A Study of the United Kingdom's recent macroeconomic history

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The United Kingdom of Great Britain and Northern Ireland, comprising of four independent nations of England, Wales, Scotland, and Northern Ireland is the world's sixth-largest economy by Gross Domestic Product (henceforth referred to as GDP) constituting nearly three percent of the world's economy (PriceWaterhouseCooper, 2023). The economy of the United Kingdom has historically been a major contributor to global economic growth, being the birthplace of the first Industrial Revolution in the 1800s.

The UK also enjoyed a large historical advantage through the 19th and early 20th centuries in the form of their extensive colonial empire, which helped propelled their domestic economy. Over the past century however, the UK has joined it's Organization of Economic Cooperation and Development(henceforth referred to as OECD) peers as a service-dominant economy, with the world's second largest financial services hub in the Greater London Area (CNBC, 2019), and the third largest technological services industry behind only the United States and China. The UK's pre-eminent position in the global economy reflects in its highly internationalized economy, and its status as the fifth largest importer and exporter in the world. Nearly three-quarters of the Fortune 500, a collection of the world's largest firms, have their European headquarters in London.

The UK's economic policy is formulated by two high-powered bodies: His Majesty's Treasury which develops and executes all fiscal policy and public spending plans, and the Bank of England which is the apex monetary authority. The Treasury is headed by the
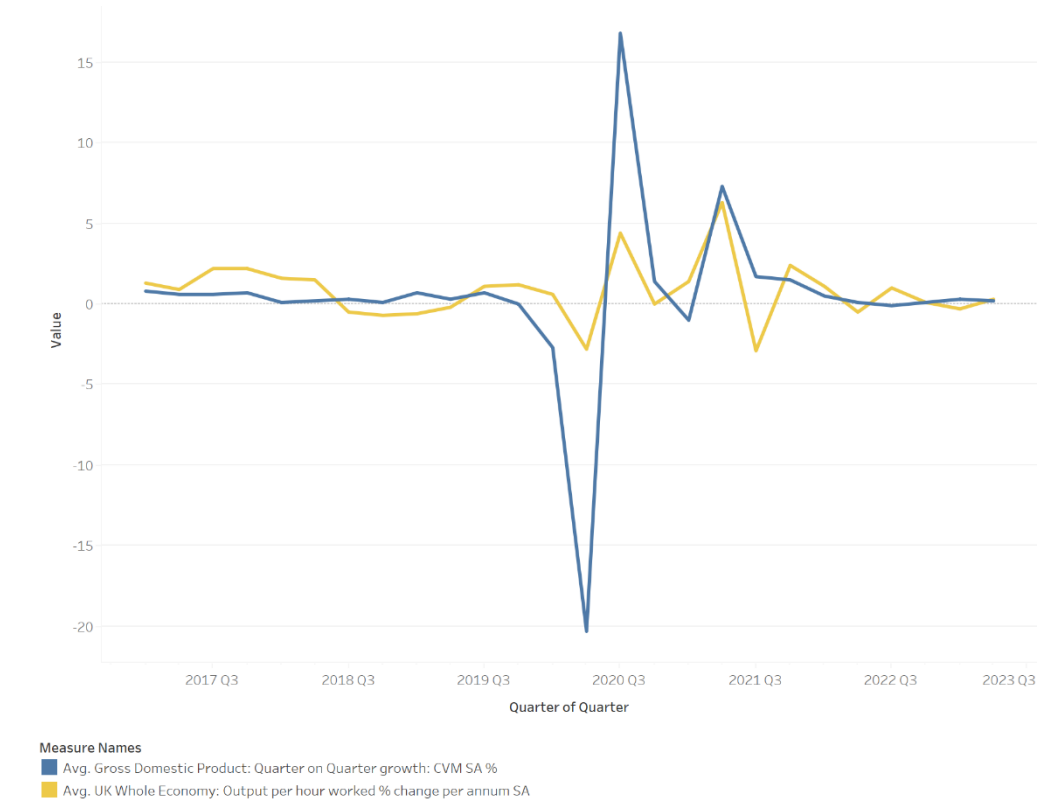
Chancellor of the Exchequer, who is presently Jeremy Hunt. The Chancellor presents the UK's annual fiscal policy in the form of the budget statement before it's parliament and plays a key role in steering the direction and magnitude of public spending. The Bank of England's Monetary Policy Committee has steered UK monetary policy since 1997, with an explicit mandate to maintain stable prices and low inflation.

As part of this study on the macroeconomic environment surrounding the United Kingdom over the recent years, data was collected on a wide range of economic indicators that reflect trends since the 1st of January 2017. The choice of start date was deliberate, to reflect the immediate impact of one of the largest macroeconomic shifts in the UK's history, Brexit. After the 2016 referendum saw voters choose to leave the European Economic Community, there was a sustained period of instability in the UK, caused by fears over future growth without unrestricted access to the lucrative European market. In 2020, the COVID-induced pandemic saw the UK take the largest hit to its economy amongst its OECD peers, with the Conservative government forced to put in place a large economic stimulus package to keep the UK afloat.

While it might be tempting to reduce the cause behind the UK's present stagnation to these two key events, there are other variables that have considerably influenced this outcome. The current party in power, the Conservative party, are known for their fiscal frugality and have executed a series of austerity measures over the past decade in power. This paper attempts to trace out the recent trends in monetary and fiscal policy, and also provide commentary on the possible path ahead for the UK.

Contextualizing the present state of the UK's economy

As of December 2023, the UK is a 3.32 trillion-dollar economy[1], with an estimated population of 67 million, and a GDP-per-capita of 48,913 USD. The economy has recorded slow growth over the past few years, reaching depths in 2020 of nearly -20% quarterly slowdown as a result of the COVID-19 pandemic and related shutdowns. Chart 1 shows the UK's quarterly growth in both GDP and output per hour worked. Both measures have been indexed, and seasonally adjusted. The stagnation in GDP is quite clearly linked to very poor growth in productivity, and the UK has not managed to yet recover to a pre-pandemic state, with November 2023 registering a very poor 0% economic growth figure.

Measure Names
- Avg. Gross Domestic Product: Quarter on Quarter growth: CVM SA %
- Avg. UK Whole Economy: Output per hour worked % change per annum SA

[1] International Monetary Fund estimate dated November 15, 2023

The poor rate of growth is reinforced by Chart 2, which shows the total GDP of the UK since January 2017. A growth of 900 billion pounds in nearly seven years is dismal growth for one of the world's most advanced economies. The lack of growth post the lifting of the COVID restrictions is also puzzling, revealing deeper-lying structural challenges to the UK economy.

UK Gross Domestic Product in Millions of GBP
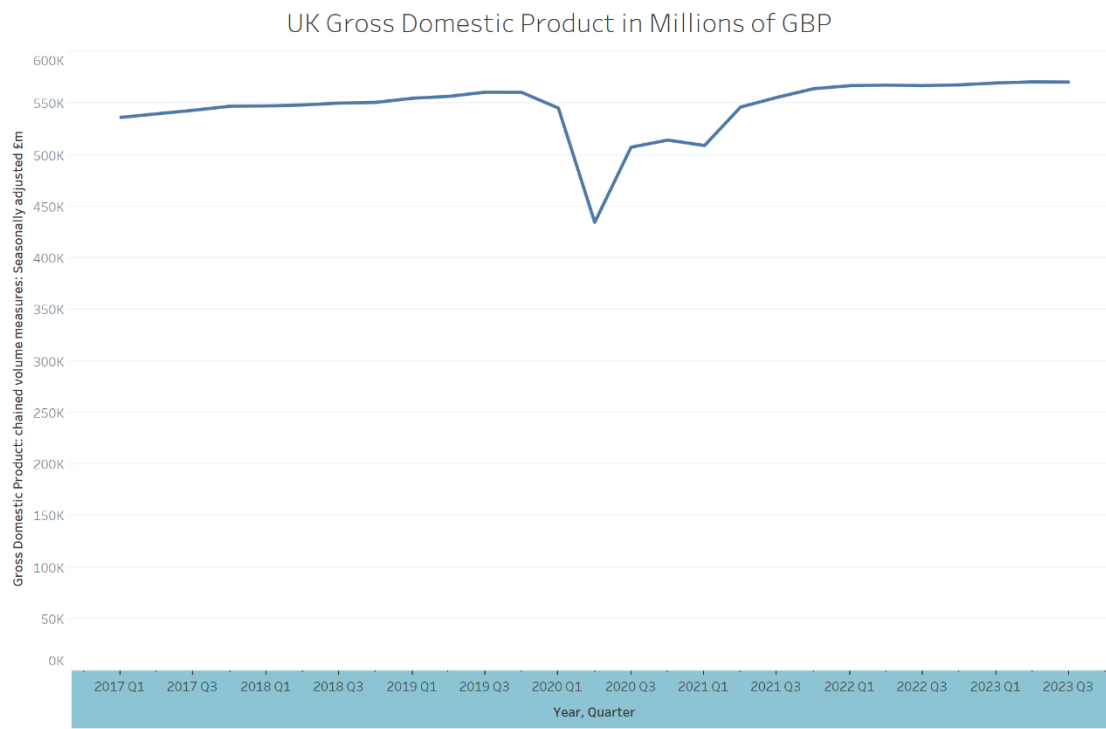
The trend of sum of Gross Domestic Product: chained volume measures: Seasonally adjusted £m for Title Quarter.

Rather interestingly, this period of slow growth has not created an unemployment crisis, with a very stable trend of 4.25% unemployment over this period as shown by Chart 3. This is perhaps the sole area that the UK has managed to considerably outperform its peers, even in the height of the pandemic-enforced lockdowns, hitting a high of only 5% in Q2 2020. This is an admirable effort to ensure economic downturn does not deeply impact the people, but it has potentially come at the expense of certain other indicators going out of control.

Unemployment Rate in the UK

The trend of sum of Unemployment rate (aged 16 and over, seasonally adjusted): % for Month Month. The view is filtered on Month Month, which keeps non-Null values only.
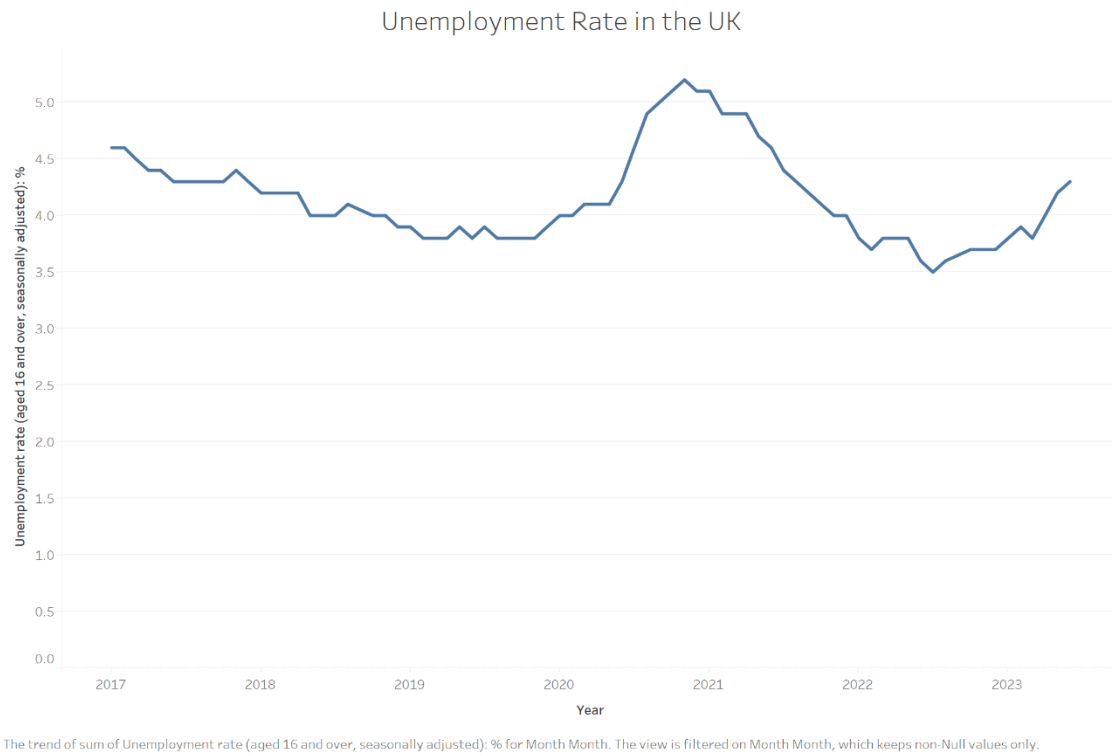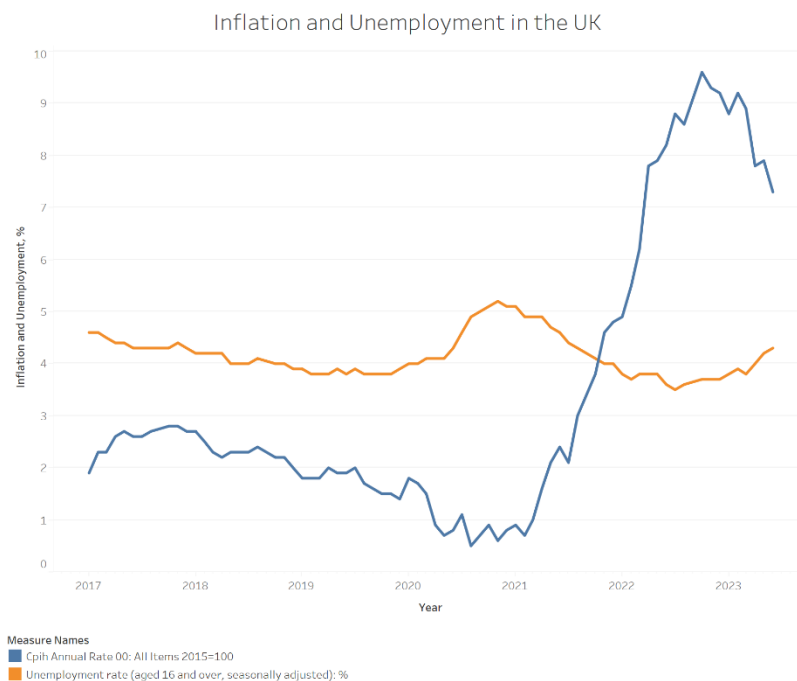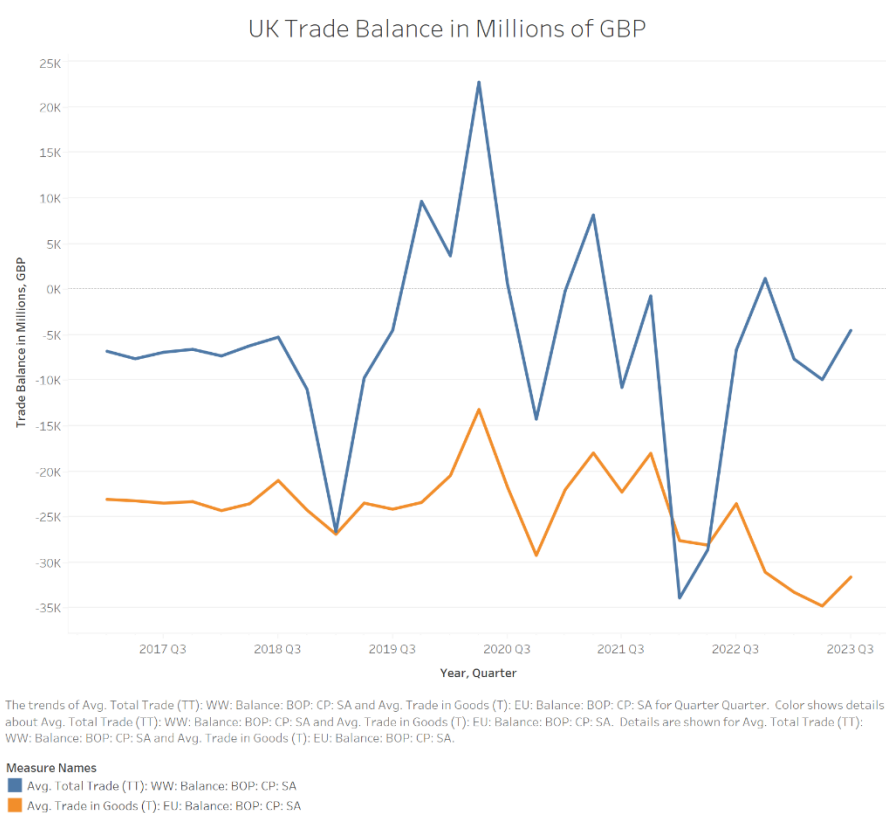
Chart 4 shows the inflation rate in the UK over the period, with a stable declining trend observed well into the pandemic, until the tide began to turn in late 2021. The UK witnessed some of the worst inflation among large economies, with core inflation hitting nearly 10% in 2022. This was compounded by the Russian invasion of Ukraine in March 2022, which set European energy markets on a frenzy, and caused run-away inflation for a few quarters. This inflation informed a large part of the Bank of England's extremely hawkish stance in recent months, which has been analyzed in detail.

Inflation Rate in the UK
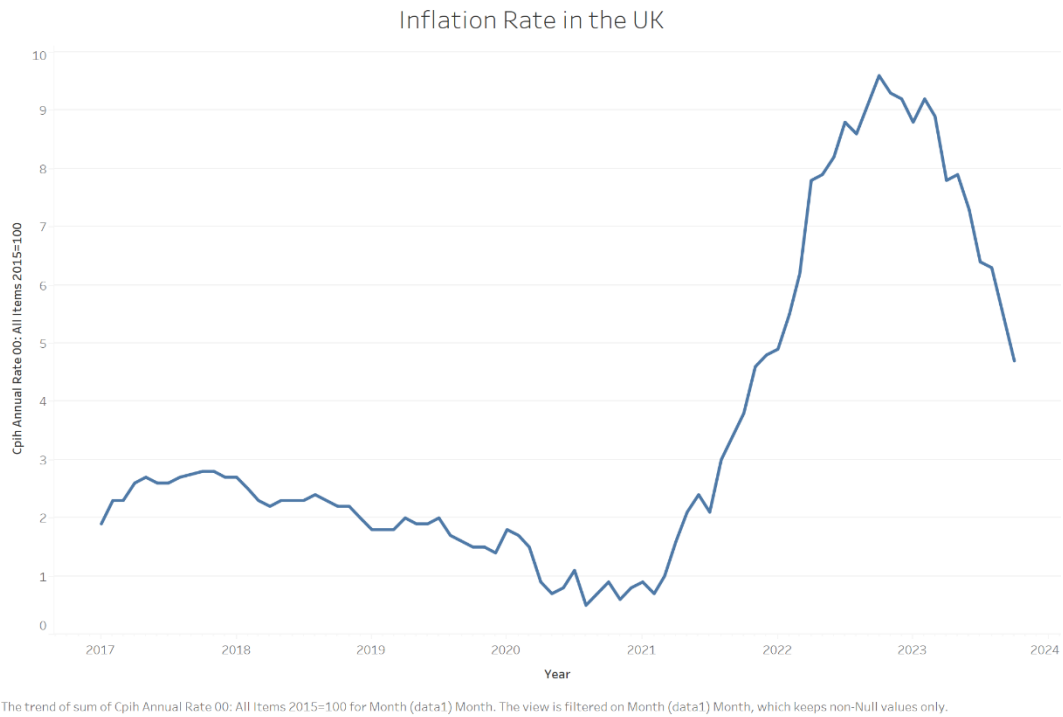
In this context, the UK government and the Bank of England have had to balance a dire need to stimulate the economy out of the doldrums, and yet also control inflation in the recent past. Chart 6 is a depiction of the theoretical relationship between inflation and unemployment as proposed in the Philip's Curve. This relationship does not appear to manifest itself in the UK, with unemployment remaining steady even in the face of decade-high interest rates designed to curb inflation.

Inflation and Unemployment in the UK

Measure Names
- Cpih Annual Rate 00: All Items 2015=100
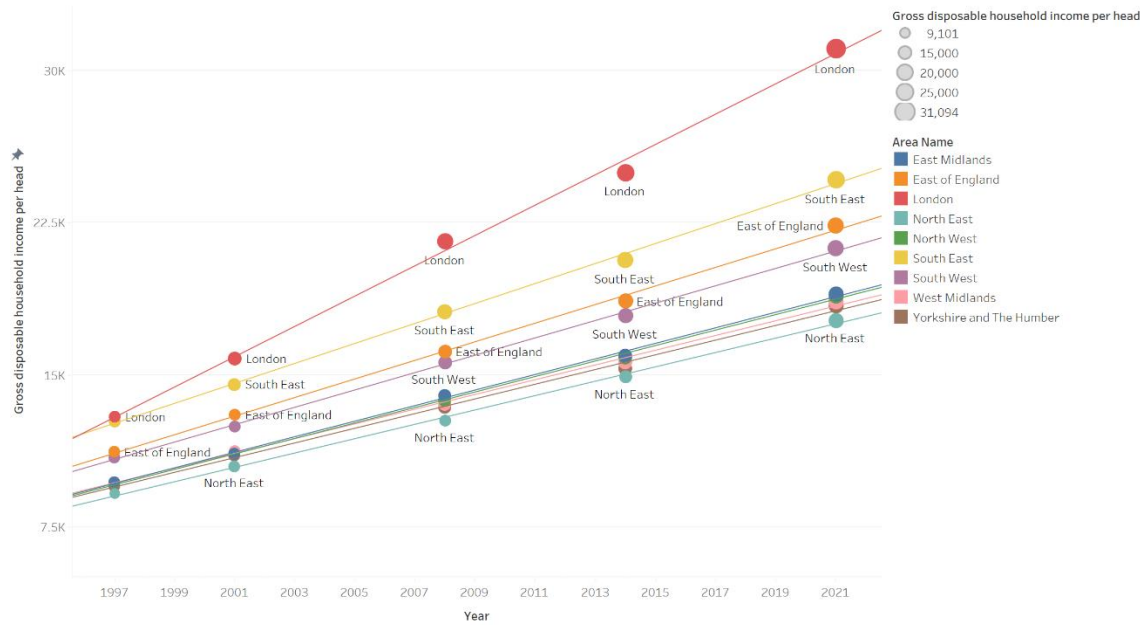- Unemployment rate (aged 16 and over, seasonally adjusted): %

A further constraint placed on the UK in this period was the extremely short-lived, yet highly controversial term of Elizabeth Truss as Prime Minister. Truss, whose term lasted a month, announced sweeping fiscal changes including some of the largest tax rate cuts in recent history. Even amidst political instability, the UK has continued to attempt striking crucial trade deals with key trading partners such as the US, India, Canada and Australia. The UK's economy remains reliant on both inward and outward flows of trade.

UK Trade Balance in Millions of GBP

The trends of Avg. Total Trade (TT): WW: Balance: BOP: CP: SA and Avg. Trade in Goods (T): EU: Balance: BOP: CP: SA for Quarter Quarter. Color shows details about Avg. Total Trade (TT): WW: Balance: BOP: CP: SA and Avg. Trade in Goods (T): EU: Balance: BOP: CP: SA. Details are shown for Avg. Total Trade (TT): WW: Balance: BOP: CP: SA and Avg. Trade in Goods (T): EU: Balance: BOP: CP: SA.

Measure Names
■ Avg. Total Trade (TT): WW: Balance: BOP: CP: SA
■ Avg. Trade in Goods (T): EU: Balance: BOP: CP: SA

The last structural cause for concern in the UK is the ever-widening regional disparity between London, which is approximately on par with most other major global cities and other regions which continue to stagnate and fall behind European peers. This divide does not bode well for long-term growth. Chart 8 depicts this widening gap.

Disposable Income per person in UK's major regions, 1997 - 2021

Gross disposable household income per head
- ○ 9,101
- ○ 15,000
- ○ 20,000
- ○ 25,000
- ○ 31,094

Area Name
- ■ East Midlands
- ■ East of England
- ■ London
- ■ North East
- ■ North West
- ■ South East
- ■ South West
- ■ West Midlands
- ■ Yorkshire and The Humber

Gross disposable household income per head (y-axis): 7.5K, 15K, 22.5K, 30K

Year (x-axis): 1997, 1999, 2001, 2003, 2005, 2007, 2009, 2011, 2013, 2015, 2017, 2019, 2021

Analyzing the UK's fiscal and monetary policy environment

Similar to the rest of the world, the macroeconomic environment of the United Kingdom on the onset of COVID-19 and beyond has faced extreme complexity and volatility. Due to strict lockdowns, the UK faced a steep reduction in demand, encouraging the British Government to enact both monetary and fiscal stimulus. This, however, led to wild fluctuations in both equity markets and the price level. During this unique time, the UK has been trying to stabilize its economy and utilize monetary and fiscal policy to achieve a more normal macroeconomic environment.
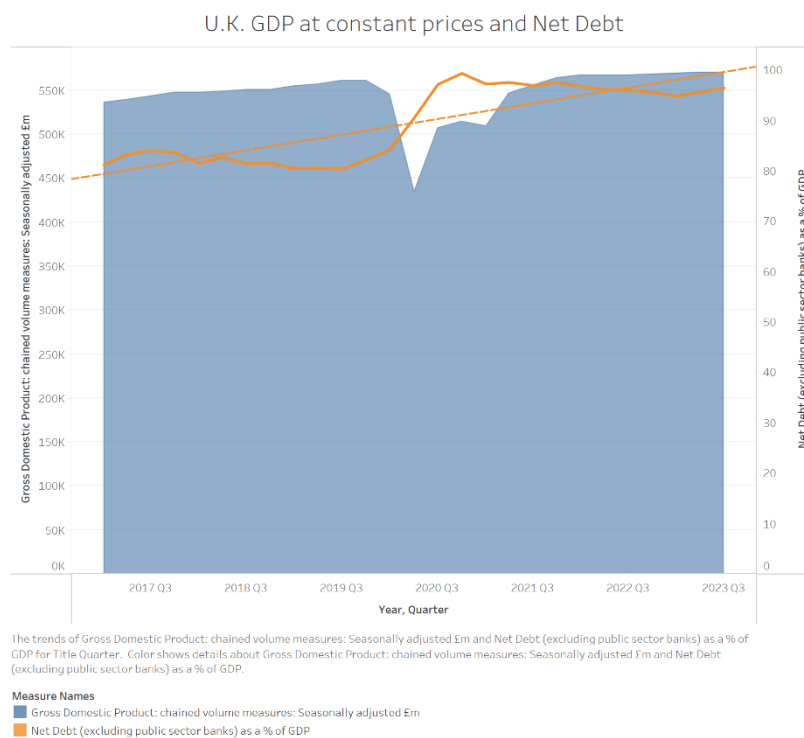
Immediately following the outbreak, the Bank of England, along with many other central banks around the world, dropped interest rates nearly as low as they could go. For the UK in particular, the bank rate was lowered to 0.1% in March of 2020 after already consistently below 1% for over a decade (since the great recession). Because this bank rate was only for the short term, the bank also introduced the "Term Funding SME", which allowed certain banks to borrow at rates close to the bank rate but for up to four years instead of just one day. This allowed the new lower rates to have more of an impact than they would have had these rates only been short term. Along with this reduction in the bank rate, the Bank of England also introduced quantitative easing measures, increasing their holdings of government bonds and investment-grade corporate bonds. This was done as another way to help reduce the interest rate, as the increase in bond purchases drove up bond prices and thus drove down the interest rate, but this time for

all time periods, not just short term. The Bank of England has already been utilizing this policy since 2009, they simply restarted the old program without offloading the bonds they had previously bought. In total, the Bank of England bought 895 billion pounds (about 1.2 trillion US dollars at the time) worth of bonds, with the large majority being UK government bonds. These measures contributed a 22% increase in the model supply since the beginning of the pandemic, and allowed consumer spending to stay alive in an environment that was extremely hostile to discretionary spending. On top of this direct increase in the money supply, the UK government also relaxed many bank regulations, allowing banks to loan out higher percentages of their assets. This further increases the access people have to pounds, increasing spending and economic activity. Chart 9 showcases the Bank of England's headline funds rate.

Bank of England Bank Rate, in %

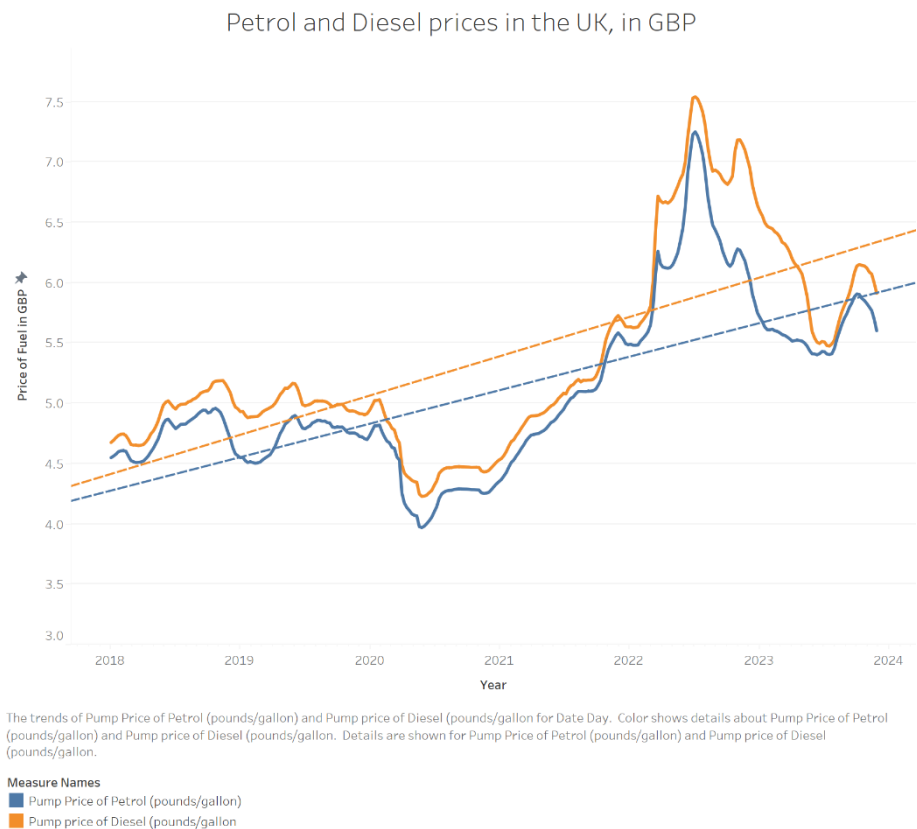

The trend of sum of Bank Rate for Date Day.
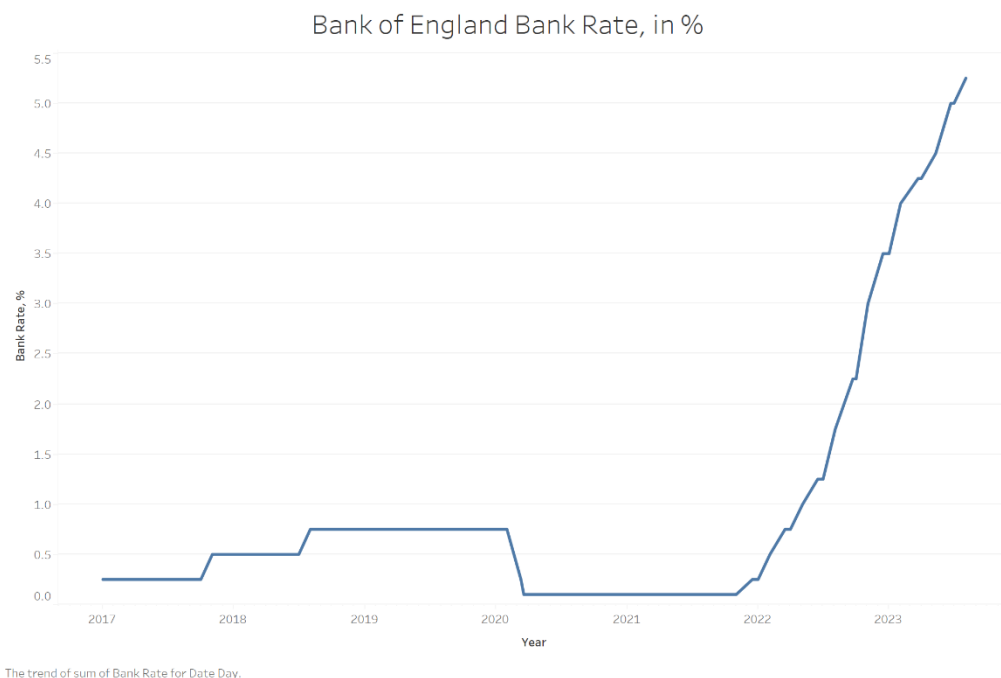
It was not just monetary policy that the UK government used to spur spending and economic activity during the COVID-19 lockdowns, but fiscal policy as well. Along

with the increase in money supply and ease of access to capital, the UK also passed numerous spending measures. The current estimates from the government say that the total cost of these measures ranges between 310-410 billion pounds (391-517 billion US dollars). This amount of spending is about twice the amount that the government would have spent had the pandemic have not happened. Most of this spending was focused on public services, such as health services, but also on business and individual support. To pay for all this, the government borrowed 313 billion pounds, as less taxes were collected in 2020 than the year prior, despite spending being the highest in record.

U.K. GDP at constant prices and Net Debt

The trends of Gross Domestic Product: chained volume measures: Seasonally adjusted £m and Net Debt (excluding public sector banks) as a % of GDP for Title Quarter. Color shows details about Gross Domestic Product: chained volume measures: Seasonally adjusted £m and Net Debt (excluding public sector banks) as a % of GDP.

Measure Names
■ Gross Domestic Product: chained volume measures: Seasonally adjusted £m
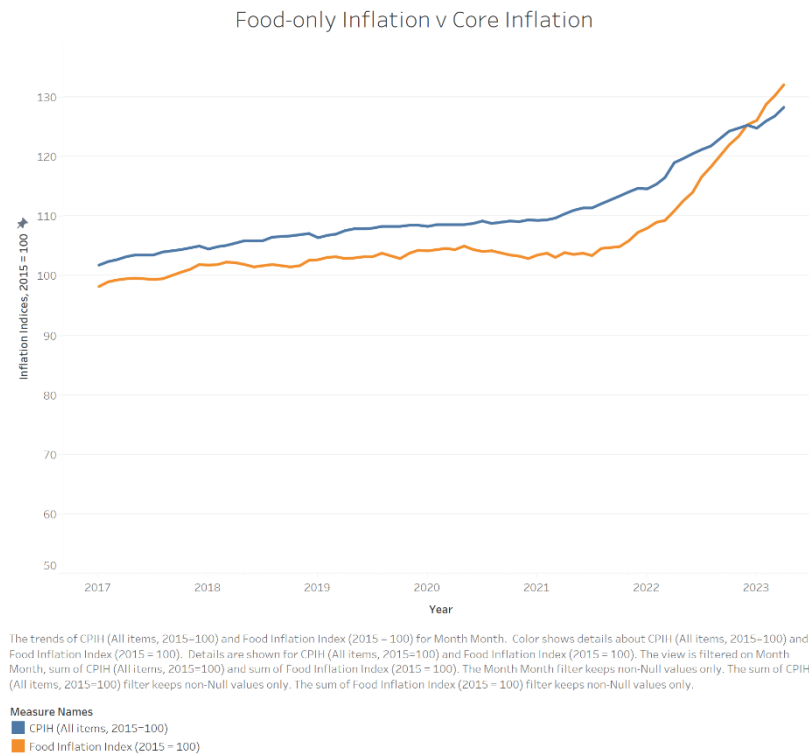■ Net Debt (excluding public sector banks) as a % of GDP

Nearly every policy that the UK brought into effect to boost the economy through the COVID pandemic also happened to be inflationary, so it should have come as no surprise that the UK faced significant inflation following the implementation of these policies. After the inflation rate broke above the 2% target in early 2021, it continued to

rise, reaching a 41-year high of 11.1% in October of 2022 before beginning to fall. This inflationary pressure was made even worse when in early 2022, the Russian invasion of Ukraine caused a rapid increase in prices, particularly in petroleum and agricultural products.

Petrol and Diesel prices in the UK, in GBP

The trends of Pump Price of Petrol (pounds/gallon) and Pump price of Diesel (pounds/gallon for Date Day. Color shows details about Pump Price of Petrol (pounds/gallon) and Pump price of Diesel (pounds/gallon. Details are shown for Pump Price of Petrol (pounds/gallon) and Pump price of Diesel (pounds/gallon.

Measure Names
■ Pump Price of Petrol (pounds/gallon)
■ Pump price of Diesel (pounds/gallon

This peak in inflation was in line with the peak of the EU's inflation at 11.5% but far higher than the peak inflation in the US at 9.1%, which happened a few months prior. By the end of 2021, it became clear to the Bank of England that inflation was starting to become a serious issue, which brought an end to easy money expansionary monetary and fiscal policy that was holding up the UK economy.

Food-only Inflation v Core Inflation

The trends of CPIH (All items, 2015=100) and Food Inflation Index (2015 = 100) for Month Month. Color shows details about CPIH (All items, 2015=100) and Food Inflation Index (2015 = 100). Details are shown for CPIH (All items, 2015=100) and Food Inflation Index (2015 = 100). The view is filtered on Month Month, sum of CPIH (All items, 2015=100) and sum of Food Inflation Index (2015 = 100). The Month Month filter keeps non-Null values only. The sum of CPIH (All items, 2015=100) filter keeps non-Null values only. The sum of Food Inflation Index (2015 = 100) filter keeps non-Null values only.

Measure Names
■ CPIH (All items, 2015=100)
■ Food Inflation Index (2015 = 100)

In December of 2021, the Bank of England began their period of bank rate increases with an increase from 0.1 to 0.25 and have consistently been increasing this rate all the way to 5.25% in August 2023, where it remains today. This increase in the interest rate has a double effect on slowing the economy as it makes borrowing to spend more costly and makes saving and not spending more attractive. These moves in the interest rate were meant to reduce spending so that prices would slow their increase, which they did, but not until several months later, as the inflation rate did not begin to fall until november of 2022.

Along with the increase in the bank rate, the Bank of England still needed to reverse its other expansionary monetary policy, quantitative easing. This was done with a process often called "quantitative tightening" and involved the bank selling its bond holdings. This policy decreased the price of bonds and thus increased their yield, and

pulled money out of the economy as buyers gave their pounds to the bank in exchange for the bonds. The bank decided in September 2022 that it was going to begin to reduce the size of its balance sheet by 80 billion pounds (about 100 billion US dollars) in 12 months starting November 2022. This was just a start and was only a very small portion of the 895 billion pounds it had originally bought. The plan for this reduction of the balance sheet was to reduce it by 20 billion pounds a quarter; half through direct sales of the bonds and the other half by letting the bonds expire without replacement.

Though it seemed like a slow process, Deputy Governor Ben Broadbent said that "anything more than 100 (billion pounds per year), our markets people said that might risk disturbing market liquidity," and that the 80 billion number seemed to be, "about right". This strategy was executed well, and despite planning to reduce the balance sheet by 80 billion pounds by November 2023, the bank had reached its target by June 2023. In a speech, Deputy Governor of the BoE Dave Ramsden stated that, the overall impact of QT on gilt yields appears to have been small," estimating that they have only affected these yields by 10 basis points, but with only an 11.6% reduction in the balance sheet, not much change was expected. Ramsden continued to say that this policy has overall been a success, and the Bank of England is currently planning out the pace for a new 12 month round of asset reduction, though it will likely be similar in size to the previous one.

Despite the efforts to rein in inflation beginning in 2021, it took until November of 2022, almost a year after the Bank of England began to raise the bank rate, for inflation to begin on its downward trajectory, after a peak of 11.5% percent in October. The fall

was far from immediate though, with double digit inflation sticking around until April of 2023, where the UK had its first month of inflation under 10% since June 2022. In the spring of 2023 is when the decline in inflation began to really pick up, as the bank rate reached 4% and kept climbing. The inflation rate in the UK in October 2023, the most recent published statistic, was 4.6%, and had the largest decrease this century, falling by 210 basis points from a measurement of 6.7% in September. Though still far from the inflation target of 2%, the UK's high bank rate and persistent contractionary monetary policy give hope that the inflation rate will fall and the bank can relax some of these policies.

The only thing stopping the UK on its quest to 2% inflation is the negative effects of its restrictive monetary policy. A large issue is it makes borrowing far more expensive, which hurts businesses and projects that rely on debt to continue operations. Some failures of businesses are expected and almost encouraged as the push for "creative destruction" in the UK has been increasing, but too much of this could cause problems. If good companies are institutions begin to have issues staying operational, the Bank of England may need to abandon its current hawkish monetary policy. Another serious issue, not unique to the UK, is that when the bank rate increases, the value of existing bonds fall as their yields are less valuable.

UK total output index
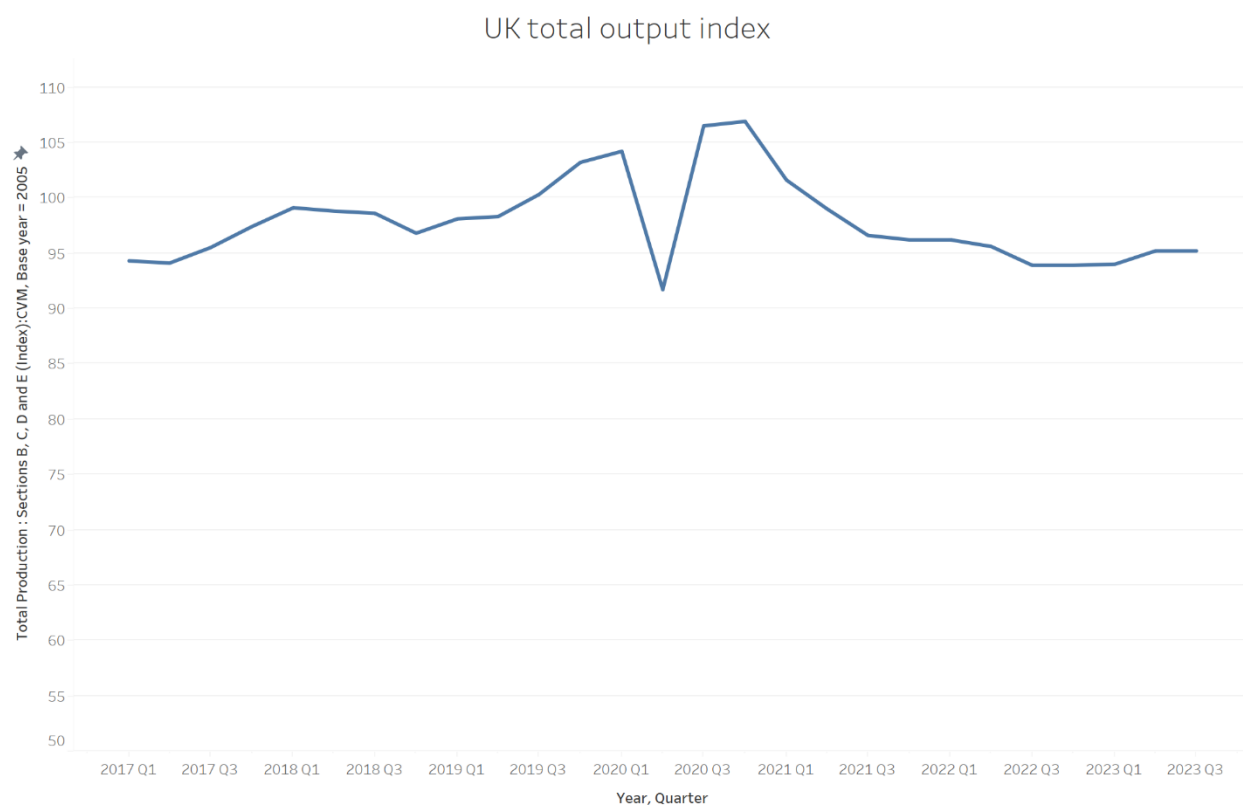
The trend of sum of Total Production : Sections B, C, D and E (Index):CVM, Base year = 2005 for Quarter Quarter.

Generally thought of as a stable store of value and resistant to price swings, bonds can swing in value quite dramatically if interest rates move fast enough and shock markets. Bonds are used by both individuals and more importantly banks to store extra cash safely, but when the value of these go down, it can have harmful effects. In the US, a rapid devaluing of bonds caused bank failures like Silicon Valley Bank, which after their bonds devalued, no longer had the assets to return customer deposits. In the fall of 2022, the UK's 30-year bond tumbled in value as yields shot up in the face of the Truss Tax Cut, panicking investors and savers throughout the world, and there remains worry this could happen again. Though currently it seems like the UK and the Bank of England has things under control, if good companies start to go under or banks begin to fail, we may see the UK forced to change course on their deflationary path.

Predicting the path ahead for the UK

The referendum on 23rd June 2016 that resulted in the UK exiting the EU ("Brexit") marked a significant change in the economic trajectory of the UK, leading to significant impacts on several macroeconomic fundamentals. There were months of negotiation that dealt with trade agreements, labor movement, and rights of people between the UK and EU. While the UK was still grappling with the aftermath of Brexit, the pandemic in 2020 led to an economic shutdown for months, culminating in today where they face a cost-of-living crisis, economic uncertainty, low productivity, high inflation, and extended high interest rates despite the global markets igniting with the signaling of cuts by the Fed.

For analysis and then forecasting, taking GDP, Consumer Price Index, Export, Import, Trade Balance with the EU, Bank Rate, Public Debt as a percentage of the GDP, total output, unemployment, and fuel prices, a stepwise analysis is undertaken, with cointegration to test long-term equilibrium or stable relationship between pairs of variables. Then a VAR model is executed with a lag order of 1 to test the Impulse Response Function for 5 years ahead between each parameter in our model. To test the short-term relationship and to see whether one variable can predict the other variable, Granger Causality is performed on pairs of variables. All the tests were performed on Python using the libraries for various statistical modeling tools. The time series dataset

adopted for all variables was seasonally adjusted and quarterly in frequency from 2017 Q1 to 2023 Q3.

Cointegration between pairs of variables showed important inferences for the policy actions in the UK. The test was run on the statsmodels library from Python. Taking GDP, seasonally adjusted percent, CVM, and Public Debt as a percent of the GDP, we saw that the two were cointegrated, showing that there is a long-term relationship between the two post-Brexit till today. It gives an indication that the public debt increases as GDP increases, showing poor debt management and an indication of future negative impacts on investor confidence and economic stability.

Taking the Total Exports and Total Imports data and drawing the Trade Balances of the UK, we run a cointegration of the UK trade balance with its trade balance with the EU, we again see a weak cointegrated relationship between the two, showing that post-Brexit negotiations that the reliance of UK trade on EU has decreased and it has begun to diversify its trade patterns with other non-EU nations. Affirming to the news that the UK has increased its non-EU trade during the pandemic.

Upon running a cointegration between unemployment levels and total output, we see a weak cointegrated relationship and we may conclude that the rise in unemployment levels in the UK may not impact the total output in the UK strongly in the long term.

There is a strong cointegrated relationship observed between the Bank Rate as set by the Bank of England and the Consumer Price Index, as an indicator for Inflation for

households. It implies a stable, statistically significant connection between changes in the bank rate and movements in the CPIH.

On the other hand, there exists no cointegrated relationship between petrol and Diesel prices post Brexit and the pandemic and the CPIH rate. This shows that the prices of these fuels may not be associated with the inflation rate increases for households in the UK.

However, the cointegration results between these variables give us an image of the long-term relationship but to see the direction and to analyze, which variable may cause or predict the changes in the other variable, granger causality results will be analyzed after VAR modeling.

Cointegration result:

Variable Pairs	GDP (%)
Public Debt (%)	Test stats: -7.295780061396598, p-value: 1.6679956769553936e-09

Variable Pairs	Total Trade Balance (Exports - Imports)
Total Trade Balance with EU	Test stats: -3.5309165048824727, p-value: 0.029751366857902212

Variable Pairs	Total Production
Unemployment (in 1000s)	Test stats: -3.5277552420957323, p-value: 0.030012993514814436

Variable Pairs	Bank Rate
CPIH Annual Rate	Test stats: -4.22784394331346 p-value: 0.00330879698596522245

Variable Pairs	Petrol Prices
CPIH Annual Rate	Test stats: -1.1278960459959544 p-value: 0.8757847980656022

Variable Pairs	Diesel Prices
CPIH Annual Rate	Test stats: -1.0694457140682956 p-value: 0.8888648536631649

A VAR model is executed with all the variables including, official bank rate as set by the Bank of England, GDP percent, public debt as a percentage of GDP, total exports, total imports, total trade balance with the EU, total output and unemployment rate for 16+ UK nationals. VAR model with 1 lagged difference was performed and corresponding results were plotted as Impulse Response Functions to see the effect of exogenous shocks on one variable on the other and its implications over the next 5 periods. The results of the test were as follows:

Impulse responses (orthogonalized)
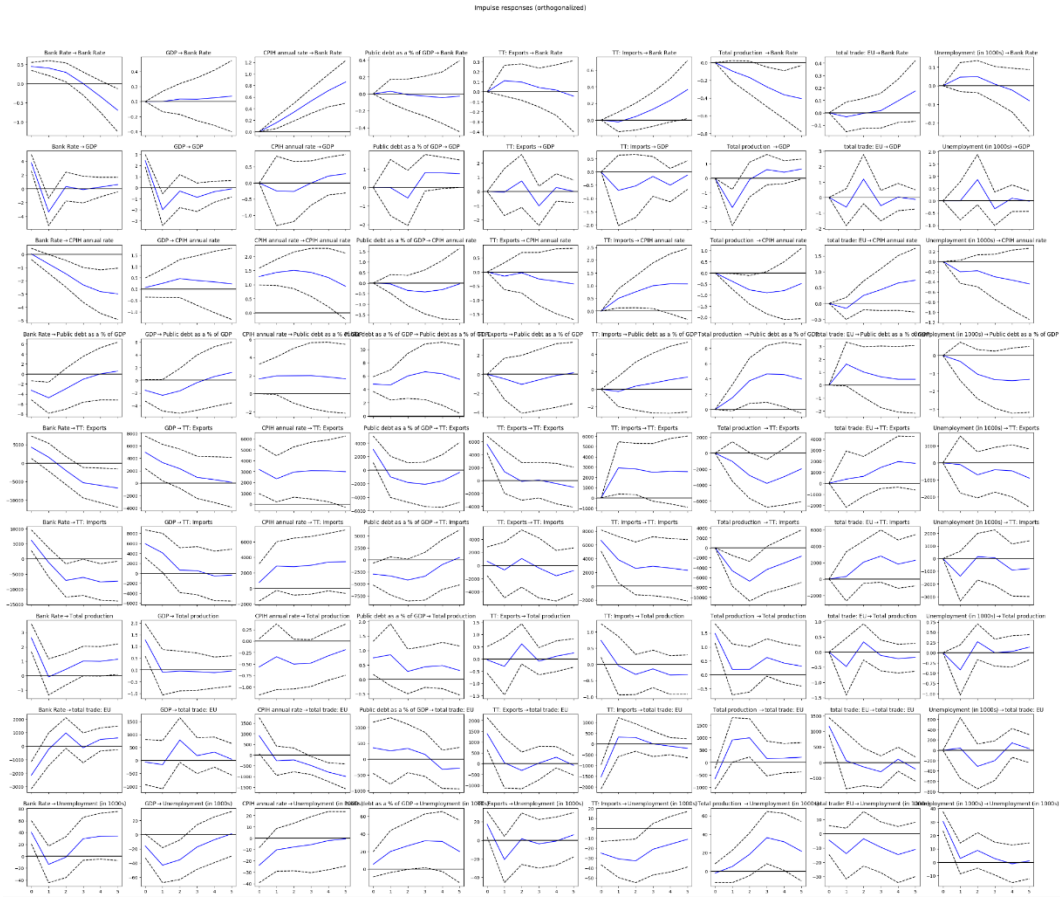
The plot above shows that almost for all variable pairs, the uncertainty in the response is high. However, for certain response graphs, namely, between Bank Rate and GDP, Total Production and GDP, Total Trade with EU and GDP, Unemployment levels and GDP, Unemployment and total production, total trade with EU and total production, total trade in Exports and total production and Bank Rate, show very narrow confidence interval showing less uncertainty in their response between the variables.

Some plots show that the response to the exogenous shocks remains rather constant but for certain pairs the response graph changes, showing that the response of the variables dissipates or changes its direction in the next 5 periods. We see that for trade balance with the EU and Bank Rate, the response on Bank Rate rises. The response on bank Rate

due to shocks in unemployment level declines over time. The response in GDP due to shocks in bank rate is erratic initially and almost dissipates over time.

The response in GDP due to the CPI rate, public debt rate, and total production increases over time and dissipates over time for GDP due to shocks in trade balance with the EU, unemployment levels, exports, and imports. The response direction of the CPI rate changes over time due to shocks in the trade balance in the EU, and exports and almost dissipates with shocks in GDP. The response in the public debt percentage changes its direction with shocks in bank rate, GDP, exports, imports, and trade balance with the EU. The response of exports changes with shocks on all variables and dissipates with shocks in GDP over time. Similarly, for imports, the response changes over time with shocks in all other variables. With total production the response changes with shocks in all and with exogenous shocks in the GDP, the response dissipates over time.

The response in trade balances with the EU post-Brexit changes its direction with shock in all variables and over the next 5 periods, the VAR model predicts that the response to the trade balance with the EU will dissipate with shocks in GDP and unemployment levels. For unemployment levels the response is rather erratic with exogenous shocks in all variables and the response dissipates over the next 5 periods with shocks in CPI annual rate and GDP. The IRF tells us important information about the potential policy actions that can be undertaken keeping in mind the response of variables to shocks or changes in any of the other variables discussed above. It also shows the status of the parameters right now and how it would unfold in the upcoming periods.

To see the forecasting of error variance in the variables, and to assess how much error in forecasting is due to its shocks or from exogenous shocks in other variables, Forecasting Error Variance Decomposition (FEVD) was performed. The results were in a tabular form but the plot of the same is as follows:

The plot shows the decomposition of the error variance can be seen with the plot below for each variable. With the legend, we can identify the shades that contribute to the error variance in each variable whether to itself or shocks from other variables. For Bank Rate, the composition in error variance can be attributed most to public debt percentage over the period. In the case of the CPI annual rate, the composition is most attributable to the Bank Rate. With public debt% the error variance over the period accounts maximum for GDP.

It is also striking to see how the error variance composition for exports, shows a significant change from the shocks to the bank rate over the period. For imports, the error variance is composed mainly of GDP shocks but over the period it is more impacted by the shocks in bank rate. The total production shows that the shocks in bank rate constitute a major part of the error variance. The total trade balance with the EU shows a constant contribution from the shocks in the bank rate over the period. The unemployment levels show a decline in the share of shocks in GDP, public debt%, exports, imports, total production, and trade balances with EU over the period but the contribution from the shocks in the Bank Rate remains rather constant.

Forecast error variance decomposition (FEVD)
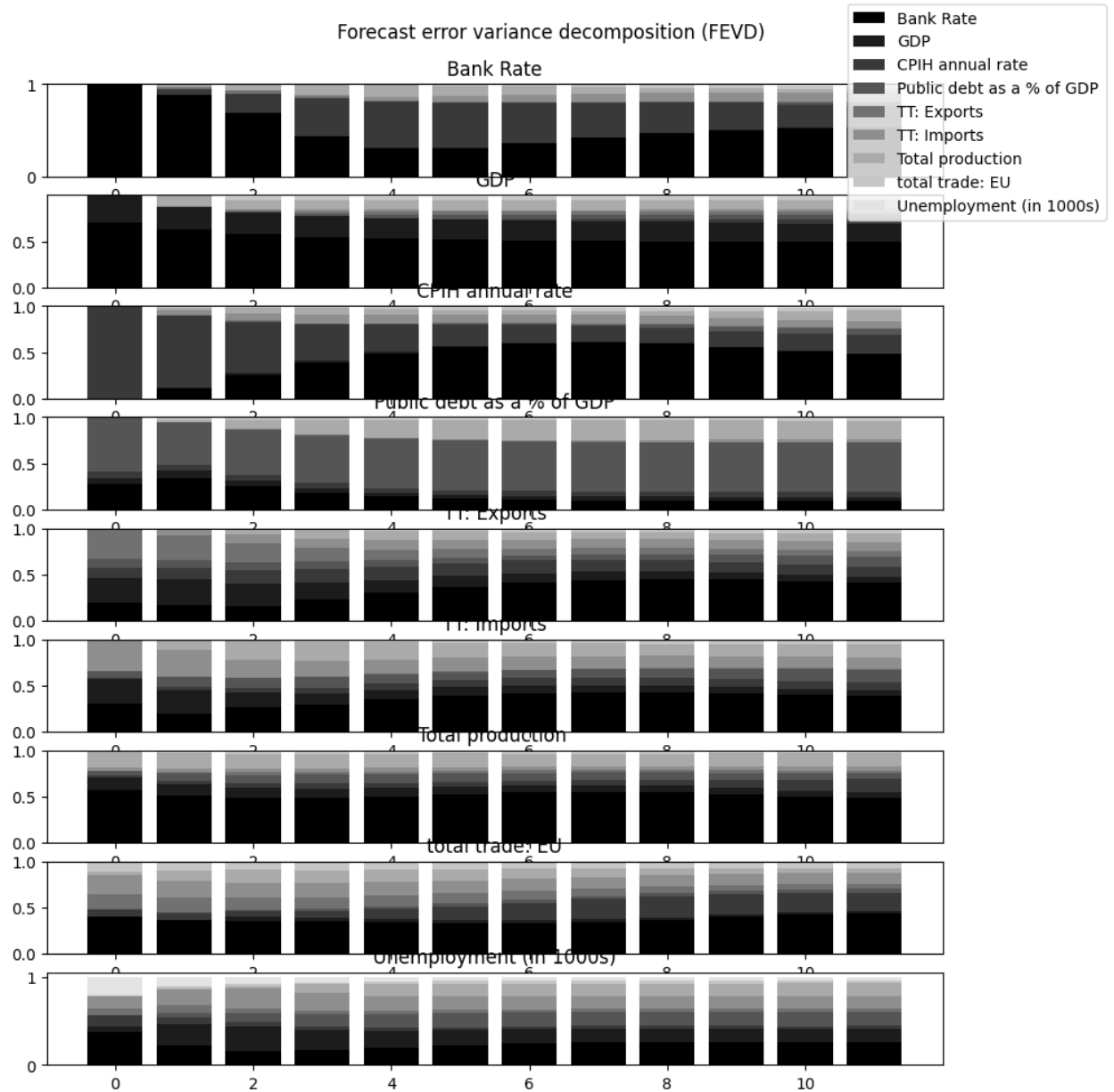
To see the direction and causation between the variable pairs, Granger causality is performed between different pairs. It is observed that the Granger Causality doesn't exist (the null hypothesis fails) between bank rate and GDP, CPI rate and public debt %, exports and total trade balances with the EU, imports and total trade balance with the EU, imports and exports, unemployment and total production, total trade balances with

the EU and bank rate (contrary to our assessment in FEVD), GDP and total trade balances with the EU. However, there are cases where the null hypothesis is rejected and we conclude that there is Granger causality. It is observed that GDP Granger causes total trade balances with the EU but the vice versa is not true. Despite the inclination towards non-EU trade, the result shows us a different picture.

It gives us an insight that despite the exceptional circumstances centering around post-Brexit and pandemic, the GDP movements continue to predict the trade balances with the EU. The public debt as a percent of GDP Granger causes the CPI annual rate but the vice versa is not true. It shows that the fiscal policy changes in the UK have a predictive power over the CPI rate which determines the inflation for the households in the UK. There is also a Granger causality between the CPI annual rate and the Bank Rate bidirectionally, confirming our macroeconomic standard theory that inflation has predictive effects on the bank rate (indicative of monetary policy) and bank rate has predictive power over inflation when the rate decreases leading to increased spending and investment and vice versa.

In the analysis and forecasting above, certain results lead to contrary conclusions on the relationship between the variables while most relationships became robust through every test and VAR model, producing the same result. The co-dependency in the variables suggests a need for a very nuanced approach by the policymakers while they exercise their monetary and fiscal policy in the UK to stabilize the economy post-Brexit and the COVID-19 pandemic.

Conclusion

For well over a decade, the United Kingdom has become very used to expansionary fiscal and monetary policy. Spending has been far higher than government revenue, and money has been cheap and easy to access. The UK has not fully begun to realize the consequences to these policies, but eventually they will catch up to them if they do not become serious about spending less and slowing things down. It is recommended that the UK continues with its restrictive monetary policy and turn to make its fiscal policy more restrictive. It seems as if the UK has been propping up their economy from one financial crisis to another, without resetting when the economy is good. It is important that the UK starts to reverse many of these policies so that they can still use them in the future when they actually need them.

The forecasting analysis yielded valuable insights into future trends and potential patterns based on historical data. The cointegration, Granger Causality, and the VAR model employed provided a lens into the probable trajectories of the variables under study. To list the problems in the UK, there is a triple supply shock effect from Brexit, the pandemic, and the Russia-Ukraine war, leading to high inflation, high bank rates, high cost of living, an energy crisis, a declining workforce, poor trade performance, and staggering economic growth. The bidirectional Granger casualty between bank rate and inflation indicates a conundrum for policy formulation, where they will have to strike a balance to control inflation and promote economic growth. We see that this complicated behavior between the two is further reflected in the error variance decomposition, where

the two contribute maximum to each other's forecasting error variance. At the same time, we also observe a statistically significant cointegrated relationship between the two indicating that this cyclical relationship can pose potential risks for the UK, and they would have to employ a mix of policies such as forward guidance, quantitative easing, or targeted fiscal policy while calibrating the movements of other variables while policy making.

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All Figures, Statistics, Charts, Tables, and other information is courtesy of the Office of National Statistics, Government of the United Kingdom (henceforth referred to as ONS), and the Bank of England (henceforth referred to as BoE), unless explicitly specified otherwise.

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