for it to be economically plausible that they could be the main explanation of the subsequent financial market movements.

The full list of fiscal measures announced was as follows.

- An "Energy Price Guarantee" that had the effect of capping annual energy bills for a typical household to £2,500 from October 2022, scheduled to last for two years. (Note that this measure had already been formally announced several weeks before the mini-Budget, on 8 September 2022. Note also that on 21 September the Government also announced that it would freeze wholesale gas and electricity prices for businesses.)

[5] See, for example, Hart, S. & Y. Tauman (2004). "Market Crashes without External Shocks," *The Journal of Business*, **77(1)**, pp1-8.

- Cancellation of a scheduled April 2023 rise in Corporation Tax from 19 percent to 25 percent. (Note that this was the central pledge of Liz Truss' campaign to become Conservative Party Leader through the summer of 2022, and thus was repeatedly announced for many months ahead of the mini-Budget.)
- Cancellation of a new system of social care, which was to be funded via a new Health and Social Care Levy which was intended to initially take the form of a 1.25 percent rise in Employee National Insurance Contributions. (Note that this cancellation applied to both the spending and tax-raising side of the measure, and thus was fiscally neutral. Note also that this measure was announced before the mini-Budget, on September 22nd.)
- A bringing forward of an already-scheduled cut in the basic rate of income tax to 19 percent, such that it would commence in April 2023 instead of April 2024.
- Abolition of the 45p top rate of income tax.
- The Stamp Duty Threshold being raised to £250,000 (£425,000 for first-time buyers).
- Cancellation of planned increases in alcohol duties.
- Re-introduction of VAT-free shopping for overseas visitors (extended in the case of visitors from the EU)
- Repeal of IR35 anti-avoidance tax rules
- Potential benefits sanctions for 120,000 extra people on Universal Credit unless they looked for work

In addition there were a number of regulatory reforms, of which the most-discussed were the removal of a limit on bankers' bonuses and some changes to planning regulations. There was also the announcement that a series of additional growth-enhancing measures would be detailed ahead of a full Fiscal Event in November 2022.

We can see from the list above that the main measures had either been announced in advance (in most cases well in advance) or were fiscally neutral (like the abolition of the new system of social care). The only new measures of fiscal significance were the bringing forward of an already-scheduled income tax cut (fiscally significant to the extent of one year's additional lost revenue from the higher tax — thus creating a one-off addition to government debt of around £5bn), the abolition of the top rate of income tax (with estimates of an annual fiscal loss varying from around £0.5bn to £2bn), and the stamp duty reduction, which had a cost of around £1bn-£1.5bn per annum.

The total fiscal impact of measures discussed in the mini-Budget was undoubtedly much greater than this, but for almost all those measures, announced days, weeks and months earlier, market prices had had a chance to adjust. There is no obvious reason why, for example, markets would have waited until 23 September 2022 or thereafter to react to an Energy Price Guarantee that had been announced on 8 September or to Corporation Tax rise cancellations that had been committed to repeatedly all through the Summer.[6]

We are left with the conclusion that the totality of novel measures announced in the mini-Budget was very small in fiscal terms — vastly lower than any plausible degree of new fiscal measures that could be associated with the significant gilts and currency market fluctuations that then occurred.

[6] The strongest case that there was material fiscal novelty in the mini-Budget would perhaps be to propose that until the mini-Budget, markets might have wondered whether Truss would u-turn on the tax cuts she had committed to, just as she had u-turned on other proposals she had announced — e.g. her proposals for regional public sector pay. But there was no hint of that after she became Prime Minister and no financial markets narrative that she was about to do that, of the sort that often accompanies such speculation.

4.1.2 Economic and financial commentary

The economic and financial commentary argument notes that at the time of the volatility economic and financial commentators said that the volatility was a reaction to the mini-Budget.[7] The idea is that if that's what those selling bonds and sterling said was the reason they were selling, we should believe them, and that if those who are expert commentators on the factors driving financial markets said was what was going on at the time, we should believe them.

This is a particularly unconvincing argument, for several reasons. Let us focus first on the stated reasons for selling of market participants. There are at least three reasons their stated views are unconvincing. First, financial market participants have strong incentives to offer commentary that serves their own interests rather than revealing their own motivations (even assuming they fully understand their own motivations). Second, most market participants have strong incentives to herd, so if everyone is saying how terrible the mini-Budget is and that that's why gilts prices are falling, they have strong incentives to agree, at least in the short term.

But third, and by a long way most importantly, market equilibrium value arises from the complex interplay of beliefs and preferences of many agents, including across multiple capital markets, no one trader or group of traders has visibility of all factors driving the market, and even if they did so, the reasons one trader or a group of traders choose to buy or sell are not the same thing as the reasons why market prices are generally falling or rising. Traders A, B and C could all be selling in a market, and offer their reasons for selling, yet the market price could be rising. Market expectations and preferences are collective, emergent factors, not some kind of count through the expectations and preferences of individual market participants (even if those expectations and preferences are expressed accurately and without bias).

As an illustration of this, when UK regulators seek to determine the cost of capital of a regulated sector — say, water or energy — a part of that process might include consulting with industry analyst and large funds that trade in the equity or bonds of the utilities concerned. But regulators place little to no weight upon the stated opinions of such analysts or trading entities about what the cost of equity or cost of debt of these utilities are. Instead, they use mathematical techniques to attempt to infer the collective market cost of capital. The individual opinions of market participants would be biased, and even if it were not it would provide only the view of that trader not the market equilibrium.

Overall economic commentary from non-traders has a better chance of being relevant, but commentary offered as events unfold is notoriously unreliable, and opinions are almost never universal — and were not universal in the case of the volatility of September / October 2022, either.

In the case of the events of September / October 2022, some commentary felt the key issue was the mini-Budget; other commentary suggested it was not so much the mini-Budget itself but what was characterised as the side-lining of the UK's macroeconomic institutions, with no OBR report accompanying the mini-Budget[8], the dismissal of senior Treasury official Tom Scholar (on 8 September), and talk of reviewing the

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[7] For example, see https://www.cnbc.com/2022/09/27/larry-summers-blasts-uks-utterly-irresponsible-fiscal-policy.html and https://www.nytimes.com/2022/09/27/opinion/uk-pound-inflation-mortages.html

[8] Although the role of an OBR report is tangential to our main discussion here, we remark in passing that it is most unclear to us that publishing an OBR report to accompany the mini-Budget would have made any market impacts of the mini-Budget that there were (which as we shall demonstrate below were certainly only a minority of the total volatility, and could well have lain within the normal range of market movements at around the period of Fiscal Events) smaller rather than larger. The plan set out in the mini-Budget was to have a full Fiscal Event, including details of the required fiscal consolidation, in November, once details of the very extensive growth plan that the Truss administration anticipated preparing were in place. (That growth plan was never completed or published.) Absent the details of that growth plan, what growth assumptions would the OBR use in analyzing the impact of the mini-Budget on the government's fiscal targets (even supposing those were unchanged)? The growth target announced in the mini-Budget was 2.5 percent — that was the ambition for what the growth plan would

Bank of England's mandate, with this "side-lining" contributing to doubts about the credibility of UK sovereign debt; other commentary felt it was a reaction to the Bank of England not raising rates as rapidly as the market had expected at the Monetary Policy Committee (MPC) Meeting of 22 September (the day before the mini-Budget), when the MPC split three ways (5 voting for 0.5 percent, 3 voting for 0.75 percent – which was the amount the market had expected the rise to be – and one voting for 0.25 percent); others claimed it was to do with emerging problems in the pension funds markets as interest rates normalised after many years of being near-zero; others claimed it was a reaction to opinion polling suggesting Labour would win the next General Election; others claimed it was the consequences of Brexit finally becoming properly accepted by markets; and others claimed the key issue was the strength of the dollar exposing the longstanding relative weakness of the economic and fiscal position of the UK.

One reason commentary offered as financial market events unfold can be a poor indicator of the true economic drivers of those events is that the true drivers either may not be in the public domain at all (but only emerge later) or, if they are in the public domain, they may be known only be a few key players, not including high-profile economic commentators, especially if the true factors are, for example, regulatory or microeconomic whilst the highest-profile economic commentators are experts in interpreting macroeconomic and fiscal policy events (and hence naturally seek to interpret market volatility through such a macro lens).

4.1.3 Is it plausible that the main driver of market yields movements was concern about fiscal sustainability?

The narrative that the mini-Budget was the main cause of the gilts market and foreign exchange volatility of September / October 2022 includes interpreting the market reaction as fundamentally driven by concerns about the sustainability of UK sovereign debt. The idea is that some combination of

- the increased spending announced in the mini-Budget (especially in the form of the Energy Price Guarantee and the freeze on wholesale gas and electricity prices for businesses); and
- the tax cuts, perhaps in combination with
- scepticism about the political feasibility of the government's notional commitment to stick to the previously-scheduled nominal spending levels for departmental spending (despite inflation turning out much higher than expected) and
- the political implications of the scheduled major Fiscal Event of early November 2022 (at which further details of a fiscal consolidation were expected), exacerbated by what some commentators deemed
- a disregard for fiscal disciplining mechanisms such as the Office for Budget Responsibility (by not having an OBR report on the mini-Budget)

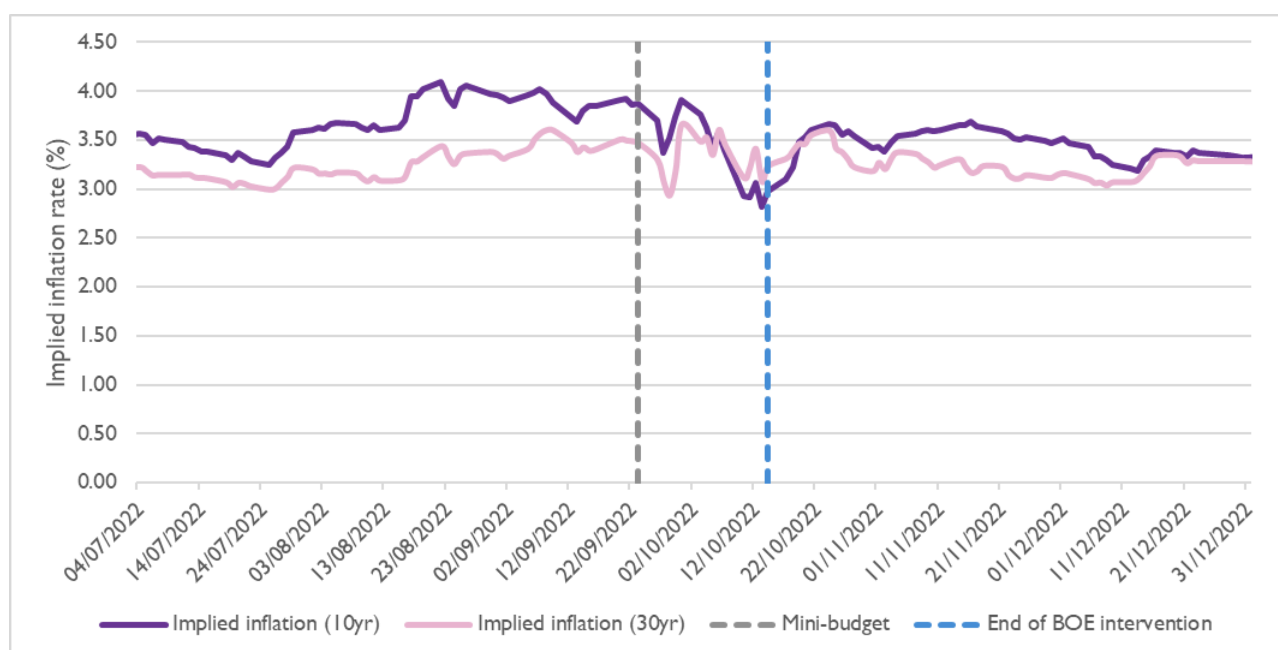
led market participants to have serious concerns about the risk of a UK sovereign default of some sort, and therefore to lose their appetite for holding UK sovereign debt. Indeed, this appears to have been the interpretation within the UK Treasury during the crisis period, given the claims that Liz Truss was warned that if she did not reverse mini-Budget policies then UK sovereign debt auctions might fail.

deliver, once details were finalized, and constituted a very large increase on previous assumptions (e.g. in its March 2022 Economic and Fiscal Outlook the OBR discussed a range for the annual potential output growth rate of 1.2 to 1.6 per cent — see https://obr.uk/docs/dlm_uploads/CCS0222366764-001_OBR-EFO-March-2022_Web-Accessible-2.pdf). Absent some assumed increase in growth from this plan, any OBR analysis would clearly have been meaningless and misleading. But what growth increase should have been assumed? Would the OBR have been instructed to assume a 2.5 percent growth rate was achieved, in line with the government's own assumption, without any details yet being ready of how that was to be done? Why would financial markets have considered that in any way credible? Wouldn't publication of an OBR plan based on an arbitrary, unsubstantiated growth rate increase have undermined the fiscal credibility of the mini-Budget rather than enhanced it?

However, a number of subsequent analyses have pointed out that this is simply economically implausible as an interpretation of the events, as it is inconsistent with key aspects of the market developments. In particular, as Former Deputy Governor of the Bank of England for Financial Stability Paul Tucker has repeatedly pointed out,[9] there are two forms of de facto sovereign default. In one, a state fails to make coupon payments. In the other, having issued nominal debt in its own currency, a state then delivers materially more inflation than it promised, eroding the real value of that debt below the level anticipated in the initial debt contracts. As an issuer of debt in its own currency (as versus non-US countries that issue debt in dollars or countries issuing in euros, say), with a floating exchange rate, overwhelmingly the main form concerns about sovereign debt should take would be elevated inflation. (Indeed, some market commentary during the September / October 2022 crisis contended that elevated inflation was precisely the risk, and the reason for a loss of appetite for holding gilts.)

Yet, as Tucker emphasizes, and as we can see in the graph below, there was no increase in market-implied inflation expectations during the period, as measured by the gap between yields on nominal and index-linked bonds.[10]

Figure 4-1: UK inflation expectations during the September / October 2022 financial market crisis



Thus it is simply not sustainable to interpret the period of temporary volatility or crisis of September / October 2022 as being a crisis of sovereign debt sustainability concerns. As well as the alleged trigger of these concerns (fiscal announcements made in the mini-Budget) being vastly too small for it to be plausible they caused concern (being only of order only of order £1bn-£5bn per year in an economy of around £2.3 trillion, or around 0.04-0.22 percent of GDP), one of the fundamental symptoms of sovereign debt concern, namely a rise in inflation expectations, was wholly absent. Whatever was happening in financial markets during September / October 2022, it wasn't that those markets had been induced by the mini-Budget of 23 September to fear that the UK might default on its sovereign debt.

[9] https://www.annualreviews.org/content/journals/10.1146/annurev-financial-082123-110030;jsessionid=CACWka7F0IT_oxbdrFCJjo4yrAicmHH1XdVM9MIk.annurevlive-10-241-10-104

[10] Tucker himself refers to 10-year and 30-year sterling inflation forward rates as estimated by the Bank of England. The pattern is the same as in our figure above.

4.2 What other potential causes are there of the financial market events of September / October 2022?

Fiscal events are not the only source of volatility in markets and other events can occur at the same time, providing their own source of volatility. In the case of the mini-Budget, other events occurring at around the same time that might have had an impact on gilts and foreign exchange markets included:

- natural volatility as sentiment evolved regarding where long-term interest rates were likely to settle, as the world came out of the decade of near-zero interest rates;
- general concerns that the Bank of England was both behind the curve in terms of raising rates in response to inflation (and falling further behind) and hence might end up having to raise them too high in the end to compensate and also falling behind relative to other central banks;
- specific concern about the Bank of England's decision to raise rates by less than expected on 22 September;
- the Bank of England's switch out of quantitative easing and into quantitative tightening;
- a "strong dollar" story, with the dollar strengthening against many currencies, as we have seen above already;
- a reevaluation of US Treasuries in the light of US growth expectations, meaning some portfolio adjustment out of Gilts and into Treasuries
- general concerns that with the Tories polling so badly there might not be any sustained political appetite for fiscal consolidation in the UK

As well as such events being their own source of volatility there can be an interaction between events, such that two events occurring together might induce a much larger change than would one of the events occurring alone.

We do not deny that the above list of factors may have made their own contribution to the events of September / October 2022, but in our view it is highly unlikely that they (without or without some modest contribution of the normal volatility associated with Fiscal Events such as the mini-Budget) would have induced anything close to the scale of volatility markets exhibited in that period without one key further background factor.

Before we explain that key factor, let us remind ourselves of the analogy of the balloon. A balloon that has been over-inflated and continues to be further over-inflated might be burst by the heat of the sun coming out, but its bursting was not really caused by the sun's heat. The bursting was inevitable given the over-inflation and the sun's heat would not have burst it without the over-inflation. The sun's heat was merely an incidental trigger.

In our view, this was the nature of the circumstances of September / October 2022. It was not that any of the factors above either individually or in combination or added to or even interacting with the mini-Budget caused the crisis. Rather, it is most likely that either

a. the crisis would have happened in September 2022 anyway because of the key factor, regardless of any of these other factors; or
b. the crisis was inevitable anyway at some point, given the key factor, but happened incidentally to be triggered at that specific moment by some combination of the events and conditions of September 2022 that we have mentioned above (potentially including the mini-Budget); or
c. the crisis occurred because of the interaction of some combination of these other events (potentially including the mini-Budget) with that key factor, but they collectively only played a minor role compared with this main key factor.

The main key factor to which we have so far only alluded is the liability-driven investment (LDI) crisis. Indeed, the period itself is often now referred to as the "LDI Crisis".[11]

4.3 Liability-driven investment and its role in the LDI Crisis

A common strategy for pension funds involves the matching of long-term liabilities with assets of similar duration. In the case of defined benefit schemes, for which liabilities are broadly fixed, one obvious approach would be to secure fixed returns from government bonds of a similar duration, thus achieving a broad match both of maturity and of risk (high certainty of the fixity of liabilities with high certainty of the fixity of income).

During the period following the Great Recession of 2008/09, yields on government bonds fell very low — indeed in some periods negative in real terms. This made it particularly attractive to seek alternative ways to match liabilities that might involve higher returns.

Pension funds adopted a number of these. One alternative involved buying gilts that were then hired out via repo agreements that might in turn include cash collateral that would itself be invested in higher-yielding assets. Other alternatives involved swaps, for example the pension fund agreeing to pay a floating interest rate while receiving fixed payments aligned with its liability profile, thus avoiding actual gilts purchases (exposure to gilts movements is only synthetic) and instead providing only a margin deposit at a fraction of the swap's notional value, freeing up capital for other uses.

One curlicue here is that regulations and internal fund policies forbid many funds from trading in derivatives such as swaps. Consequently, the derivative contracts themselves are entered into via Special Purpose Vehicles (SPVs) established by the funds, with the fund providing the collateral for the swap through the capital injection into the SPV. That makes the process of securing additional collateral for these derivatives cumbersome and potentially slow (e.g. in the event what is known as "rebalancing" is required if the losses on the swaps exceed the collateral posted), since there are added steps (a capital injection and then that being used for collateral) that require their own decision processes, internal clearance and regulatory compliance checking. Some SPVs provide this function for multiple funds, which makes the process of adding collateral even more complex, since capital injections are required from multiple parties. Even absent the SPV, rebalancing could be challenging to achieve rapidly because the alternative higher-yielding assets the freed-up capital has been invested in (e.g. equities) is often less liquid than gilts, meaning that the most likely response to a call for rebalancing, in response to a fall in gilts prices, is for funds to sell gilts to obtain the required collateral in the required timescale. Thus, by their nature, LDIs tend to magnify significant movements in gilts markets. So an initial rise in yields might, via quasi-forced-selling by funds to meet collateral calls, induce an overall rise in yields that was multiples of the initial effect.[12]

From even this very brief description we can see that LDIs give rise to at less three areas of concern:

1. By their nature they involve a departure from risk matching. Whereas a strategy involving gilts purchases matches not only maturity but risk, the LDI strategy matches maturity but secures higher returns at the expense of elevated risk — typical risk profiles of the assets of funds involved in LDI sat towards the bottom of investment grade.

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11 See, for example, https://www.imf.org/en/Publications/selected-issues-papers/Issues/2023/07/13/Lessons-from-the-United-Kingdoms-Liability-Driven-Investment-LDI-Crisis-United-Kingdom-536314

12 Bank of England modelling has found that "LASH[Liquidity After Solvency Hedging]-induced trading accounts for around two thirds of the yield spike during the LDI crisis", estimating the total "spike" component of the 30 year yields rise at 103 bps. https://www.bankofengland.co.uk/-/media/boe/files/working-paper/2024/lash-risk-and-interest-rates.pdf

2. By their nature they involve a get-around of regulation and policies aimed at preventing participation in swaps.
3. The cumbersome nature of the collateral arrangements meant that, by their nature, they were not well-configured to deal with circumstances in which collateral requirements suddenly increased and hence additional collateral was required rapidly.

Furthermore, because the reaction function of LDIs (reacting to an initial fall in gilt prices by selling gilts) potentially significantly amplifies any initial effect, standard stress-testing magnitudes (whereby a 100 basis points rise in gilts was regarded as a very significant stress test, and this was the scale of stress testing the Bank of England's Financial Policy Committee did in 2018 when examining the capacity of the UK pension funds with the most involvement in derivatives to respond to a rise in gilt yields) were likely to be inadequate to expose the systemic nature of the risks involved.[13]

Nonetheless, by 2022 the Pensions Regulator estimated that around 60 percent of private sector defined benefit schemes used LDI strategies of some form.[14] This did not occur without industry and market criticism. Concerns about pension fund participation in LDIs were raised well before September 2022. For example, as already noted, the Bank of England explored the issue in 2018. The Pensions Regulator subsequently conducted a survey in 2019 exploring the arrangements funds had in place to manage LDI-related risks.[15]

However, these investigations by the authorities missed key aspects of the issue (e.g. the Pension Regulator survey, by focusing on large funds, missed the point that when multiple funds used the same SPV there would potentially be especially acute problems) and did not anticipate the way that the Covid crisis, the policy response to it, the recovery from it and the Russo-Ukraine War would lead to a rapid rise in inflation that meant interest rates rose rapidly without a corresponding strengthening in real GDP growth (which would have been associated with elevated returns on higher-risk assets such as equities, providing additional solvency and liquidity to funds). That meant the LDI situation had become highly volatile and was always likely to turn into a crisis at some point.

Tucker regards the LDI crisis as the UK's equivalent of the US and Swiss banking crisis of early 2023[16] — that as interest rates normalised, driven by inflation, after an extended period of near-zero rates, a number of financial strategies that worked during (and were contingent upon the continuation of) the period of very low interest rates that followed the Great Recession were bound to be exposed.[17]

Thus, the correct understanding of the market volatility of September / October 2022 is not that it was a sovereign debt crisis caused by the mini-Budget or "Liz Truss" more generally. Rather, late 2022 was a period in which interest rates were rising rapidly, to more historically normal levels, under pressure from inflation, and without any corresponding acceleration in the real economy. In that environment, pension funds (which had collectively participated heavily in LDIs) had become highly exposed to movements in gilt yields that should have been regarded as naturally expected given the large adjustments going on. Some combination of general macroeconomic factors, evolving views about Bank of England policy, and the normal volatility associated with Fiscal Events induced a fall in gilts prices inducing yields rises (of a few tens of basis points) that at almost any other time would have been considered unremarkable (and in particular would not have induced any form of crisis). But because of the exposed nature of LDIs, pension funds were

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[13] See Tucker (2023), *op. cit.*

[14] See p13 of https://committees.parliament.uk/publications/40563/documents/197799/default/

[15] See https://webarchive.nationalarchives.gov.uk/ukgwa/20210104112035mp_/https://www.thepensionsregulator.gov.uk/-/media/thepensionsregulator/files/import/pdf/db-pension-scheme-leverage-and-liquidity-survey.ashx

[16] See Tucker (2023), *op. cit.*

[17] In the words of the famous quote by Warren Buffett: "Only when the tide goes out do you discover who's been swimming naked."

forced to respond to these otherwise-modest falls in gilt prices by selling gilts to obtain collateral rapidly enough that (after the cumbersome processes involved) they could rebalance in their SPVs. Those forced sales induced further falls in gilt prices, creating a self-feeding cycle and a yield spike that was ended only when the Bank of England provided a backstop intervention to purchase gilts.

It is worth observing that although the Bank of England estimates that LDI funds faced more than £70bn of collateral and margin calls over the crisis period and the Bank made £5bn available per day for intervention in the form of daily auctions to purchase gilts, rising to £10bn in the final week, it actually only purchased £19.3bn of gilts over the intervention period, and by 12 January 2023, it had resold them at a profit of £3.8 billion. Thus even in respect of the Bank of England's intervention to halt the LDI crisis there was no enduring fiscal loss — nothing that "Liz Truss" could be said to have "cost the economy".

5 Conclusion

We have seen in this report that it is not true that "Liz Truss crashed the economy".

- The economy did not crash, by any understanding of an "economic crash" that economists would normally recognise.
- The financial volatility of late 2022 did not create material enduring economic effects that could be understood as "crashing the economy" even by some very loose understanding of that term.
- Even in respect of the period of financial volatility itself (which was manifestly not a crashing of the economy), it is implausible that the mini-Budget played a significant role other than as a component of a trigger. The crisis was demonstrably not a sovereign debt crisis. Rather, it was a consequence (perhaps even a consequence that was inevitably going to occur at some point) of the normalisation of interest rates in an inflationary (rather than improving real growth) environment, given the liquidity vulnerabilities of LDI pension funds.