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The Impact of Quantitative Easing on Government Bond Yields

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Abstract

This thesis concerns the matter regarding the impact of quantitative easing on government bond yields. The extensive use of asset purchase programmes in the beginning of this century has raised a number of discrepancies for researchers to unravel. By applying a SVAR on time series data of Sweden, Australia, the United Kingdom and the United States and using impulse response analysis we try to contribute to the existing literature. Our results show great ambiguity, some consistent with the existing theory and literature and some not. The overall assessment highlights the complexity of quantitative easing which is yet to be fully understood. Future researchers may find guidance in our results to conduct further research of great importance for monetary policy makers.

Keywords: quantitative easing, government bond yields, SVAR, impulse response analysis, monetary policy

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1 Introduction

The unconventional monetary policy tool of quantitative easing (QE) was first introduced by Japan in 2001 and has since been utilised by central banks all over the world. During the episode of the Covid-19 pandemic, central banks turned to massive programmes of quantitative easing, so called asset purchase programmes, as a policy tool after the conventional tool of the policy rate had reached the zero, or effective, lower bound. The aim was to avert potential disinflationary pressures from the pandemic. Up until the 2007-8 financial crisis, the Bank of Japan was the sole implementor of QE, but the aftermath of the financial crisis led many central banks to follow the initiative of the Bank of Japan. The U.S. federal reserve began their first round of QE in late 2008 followed by the Bank of England in 2009. The Swedish Riksbank began utilising quantitative easing in 2015 after periods of low inflation despite the ultra-low level of the policy rate (Christensen and Zhang, 2024). The reserve bank of Australia is one of the more recent implementors of QE with their first asset purchase programme in 2020 following the pressures from the Covid-19 pandemic. All had the aim of eventually counter disinflationary pressures by increasing demand to drive up inflation mostly by reducing long-term yields since the short term yields or policy rate was already constrained by the effective lower bound (Christensen and Krogstrup, 2014; De Fiore and Tristani, 2019; Matousek et al., 2019).

Figure 1 shows yields of Swedish government bonds of maturities of two, five and ten years and the Swedish Riksbank's asset holdings for the purpose of QE from 2010 to 2023. One can observe that the QE implementation indeed coincides with the yields reaching the zero level and after implementation, the two year yield fails to significantly reduce further while the five and ten year yields suppress towards the two year yield. Further, the wind back of asset holdings seem to coincide with a sharp rise in all yields. The policy rate decisions are of course main reasons for movements in yields which raise the question regarding the contribution of the quantitative easing measures to such movements.

This study seeks to examine the effect quantitative easing impose on government bond yields of maturities of two, five and ten years in Sweden, Australia, the United Kingdom and the United States. Whether the approach of QE has been successful in reducing long term yields is an important matter for monetary policy makers and has become subject to a growing area of the literature.

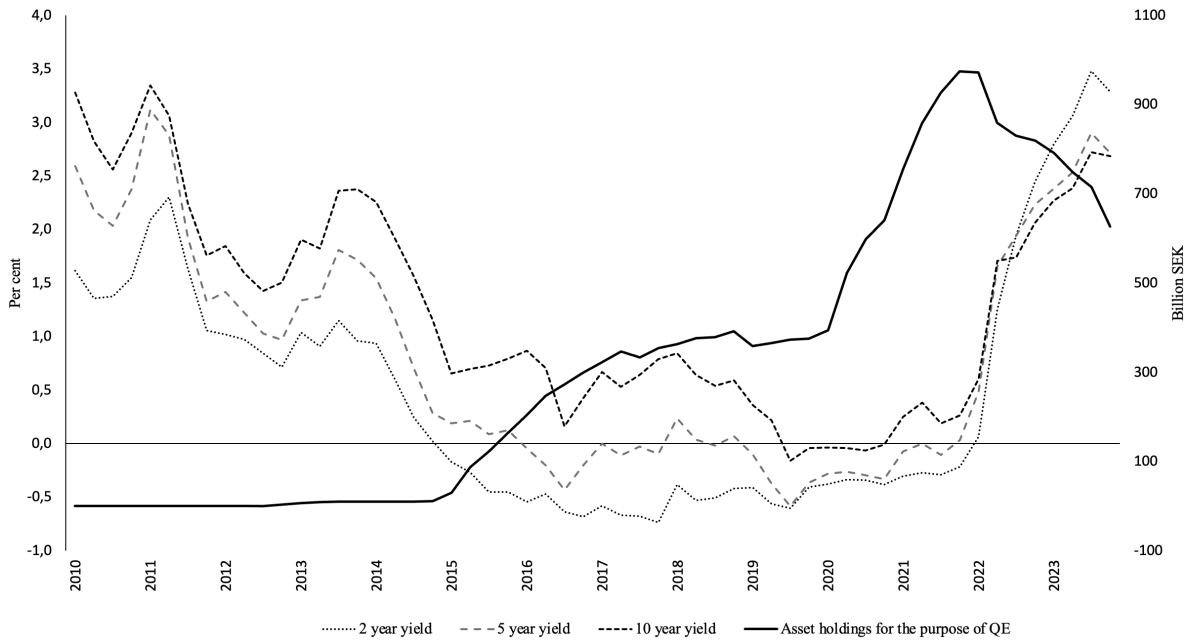


Figure 1: *Swedish two, five and ten year maturity government bond yields left axis. The Swedish Riksbank’s accumulated asset holdings for the purpose of quantitative easing right axis. Years 2010 - 2023.*

Much focus of the research has been to establish the detailed workings regarding quantitative easing measures, see for example Krishnamurthy and Vissing-Jorgensen (2011) who provides perhaps one of the most extensive studies on the transmission channels of QE. Other studies such as Bauer and Rudebusch (2014) and Gagnon et al. (2011) are focused on the relative effectiveness between the channels. The literature differs also in the approach. Event-studies are commonly performed around announcements of QE, see for example Christensen and Krogstrup (2014) and Diez and Shamloo (2017). The time series approach such as the one of Christensen and Zhang (2024) of estimating the effect of asset purchases on decomposed yields is also present in the literature.

In this study we put forward the theory of what the literature regards as the main channels of transmission of quantitative easing together with an overview of the existing literature. By then following the time series approach and using a structural vectorautoregressive model we estimate shocks as the exogenous representation of QE and use these shocks to conduct impulse response analysis to measure the impact of asset purchases on government bond yields. We also provide a discussion concerning the importance of the findings and recommendations for future policy makers and researchers.

First and foremost, our results highlight the ambiguity regarding the findings of quantitative easing in the literature. We estimate both negative and positive responses depending on country and the majority of the results show weak or no statistical significance. Further, we also manage to find evidence that suggest that longer-term yields respond more significantly than shorter-term yields to a shock in QE. Thus, consistent with the purchases being targeted towards longer-term assets and the pattern seen in figure 1 of the

suppression of ten and five year yields but not the two year yield. In addition, we bring forward a variety of limitations partly regarding studies of quantitative easing in general but also depending on our approach. Ultimately, the result of the study brings further light to the fact that quantitative easing is yet to be fully understood and that research results are sensitive to methodology and model specification. Future studies with more precise methods are needed to produce reliable results of importance for policy makers.

The rest of the paper is structured as follows: Section 2 describes the theory behind government bond yields and quantitative easing and presents some empirical evidence. Section 3 regards model setup and data. In section 4, the results, estimated shocks and sensitivity tests are presented. Section 5 discuss the results. Section 6 concludes.

2 Theory and Empirical Evidence

When the policy rate has reached its zero, or effective, lower bound the conventional stimulative monetary policy tool of adjusting the policy rate downwards cannot provide further stimulus. The reduction of the policy rate to the effective lower bound results in a liquidity trap where banks hoard cash rather than investing through lending, thereby not contributing to increased borrowing nor consumption which would otherwise act as stimulative. This calls for the need of other unconventional monetary policy tools such as quantitative easing (Eggertsson and Woodford, 2003). When a central bank conducts quantitative easing it purchase large amount of assets of a certain targeted segment of the market, often but not restricted to, medium and long term maturity government bonds. Such purchases increase demand on the targeted segment of assets while also providing liquidity to the market and forward guidance of future interest rates. One of the sought after outcomes is to reduce interest rates over a longer duration while also signalling the commitment of the central bank to keep rates lower for longer. The commitment should act as stimulative and inflationary even when the policy rate is constrained by its effective lower bound.

Despite the extensive use of asset purchase programmes in recent years, researchers have yet to unravel the full meaning of quantitative easing. The purpose of this study is not to dissect the workings of quantitative easing into details, but rather to try to estimate the overall effect asset purchases as quantitative easing measures inflicts on bond yields. However, in order to gain an understanding of how quantitative easing should affect bond yields, it is still beneficial to gain an understanding concerning the composition of bond yields and the transmission mechanism through which quantitative easing intends to operate.

Government Bond Yields

Government bond yields can be thought of as consisting of two components. One reflecting average short rate expectations and one term premium component capturing the risks associated with investing in a longer maturity bond compared to a roll over strategy in the short-term money market (Christensen and Krogstrup, 2014). Agents acting in the financial markets discount all information about future economic conditions into present prices. This implies that bond yields are forward looking assets that react instantaneously to changes regarding future conditions such as monetary policy. The communication of central bank commitment for policy making such as the implementation of asset purchase programmes thus gets, to some extent, discounted into present bond yields immediately to the extent the market agents can interpret the information. These are changes in expectations and should be captured by the risk neutral expectations component of the yields thereby reducing yields immediately (Bauer and Rudebusch, 2014). Remaining effects regarding market conditions should be reflected in the term premium component. The term premium component collects macroeconomic risks related to uncertainty in economic outlooks about for example future inflation or growth. But also risks regarding demand and supply from altered market conditions such as liquidity risk (Gagnon et al, 2011). Quantitative easing, through the various parts of its transmission mechanism which will be presented below, should affect bond yields through both these components.

Transmission Channels of QE

There are several transmission channels of quantitative easing who together constitutes a complete set of an extensiveness too large to be fully presented here. A collection of authors including Christensen and Krogstrup (2014), Bauer and Rudebusch (2014) and Bowdler and Radia (2012) brings forward the signalling channel and the portfolio balancing channels as key channels of transmission of QE. These two channels of transmission will be presented here.

According to Krishnamurthy and Vissing-Jorgensen (2011), unconventional monetary policy such as QE can only have an effect on bond yields if the policy implementation is viewed as trustworthy by the market. When the central bank buys large volumes of longer maturity assets, it can serve as a credible commitment to keep interest rates lower for longer. If the central bank raise interest rates while holding the longer-term assets, the central bank induce a loss on those same assets. Given that potential losses are unfavourable to such extent that the central bank want to avoid them, the asset purchases can serve as implicit forward guidance regarding lower interest rates for a prolonged period of time and reduce the uncertainty among investors. Hence, the act of conducting QE works as a signalling from the monetary authority to fulfil its commitment of keeping interest rates lower for longer. The mere announcement of an asset purchase programme

can thus lead investors to revise their expectations about future interest rates which should then affect the government bond yield through the expectations component. This is what is commonly referred to as the signalling channel (Diez and Shamloo, 2017).

The perhaps major channel of transmission of quantitative easing which for example Bauer and Rudebusch (2014), Bernanke (2010) and Bowdler and Radia (2012) deems to be the most prominent and the main channel through which QE achieve its effect is the portfolio balancing channel.

The portfolio balancing channel requires a departure from the frictionless asset pricing model into a view of imperfect substitutability between assets of different types and maturity. This leads to the thought of partial market segmentation where investors may have so called preferred habitats as explained by Christensen and Rudebusch (2012). Investors may have asset classes of specific maturity structures as preferred holdings and thus have specific higher demand for such assets than for close substitutes, and the less substitutional an asset is, the less the demand for it. How would this then result in asset purchase programmes affecting bond yields?

When the policy rate is at the effective lower bound, the credit risk and interest of short-term assets are at or close to zero. If the central bank acquires such assets from a financial institution the effect may be that the institution views the money received as an acceptable substitute for the asset and will thus not try to rebalance its portfolio. This is a case of perfect substitutability between a short-term asset and money where the effect on yields would be absent and could be referred to as the liquidity trap mentioned earlier. Larger holdings of cash do not increase trade and investment (Eggertsson and Woodford, 2003). As briefly mentioned in the beginning of this section, quantitative easing entails the purchase of medium and long-term assets and not assets of the shorter-term. Longer-term assets have a more tangible term premium component which compensates investors for the risks associated with longer maturity, thus making the longer-term assets yield a higher return compared to short-term assets or money holdings, all else equal. If the central bank purchases a longer-term asset with higher yield from an institution that receives money, the institution's expected return will fall and may cause it to not meet the requirements from its investors. Money and longer-term assets are thus imperfect substitutes (Bowdler and Radia, 2012). The financial institution has an incentive to use the received funds to buy a substitute for the liquidated asset and thus try to rebalance its portfolio. When this mechanism is put in place for a large number of financial agents, such as the case when asset purchase programmes are implemented, there is a large increase in demand for specific assets. Further, the supply is reduced since the central bank effectively removes the purchased assets from the market. This raises the price of those assets and subsequently reduce the yield (Diez and Shamloo, 2017). In addition, as the supply decrease and prices increase, the financial agents may instead choose to buy other more riskier assets outside of their preferred habitat leading to increasing demand, raised prices

and reduced yields of close substitutes to the originally purchased asset. This triggers a spillover effect to assets of other type and maturity in the market which will affect the holdings of other financial agents who will in turn try to rebalance their portfolio in a similar manner. The effect of asset purchases can thus cause great movement in markets outside the segmentation first targeted.

One further way asset purchases may cause a balancing effect is related to the interest rate risk of government bonds. Bowdler and Radia, (2012) lays out an explanation for what they call a duration channel. The prices of government bonds are affected by movements in interest rates, this is in the area of finance commonly referred to as duration. If the interest rate rise, the price of the bond will fall but the bond will yield a higher return and vice versa. This imposes an interest rate risk on bonds which investors require compensation for in the form of the term premium. When the central bank acts as a large buyer of longer-term assets it reduces the amount of risk associated with time since the assets always can be sold to the central bank who has communicated its commitment to act as a buyer. The result is that the duration risk, i.e. the interest risk associated with time, should fall over all maturities and reduce the term premium. This will again alter the expected return of investors' holdings which will incentivise them to further rebalance their portfolios.

There are more ways presented in the literature through which portfolio balancing effects and other transmission mechanisms of QE can occur, see for example Krishnamurthy and Vissing-Jorgensen (2011) who attend to a great compilation of such channels and presents empirical evidence for them. The purpose of the presentation in this study is not to list them all but to equip the reader with an insight regarding the transmission from asset purchases to bond yields.

Transmission Lags of Monetary Policy

The change in expectations should occur immediately after policy announcements to the extent that investors can interpret and understand the information contained in the announcements. However, the full effect of the policy implementation does not occur immediately as monetary policy is known to operate with time lag. Parties within the economy takes time to adjust their behaviour which creates a horizon of lag before monetary policy affects economic activity which can vary with the grade of complexity of the economy (Havranek and Rusnak, 2013). Research as far back as Friedman (1972) suggest that alternations of interest rate and money supply do in fact act with time lag on economic activity with a horizon between seven and thirty-one months. The results of Friedman (1972) were updated and further established by Batini and Nelson (2002) who find a lag horizon of one to four years as best representative for the relationship between money supply and economic activity. Havranek and Rusnak (2013) perform an overview of sixty-seven studies on monetary policy. They find that the reported horizon of trans-

mission lag reported in the literature vary substantially with an average of twenty-nine months and a standard deviation of nineteen months.

Empirical Evidence

There is a rather extensive amount of research regarding the overall effect of QE. A common approach is to perform event-studies, looking at the response of government bond yields in connection to announcements of asset purchase programmes. Such studies have been performed by authors as Diez and Shamloo (2017), Bauer and Neely (2013) and Gagnon et al. (2011) who all find a negative impact on bond yields following asset purchase programme announcements.

Diez and Shamloo (2017) look at open economies to compare the effect of asset purchase programmes in lowering long-term yields. They look at Sweden the United Kingdom and the United States, which are countries included in our study, but also Switzerland over a period of 21 years from 1995-2016. By using an event-study methodology, they measure the movement in ten-year yields around the central banks' asset purchase programme announcements and decompose the yields to measure the component specific responses respectively, but also present the overall effect. They estimate the effect using a panel vector autoregressive model and finds varying results. The results suggest significant negative responses of the ten year yield for all countries, with the results for the U.S. ten year yield being highly significant after several announcements while the results for the U.K. ten year yield are only significant for less than half of the measurement periods. The results for the Swedish and Swiss ten year yields fall between the two former with roughly half of the measurement periods showing a significant negative response. Diez and Shamloo (2017) thus manage to find evidence of the functioning of QE in reducing long-term yields in both small and large open economies.

A similar approach of decomposing yields and measuring the effectiveness of asset purchase programmes in an event-study methodology is undertaken by Bauer and Neely (2013). They measure the response of long-term yields in the U.S., Japan, Canada, Germany and Australia (which is the fourth and final country in our study) on a window around the Federal Reserve's large scale asset purchase announcements only and not country specific asset purchase programmes. Like Diez and Shamloo (2017) they find significant negative responses to the ten year yield in the U.S. Further, Bauer and Neely (2013) find that the estimates of the ten year yield responses in the smaller countries such as Australia are weaker and significant for fewer periods.

Like both Diez and Shamloo (2017) and Bauer and Neely (2013), Gagnon et al. (2017) examines the effect of the Federal Reserve's large scale asset purchase programmes announcements on bond yields in the U.S. in an event-study approach on a window around the announcements. Similar to the previous authors, they estimate a negative effect on bond yields with the magnitude larger on yields of longer maturity.

One prominent limitation of such common event-studies is that they only investigate instantaneous movements around the announcements with the underlying assumption that effective markets with forward looking agents discounts all information about future conditions. This assumption implies that the implementation of QE should only have an effect around the announcements and that the forthcoming purchases of assets should carry no effect. This is in contrast to the theory of QE as described above regarding the portfolio balancing channel. To address this shortcoming, Gagnon et al. (2011) also proceeds with a different method using a time series setup to measure the impact of purchases of assets on longer-term treasury supply and bond yields. Krishnamurthy and Vissing-Jorgensen (2010) provides evidence where changes in treasury supply can alter the term premium on yields and Krishnamurthy and Vissing-Jorgensen (2011) argues that these findings suggest that QE purchases can lower the yields on interest bearing assets. Gagnon et al. (2011) investigates this by estimating historical time variation in term premiums of yields following the changes in net public sector supply of long-term debt securities by using an ordinary least squares regression. Their results suggest that a 1-per cent in relation to GDP increase of longer-term debt supply increase ten year term premiums by between 4.4 - 6.4 basis points. Asset purchases, which reduce the supply of longer-term securities, should thus have a negative impact on longer-term bond yields according to Gagnon et al. (2011) which is in accordance with the theory of the portfolio balancing channel. Finally, a recent study by Christensen and Zhang (2024) also employs a time series approach to analyse the impact of the Swedish Riksbank's and the European Central Bank's large scale asset purchases on Swedish government bond components between 2015 and 2019. By applying an updated dynamic term structure model, they estimate significant negative responses of Swedish five and ten year yields following asset purchases from the Swedish Riksbank and the European Central Bank.

The literature regarding quantitative easing and bond yields thus takes different approaches and manage to establish results suggesting both instantaneous effect and implementation effects of central bank large scale asset purchases. Although not always significant, the literature appears to be more or less unanimous in the negative response of bond yields following QE implementation. This study will try to contribute to the existing research by following the time series approach to examine the effect asset purchases related to quantitative easing measures impose on government bond yields overall.

3 Model and Data

3.1 Model

To analyse the effect of quantitative easing on government bond yields we will use a structural vectorautoregressive model (SVAR). By estimating a SVAR, an impulse response

analysis can be carried out to efficiently trace out the effect of unanticipated, discretionary monetary policy over time. However, monetary policy actions as conducted by the central banks are in fact not entirely unanticipated (Gottschalk, 2001). Macroeconomic policy decisions are partly based upon the close preceding history of economic activity. This infer endogeneity in macroeconomic variables since the decisions regarding a monetary policy tool is based upon the history of that same tool, thereby affecting itself in a later period and driven partly by economic conditions from within the economic system. This presence of endogeneity may cause parts of the policy to change not because of an unanticipated response to the situation at hand but rather to changes in other economic conditions, hence making the measurement contain noise that will distort any tries of research. To make any sensible interpretation of macroeconomic variables, the modelling of the variable is crucial to not make the mistake of interpreting endogenous effects as reliable results. In order to tackle this potential problem, we can use monetary policy shocks rather than the monetary policy implementation itself. The idea of the shock is that it is assumed to contain the exogenous components of the policy implementation that cannot be explained by the model, i.e. the components that was not anticipated and therefore not accounted for within the system and hence, not endogenous (Romer and Romer, 2004). The exogenous monetary policy shocks can then be used to create impulse responses for analysis (Gottschalk, 2001).

We thus need to establish a setup to estimate exogenous policy shocks and a system that can be shocked in order to produce impulse responses. The structural vector autoregressive model (SVAR) is suitable for both purposes (Gottschalk, 2001). The SVAR is a multi-simultaneous equation system which uses a set of economic variables as input and can be utilised to separate changes in the variables of policy into a response to change in economic variables within the system, and an unexplained residual term. This unexplained residual variation is interpreted as the sought after exogenous shock that is discretionary and not explained within system (Andersson, 2023).

Our policy variable of interest for explaining changes in yield(r) is the quantitative easing(qe). Further we also include variables regarding other policy and economic outcomes that may affect the yield of government bonds in order to control for such effects. The variables are nominal policy rate(i), fiscal policy(f), GDP growth rate(gdp), inflation(π), exchange rate(ex) and financial market conditions(fm). Since Sweden, Australia and the United Kingdom are considered small economies it is reasonable to assume that, by the theory of small and large open economies, the small economies do not have spillover effects to the world market equilibrium but may very well be affected by it. The world market equilibrium is however influenced by the policy decisions of large open economies such as the United States and the Euro Area (Balatti, 2020; Casola and Corbo, 2020). Thus, in the models of Sweden, Australia and the United Kingdom we include, as exogenous variables, the quantitative easing of the the United States and the Euro Area

to control for such effects.

The models for the small countries, Sweden, Australia and the U.K. takes the following form:

$$A_0 y_t = \sum_{i=1}^I A_i y_{t-i} + \sum_{j=0}^J D_j x_{t-j} + e_t \quad (1)$$

the vector

$$y_t = \begin{pmatrix} qe_t \\ r_{\tau,t} \\ \pi_t \\ ex_t \\ f_t \\ gdp_t \\ fm_t \\ i_t \end{pmatrix}$$

contains the country specific variables mentioned above and the vector

$$x_t = \begin{pmatrix} qe_EMU_t \\ qe_US_t \end{pmatrix}$$

contains the variables affecting the world market, also explained above.

The model of the United States, which does not include any world market variables takes the following form where the vector y_t contains the country specific variables as in the models of the small economies:

$$A_0 y_t = \sum_{i=1}^I A_i y_{t-i} + e_t \quad (2)$$

The matrix A_0 in equation (1) and (2) contains elements of the parameters capturing the contemporaneous effect among the country specific variables whereas the matrix A_i for all $i \in [1, I]$ captures the parameters of the lagged effects of the country specific variables. The effects of the variables representing the world market in the small economy models in equation (1) are captured by parameters in the matrix D_j .

The changes in variables that cannot be explained by the other variables in the model are captured by the error terms e_t in equation (1) and (2) and are the sought after exogenous shocks we are interested in for the representation of discretionary monetary policy shocks.

The inclusion of lagged variables enables the model to capture lagged effects as we know from the presentation of the theory of monetary policy and, more specifically, quantitative

easing is important since the effect of the policy operates with time lag. The lag order selection is important in order not to under-fit or over-fit the models. Underfitting the models may cause biasness due missing variables, while overfitting may lead to inefficient estimates, although not biased. To select the preferred lag order, we use an information criteria. Information criteria use a penalised objective function in order to perform a trade-off between including or excluding an additional parameter, or in our case, an additional lag order. There are several information criterion with a different approach to the penalising function. The one we use for our models is the Bayesian (Schwarz) information Criterion (BIC) which is preferred for lag order selection of macroeconomic variables in smaller samples (we have relatively small samples with less than 100 observations). The BIC is also preferred due to its consistency properties being affected less by increasing sample sizes compared to, for example, the Akaike Information Criterion (Stock and Watson, 2016). The BIC selected a lag order of 1 for all models.

Equation (1) and (2) are the structural models assumed to represent the true structure of the economy. However, it is not possible to estimate (1) and (2) and find the values of A_0 and A_i . Without any identifying restrictions, the information of the sample data is insufficient for estimation and there is an infinite number of values for A_0 and A_i such that the probability distribution of the data is the same. The model is over-parameterised. Since the data alone is insufficient for determining the true values of A_0 and A_i the parameters are said to be unidentified and an identification problem occurs (Gottschalk, 2001).

To handle this problem we estimate the following reduced form models:

$$y_t = \sum_{i=1}^I B_i y_{t-i} + \sum_{j=0}^J S_j x_{t-j} + \varepsilon_t \quad (3)$$

$$y_t = \sum_{i=1}^I B_i y_{t-i} + \varepsilon_t \quad (4)$$

where $B_i = A_0^{-1}A_i$ and $S_j = A_0^{-1}D_j$ and $\varepsilon_t = A_0^{-1}e_t$ with the restricting assumption that A_0 is a lower-triangular matrix of the form:

$$A_0 = \begin{pmatrix} 1 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ a_{21} & 1 & 0 & 0 & 0 & 0 & 0 & 0 \\ a_{31} & a_{32} & 1 & 0 & 0 & 0 & 0 & 0 \\ a_{41} & a_{42} & a_{43} & 1 & 0 & 0 & 0 & 0 \\ a_{51} & a_{52} & a_{53} & a_{54} & 1 & 0 & 0 & 0 \\ a_{61} & a_{62} & a_{63} & a_{64} & a_{65} & 1 & 0 & 0 \\ a_{71} & a_{72} & a_{73} & a_{74} & a_{75} & a_{76} & 1 & 0 \\ a_{81} & a_{82} & a_{83} & a_{84} & a_{85} & a_{86} & a_{87} & 1 \end{pmatrix}$$

This identifying restriction on A_0 makes it possible to estimate the parameters of B_i using ordinary least squares (OLS) equation by equation and to then identify the parameters in equation (1) and (2) using the estimates of B_i together with Cholesky decomposition. The restriction on A_0 and the crucial selection of the causal ordering of the variables in the system makes it possible to restrict the contemporaneous effects of the variables throughout the system. We assume the QE shocks to be the most exogenous variable in the system. By ordering domestic QE(qe_t) as the first variable, the restriction on A_0 allows for QE to contemporaneously affect all other variables in the system but the other variables are restricted in their contemporaneous effect. This makes it possible for the SVAR to allow for an instant impact effect of QE on government bond yields in the model (Enders, 2014a). The residuals from the carried out estimations are the exogenous monetary policy shocks we want to use as shocks in the impulse response analysis. Due to large fluctuations, mainly around the periods of the financial crisis 2007-8 and the COVID-19 pandemic, we see a range of outliers in the estimated residuals. Outliers can cause unreliability issues in the least squares estimation method which is the method for estimating the equations of the SVAR (Rousseeuw, 1990). We use 1.5 times the interquartile range to objectively detect outliers in the residuals and use dummy variables for all outliers respectively to sort out their effects in order to create exogenous shocks without the presence of outliers.

The idea behind the impulse response analysis is to trace out the effect of shocks on the variables included in the system. To create the impulse response functions, the estimated exogenous shocks from equation (3) and (4) are used to shock the system of variables in the model (Enders, 2014b).

3.2 Data

In order to produce results suitable for inference, the composition of the dataset is of great importance. All variables have been seasonally adjusted and detrended when necessary. Further, when tested, all variables rejected the null hypothesis of the presence of a unit root. Full tables of descriptive statistics along with test statistics, data plots and sources can be found in appendix A. In this study, we are working with time series data and have an overall dataset over four countries with a complete set of macroeconomic variables for each. The starting periods of the country specific datasets differ depending on the availability of data but are chosen at a time prior to the implementation of quantitative easing in order to gain more observations and are not limited by the datapoints on QE nor the datapoints on yields, but rather by the data of control variables. The starting point for Sweden, U.K. and U.S. is the year 2000 and for Australia it is 2003 due to difficulties of finding reliable data regarding budget balance for earlier periods. All samples end in 2023. The data consists of quarterly observations of twelve variables for Sweden, Australia and

the U.K. and ten variables for the U.S. spanning a time horizon between roughly 21-24 years.

We want to measure the effect of QE on government bond yields and the selection of yields of maturities of two, five and ten years provides a suitable set of yields of short/medium, medium and long term maturity to examine potential differences in effect over different maturities as suggested by the theory presented in the previous section. The data on QE is not retrieved as the entire central bank balance sheet, but rather as total holdings of securities by the central bank for the purpose of quantitative easing at each period and has been taken in relation to nominal GDP to measure the relative size of QE to the economy. It has also been taken in first difference to reflect the change between each period. See section 3.2.1 below for further considerations of the data on QE.

The remaining variables are control variables which are not intended for any inference or analysis, but to sort out the causal effect they may impose on bond yields that would otherwise distort the estimates or weaken the explanatory power of the model (Nielsen and Raswant, 2018). GDP growth and consumer price inflation directly affect bond yields since they reveal information about the economic activity which provides information about current and future market conditions and hence possible policy changes. Investors who place capital over borders carry a currency risk which they demand compensation for in the form of a risk premium on the yield. Movements in exchange rate may affect the investors' view of the currency risk and thus alter the risk premia component of the bond yield. Budget balance is a measure of fiscal policy in the form of government spending, which is known to affect bond yields through term premia and can affect the term structure (Bretschger et al. 2020). The nominal policy rate is the main monetary policy tool of inflation targeting central banks. Changes in policy rate thus have a direct effect on bond yields. The stock market index is included as a measure of market conditions. When financial markets become subject to more risk and stock prices become more volatile, investors may seek safer assets thereby moving capital from stock markets to safer assets such as government bonds. When markets are less volatile, the investor may be more willing to seek the higher potential return in the stock market and thus moves capital from government bonds to more riskier assets. The financial market conditions thus change the demand for and subsequently the price of government bond yields which should have an impact on the yields (Beltratti and Shiller, 1990; Durré and Giot, 2005). Finally, small open economies, in contrast to large open economies, do not have the size nor financial influence to affect the world market equilibrium but may very well be affected by the world market conditions (Balatti (2020); Di Corbo and Casola (2020)). Hence, in the models of the three small open economies in our sample, Sweden, Australia and the U.K. we chose to include the quantitative easing of the U.S. and the Euro Area to control for such effects.

Table 1: List of Variables

Variable	Unit of Measurement	Abbreviation	Model used in
QE	Relative to nominal GDP, %-change from previous period	qe	All
Yield of maturity τ	%-change from previous period	r_τ	All
Inflation	%-change from previous period	π	All
Exchange rate	%-change from previous period	ex	All
Fiscal policy	Relative to nominal GDP, %-change from previous period	f	All
GDP growth	%-change from previous period	gdp	All
Financial market conditions	Stock market index %-change from previous period	fm	All
Nominal policy rate	%-change from previous period	i	All
QE of the EMU	Relative to nominal GDP, %-change from previous period	qe_EMU	SWE, AUS, U.K.
QE of the U.S.	Relative to nominal GDP, %-change from previous period	qe_US	SWE, AUS, U.K.

3.2.1 Data on Quantitative Easing

Data on the asset purchases intended for quantitative easing measures is tricky to collect. Asset purchase programmes include the purchase of different types of assets in different periods. The full central bank balance sheet in its entirety is not a representative measurement of quantitative easing. Further, not all monetary authorities present their holdings in identical ways. Thus, we need to inspect the central bank balance sheet and the communications of the central banks to find the holdings best representative of the QE related asset purchases. This imposes a large source for measurement error. As seen in figure 2 the data on QE for all countries includes variations before the implementation of QE in the respective countries. We clearly have measurement errors and have tried to find more suitable data without any success, the presented data is the most representative in measuring QE of the data we have searched. The results should be interpreted with this consideration in mind.

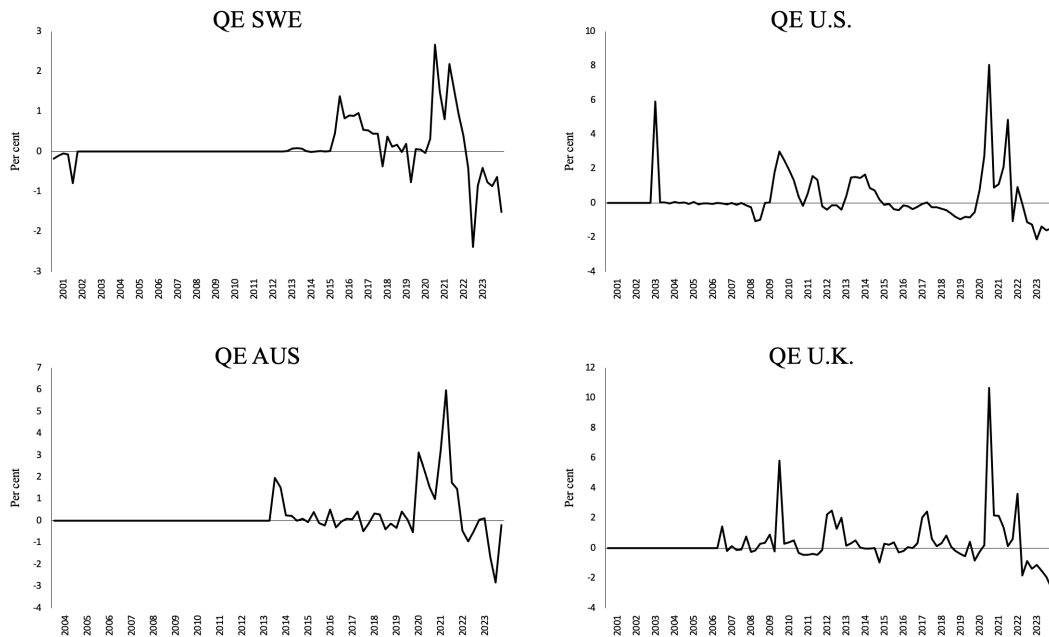


Figure 2: *QE data for all countries. Change in asset holdings for the purpose of QE relative to nominal GDP.*

4 Results

4.1 Estimated QE Shocks

We estimate twelve models in total. Plots of the estimated QE shocks for all three maturities of all four countries in the sample can be found in appendix B. A QE shock of one unit represents a one per cent change in asset holdings for the purpose of QE relative to nominal GDP. Table 2 shows descriptive statistics for all twelve estimated shocks. Figure 3 plots the estimated QE shocks for the models of 10 year yields for all four countries. The shocks have mean zero and are non-trending. Further, the shocks appear to be subject to volatility clusters around the period of the financial crisis for the U.K. and the U.S. and around the period of the Covid-19 pandemic for all countries. This can be explained by the fact that Sweden and Australia did not implement quantitative easing measures in response to the financial crisis while the U.K. and the U.S. did. There is therefore no increased volatility in the estimated shocks for Sweden and Australia around the period of the financial crisis. All four countries did however implement asset purchase programmes during the Covid-19 pandemic which explains the increased variation towards the end of the sample.

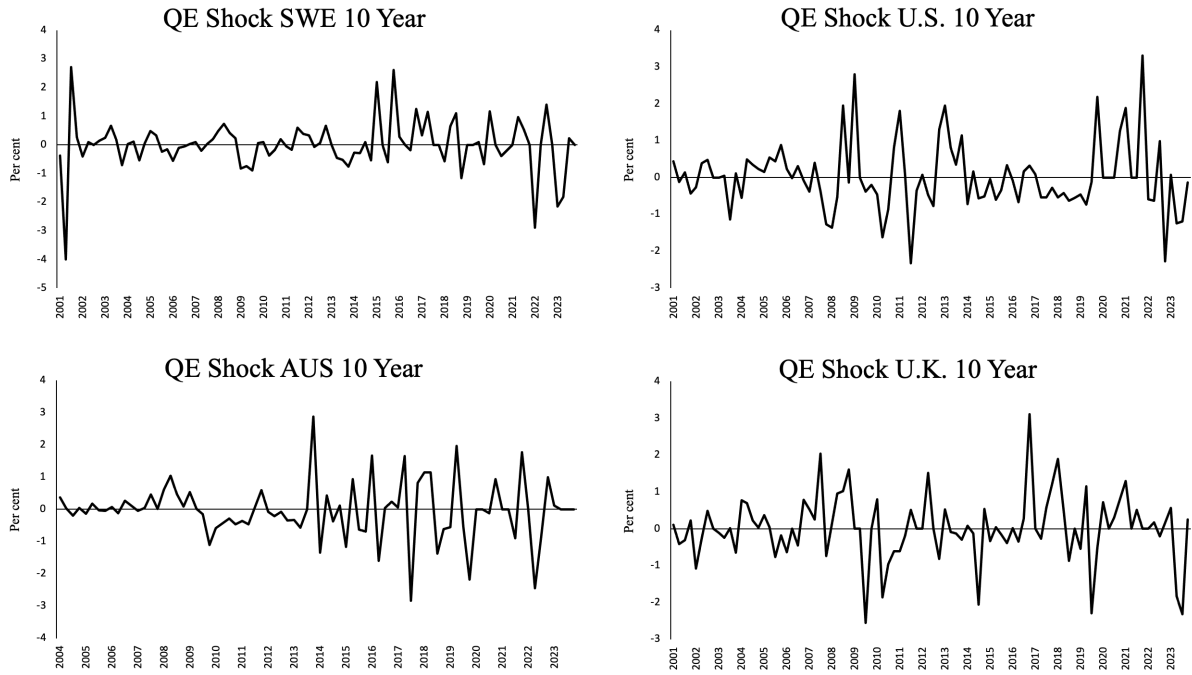


Figure 3: *QE shocks of 10 year models.*

In addition, remember that our sample period is constructed to include observations before the introduction of quantitative easing. Hence, we expect the real shock to be zero before the implementation of QE in the respective countries. However, by observing the plots of the QE shocks in figure 3 we see variations for earlier periods as well. To illustrate as an example, figure 4 plots the final variable of QE used in the models for Australia together with the estimated QE shock for the model with the ten year yield for Australia. For the first half of the sample period there is no variation of Australian QE whatsoever. The model clearly estimates variations in the shock even in the periods before QE was implemented. Further, the variation in the shock clearly increases from the point when asset purchases were initiated. The same analysis can be drawn from the estimates of the other three countries as well. Thus, the shock estimates manage to present the variation we want to estimate, but also a lot of noise. The estimated QE shocks may not only represent the exogenous behaviour of the macroeconomic policy we want to see, but also other variations that make the impulse response functions less representative for the research question.

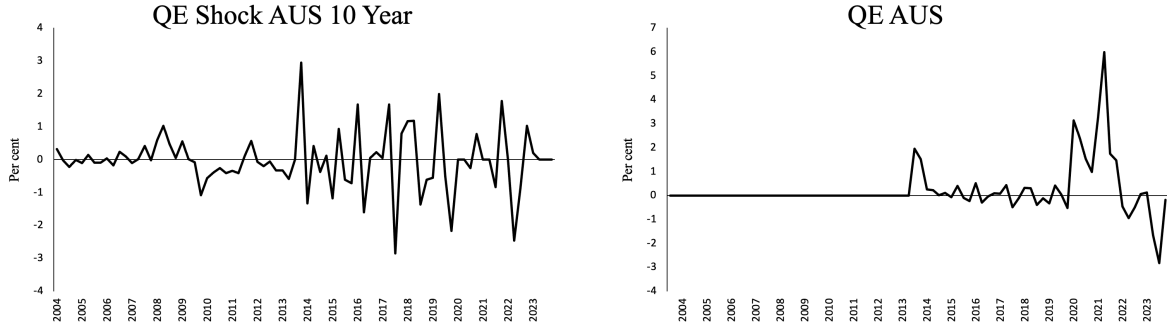


Figure 4: *Australia estimated QE shock for the ten year model right, QE variable as change in asset holdings relative to size of nominal GDP left.*

Table 2: Shock Estimates Data Descriptives

QE Shock	Mean	Std. Dev.
SWE 10 year model	0.003	0.880
SWE 5 year model	0.010	0.880
SWE 2 year model	0.004	0.880
AUS 10 year model	-0.025	0.882
AUS 5 year model	-0.033	0.874
AUS 2 year model	-0.042	0.881
U.K. 10 year model	0.011	0.880
U.K. 5 year model	0.023	0.892
U.K. 2 year model	0.019	0.886
U.S. 10 year model	0.017	0.916
U.S. 5 year model	0.017	0.916
U.S. 2 year model	0.008	0.910

4.2 Impulse Response Functions

We now turn to the analysis of the impulse response functions of all models. The remainder of this section will present the impulse response functions as well as the accumulated response of two, five and ten year government bond yields for all countries to a shock in domestic QE. The complete collection of estimation outputs and impulse response functions of all models may be resorted to in appendix C and D respectively.

4.2.1 Sweden

Figure 5 presents the response and accumulated response of two, five and ten year government bond yields to a QE shock of one per cent in relation to nominal GDP in the models of Sweden. The results vary slightly over the three maturities. The response of the yield for the bond of ten year maturity to a QE shock is -0.07 or -7 basis points (bps) and significant for one period to then trace out and be absent after four quarters. However,

the effect from two quarters and on is insignificant. The accumulated response of the ten year yield is significantly estimated to be -12 bps for up to six quarters. The response of the five year maturity bond yield is estimated on the verge of significant to be -7 bps and -5 bps for one and two quarters respectively, with longer periods insignificant. The accumulated response is significant over the first five quarters with an estimated effect of about -12 bps from a QE shock. The results of the two year maturity bond yield to a QE shock are insignificant over the whole period and the 95-per cent confidence bands are wide.

Thus, we see a similar response of the yield on ten and five year government bonds to a QE shock which is statistically significantly estimated to around -7 bps to -5 bps for one to two quarters and accumulated responses of roughly -12 bps for up to six quarters. These findings show similarities to those of Christensen and Zhang (2024) reviewed in section 2, who found evidence suggesting negative responses to Swedish five and ten year government bond yields following QE asset purchases. They estimated impacts of -7 bps and -10.5 bps for the ten and five year nominal term premiums respectively which is not directly comparable to our results since they employ a different method and estimate term premiums, but overall sign estimates and magnitudes are similar.

The results are after all sizeable for being the response of a one period shock only. The extensive utilisation of QE over time may then build up to accomplish a notable negative impact on government bond yields which is what to expect from the theory regarding quantitative easing and one of the intended purposes of the implementation of QE. The estimates of the ten year model and the five year model are similar in magnitude, but the estimates of the two year model are not significant at all, perhaps suggesting that the effect is more prominent on the longer yields in the sample as suggested by theory. This is however not consistent with the results of Christensen and Zhang (2024) who found greater impact on the five year yield than the ten year yield.

Further, consistent with the results of Diez and Shamloo (2017) we see generally weak significance, especially for longer horizons, which perhaps makes it unwise to draw any far reaching conclusions from the results.

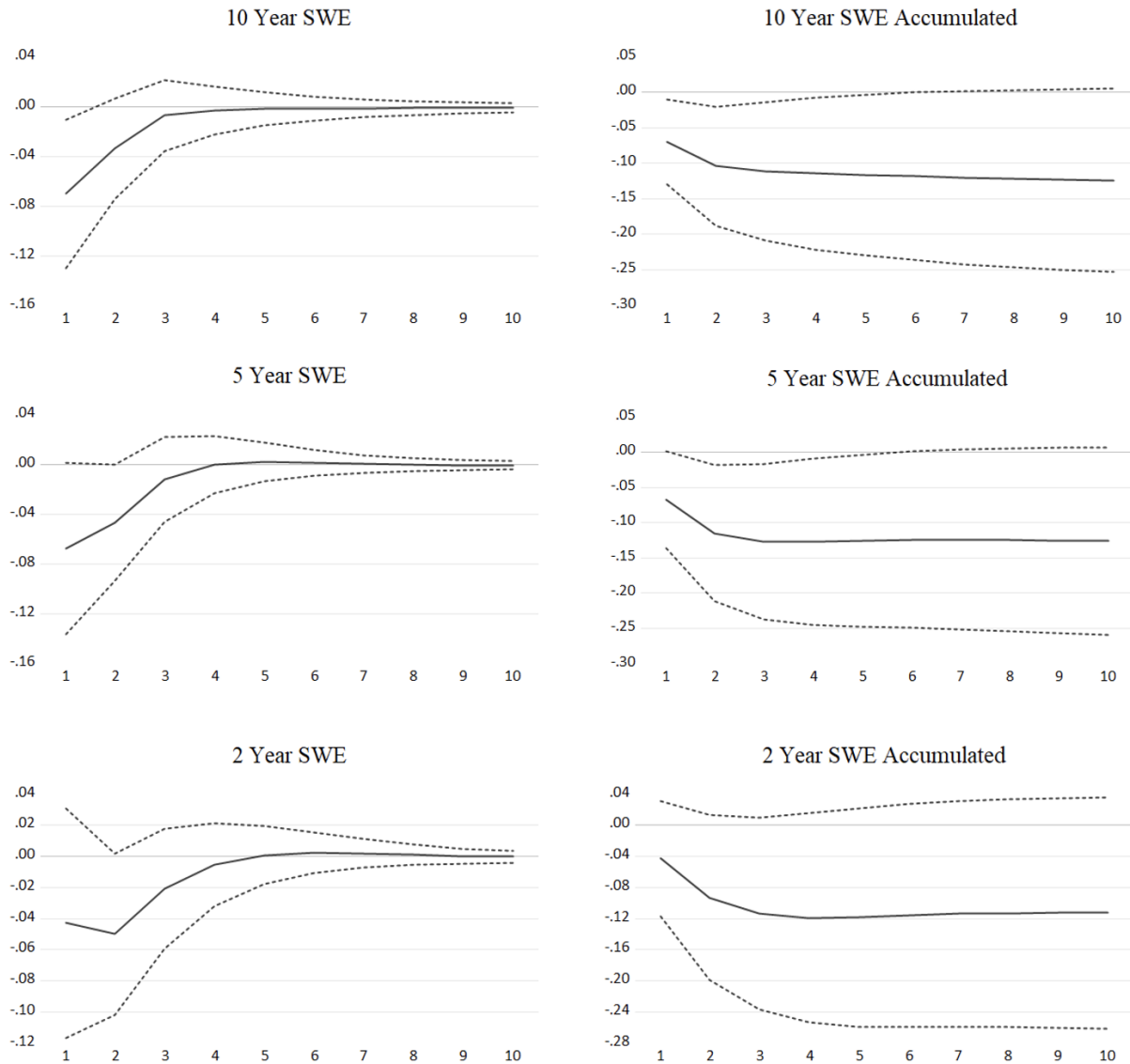


Figure 5: *Model of Sweden impulse responses to a positive QE shock left, accumulated responses right. Dashed lines indicates the 95 per cent confidence band. x-axis show quarters and y-axis indicates change in percentage points.*

4.2.2 Australia

Figure 6 presents the response and accumulated response of two, five and ten year government bond yields to a QE shock of one per cent in relation to nominal GDP in the models of Australia. The results are not subject to any reliable inference. All periods show insignificant response and accumulated response with very wide confidence bands. The results of Bauer and Neely (2013) also showed weaker results and insignificance in small countries, one of them Australia. Still, they find some significance but highlights the fact of lower significance for smaller economies.

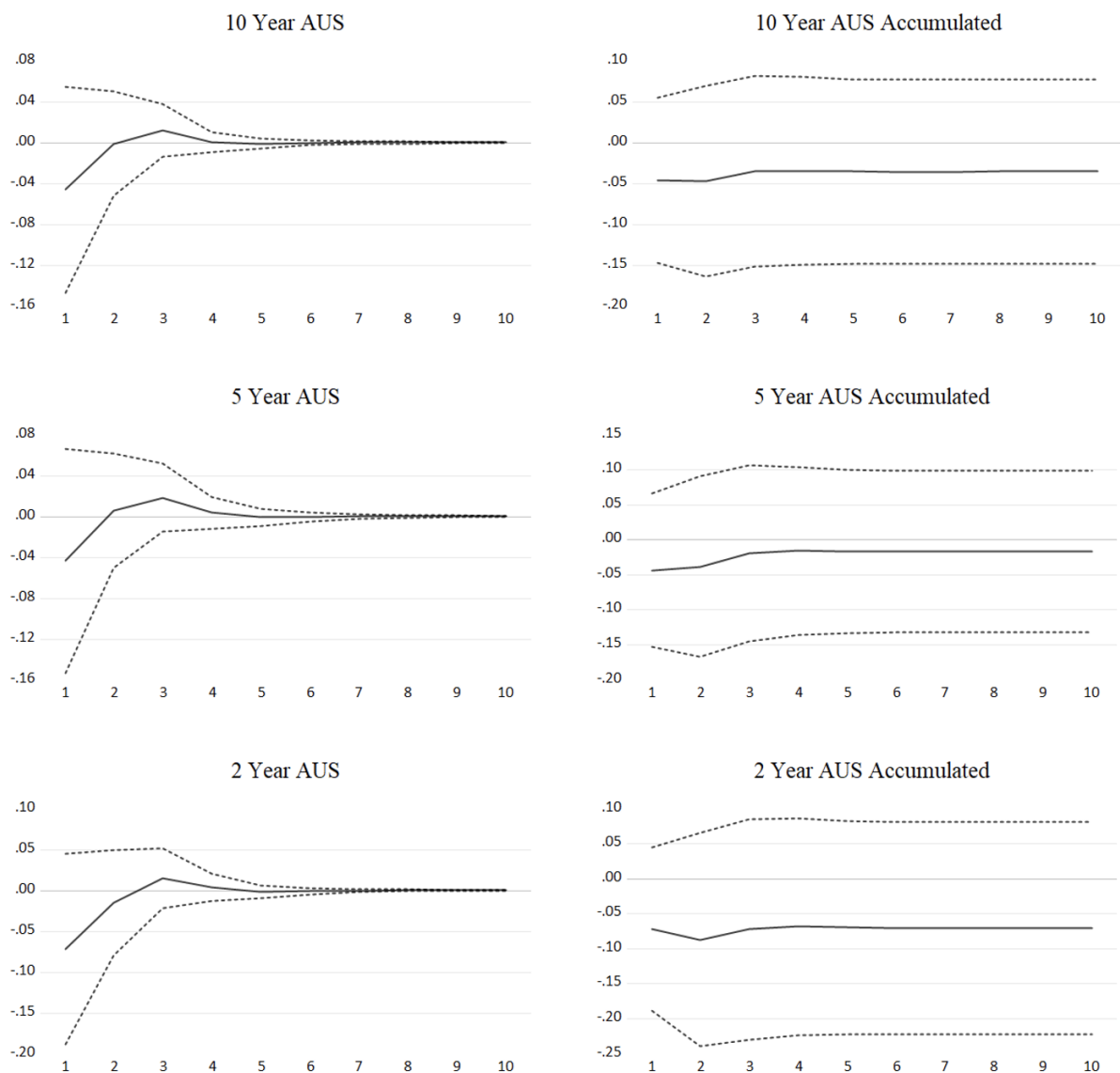


Figure 6: *Model of Australia impulse responses to a positive QE innovation shock left, accumulated responses right. Dashed lines indicates the 95 per cent confidence band. x-axis show quarters and y-axis indicates change in percentage points.*

4.2.3 The United Kingdom

Figure 7 presents the response and accumulated response of two, five and ten year government bond yields to a QE shock of one per cent in relation to nominal GDP in the models of the United Kingdom. The results do not support any conclusion. The responses to a positive QE shock are highly insignificant for all periods, making any type of inference unreliable. The lack of significance for estimates of the U.K. is a feature of Diez and Shamloo (2017) who found the U.K. to be the country with the least significant estimates in their sample.

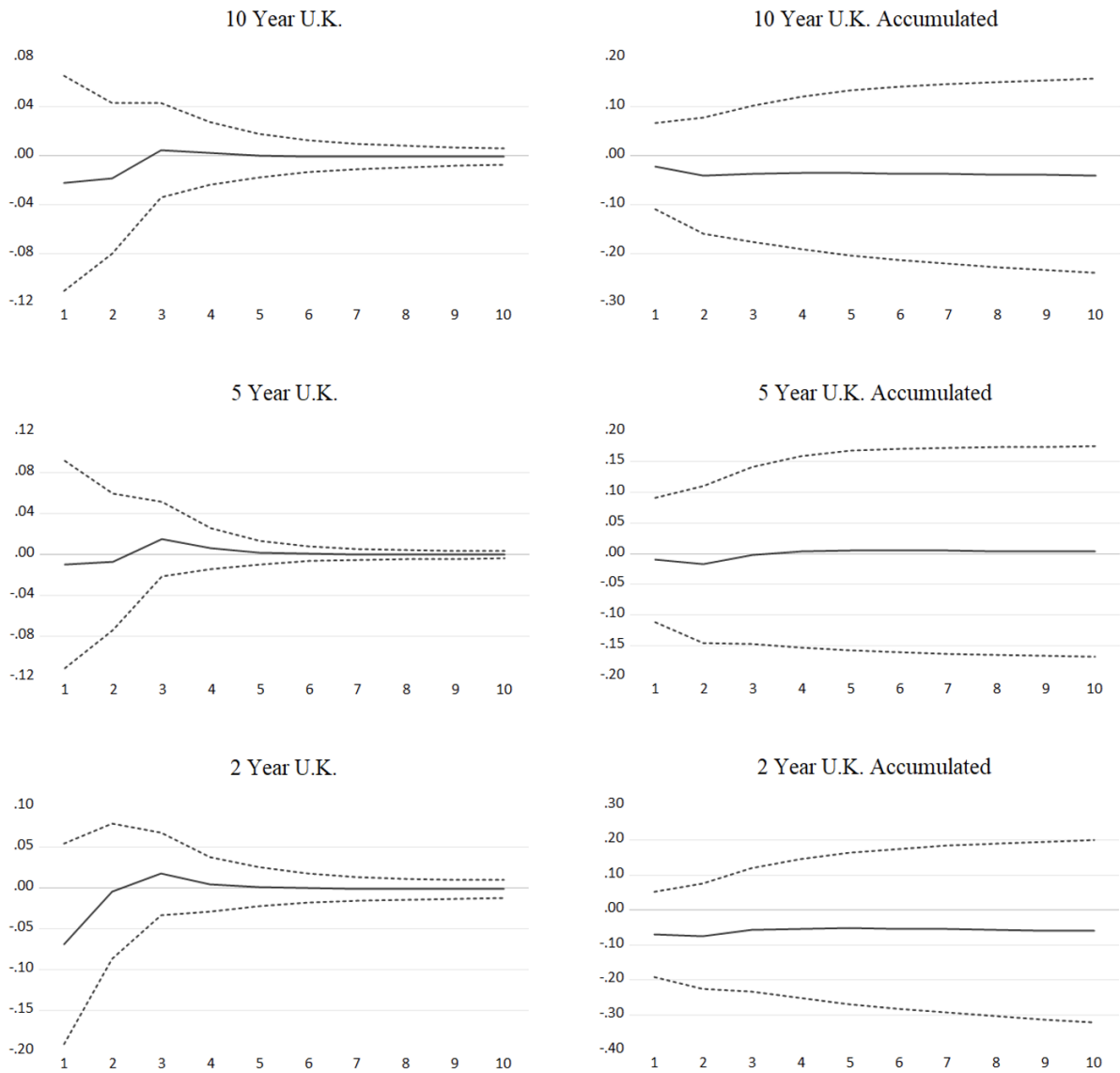


Figure 7: *Model of the United Kingdom impulse responses to a positive QE shock left, accumulated responses right. Dashed lines indicates the 95 per cent confidence band. x-axis show quarters and y-axis indicates change in percentage points.*

4.2.4 The United States

Figure 8 presents the response and accumulated response of two, five and ten year government bond yields to a QE shock of one per cent in relation to nominal GDP in the models of the United States. The response of the ten year government bond yield to a QE shock is significantly estimated in one quarter with a positive response of 12 bps with all periods beyond the first insignificant. The accumulated response is also only significant for the first quarter with an estimated effect of 12 bps. For the five year government bond yield response to a QE shock the results are strikingly similar to those of the ten year yield. The response is estimated to 10 bps for one quarter with further periods insignificant and the accumulated response is significant for one quarter only with an estimated effect of 10

bps. For the two year government bond yield, the results are insignificant for all periods. The results of the U.S. model thus estimate significant results for the ten and five year government bond yields, but not for the two year yield which is similar to the results of the models for Sweden. Further, the results suggest that the effect may in fact be larger on longer term yields. However, most surprising is the positive estimates of the responses indicating that a QE shock would raise government bond yields which is not according to the theory of quantitative easing, but rather the opposite.

The positive significant results of the United States contradicts not only theory but also the studies reviewed in section 2. Gagnon et al. (2017) who measured the impact both from announcements and purchases along with Diez and Shamloo (2017) and Bauer and Neely (2013) all found significant negative response of U.S. longer-term bond yields following QE.

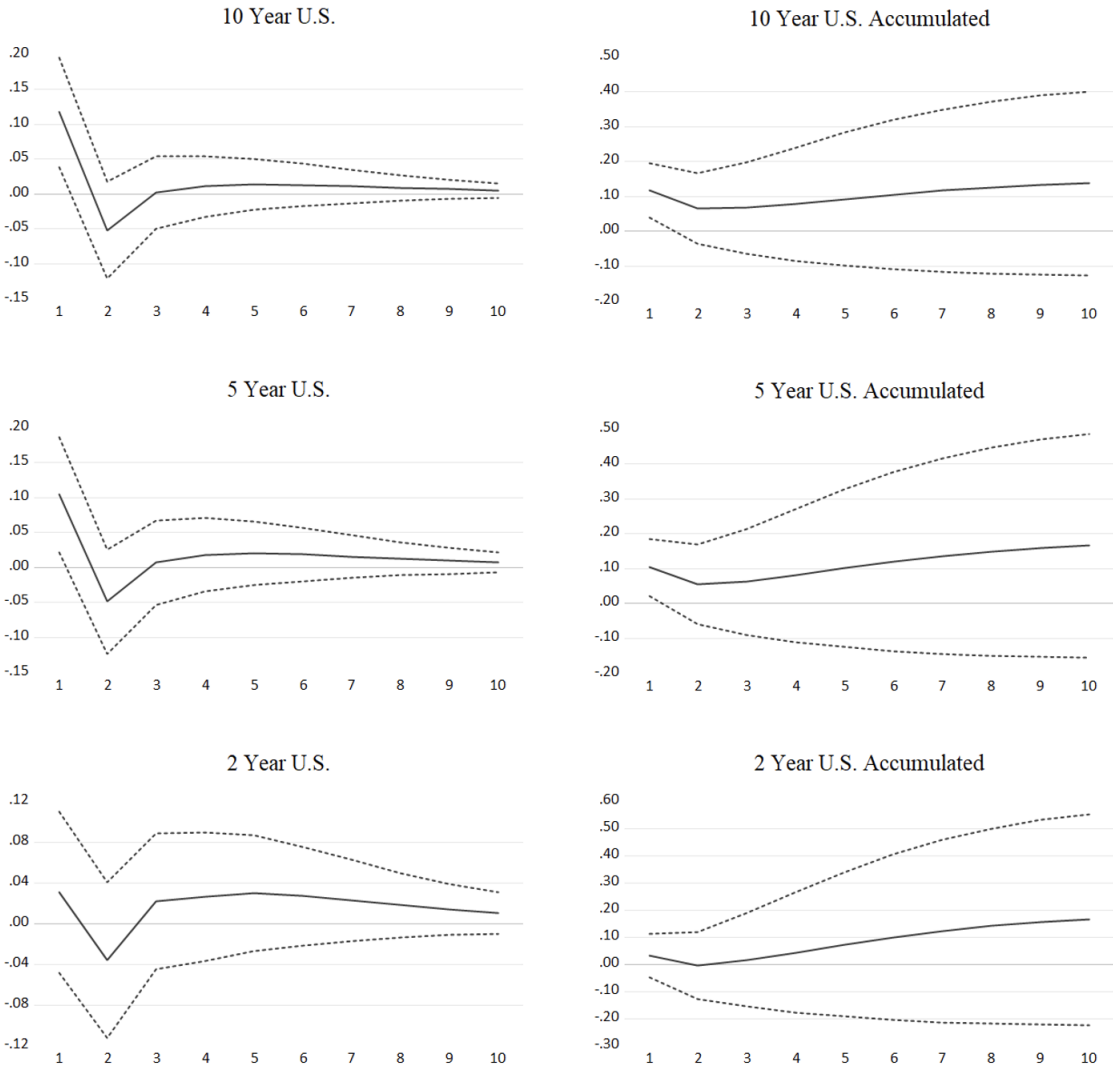


Figure 8: Model of the United States impulse responses to a positive QE shock left, accumulated responses right. Dashed lines indicates the 95 per cent confidence band. x-axis show quarters and y-axis indicates change in percentage points.

4.3 Sensitivity Analysis

We test the sensitivity of the model specifications and results in order to evaluate the validity and accuracy of the study. Kilian (2001) explains that estimated macroeconomic dynamics using VAR models are sensitive to the lag order selection. Statistical inference functions, such as the impulse response functions, are functions of the order of the lag polynomial from the autoregressive component. Thus, underfitting or overfitting the model can produce asymmetric summary statistics which will influence the true dynamics of the the impulse response functions. Specifically, underfitting the lag order effectively erase the curvature of the impulse response function, leading to unreliable results. Due to its consistency properties, we have used the Bayesian (Schwartz) information criterion (BIC) which selected a lag order of one for all models. To test the possibility that the BIC has underfitted the lag order, we estimate new models of lag orders of two and four to evaluate the sensitivity of the model to lag orders of different length.

For the models of Sweden there is no great change in the shape of the impulse response functions when including two lags. The most obvious result is that the confidence band of the ten year yield has tightened making the result significant for one further period and the five year yield response is insignificant for all periods. The two year yield response is still insignificant. For the models with lag order of four, the shape of the impulse response functions break down completely and starts oscillating between negative and positive with no increased significance. The overall assessment of the widened analysis is that the BIC lag order selection of one appears to be the most appropriate leading to the highest significance overall.

For the models of the United States, the results when including two lags are almost identical to the original models of one lag. Although the impulse response functions varies slightly in shape, the estimated impact and significance is the same. When four lags are included, the impulse response functions begin to oscillate and show no increased level of significance. The overall interpretation is the same as for the models of Sweden. The lag length of one seem to perform the most reliable results. The models for Sweden and the U.S. were the only models in the original specification that produced reliable inference suitable for analysis. The sensitivity analysis performed may indicate that the original specifications appear to be appropriately specified.

In their original specifications, the models of all yields of both Australia and the United Kingdom were insignificant for all periods. The results for longer lag lengths differ slightly from the original specifications. Beginning with Australia, with two lags the response of the two year yield is significant and estimated to be -12 bps. The responses of the ten and five year yields are still insignificant. With four lags the impulse response functions lose their original shape and oscillates between positive and negative with no significance. The lag order of two may fit the Australian models better and the original specification appears

to be more sensitive than the ones of Sweden and the U.S. Still, we do not manage to find results consistent with those of Bauer and Neely (2013) who found significant impact on the ten year yield.

Responses of the yields for the United Kingdom are still insignificant for two lags. For four lags the response of the 10 year yield is significant for one period, estimated to -10 bps. This is not entirely different from Diez and Shamloo (2017) who found significant effect on the U.K. ten year yield while also seeing several measurements insignificant. Overall, none of the lag orders one, two or four appears to fit the U.K. models. To investigate the models of the United Kingdom further we again turn to Kilian (2001). By performing a Monte Carlo simulation study, Kilian (2001) shows that for impulse response functions of higher order dynamics, the Akaike information criterion (AIC) may in fact show better properties than the BIC. Therefore, we also re-estimate the U.K. models with lag order selected by the AIC in order to investigate the possibilities of higher order dynamics. The AIC selected a lag order of 8 for all three models. The results for all three models are worse than for the previously tested specifications. Estimated impacts are close to zero and insignificant. Thus, we fail to find specifications for the models of the U.K. which would be suitable for inference.

Figure 9 shows the impulse response functions of the new results of Australia and the U.K. that showed any kind of significance. All yield responses from the sensitivity analysis can be found in appendix D.

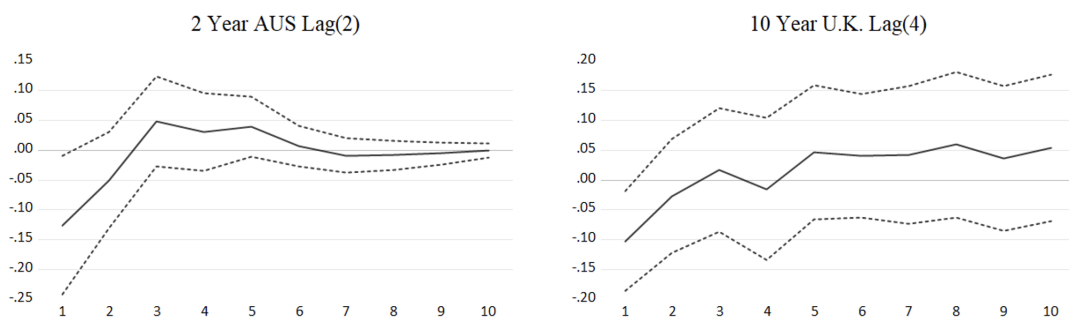


Figure 9: *Australian model of two lags two year yield and U.K. model of four lags ten year yield impulse responses to a positive QE shock. Dashed lines indicates the 95 per cent confidence band. x-axis show quarters and y-axis indicates change in percentage points.*

5 Discussion

The purpose of this study was to examine the impact quantitative easing has on government bond yields. The results of the four countries varies to such extent that it is difficult or perhaps unwise to draw any far reaching conclusions in an attempt to answer the research question. For Sweden, the results are weak but show consistency with the theory of quantitative easing with negative response of the two yields of longer maturity in the sample but not of the shorter yield. Further, the results show similarities to the ones of Christensen and Zhang (2014) who also found negative impact on Swedish bond yields of five and ten year maturity following asset purchases from the Swedish Riksbank. Significance was found also in the models of the U.S. but with positive impact which is in contrast both to the theory reviewed and the findings of Bauer and Neely (2013), Diez and Shamloo (2017) and Gagnon et al. (2011) who all found negative responses of bond yields following QE in the U.S. Australian and U.K. estimates showed great insignificance leaving no interpretable result for answering the research question other than the fact that estimates can be hard to pinpoint for the two countries. Bauer and Neely (2013) and Diez and Shamloo (2017) also found Australia and the U.K. to produce the least significant estimates which may highlight the fact that they are difficult to estimate.

The weak results of this study, especially those for Australia and the U.K. may be explained by several aspects of limitations regarding data, methodology and the estimations of QE shocks. The relative recent introduction of quantitative easing makes studies over longer time horizons impossible which leads to short sample sizes as the ones in this study. Short sample sizes make the model estimates less efficient, leading to less reliable results. We use quarterly data for this study, but future researchers would be advised to use more frequent data in order to gain larger sample sizes. Indeed, the studies reviewed in this thesis all used datasets of monthly or shorter frequencies and found more significant result than what we could estimate. Krishnamurthy and Vissing-Jorgensen (2011) even use intra-day frequency. The absence of quarterly data in the literature together with the weak results of this study may highlight inappropriateness of quarterly frequency and that it should be avoided in future studies.

A perhaps greater source of unreliability is the choice of methodology. The VAR models and specifically the SVAR model used in this study are well established models in the literature which are suitable for investigating macroeconomic dynamics (Kilian, 2011). Thus, the limitation does not necessarily lie within the regression model, but rather in how the yields are measured. In our study, we use the bond yields in their entirety as the variables we want to estimate responses of. However, the theory listed in this study suggest that bond yields consist of several components and that those components are affected in different ways by quantitative easing. Estimating the bond yield as such may then not explain the entire dynamics of the response to asset purchases. All research

reviewed in this study use term structure models to separate the components of bond yields to then measure the impact on the components respectively. The studies also show varying results of the components, with Gagnon et al. (2011) suggesting that the term premium accounted for much of the yield movement while Bauer and Rudebusch (2014) found strong effects regarding the short-rate expectations component. In further studies, researchers may want to avoid using yields in their entirety and try to further develop the methods of separating yield components in order to find more reliable results.

The data on QE and the estimated QE shocks are crucial in order to create representative measurements of asset purchases. Our difficulties of finding precise data of the exact asset purchases and the high variation of the estimated shocks in periods not subject to quantitative easing limits our success in creating appropriate QE measures. To create reliable and trustworthy result in accordance with theory it is of outmost important for researchers to carefully gather representative data. Even if data is found to be appropriate, the precise estimation of shocks is still a crucial component for works of the future. One approach is the one used by Christensen and Zhang (2024) of selecting a sample period with beginning after the implementation of QE. Thus, there is no period of the shock where QE was not present. This method will however shorten the sample size even further.

The implications of the results of this study are not many, but rather the results highlight the ambiguity associated with quantitative easing also shown by the variation of results in other studies reviewed. Hence, policy makers should be cautious when conducting unconventional monetary policy in the form of quantitative easing. The lack of clear results and agreement regarding the workings of QE in the literature emphasise the importance of not basing important policy decisions on segmented areas of the literature. The largest implication of the results for this study is that it indicates the difficulties and complexity of performing reliable studies regarding quantitative easing.

6 Conclusion

In response to the financial crisis of 2007-8 and subsequent periods of low economic activity with low inflation despite low policy rates, central banks turned to the introduction of quantitative easing. The outbreak of the Covid-19 pandemic in 2020 with the fear of halt in the economic activity lead policy makers to resort to even larger volumes of quantitative easing. With the purpose of lowering longer-term yields and signalling the future path of interest rates such expansionary asset purchases are intended to assist the conventional tool of the policy rate when it is obstructed by the effective lower bound. Around this new unconventional monetary policy tool there has gathered much attention which has opened up for a new area within the research literature. Following this development, this thesis has aimed at contributing to the research regarding the impact of quantitative easing on government bonds yields.

By applying a structural vectorautoregressive model and performing impulse response analysis on the effect of QE shocks on government bond yields in Sweden, Australia, the United Kingdom and the United States some results were found. Part of the results indicate that asset purchase programmes have indeed had an impact of reducing longer-term bond yields in accordance with theory. However, other results show the opposite, that QE would increase yields and a lot of the models were found to be difficult to estimate efficiently. These findings should not be viewed as defeat, but rather as a demonstration of the complexity of quantitative easing and the difficulties of researching it. The limitations regarding small sample sizes and data measurements along with the complexity of different channels of transmission provides an extensive base for future researchers to unravel.

Monetary policy makers have implemented large scale asset purchase programmes despite the still relative uncertainty about the effects and the ambiguity in the research literature. Policy makers of the future would be wise to show restraint until further knowledge regarding quantitative easing has been acquired. Quantitative easing measures in the form of asset purchase programmes is an interesting entity which hold research potential of great importance for policy makers and the future development of monetary policy.

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8 Appendices

8.1 A - Data

Sources

Table 3: Sweden Data Sources

Variable	Source
Yield 10 year maturity	Swedish Riksbank
Yield 5 year maturity	Swedish Riksbank
Yield 2 year maturity	Swedish Riksbank
QE	Swedish Riksbank
Inflation	Statistics Sweden
Exchange rate	Swedish Riksbank
Fiscal policy	The Swedish National Financial Management Authority
GDP growth	Statistics Sweden
Financial market conditions	Nasdaq Nordic
Nominal policy rate	Swedish Riksbank
QE of the EMU	European Central Bank
QE of the U.S.	The Federal Reserve System

Table 4: Australia Data Sources

Variable	Source
Yield 10 year maturity	Reserve Bank of Australia
Yield 5 year maturity	Reserve Bank of Australia
Yield 2 year maturity	Reserve Bank of Australia
QE	Reserve Bank of Australia
Inflation	Australian Bureau of Statistics
Exchange rate	Federal Reserve Bank of ST.Louis
Fiscal policy	Australian Bureau of Statistics
GDP growth	Australian Bureau of Statistics
Financial market conditions	The Wall Street Journal
Nominal policy rate	Reserve Bank of Australia
QE of the EMU	European Central Bank
QE of the U.S.	The Federal Reserve System

Table 5: U.K. Data Sources

Variable	Source
Yield 10 year maturity	Bank of England
Yield 5 year maturity	Bank of England
Yield 2 year maturity	Bank of England
QE	Bank of England
Inflation	Office for National Statistics
Exchange rate	Federal Reserve bank of ST.Louis
Fiscal policy	Office for National Statistics
GDP growth	Office for National Statistics
Financial market conditions	The Wall Street Journal
Nominal policy rate	Bank of England
QE of the EMU	European Central Bank
QE of the U.S.	The Federal Reserve System

Table 6: U.S. Data Sources

Variable	Source
Yield 10 year maturity	Federal Reserve Bank of ST.Louis
Yield 5 year maturity	Federal Reserve Bank of ST.Louis
Yield 2 year maturity	Federal Reserve Bank of ST.Louis
QE	The Federal Reserve System
Inflation	Bureau of Labor Statistics
Exchange rate	The Federal Reserve System
Fiscal policy	Bureau of the Fiscal Service
GDP growth	Bureau of Economic Analysis
Financial market conditions	Yahoo Finance
Nominal policy rate	Federal Reserve Bank of ST.Louis

Descriptive Statistics

Table 7: Sweden Data Descriptives

Variable	Mean	Median	Std. Dev.	N
Yield 10 year maturity	-0.03	0.00	0.31	94
Yield 5 year maturity	-0.03	-0.04	0.36	94
Yield 2 year maturity	-0.02	-0.02	0.40	94
QE	0.10	0.00	0.62	94
Inflation	0.51	0.40	0.57	94
Exchange rate	0.31	0.05	0.57	94
Fiscal policy	0.30	0.52	3.15	94
GDP growth	0.01	0.01	0.02	94
Financial market conditions	1.14	2.74	9.83	94
Nominal policy rate	0.00	0.00	0.38	94
QE of the EMU	-0.03	0.00	1.34	94
QE of the U.S.	0.29	-0.01	1.44	94

Table 8: Australia Data Descriptives

Variable	Mean	Median	Std. Dev.	N
Yield 10 year maturity	-0.01	-0.02	0.47	83
Yield 5 year maturity	-0.01	-0.01	0.49	83
Yield 2 year maturity	-0.01	-0.01	0.52	83
QE	0.22	0.00	1.03	83
Inflation	0.67	0.58	0.53	83
Exchange rate	0.29	0.55	5.66	83
Fiscal policy	-0.21	-0.06	0.84	83
GDP growth	0.67	0.70	1.14	83
Financial market conditions	1.45	2.55	7.34	83
Nominal policy rate	-0.01	0.00	0.44	83
QE of the EMU	-0.04	0.00	1.42	83
QE of the U.S.	0.26	-0.04	1.40	83

Table 9: U.K. Data Descriptives

Variable	Mean	Median	Std. Dev.	N
Yield 10 year maturity	-0.01	-0.05	0.42	94
Yield 5 year maturity	-0.03	-0.09	0.48	94
Yield 2 year maturity	-0.03	-0.02	0.58	94
QE	0.32	0.00	1.54	94
Inflation	0.61	0.51	0.51	94
Exchange rate	-0.09	-0.31	4.45	94
Fiscal policy	2.95	2.11	3.11	94
GDP growth	0.99	1.08	2.17	94
Financial market conditions	0.48	1.72	7.16	94
Nominal policy rate	-0.01	0.00	0.40	94
QE of the EMU	-0.03	0.00	1.34	94
QE of the U.S.	0.29	-0.01	1.44	94

Table 10: U.S. Data Descriptives

Variable	Mean	Median	Std. Dev.	N
Yield 10 year maturity	-0.02	0.02	0.44	95
Yield 5 year maturity	-0.02	0.02	0.47	95
Yield 2 year maturity	-0.02	0.01	0.47	95
QE	0.29	-0.01	1.44	95
Inflation	0.63	0.60	1.44	95
Exchange rate	0.23	0.48	4.44	95
Fiscal policy	1.23	0.93	1.32	95
GDP growth	0.01	0.01	0.02	95
Financial market conditions	1.52	2.59	6.87	95
Nominal policy rate	-0.02	0.00	0.52	95

Tests for unit root

Table 11: SWE data Augmented Dickey-Fuller test statistics

Variable	t-statistic	p-value
Yield 10 year maturity	-7.674	0.000***
Yield 5 year maturity	-7.263	0.000***
Yield 2 year maturity	-6.760	0.000***
QE	-3.829	0.004***
Inflation	-3.532	0.009***
Exchange rate	-6.489	0.000***
Fiscal policy	-6.361	0.000***
GDP growth	-11.260	0.000***
Financial market conditions	-8.591	0.000***
Nominal policy rate	-4.419	0.001***
QE of the EMU	-15.362	0.000***
QE of the U.S.	-6.013	0.000***

*, **, ***, denotes significance levels of 10%, 5% and 1% respectively.

Table 12: AUS data Augmented Dickey-Fuller test statistics

Variable	t-statistic	p-value
Yield 10 year maturity	-9.226	0.000***
Yield 5 year maturity	-8.770	0.000***
Yield 2 year maturity	-8.137	0.000***
QE	-4.878	0.000***
Inflation	-7.858	0.000***
Exchange rate	-8.100	0.000***
Fiscal policy	-3.554	0.009***
GDP growth	-10.870	0.000***
Financial market conditions	-9.556	0.000***
Nominal policy rate	-5.611	0.000***
QE of the EMU	-15.362	0.000***
QE of the U.S.	-6.013	0.000***

*, **, ***, denotes significance levels of 10%, 5% and 1% respectively.

Table 13: U.K. data Augmented Dickey-Fuller test statistics

Variable	t-statistic	p-value
Yield 10 year maturity	-8.800	0.000***
Yield 5 year maturity	-9.350	0.000***
Yield 2 year maturity	-4.770	0.000***
QE	-7.354	0.000***
Inflation	-3.205	0.023**
Exchange rate	-8.558	0.000***
Fiscal policy	-4.054	0.002***
GDP growth	-13.088	0.000***
Financial market conditions	-10.111	0.000***
Nominal policy rate	-3.428	0.012**
QE of the EMU	-15.362	0.000***
QE of the U.S.	-6.013	0.000***

*, **, ***, denotes significance levels of 10%, 5% and 1% respectively.

Table 14: U.S. data Augmented Dickey-Fuller test statistics

Variable	t-statistic	p-value
Yield 10 year maturity	-9.344	0.000***
Yield 5 year maturity	-8.358	0.000***
Yield 2 year maturity	-6.725	0.000***
QE	-6.013	0.000***
Inflation	-8.179	0.000***
Exchange rate	-8.800	0.000***
Fiscal policy	-3.000	0.039**
GDP growth	-12.426	0.000***
Financial market conditions	-8.286	0.000***
Nominal policy rate	-5.480	0.000***

*, **, ***, denotes significance levels of 10%, 5% and 1% respectively.

Sweden Data Plots

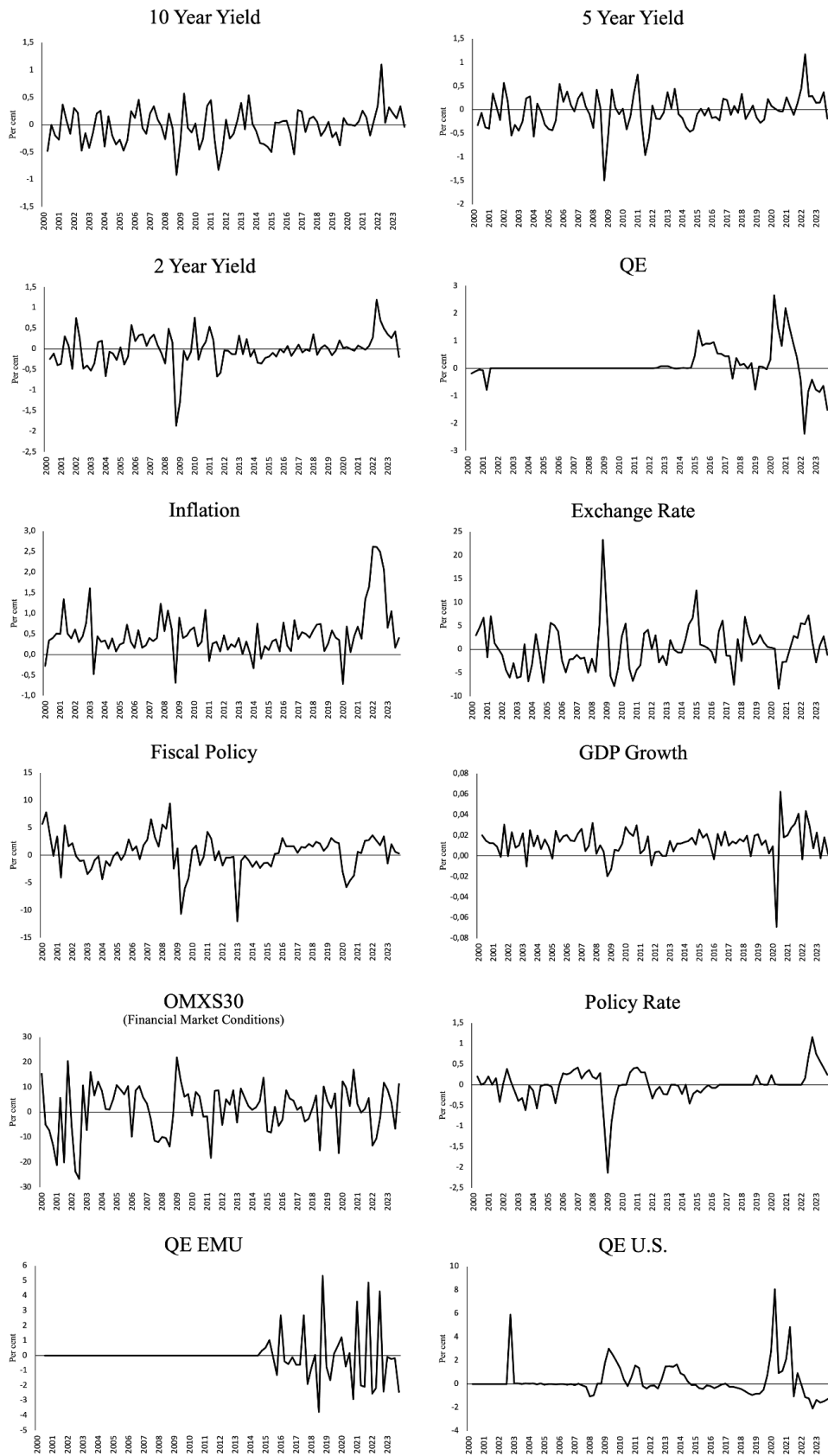


Figure 10: *Plots of Swedish data*

Australia Data Plots

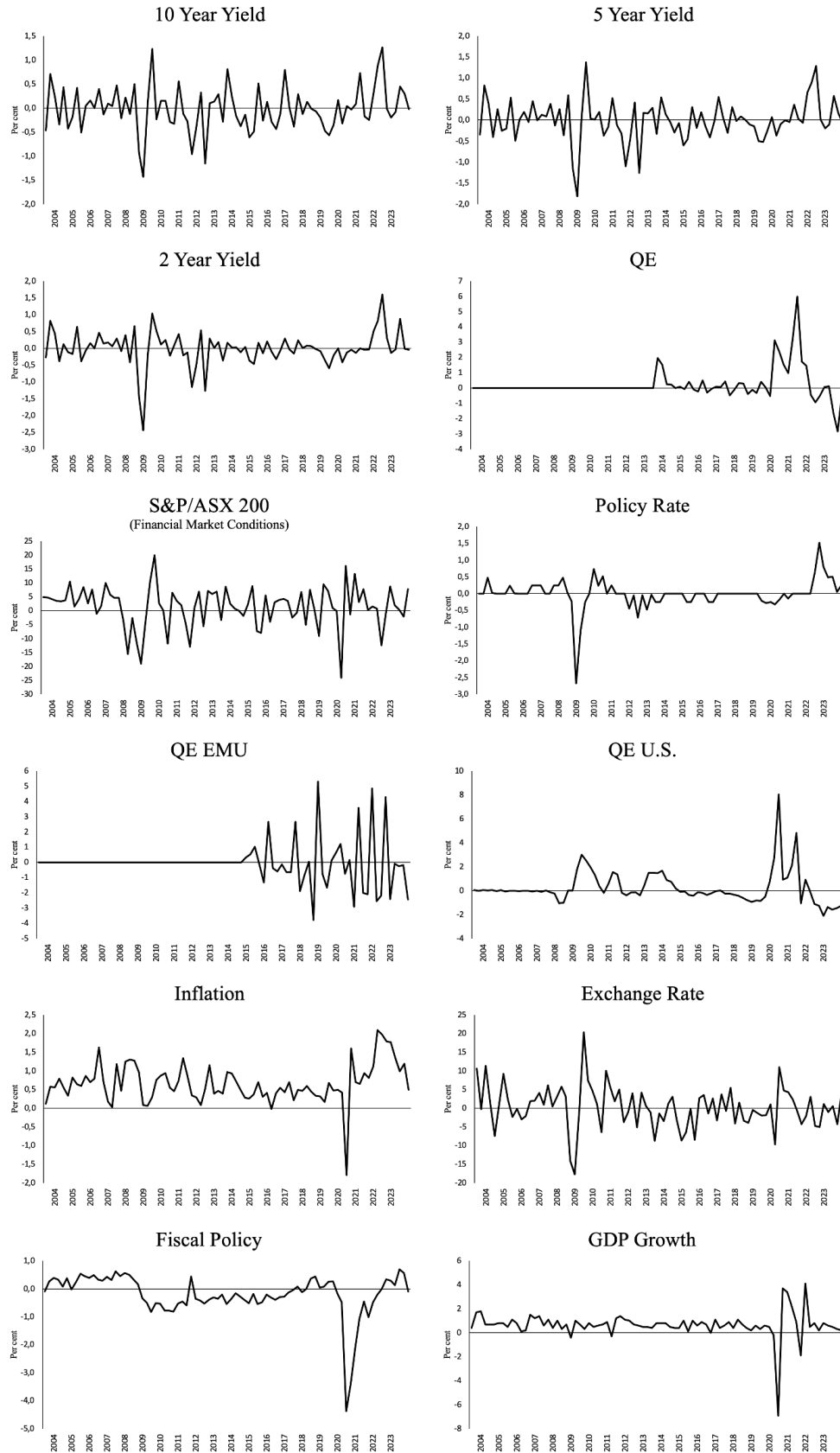


Figure 11: *Plots of Australian data*

United Kingdom Data Plots

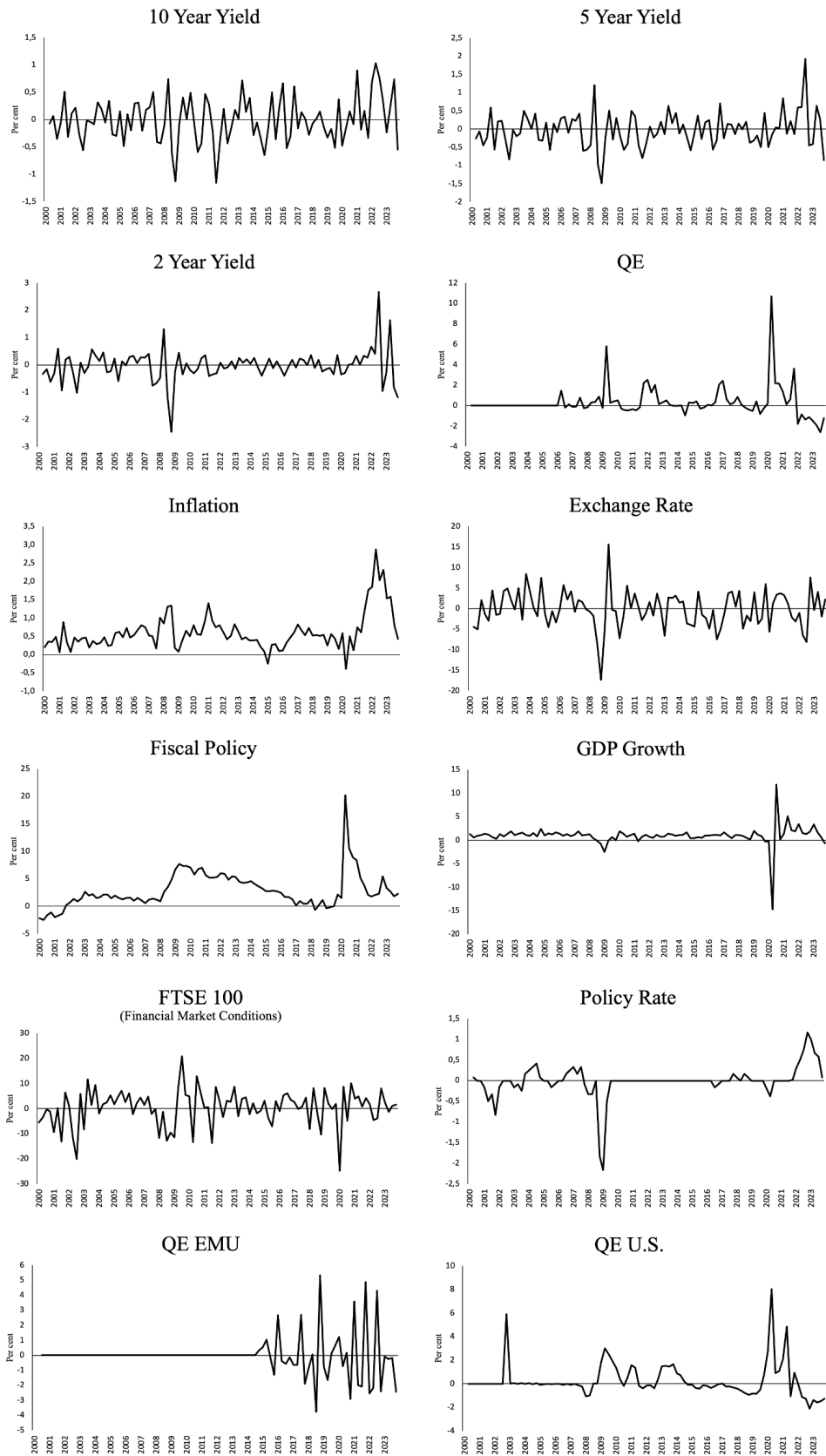


Figure 12: *Plots of U.K. data*

United States Data Plots

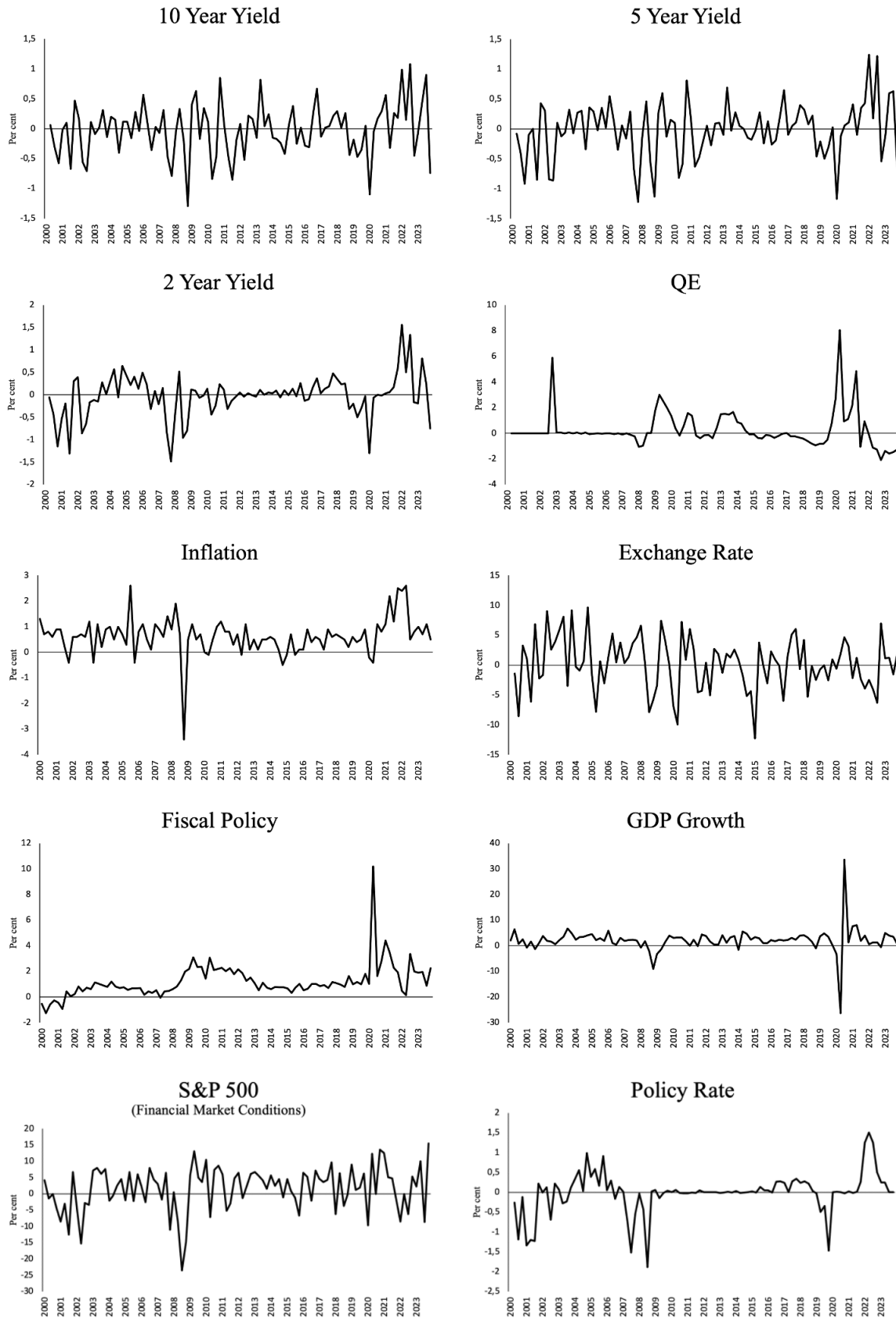


Figure 13: *Plots of U.S. data*

8.2 B - Estimated QE Shocks

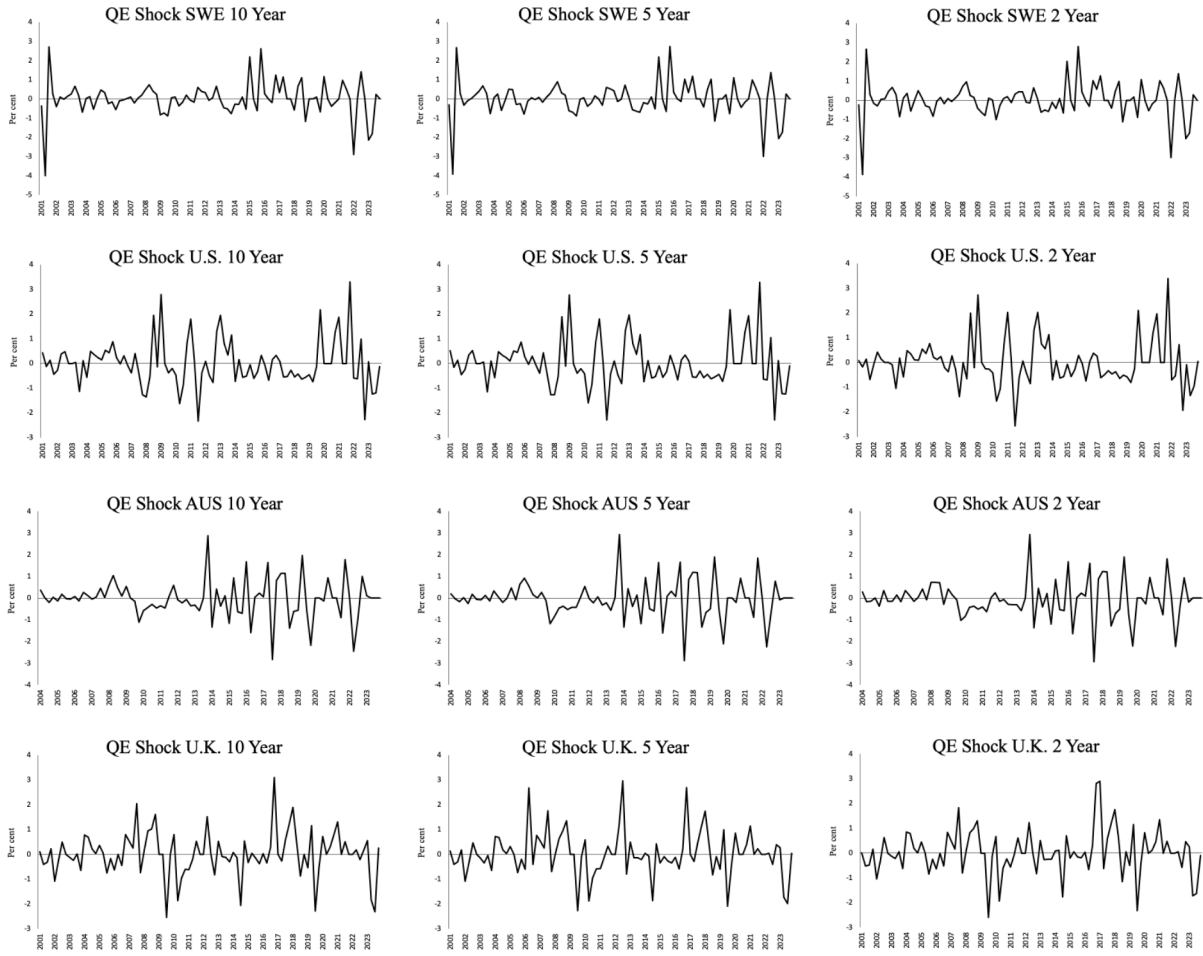


Figure 14: *Estimated QE shocks of all models*

8.3 C - Estimation Outputs

Table 16: SWE ten year model estimation output

Standard errors in () & t-statistics in []

	QE_CHANGE	YIELD_10	INFLATION	EXCHANGE_RATE	FISCAL_POLICY	GDP	FINANCIAL_MARKET	POLICY_RATE
QE_CHANGE(-1)	0.647410 (0.03593) [18.0192]	-0.031537 (0.06472) [-0.48730]	0.034642 (0.11464) [0.30219]	-0.539730 (0.96558) [-0.55897]	0.324127 (0.59417) [0.54551]	0.013095 (0.00290) [4.51445]	1.342359 (2.07175) [0.64793]	-0.018134 (0.05425) [-0.33424]
YIELD_10(-1)	0.126682 (0.06326) [2.00241]	0.236916 (0.11396) [2.07897]	-0.109898 (0.20186) [-0.54443]	-2.345161 (1.70022) [-1.37933]	0.496249 (1.04623) [0.47432]	-0.001473 (0.00511) [-0.28837]	-8.095945 (3.64800) [-2.21928]	0.349122 (0.09553) [3.65448]
INFLATION(-1)	-0.058016 (0.03557) [-1.63096]	0.002572 (0.06408) [0.04014]	0.469272 (0.11350) [4.13460]	-0.433985 (0.95598) [-0.45397]	-0.380578 (0.58826) [-0.64695]	0.012080 (0.00287) [4.20629]	-0.232765 (2.05115) [-0.11348]	0.030043 (0.05371) [0.55930]
EXCHANGE_RATE(-1)	0.007675 (0.00469) [1.63571]	-0.002980 (0.00845) [-0.35257]	0.012305 (0.01497) [0.82197]	0.423929 (0.12609) [3.36206]	0.117826 (0.07759) [1.51856]	-3.01E - 05 (0.00038) [-0.07944]	-0.148256 (0.27054) [-0.54799]	-0.018883 (0.00708) [-2.66529]
FISCAL_POLICY(-1)	-0.002194 (0.00657) [-0.33411]	0.010045 (0.01183) [0.84940]	0.005165 (0.02095) [0.24656]	0.170746 (0.17644) [0.96774]	0.111769 (0.10857) [1.02946]	0.000156 (0.00053) [0.29452]	-0.578494 (0.37857) [-1.52812]	0.006482 (0.00991) [0.65388]
GDP(-1)	2.580767 (1.21126) [2.13065]	-1.840729 (2.18183) [-0.84366]	11.00493 (3.86476) [2.84751]	45.10173 (32.5521) [1.38552]	47.49153 (20.0309) [2.37091]	0.086275 (0.09779) [0.88223]	46.53121 (69.8440) [0.66622]	1.714268 (1.82905) [0.93725]
FINANCIAL_MARKET(-1)	0.000556 (0.00212) [0.26229]	0.007842 (0.00382) [2.05360]	0.001145 (0.00676) [0.16923]	-0.048319 (0.05697) [-0.84809]	-0.036800 (0.03506) [-1.04967]	0.000343 (0.00017) [2.00182]	0.039998 (0.12224) [0.32719]	0.004523 (0.00320) [1.41294]
POLICY_RATE(-1)	-0.057840 (0.06235) [-0.92771]	-0.023862 (0.11230) [-0.21248]	-0.075826 (0.19893) [-0.38117]	1.326924 (1.67553) [0.79194]	2.688218 (1.03104) [2.60729]	0.006055 (0.00503) [1.20296]	-3.572407 (3.59503) [-0.99371]	0.435921 (0.09415) [4.63029]
QE_EMU_CHANGE	0.084578 (0.02023) [4.18083]	-0.004199 (0.03644) [-0.11524]	-0.013087 (0.06455) [-0.20275]	-0.021846 (0.54367) [-0.04018]	0.006200 (0.33455) [0.01853]	0.004222 (0.00163) [2.58498]	1.942934 (1.16651) [1.66560]	0.026141 (0.03055) [0.85573]
QE_US_CHANGE	0.017624 (0.01787) [0.98643]	0.029567 (0.03218) [0.91872]	-0.004352 (0.05701) [-0.07635]	-0.175719 (0.48016) [-0.36596]	-0.482231 (0.29546) [-1.63212]	0.001473 (0.00144) [1.02151]	0.660668 (1.03022) [0.64129]	-0.032271 (0.02698) [-1.19616]
D2015Q2	0.900398 (0.18484) [4.87124]	0.342531 (0.33295) [1.02877]	-0.217025 (0.58977) [-0.36798]	-6.344144 (4.96751) [-1.27713]	-4.566081 (3.05675) [-1.49377]	0.007784 (0.01492) [0.52161]	-14.80436 (10.6583) [-1.38900]	0.248554 (0.27912) [0.89050]
D2016Q2	0.478202 (0.17380) [2.75149]	-0.160686 (0.31306) [-0.51327]	-0.156065 (0.55454) [-0.28143]	-2.212810 (4.67075) [-0.47376]	1.413065 (2.87414) [0.49165]	0.003958 (0.01403) [0.28206]	11.05353 (10.0216) [1.10297]	-0.087741 (0.26244) [-0.33432]
D2017Q3	-0.857575 (0.18017) [-4.75987]	0.165167 (0.32453) [0.50893]	0.098671 (0.57486) [0.17164]	-7.572278 (4.84195) [-1.56389]	0.801176 (2.97948) [0.26890]	-0.013644 (0.01455) [-0.93801]	-10.42145 (10.3889) [-1.00313]	-0.108004 (0.27206) [-0.39699]
D2017Q4	0.832791 (0.17794) [4.68021]	0.122008 (0.32052) [0.38066]	0.133190 (0.56775) [0.23459]	4.600624 (4.78205) [0.96206]	2.184955 (2.94262) [0.74252]	0.023637 (0.01437) [1.64536]	2.063228 (10.2604) [0.20109]	-0.177083 (0.26870) [-0.65905]
D2019Q1	-0.875129 (0.16978) [-5.15462]	-0.265769 (0.30582) [-0.86905]	-0.036342 (0.54170) [-0.06709]	0.560138 (4.56266) [0.12277]	0.340245 (2.80763) [0.12119]	0.016567 (0.01371) [1.20868]	5.969713 (9.78967) [0.60980]	0.140618 (0.25637) [0.54850]
D2019Q2	0.710974 (0.17465) [4.07081]	-0.096228 (0.31460) [-0.30587]	0.196153 (0.55726) [0.35199]	0.113967 (4.69371) [0.02428]	1.421131 (2.88827) [0.49204]	0.020589 (0.01410) [1.46012]	5.329246 (10.0708) [0.52918]	-0.044703 (0.26373) [-0.16950]
D2020Q2	2.311719 (0.23117) [9.99988]	-0.275899 (0.41641) [-0.66256]	0.942541 (0.73761) [1.27783]	1.596751 (6.21275) [0.25701]	-2.664763 (3.82300) [-0.69703]	-0.079058 (0.01866) [-4.23587]	3.732064 (13.3301) [0.27997]	0.168160 (0.34908) [0.48172]
D2021Q1	1.296927 (0.20042) [6.47104]	0.149896 (0.36102) [0.41521]	0.328761 (0.63948) [0.51411]	0.349089 (5.38623) [0.06481]	2.006353 (3.31441) [0.60534]	-0.021089 (0.01618) [-1.30334]	-9.747821 (11.5567) [-0.84348]	-0.180190 (0.30264) [-0.59539]
D2021Q4	-0.632597 (0.20942) [-3.02068]	0.169115 (0.37723) [0.44831]	0.632039 (0.66820) [0.94588]	0.295993 (5.62815) [0.05259]	1.437739 (3.46327) [0.41514]	-0.013137 (0.01691) [-0.77701]	-6.529237 (12.0758) [-0.54069]	-0.074319 (0.31624) [-0.23501]
D2022Q2	-1.825248 (0.20784) [-8.78190]	1.100388 (0.37438) [2.93919]	1.366290 (0.66316) [2.06027]	3.289191 (5.58569) [0.58886]	1.748097 (3.43714) [0.50859]	0.033199 (0.01678) [1.97848]	1.944964 (11.9847) [0.16229]	0.124609 (0.31385) [0.39703]
D2022Q4	0.436729 (0.20084) [2.17450]	0.421727 (0.36177) [1.16572]	0.514656 (0.64082) [0.80312]	-3.724490 (5.39753) [-0.69004]	-0.666892 (3.32136) [-0.20079]	-0.004489 (0.01621) [-0.27687]	23.10325 (11.5810) [1.99493]	0.837986 (0.30328) [2.76309]
D2023Q4	-0.937753 (0.18121) [-5.17498]	-0.012886 (0.32641) [-0.03948]	0.151394 (0.57818) [0.26184]	-3.882761 (4.86993) [-0.79729]	-2.791250 (2.99670) [-0.93144]	0.018821 (0.01463) [1.28646]	22.00868 (10.4489) [2.10631]	0.001976 (0.27363) [0.00722]

Table 17: SWE five year model estimation output

Standard errors in () & t-statistics in []

	QE_CHANGE	YIELD_5	INFLATION	EXCHANGE_RATE	FISCAL_POLICY	GDP	FINANCIAL_MARKET	POLICY_RATE
QE_CHANGE(-1)	0.646363 (0.03546) [18.2298]	-0.048578 (0.07381) [-0.65817]	0.031929 (0.11376) [0.28067]	-0.462431 (0.96797) [-0.47773]	0.345857 (0.58903) [0.58717]	0.013187 (0.00289) [4.56009]	1.412790 (2.04121) [0.69213]	-0.019120 (0.05113) [-0.37396]
YIELD_5(-1)	0.130905 (0.05589) [2.34223]	0.281188 (0.11634) [2.41695]	-0.169318 (0.17931) [-0.94426]	-1.531644 (1.52578) [-1.00384]	0.910448 (0.92846) [0.98060]	-0.000296 (0.00456) [-0.06488]	-8.311450 (3.21750) [-2.58320]	0.389985 (0.08059) [4.83891]
INFLATION(-1)	-0.057359 (0.03493) [-1.64189]	0.012531 (0.07272) [0.17232]	0.475442 (0.11208) [4.24188]	-0.553941 (0.95372) [-0.58082]	-0.426075 (0.58036) [-0.73416]	0.011924 (0.00285) [4.18496]	-0.281329 (2.01117) [-0.13988]	0.028321 (0.05038) [0.56218]
EXCHANGE_RATE(-1)	0.008945 (0.00476) [1.87837]	-0.002915 (0.00991) [-0.29410]	0.009539 (0.01528) [0.62435]	0.427039 (0.13000) [3.28490]	0.134673 (0.07911) [1.70241]	-8.25E - 06 (0.00039) [-0.02124]	-0.227799 (0.27414) [-0.83096]	-0.014511 (0.00687) [-2.11317]
FISCAL_POLICY(-1)	-0.003690 (0.00650) [-0.56751]	0.004255 (0.01353) [0.31438]	0.006803 (0.02086) [0.32609]	0.193022 (0.17751) [1.08740]	0.103486 (0.10802) [0.95806]	0.000166 (0.00053) [0.31311]	-0.483189 (0.37432) [-1.29085]	0.002180 (0.00938) [0.23254]
GDP(-1)	2.546792 (1.19649) [2.12855]	-0.751993 (2.49064) [-0.30193]	10.93461 (3.83877) [2.84847]	47.32672 (32.6644) [1.44888]	48.07021 (19.8768) [2.41840]	0.088865 (0.09759) [0.91063]	48.79976 (68.8812) [0.70846]	1.672948 (1.72537) [0.96962]
FINANCIAL_MARKET(-1)	0.000265 (0.00210) [0.12641]	0.011360 (0.00437) [2.60102]	0.001440 (0.00673) [0.21396]	-0.043626 (0.05728) [-0.76167]	-0.038248 (0.03485) [-1.09736]	0.000345 (0.00017) [2.01649]	0.058542 (0.12078) [0.48468]	0.003699 (0.00303) [1.22265]
POLICY_RATE(-1)	-0.067270 (0.06208) [-1.08354]	-0.062361 (0.12924) [-0.48254]	-0.059919 (0.19919) [-0.30082]	1.377943 (1.69490) [0.81299]	2.596171 (1.03138) [2.51719]	0.005995 (0.00506) [1.18392]	-2.977247 (3.57413) [-0.83300]	0.405881 (0.08953) [4.53363]
QE_EMU_CHANGE	0.081699 (0.02010) [4.06534]	3.18E - 05 (0.04183) [0.00076]	-0.008976 (0.06448) [-0.13921]	0.005647 (0.54864) [0.01029]	-0.016587 (0.33385) [-0.04968]	0.004220 (0.00164) [2.57461]	2.125356 (1.15694) [1.83705]	0.017361 (0.02898) [0.59906]
QE_US_CHANGE	0.017557 (0.01769) [0.99251]	0.010563 (0.03682) [0.28685]	-0.004958 (0.05675) [-0.08737]	-0.163859 (0.48293) [-0.33930]	-0.477756 (0.29387) [-1.62573]	0.001489 (0.00144) [1.03195]	0.665588 (1.01838) [0.65357]	-0.032108 (0.02551) [-1.25868]
D2015Q2	0.832477 (0.18369) [4.53185]	0.214613 (0.38238) [0.56125]	-0.139114 (0.58936) [-0.23604]	-5.390467 (5.01491) [-1.07489]	-4.967581 (3.05165) [-1.62783]	0.008156 (0.01498) [0.54439]	-10.48220 (10.5752) [-0.99121]	0.051417 (0.26489) [0.19411]
D2016Q2	0.512753 (0.17260) [2.97082]	-0.057849 (0.35928) [-0.16101]	-0.198833 (0.55375) [-0.35907]	-2.647795 (4.71192) [-0.56194]	1.639667 (2.86728) [0.57185]	0.003838 (0.01408) [0.27261]	8.857939 (9.93628) [0.89147]	0.014185 (0.24889) [0.05699]
D2017Q3	-0.847592 (0.17864) [-4.74479]	0.102081 (0.37185) [0.27452]	0.075815 (0.57313) [0.13228]	-7.530045 (4.87682) [-1.54405]	0.941528 (2.96762) [0.31727]	-0.013448 (0.01457) [-0.92301]	-11.04557 (10.2840) [-1.07405]	-0.073053 (0.25760) [-0.28359]
D2017Q4	0.841509 (0.17636) [4.77153]	-0.087518 (0.36712) [-0.23839]	0.116511 (0.56583) [0.20591]	4.585023 (4.81468) [0.95230]	2.284122 (2.92981) [0.77961]	0.023736 (0.01438) [1.65018]	1.514965 (10.1530) [0.14921]	-0.148278 (0.25432) [-0.58305]
D2019Q1	-0.878260 (0.16816) [-5.22276]	-0.278047 (0.35005) [-0.79432]	-0.025115 (0.53952) [-0.04655]	0.481998 (4.59081) [0.10499]	0.267279 (2.79358) [0.09568]	0.016417 (0.01372) [1.19695]	6.161539 (9.68089) [0.63646]	0.127527 (0.24249) [0.52590]
D2019Q2	0.702712 (0.17256) [4.07218]	-0.281305 (0.35921) [-0.78311]	0.193460 (0.55365) [0.34943]	0.424602 (4.71104) [0.09013]	1.459091 (2.86674) [0.50897]	0.020901 (0.01407) [1.48507]	5.866854 (9.93442) [0.59056]	-0.062303 (0.24884) [-0.25037]
D2020Q2	2.301979 (0.22911) [10.0475]	-0.168688 (0.47692) [-0.35370]	0.968146 (0.73506) [1.31709]	1.502719 (6.25473) [0.24025]	-2.825266 (3.80611) [-0.74230]	-0.079322 (0.01869) [-4.24495]	4.337819 (13.1897) [0.32888]	0.132325 (0.33038) [0.40052]
D2021Q1	1.323569 (0.19868) [6.66195]	0.107868 (0.41357) [0.26082]	0.296841 (0.63742) [0.46569]	-0.003257 (5.42390) [-0.00060]	2.173534 (3.30053) [0.65854]	-0.021205 (0.01620) [-1.30865]	-11.44187 (11.4377) [-1.00037]	-0.102151 (0.28650) [-0.35655]
D2021Q4	-0.627435 (0.20745) [-3.02446]	0.192437 (0.43184) [0.44562]	0.615513 (0.66559) [0.92477]	0.393095 (5.66353) [0.06941]	1.543886 (3.44635) [0.44798]	-0.012933 (0.01692) [-0.76433]	-6.847418 (11.9430) [-0.57334]	-0.053776 (0.29915) [-0.17976]
D2022Q2	-1.854966 (0.20650) [-8.98276]	1.155231 (0.42986) [2.68745]	1.409214 (0.66253) [2.12700]	3.565161 (5.63757) [0.63239]	1.509417 (3.43055) [0.43999]	0.033168 (0.01684) [1.96930]	3.827437 (11.8882) [0.32195]	0.033724 (0.29778) [0.11325]
D2022Q4	0.394546 (0.19870) [1.98568]	0.265677 (0.41361) [0.64234]	0.558819 (0.63749) [0.87659]	-3.064655 (5.42445) [-0.56497]	-0.886117 (3.30087) [-0.26845]	-0.004165 (0.01621) [-0.25703]	25.79164 (11.4388) [2.25475]	0.717768 (0.28653) [2.50508]
D2023Q4	-0.951419 (0.17985) [-5.29020]	-0.193128 (0.37437) [-0.51587]	0.186740 (0.57701) [0.32363]	-4.005443 (4.90982) [-0.81580]	-3.012319 (2.98771) [-1.00824]	0.018463 (0.01467) [1.25871]	22.85914 (10.3536) [2.20784]	-0.047999 (0.25934) [-0.18508]

Table 18: SWE two year model estimation output

Standard errors in () & t-statistics in []

	QE_CHANGE	YIELD_2	INFLATION	EXCHANGE_RATE	FISCAL_POLICY	GDP	FINANCIAL_MARKET	POLICY_RATE
QE_CHANGE(-1)	0.644272 (0.03525) [18.2797]	-0.064195 (0.07863) [-0.81638]	0.032253 (0.11290) [0.28567]	-0.351002 (0.97209) [-0.36108]	0.316110 (0.58961) [0.53614]	0.013423 (0.00286) [4.68696]	1.662748 (2.07783) [0.80023]	-0.024347 (0.04925) [-0.49438]
YIELD_2(-1)	0.141803 (0.05777) [2.45443]	0.241376 (0.12890) [1.87264]	-0.236029 (0.18507) [-1.27533]	0.264002 (1.59345) [0.16568]	0.649963 (0.96649) [0.67250]	0.004798 (0.00469) [1.02211]	-6.411255 (3.40599) [-1.88235]	0.444610 (0.08072) [5.50773]
INFLATION(-1)	-0.053830 (0.03452) [-1.55929]	0.035796 (0.07702) [0.46476]	0.475440 (0.11059) [4.29923]	-0.761987 (0.95214) [-0.80029]	-0.372373 (0.57751) [-0.64479]	0.011472 (0.00281) [4.08966]	-0.730146 (2.03520) [-0.35876]	0.036912 (0.04824) [0.76525]
EXCHANGE_RATE(-1)	0.008709 (0.00469) [1.85713]	-0.017566 (0.01046) [-1.67882]	0.008480 (0.01502) [0.56447]	0.479604 (0.12935) [3.70790]	0.124328 (0.07845) [1.58473]	0.000125 (0.00038) [0.32767]	-0.145729 (0.27648) [-0.52709]	-0.014637 (0.00655) [-2.23375]
FISCAL_POLICY(-1)	-0.003740 (0.00648) [-0.57718]	0.006256 (0.01446) [0.43272]	0.007182 (0.02076) [0.34597]	0.182122 (0.17872) [1.01903]	0.105146 (0.10840) [0.96998]	0.000136 (0.00053) [0.25750]	-0.495490 (1.38201) [-1.29705]	0.001899 (0.00905) [0.20971]
GDP(-1)	2.357713 (1.18832) [1.98407]	-0.133665 (2.65119) [-0.05042]	11.16239 (3.80665) [2.93234]	50.15242 (32.7747) [1.53022]	46.64790 (19.8791) [2.34658]	0.090925 (0.09656) [0.94163]	61.63161 (70.0559) [0.87975]	1.116719 (1.66038) [0.67257]
FINANCIAL_MARKET(-1)	0.000283 (0.00209) [0.13539]	0.014033 (0.00466) [3.00861]	0.001448 (0.00670) [0.21624]	-0.044969 (0.05766) [-0.77988]	-0.037926 (0.03497) [-1.08440]	0.000342 (0.00017) [2.01317]	0.055881 (0.12325) [0.45339]	0.003739 (0.00292) [1.28002]
POLICY_RATE(-1)	-0.107054 (0.06577) [-1.62779]	0.003377 (0.14673) [0.02302]	0.013031 (0.21067) [0.06185]	1.057862 (1.81387) [0.58321]	2.456839 (1.10018) [2.23312]	0.003994 (0.00534) [0.74735]	-1.510134 (3.87715) [-0.38950]	0.278309 (0.09189) [3.02867]
QE_EMU_CHANGE	0.079163 (0.02013) [3.93304]	0.025824 (0.04491) [0.57508]	-0.003349 (0.06448) [-0.05194]	-0.050453 (0.55513) [-0.09089]	-0.019227 (0.33671) [-0.05710]	0.003997 (0.00164) [2.44409]	2.170762 (1.18660) [1.82940]	0.008817 (0.02812) [0.31352]
QE_US_CHANGE	0.021244 (0.01775) [1.19714]	-0.013496 (0.03959) [-0.34090]	-0.011673 (0.05684) [-0.20535]	-0.135847 (0.48943) [-0.27757]	-0.464557 (0.29686) [-1.56493]	0.001670 (0.00144) [1.15809]	0.527422 (1.04614) [0.50416]	-0.020306 (0.02479) [-0.81895]
D2015Q2	0.853717 (0.18232) [4.68244]	0.279842 (0.40677) [0.68796]	-0.157925 (0.58405) [-0.27040]	-5.955572 (5.02859) [-1.18434]	-4.764497 (3.05003) [-1.56212]	0.007266 (0.01482) [0.49041]	-12.25750 (10.7486) [-1.14038]	0.111047 (0.25475) [0.43591]
D2016Q2	0.498948 (0.17165) [2.90674]	0.145808 (0.38296) [0.38074]	-0.187002 (0.54987) [-0.34009]	-2.266080 (4.73428) [-0.47865]	1.505151 (2.87152) [0.52417]	0.004455 (0.01395) [0.31938]	10.03124 (10.1195) [0.99128]	-0.024405 (0.23984) [-0.10176]
D2017Q3	-0.840472 (0.17822) [-4.71600]	-0.115126 (0.39761) [-0.28955]	0.051597 (0.57090) [0.09038]	-7.064766 (4.91535) [-1.43729]	0.895123 (2.98135) [0.30024]	-0.012004 (0.01448) [-0.82891]	-10.75822 (10.5065) [-1.02395]	-0.045520 (0.24901) [-0.18280]
D2017Q4	0.847766 (0.17588) [4.82023]	-0.139015 (0.39239) [-0.35428]	0.098154 (0.56340) [0.17422]	4.886940 (4.85079) [1.00745]	2.262048 (2.94219) [0.76883]	0.024721 (0.01429) [1.72975]	1.623286 (10.3685) [0.15656]	-0.125314 (0.24574) [-0.50994]
D2019Q1	-0.874468 (0.16749) [-5.22091]	-0.119186 (0.37368) [-0.31895]	-0.024013 (0.53654) [-0.04475]	0.218063 (4.61958) [0.04720]	0.332047 (2.80195) [0.11851]	0.015824 (0.01361) [1.16262]	5.624815 (9.87433) [0.56964]	0.136295 (0.23403) [0.58238]
D2019Q2	0.688694 (0.17173) [4.01043]	-0.229143 (0.38313) [-0.59809]	0.208203 (0.55010) [0.37848]	0.712465 (4.73631) [0.15043]	1.339939 (2.87275) [0.46643]	0.021263 (0.01395) [1.52376]	6.923824 (10.1239) [0.68391]	-0.102638 (0.23994) [-0.42776]
D2020Q2	2.291545 (0.22861) [10.0238]	0.064198 (0.51003) [0.12587]	1.000457 (0.73232) [1.36615]	0.937069 (6.30519) [0.14862]	-2.777579 (3.82434) [-0.72629]	-0.081129 (0.01858) [-4.36733]	4.073331 (13.4773) [0.30224]	0.093317 (0.31942) [0.29214]
D2021Q1	1.328606 (0.19807) [6.70772]	-0.197980 (0.44190) [-0.44802]	0.280785 (0.63450) [0.44253]	0.286567 (5.46293) [0.05246]	2.147583 (3.31348) [0.64814]	-0.020289 (0.01609) [-1.26056]	-11.29160 (11.6770) [-0.96699]	-0.083126 (0.27675) [-0.30036]
D2021Q4	-0.626227 (0.20674) [-3.02912]	-0.004616 (0.46123) [-0.01001]	0.603008 (0.66225) [0.91054]	0.778956 (5.70190) [0.13661]	1.482344 (3.45842) [0.42862]	-0.011871 (0.01680) [-0.70663]	-6.384965 (12.1878) [-0.52388]	-0.045570 (0.28886) [-0.15776]
D2022Q2	-1.846158 (0.20548) [-8.98482]	1.306730 (0.45842) [2.85049]	1.409488 (0.65821) [2.14138]	3.035687 (5.66714) [0.53566]	1.645236 (3.43734) [0.47864]	0.032013 (0.01670) [1.91734]	2.693477 (12.1135) [0.22235]	0.055050 (0.28710) [0.19174]
D2022Q4	0.359275 (0.19904) [1.80502]	0.367349 (0.44407) [0.82723]	0.624121 (0.63761) [0.97885]	-3.371338 (5.48971) [-0.61412]	-1.005639 (3.32972) [-0.30202]	-0.006000 (0.01617) [-0.37100]	27.06147 (11.7342) [2.30620]	0.604402 (0.27811) [2.17325]
D2023Q4	-0.945582 (0.17881) [-5.28808]	-0.158351 (0.39894) [-0.39693]	0.197488 (0.57281) [0.34477]	-4.742542 (4.93180) [-0.96162]	-2.854778 (2.99132) [-0.95435]	0.016670 (0.01453) [1.14726]	21.58710 (10.5417) [2.04778]	-0.038316 (0.24985) [-0.15336]

Table 19: AUS ten year model estimation output

Standard errors in () & t-statistics in []

	QE_CHANGE	YIELD.10	INFLATION	EXCHANGE_RATE	FISCAL_POLICY	GDP	FINANCIAL_MARKET	POLICY_RATE
QE_CHANGE(-1)	0.325327 (0.04028) [8.07702]	-0.040588 (0.07352) [-0.55205]	-0.014561 (0.07000) [-0.20802]	-0.491993 (0.85732) [-0.57387]	-0.082014 (0.03874) [-2.11677]	-0.208502 (0.11612) [-1.79561]	-0.009937 (1.02972) [-0.00965]	-0.049016 (0.05942) [-0.82486]
YIELD.10(-1)	-0.047683 (0.07430) [-0.64179]	0.060804 (0.13562) [0.44835]	-0.093649 (0.12912) [-0.72530]	-0.849439 (1.58143) [-0.53713]	0.149343 (0.07147) [2.08961]	-0.458696 (0.21419) [-2.14151]	-1.144014 (1.89943) [-0.60229]	0.307541 (0.10961) [2.80568]
INFLATION(-1)	0.001027 (0.04930) [0.02082]	0.018881 (0.08998) [0.20983]	0.842091 (0.08567) [9.82945]	-1.610148 (1.04928) [-1.53452]	-0.021067 (0.04742) [-0.44426]	0.754061 (0.14212) [5.30589]	-2.016916 (1.26028) [-1.60037]	0.087284 (0.07273) [1.20012]
EXCHANGE_RATE(-1)	-0.007782 (0.00679) [-1.14667]	0.010485 (0.01239) [0.84638]	0.006823 (0.01179) [0.57854]	0.171640 (0.14445) [1.18823]	0.002348 (0.00653) [0.35974]	0.023041 (0.01956) [1.17768]	0.082096 (0.17350) [0.47319]	0.011528 (0.01001) [1.15142]
FISCAL_POLICY(-1)	-0.131055 (0.05206) [-2.51720]	0.042691 (0.09503) [0.44922]	-0.223776 (0.09048) [-2.47325]	-0.755828 (1.10818) [-0.68205]	0.647318 (0.05008) [12.9252]	-0.821445 (0.15009) [-5.47284]	-1.182889 (1.33102) [-0.88871]	-0.020573 (0.07681) [-0.26784]
GDP(-1)	-0.016769 (0.03504) [-0.47854]	-0.026195 (0.06397) [-0.40951]	-0.122045 (0.06909) [-2.00404]	1.075079 (0.74589) [1.44133]	0.039353 (0.03371) [1.16744]	-0.055207 (0.10103) [-0.54647]	2.330546 (0.89588) [2.60140]	-0.042975 (0.05170) [-0.83124]
FINANCIAL_MARKET(-1)	0.010539 (0.00503) [2.09362]	0.007555 (0.00919) [0.82223]	0.022319 (0.00875) [2.55142]	0.022185 (0.10714) [0.20706]	0.003700 (0.00484) [0.76405]	0.022083 (0.01451) [1.52172]	0.132009 (0.12869) [1.02581]	0.006912 (0.00743) [0.93078]
POLICY_RATE(-1)	0.092398 (0.09230) [1.00100]	-0.245804 (0.16849) [-1.45887]	-0.055767 (0.16041) [-0.34765]	0.847365 (1.96471) [0.43129]	-0.044286 (0.08879) [-0.49877]	-0.258804 (0.26611) [-0.97256]	2.185526 (2.35979) [0.92615]	0.193207 (0.13618) [1.41876]
QE_EMU_CHANGE	0.040971 (0.02352) [1.74227]	-0.000290 (0.04292) [-0.00676]	0.031291 (0.04087) [0.76568]	0.223768 (0.50054) [0.44706]	0.004302 (0.02262) [0.19016]	0.154034 (0.06779) [2.27208]	-0.541853 (0.60119) [-0.90130]	0.031761 (0.03469) [0.91546]
QE_US_CHANGE	0.028945 (0.04707) [0.61489]	0.013225 (0.08593) [0.15391]	-0.072594 (0.08181) [-0.88738]	1.458702 (1.00197) [1.45583]	-0.094768 (0.04528) [-2.09286]	-0.065430 (0.13571) [-0.48213]	1.638613 (1.20345) [1.36159]	-0.102701 (0.06945) [-1.47878]
D2013Q3	1.866841 (0.27116) [6.88467]	0.873333 (0.49496) [1.76445]	0.835990 (0.47123) [1.77405]	-1.994357 (5.77163) [-0.34554]	-0.207875 (0.26084) [-0.79696]	0.529130 (0.78173) [0.67687]	7.259890 (6.93223) [1.04727]	0.139004 (0.40005) [0.34747]
D2020Q1	3.195494 (0.28040) [11.3962]	-0.446104 (0.51183) [-0.87159]	0.171390 (0.48729) [0.35172]	-13.95991 (5.96830) [-2.33901]	-0.198005 (0.26972) [-0.73410]	-0.819446 (0.80836) [-1.01371]	-27.61853 (7.16845) [-3.85279]	-0.141939 (0.41368) [-0.34311]
D2020Q2	1.291566 (0.51593) [2.50338]	0.295989 (0.94175) [0.31430]	-1.067016 (0.89661) [-1.19006]	3.653020 (10.9816) [0.33265]	-2.881067 (0.49629) [-5.80523]	-5.798921 (1.48737) [-3.89876]	7.672881 (13.1898) [0.58173]	1.205977 (0.76117) [1.58438]
D2021Q1	2.425020 (0.32485) [7.46507]	0.722621 (0.59296) [1.21866]	-0.258105 (0.56454) [-0.45720]	-5.983543 (6.91442) [-0.86537]	0.357885 (0.31248) [1.14530]	-0.461255 (0.93651) [-0.49253]	-9.089840 (8.30482) [-1.09453]	0.056298 (0.47926) [0.11747]
D2021Q2	4.776843 (0.35866) [13.3187]	-0.110088 (0.65468) [-0.16816]	0.868999 (0.62329) [1.39421]	-7.860046 (7.63402) [-1.02961]	0.769117 (0.34500) [2.22930]	1.169203 (0.84007) [1.13079]	-6.135005 (9.16912) [-0.66909]	0.463045 (0.52914) [0.87509]
D2022Q1	-0.844665 (0.29140) [-2.89869]	1.048059 (0.53190) [1.97041]	1.647203 (0.50640) [3.25276]	2.053199 (6.20236) [0.33104]	0.038745 (0.28030) [0.13822]	0.340066 (0.84007) [0.40481]	-8.078740 (7.44957) [-1.08446]	0.130313 (0.42991) [0.30312]
D2023Q2	-1.692729 (0.26715) [-6.33618]	0.580021 (0.48765) [1.18942]	-0.161981 (0.46427) [-0.34889]	4.252132 (5.68635) [0.74778]	0.501464 (0.25698) [1.95135]	-0.343149 (0.77018) [-0.44555]	2.956184 (6.82980) [0.43284]	0.201708 (0.39414) [0.51177]
D2023Q3	-2.163465 (0.27209) [-7.95129]	0.301463 (0.49666) [0.60698]	0.503036 (0.47285) [1.06384]	-1.497933 (5.79144) [-0.25865]	-0.205495 (0.26173) [-0.78514]	0.053890 (0.78441) [0.06870]	1.097028 (6.95602) [0.15771]	-0.471740 (0.40142) [-1.17517]
D2023Q4	0.940415 (0.29947) [3.14030]	-0.104717 (0.54663) [-0.19157]	-0.294971 (0.52043) [-0.56678]	8.177707 (6.37416) [1.28295]	-0.808499 (0.28807) [-2.80664]	-0.219240 (0.86333) [-0.25395]	11.64561 (7.65592) [1.52112]	-0.056427 (0.44181) [-0.12772]

Table 20: AUS five year model estimation output

Standard errors in () & t-statistics in []

	QE_CHANGE	YIELD_5	INFLATION	EXCHANGE_RATE	FISCAL_POLICY	GDP	FINANCIAL_MARKET	POLICY_RATE
QE_CHANGE(-1)	0.328108 (0.04025) [8.15160]	-0.011016 (0.07971) [-0.13820]	-0.008982 (0.07008) [-0.12817]	-0.457514 (0.86517) [-0.52881]	-0.082148 (0.03888) [-2.11309]	-0.198409 (0.11740) [-1.69002]	0.041777 (1.03928) [0.04020]	-0.047320 (0.05795) [-0.81658]
YIELD_5(-1)	-0.072528 (0.07632) [-0.95032]	0.092567 (0.15113) [0.61249]	-0.100229 (0.13287) [-0.75432]	-0.684165 (1.64045) [-0.41706]	0.163965 (0.07371) [2.22439]	-0.434750 (0.22260) [-1.95302]	-0.644760 (1.97059) [-0.32719]	0.372879 (0.10988) [3.39360]
INFLATION(-1)	-0.012541 (0.05245) [-0.23908]	0.027911 (0.10387) [0.26872]	0.811707 (0.09132) [8.88856]	-1.792349 (1.12744) [-1.58975]	-0.032192 (0.05066) [-0.63545]	0.717919 (0.15299) [4.69258]	-2.317330 (1.35434) [-1.71105]	0.048564 (0.07552) [0.64310]
EXCHANGE_RATE(-1)	-0.006249 (0.00691) [-0.90439]	0.012113 (0.01368) [0.88523]	0.008654 (0.01203) [0.71941]	0.177513 (0.14852) [1.19520]	0.001640 (0.00667) [0.24580]	0.025817 (0.02015) [1.28098]	0.083479 (0.17841) [0.46790]	0.009585 (0.00995) [0.96354]
FISCAL_POLICY(-1)	-0.130568 (0.05221) [-2.50106]	0.049079 (0.10338) [0.47475]	-0.226744 (0.09089) [-2.49472]	-0.784879 (1.12212) [-0.69946]	0.641856 (0.05042) [12.7298]	-0.821708 (0.15227) [-5.39645]	-1.252787 (1.34794) [-0.92941]	-0.037197 (0.07516) [-0.49491]
GDP(-1)	-0.010228 (0.03578) [-0.28583]	-0.031979 (0.07086) [-0.45129]	-0.107530 (0.06230) [-1.72603]	1.165795 (0.76914) [1.51571]	0.042408 (0.03456) [1.22704]	-0.033630 (0.10437) [-0.32222]	2.477075 (0.92393) [2.68101]	-0.029714 (0.05152) [-0.57678]
FINANCIAL_MARKET(-1)	0.011741 (0.00515) [2.28199]	0.006040 (0.01019) [0.59276]	0.024594 (0.00896) [2.74555]	0.035272 (0.11059) [0.31893]	0.003765 (0.00497) [0.75771]	0.025754 (0.01501) [1.71610]	0.150973 (0.13285) [1.13642]	0.007769 (0.00741) [1.04876]
POLICY_RATE(-1)	0.162157 (0.11619) [1.39560]	-0.312149 (0.23009) [-1.35665]	0.068356 (0.20229) [0.33791]	1.442998 (2.49747) [0.57778]	-0.002291 (0.11222) [-0.02042]	-0.147231 (0.33890) [-0.43444]	3.027645 (3.0008) [1.00919]	0.320628 (0.16728) [1.91671]
QE_EMU_CHANGE	0.044256 (0.02364) [1.87202]	0.013983 (0.04681) [0.29869]	0.037112 (0.04116) [0.90168]	0.255544 (0.50815) [0.50289]	0.004188 (0.02283) [0.18340]	0.163366 (0.06895) [2.36919]	-0.498431 (0.61041) [-0.81655]	0.032978 (0.03404) [0.96893]
QE_US_CHANGE	0.031199 (0.04683) [0.66622]	0.013268 (0.09273) [0.14308]	-0.073444 (0.08153) [-0.90082]	1.424922 (1.00658) [1.41561]	-0.094999 (0.04523) [-2.10037]	-0.074488 (0.13659) [-0.54534]	1.557986 (1.20915) [1.28850]	-0.107808 (0.06742) [-1.59905]
D2009Q1	0.311238 (0.40179) [0.77464]	-0.353204 (0.79564) [-0.44392]	0.638368 (0.69951) [0.91259]	3.415773 (8.63619) [0.39552]	0.300925 (0.38806) [0.77546]	0.547419 (1.17191) [0.46712]	5.456609 (10.3742) [0.52598]	0.924408 (0.57845) [1.59807]
D2013Q3	1.890945 (0.27236) [6.94275]	0.614594 (0.53935) [1.13951]	0.891124 (0.47419) [1.87927]	-1.654049 (5.85429) [-0.28254]	-0.189841 (0.26306) [-0.72167]	0.600531 (0.79441) [0.75595]	7.823526 (7.03245) [1.11249]	0.205189 (0.39212) [0.52328]
D2020Q1	3.202837 (0.28093) [11.4007]	-0.518793 (0.55632) [-0.93255]	0.196796 (0.48911) [0.40236]	-13.80269 (6.03850) [-2.28578]	-0.168601 (0.27134) [-0.62138]	-0.817184 (0.81941) [-0.99729]	-27.29931 (7.25373) [-3.76348]	-0.057467 (0.40446) [-0.14208]
D2020Q2	1.328536 (0.51743) [2.56755]	0.044215 (1.02465) [0.04315]	-0.954669 (0.90086) [-1.05974]	4.497109 (11.1219) [0.40435]	-2.854266 (0.49976) [-5.71131]	-5.597277 (1.50922) [-3.70873]	9.174311 (13.3602) [0.68669]	1.337636 (0.74495) [1.79561]
D2021Q1	2.374411 (0.32670) [7.26776]	0.315722 (0.64696) [0.48801]	-0.349121 (0.56880) [-0.61379]	-6.515466 (7.02235) [-0.92782]	0.373741 (0.31554) [1.18443]	-0.637387 (0.95291) [-0.66888]	-9.818396 (8.43558) [-1.16393]	0.068059 (0.47036) [0.14470]
D2021Q2	4.742680 (0.35791) [13.2512]	0.046893 (0.70875) [0.06616]	0.808072 (0.62312) [1.29682]	-8.282373 (7.69300) [-1.07661]	0.815965 (0.34568) [2.36047]	0.980157 (1.04392) [0.93892]	-6.689616 (9.24120) [-0.72389]	0.553755 (0.51528) [1.07468]
D2022Q1	-0.817886 (0.29543) [-2.76843]	1.017460 (0.58503) [1.73915]	1.663016 (0.51435) [3.23322]	2.067534 (6.35018) [0.32559]	-0.025030 (0.28534) [-0.08772]	0.438039 (0.86170) [0.50834]	-8.318507 (7.62815) [-1.09050]	-0.039202 (0.42533) [-0.09217]
D2023Q2	-1.712948 (0.26710) [-6.41320]	0.740162 (0.52892) [1.39938]	-0.196012 (0.46502) [-0.42151]	4.084930 (5.74111) [0.71152]	0.498173 (0.25797) [1.93111]	-0.386805 (0.77905) [-0.49651]	2.738250 (6.89650) [0.39705]	0.187215 (0.38454) [0.48686]
D2023Q3	-2.161544 (0.27319) [-7.91223]	0.210064 (0.54099) [0.38830]	0.487690 (0.47563) [1.02536]	-1.627109 (5.87208) [-0.27709]	-0.241370 (0.26386) [-0.91477]	0.069474 (0.79682) [0.08719]	0.767597 (7.05382) [0.10882]	-0.574105 (0.39331) [-1.45967]
D2023Q4	0.975834 (0.30024) [3.25015]	-0.040352 (0.59456) [-0.06787]	-0.238279 (0.52272) [-0.45584]	8.394204 (6.45355) [1.30071]	-0.780428 (0.28999) [-2.69126]	-0.196600 (0.87573) [-0.22450]	11.91457 (7.75232) [1.53690]	0.016301 (0.43226) [0.03771]

Table 21: AUS two year model estimation output

Standard errors in () & t-statistics in []

	QE_CHANGE	YIELD_2	INFLATION	EXCHANGE_RATE	FISCAL_POLICY	GDP	FINANCIAL_MARKET	POLICY_RATE
QE_CHANGE(-1)	0.320422 (0.03951) [8.11013]	-0.016920 (0.08508) [-0.19888]	-0.017887 (0.07009) [-0.25519]	-0.496079 (0.86128) [-0.57598]	-0.077224 (0.03867) [-1.99722]	-0.220311 (0.11712) [-1.88109]	-0.014259 (1.03503) [-0.01378]	-0.034939 (0.05598) [-0.62416]
YIELD_2(-1)	-0.140983 (0.07804) [-1.80662]	0.198449 (0.16804) [1.18095]	-0.115467 (0.13845) [-0.83401]	-0.379662 (1.70118) [-0.22318]	0.170964 (0.07637) [2.23859]	-0.450785 (0.23133) [-1.94866]	-0.481103 (2.04437) [-0.23533]	0.459898 (0.11057) [4.15949]
INFLATION(-1)	0.003601 (0.04799) [0.07504]	0.031618 (0.10334) [0.30596]	0.839741 (0.08514) [9.86272]	-1.662095 (1.04619) [-1.58871]	-0.016716 (0.04697) [-0.35590]	0.737286 (0.14226) [5.18252]	-2.088264 (1.25725) [-1.66098]	0.091297 (0.06800) [1.34269]
EXCHANGE_RATE(-1)	-0.004792 (0.00681) [-0.70408]	0.017803 (0.01466) [1.21481]	0.007983 (0.01207) [0.66117]	0.162671 (0.14836) [1.09643]	0.000883 (0.00666) [0.13257]	0.025372 (0.02018) [1.25761]	0.069135 (0.17829) [0.38776]	0.005363 (0.00964) [0.55615]
FISCAL_POLICY(-1)	-0.129473 (0.05722) [-2.55283]	0.029750 (0.10921) [0.27241]	-0.226588 (0.08998) [-2.51822]	-0.805814 (1.10562) [-0.72884]	0.652285 (0.04963) [13.1417]	-0.839425 (0.15035) [-5.58332]	-1.251317 (1.32866) [-0.94179]	-0.014299 (0.07186) [-0.19899]
GDP(-1)	-0.015628 (0.03410) [-0.45826]	-0.026573 (0.07344) [-0.36186]	-0.118444 (0.06050) [-1.95766]	1.113367 (0.74342) [1.49762]	0.033500 (0.03337) [1.00374]	-0.036602 (0.10109) [-0.36206]	2.382366 (0.89340) [-2.66662]	-0.054122 (0.04832) [-1.12012]
FINANCIAL_MARKET(-1)	0.011809 (0.00497) [2.37599]	0.004908 (0.01070) [0.45858]	0.023413 (0.00882) [2.65532]	0.026313 (0.10834) [0.24287]	0.002070 (0.00486) [0.42551]	0.026444 (0.01473) [1.79491]	0.137306 (0.13020) [1.05458]	0.002620 (0.00704) [0.37211]
POLICY_RATE(-1)	0.157144 (0.09747) [1.61221]	-0.279983 (0.20989) [-1.33395]	-0.023277 (0.17293) [-0.13461]	0.750484 (2.12482) [0.35320]	-0.088373 (0.09539) [-0.92643]	-0.166982 (0.28894) [-0.57791]	2.037323 (2.55348) [0.79786]	0.039179 (0.13810) [0.28370]
QE_EMU_CHANGE	0.046602 (0.02323) [2.00583]	0.012509 (0.05003) [0.25004]	0.035551 (0.04122) [0.86249]	0.234281 (0.50647) [0.46257]	-0.001936 (0.02274) [-0.08516]	0.170062 (0.06887) [2.46926]	-0.528968 (0.60865) [-0.86909]	0.014373 (0.03292) [0.43664]
QE_US_CHANGE	0.032413 (0.04530) [0.71547]	-0.021622 (0.09755) [-0.22164]	-0.077220 (0.08037) [-0.96076]	1.369440 (0.98759) [1.38665]	-0.086458 (0.04434) [-1.95008]	-0.096219 (0.13429) [-0.71648]	1.516255 (1.18682) [1.27758]	-0.093227 (0.06419) [-1.45244]
D2013Q3	1.870131 (0.26493) [7.05894]	0.374876 (0.57049) [0.65711]	0.848875 (0.47002) [1.80603]	-1.850927 (5.77538) [-0.32049]	-0.228946 (0.25928) [-0.88302]	0.596804 (0.78535) [0.75992]	7.454262 (6.94049) [1.07403]	0.099902 (0.37536) [0.26615]
D2020Q1	3.179393 (0.27437) [11.5879]	-0.462179 (0.59082) [-0.78227]	0.166791 (0.48677) [0.34265]	-13.88986 (5.98118) [-2.32226]	-0.192876 (0.26851) [-0.71831]	-0.822759 (0.81334) [-1.01158]	-27.51913 (7.18781) [-3.82858]	-0.113325 (0.38874) [-0.29152]
D2020Q2	1.320359 (0.49899) [2.64608]	0.394196 (1.07449) [0.36687]	-0.985827 (0.88527) [-1.11359]	4.491362 (10.8777) [0.41290]	-3.012550 (0.48833) [-6.16904]	-5.383735 (1.47918) [-3.63968]	8.806562 (13.0721) [0.67369]	0.951674 (0.70698) [1.34611]
D2021Q1	2.357537 (0.31991) [7.36932]	-0.009753 (0.68889) [-0.01416]	-0.314345 (0.56757) [-0.55385]	-6.178075 (6.97395) [-0.88588]	0.441344 (0.31308) [1.40967]	-0.682466 (0.94834) [-0.71964]	-9.337549 (8.38086) [-1.11415]	0.279134 (0.45326) [0.61583]
D2021Q2	4.738770 (0.35089) [13.5049]	0.153398 (0.75559) [0.20302]	0.826681 (0.62253) [1.32794]	-8.109631 (7.64928) [-1.06018]	0.833953 (0.34340) [2.42851]	0.985009 (1.04017) [0.94697]	-6.465066 (9.19243) [-0.70330]	0.618243 (0.49715) [1.24356]
D2022Q1	-0.768196 (0.28783) [-2.66888]	0.883934 (0.61981) [1.42614]	1.679022 (0.51066) [3.28796]	1.852222 (6.27467) [0.29519]	-0.002338 (0.28169) [-0.00830]	0.411752 (0.85325) [0.48257]	-8.371573 (7.54051) [-1.11021]	-0.033357 (0.40781) [-0.08179]
D2023Q2	-1.721136 (0.26188) [-6.57221]	0.967837 (0.56392) [1.71626]	-0.179139 (0.46461) [-0.38557]	4.256296 (5.70889) [0.74556]	0.525674 (0.25629) [2.05109]	-0.399720 (0.77631) [-0.51490]	2.969026 (6.86059) [0.43277]	0.277370 (0.37104) [0.74755]
D2023Q3	-2.102820 (0.26847) [-7.83260]	-0.150560 (0.57811) [-0.26043]	0.535494 (0.47630) [1.12427]	-1.561926 (5.85253) [-0.26688]	-0.250185 (0.26274) [-0.95222]	0.151259 (0.79585) [0.19006]	0.994622 (7.03321) [0.14142]	-0.621653 (0.38038) [-1.63430]
D2023Q4	0.936900 (0.29161) [3.21285]	-0.030775 (0.62794) [-0.04901]	-0.319880 (0.51735) [-0.61830]	7.877296 (6.35696) [1.23916]	-0.767307 (0.28538) [-2.68868]	-0.354049 (0.86444) [-0.40957]	11.23765 (7.63941) [1.47101]	0.016373 (0.41316) [0.03963]

Table 22: U.K. ten year model estimation output

Standard errors in () & t-statistics in []

	QE_CHANGE	YIELD.10	INFLATION	EXCHANGE_RATE	FISCAL_POLICY	GDP	FINANCIAL_MARKET	POLICY_RATE
QE_CHANGE(-1)	0.292289 (0.05771) [5.06509]	0.019441 (0.05372) [0.36188]	0.009727 (0.04410) [0.22058]	0.395034 (0.53161) [0.74309]	-0.201420 (0.11164) [-1.80414]	0.360994 (0.11853) [3.04571]	0.768900 (0.89519) [0.85893]	0.014107 (0.02866) [0.49221]
YIELD.10(-1)	-0.180921 (0.15357) [-1.17811]	0.057288 (0.14296) [0.40072]	0.107679 (0.11735) [0.91760]	1.091564 (1.41472) [0.77158]	-0.156154 (0.29710) [-0.52558]	-0.304073 (0.31542) [-0.96403]	-0.178361 (2.38227) [-0.07487]	0.360793 (0.07627) [4.73027]
INFLATION(-1)	-0.273227 (0.11087) [-2.46442]	0.009024 (0.10321) [0.08744]	0.778346 (0.08472) [9.18731]	-2.226980 (1.02136) [-2.18042]	0.629354 (0.21449) [2.93412]	0.631948 (0.14492) [2.77514]	-2.714353 (1.71988) [-1.57822]	-0.074194 (0.05507) [-1.34737]
EXCHANGE_RATE(-1)	-0.042951 (0.01392) [-3.08458]	-0.004000 (0.01296) [-0.30859]	0.005065 (0.01064) [0.47602]	0.067362 (0.12827) [0.52514]	-0.013836 (0.02694) [-0.51361]	-0.005450 (0.02860) [-0.19057]	0.077820 (0.21600) [0.36027]	0.006681 (0.00692) [0.96603]
FISCAL_POLICY(-1)	0.003942 (0.02333) [0.16895]	-0.012273 (0.02172) [-0.56502]	0.030394 (0.01783) [1.70471]	0.084505 (0.21494) [0.39315]	0.782885 (0.04514) [17.3433]	0.210626 (0.04792) [4.39507]	0.236644 (0.36195) [0.65380]	0.006343 (0.01159) [0.54736]
GDP(-1)	0.108771 (0.02847) [3.82066]	0.014557 (0.02650) [0.54924]	0.002497 (0.02175) [0.11478]	0.227437 (0.26227) [0.86720]	0.135164 (0.05508) [2.45402]	-0.167118 (0.05847) [-2.85800]	0.811993 (0.44164) [1.83861]	0.004854 (0.01414) [0.34330]
FINANCIAL_MARKET(-1)	0.008022 (0.00917) [0.87519]	0.018251 (0.00853) [2.13884]	0.007677 (0.00700) [1.09603]	-0.003701 (0.08444) [-0.04383]	-0.000459 (0.01773) [-0.02586]	0.026925 (0.01883) [1.43019]	-0.022272 (0.14219) [-0.15663]	0.013698 (0.00455) [3.00881]
POLICY_RATE(-1)	-0.472430 (0.24171) [-1.91137]	0.073100 (0.23010) [0.31769]	-0.180196 (0.18887) [-0.95406]	3.793628 (2.27699) [1.66607]	-0.720685 (0.47819) [-1.50711]	-0.007589 (0.50767) [-0.01495]	4.047905 (3.83426) [1.05572]	0.623302 (0.12276) [5.07732]
QE_EMU_CHANGE	-0.015661 (0.04339) [-0.36090]	0.052885 (0.04040) [1.30915]	-0.018000 (0.03316) [-0.54283]	-0.309207 (0.39975) [-0.77350]	0.016055 (0.08395) [0.19124]	-0.058153 (0.08913) [-0.65247]	-0.871389 (0.67315) [-1.29450]	0.002362 (0.02155) [0.10958]
QE_US_CHANGE	0.117624 (0.08517) [1.38105]	-0.009369 (0.07929) [-0.11816]	-0.089058 (0.06508) [-1.36840]	-0.129973 (0.78461) [-0.16565]	0.311854 (0.16478) [1.89260]	-0.559491 (0.17493) [-3.19832]	0.131115 (1.32121) [0.09924]	-0.106785 (0.04230) [-2.52438]
D2002Q4	-0.449293 (0.74663) [-0.60176]	0.445640 (0.69507) [0.64114]	0.800808 (0.57053) [1.40361]	3.521762 (6.87817) [0.51202]	-1.668497 (1.44448) [-1.15508]	5.333981 (1.53353) [3.47824]	4.105836 (11.5823) [0.35449]	1.095714 (0.37083) [2.95475]
D2006Q2	1.426399 (0.47242) [3.01935]	0.173070 (0.43980) [0.39352]	0.132523 (0.36100) [0.36710]	6.114816 (4.35207) [1.40504]	-0.679363 (0.91398) [-0.74331]	0.396367 (0.97032) [0.40849]	-2.081151 (7.32852) [-0.28398]	-0.169689 (0.23464) [-0.72320]
D2009Q1	-2.340786 (0.66688) [-3.51006]	0.284312 (0.62083) [0.45796]	-0.101333 (0.50959) [-0.19885]	4.757763 (6.14348) [0.77444]	0.789094 (1.29019) [0.61161]	-3.295593 (1.36972) [-2.40603]	-4.097979 (10.3451) [-0.39613]	-0.201529 (0.33122) [-0.60844]
D2009Q2	4.652510 (0.72659) [6.40317]	0.907285 (0.67642) [1.34131]	0.125071 (0.55522) [0.22526]	24.76827 (6.69360) [3.70029]	0.049560 (1.40572) [0.03526]	-0.058629 (1.49238) [-0.03929]	17.55258 (11.2715) [1.55726]	1.370036 (0.36088) [3.79638]
D2011Q4	2.202359 (0.52488) [4.19594]	-0.052905 (0.48863) [-0.10827]	0.271870 (0.40108) [0.67784]	1.290592 (4.83534) [0.26691]	0.527908 (1.01547) [0.51987]	-0.460585 (1.07807) [-0.42723]	8.715053 (8.14231) [1.07034]	0.603193 (0.26069) [2.31381]
D2012Q1	1.754793 (0.49116) [3.57273]	0.054594 (0.45725) [0.11940]	-0.229085 (0.37532) [-0.61037]	2.248450 (4.52474) [0.49692]	1.581036 (0.95024) [1.66383]	-1.932660 (1.00882) [-1.91577]	2.023808 (7.61929) [0.26562]	0.008481 (0.24395) [0.03477]
D2012Q3	1.590922 (0.48273) [3.29567]	-0.041225 (0.44939) [-0.09173]	0.044577 (0.36888) [0.12084]	4.002495 (4.44705) [0.90003]	0.176693 (0.93392) [0.18919]	-0.992899 (0.99150) [-1.00142]	1.450912 (7.48847) [0.19375]	0.147200 (0.23976) [0.61395]
D2017Q1	1.702101 (0.50189) [3.39137]	-0.284514 (0.46723) [-0.60893]	0.192613 (0.38352) [0.50223]	-1.063840 (4.62358) [-0.23009]	-0.997964 (0.97100) [-1.02777]	0.500714 (1.03085) [0.48573]	1.863750 (7.78572) [0.23938]	-0.174320 (0.24928) [-0.69930]
D2020Q2	9.618229 (0.92382) [10.4114]	0.437094 (0.86002) [0.50823]	0.043672 (0.70593) [0.06186]	4.766881 (8.51049) [0.56012]	15.93210 (1.78729) [8.91413]	-10.59099 (1.89746) [-5.58166]	8.963565 (14.3310) [0.62547]	1.180181 (0.45884) [2.57212]
D2021Q2	-0.591832 (0.60724) [-0.97462]	-0.098116 (0.56531) [-0.17356]	0.000663 (0.46402) [0.00143]	0.084300 (5.59410) [0.01507]	-3.123873 (1.17482) [-2.65903]	5.385307 (1.24724) [4.31779]	0.296822 (9.42001) [0.03151]	0.097976 (0.30160) [0.32485]
D2021Q4	3.427912 (0.52173) [6.57022]	-0.623628 (0.48571) [-1.28396]	0.867760 (0.39868) [2.17658]	0.092761 (4.80637) [0.01930]	-2.235840 (1.00938) [-2.21505]	1.300487 (1.07161) [1.21358]	8.696559 (8.09354) [1.07451]	0.105051 (0.25913) [0.40540]
D2022Q1	-2.853469 (0.57265) [-4.98295]	0.663346 (0.53310) [1.24431]	0.341587 (0.43758) [0.78062]	0.594770 (5.27538) [0.11274]	-0.527988 (1.10788) [-0.47657]	0.511669 (1.17618) [0.43503]	-0.283900 (8.88331) [-0.03196]	0.429653 (0.28442) [1.51064]

Table 23: U.K. five year model estimation output

Standard errors in () & t-statistics in []

	QE_CHANGE	YIELD_5	INFLATION	EXCHANGE_RATE	FISCAL_POLICY	GDP	FINANCIAL_MARKET	POLICY_RATE
QE_CHANGE(-1)	0.295730 (0.06449) [4.58560]	0.030530 (0.06213) [0.49137]	0.010294 (0.04314) [0.23863]	0.413278 (0.52733) [0.78371]	-0.200976 (0.11046) [-1.81952]	0.360699 (0.11771) [3.06433]	0.769809 (0.88333) [0.87149]	0.014498 (0.02575) [0.56298]
YIELD_5(-1)	-0.150617 (0.13745) [-1.09580]	-0.017074 (0.13243) [-0.12893]	0.139575 (0.09193) [1.51820]	1.822722 (1.12391) [1.62177]	0.168373 (0.23541) [0.71522]	-0.234666 (0.25087) [-0.93540]	0.484300 (1.88264) [0.25724]	0.360247 (0.05489) [6.56344]
INFLATION(-1)	-0.296574 (0.12130) [-2.44489]	0.006438 (0.11687) [0.05508]	0.772012 (0.08113) [9.51517]	-2.404865 (0.99188) [-2.42455]	0.544510 (0.20776) [2.62086]	0.635630 (0.22140) [2.87092]	-2.912588 (1.66149) [-1.75300]	-0.076257 (0.04844) [-1.57429]
EXCHANGE_RATE(-1)	-0.045069 (0.01556) [-2.89726]	-0.002595 (0.01499) [-0.17316]	0.004588 (0.01040) [0.44096]	0.054172 (0.12720) [0.42589]	-0.015664 (0.02664) [-0.58793]	-0.004713 (0.02839) [-0.16601]	0.073162 (0.21307) [0.34338]	0.006097 (0.00621) [0.98150]
FISCAL_POLICY(-1)	0.015848 (0.02572) [0.61622]	-0.016720 (0.02478) [-0.67479]	0.031668 (0.01720) [1.84092]	0.132408 (0.21030) [0.62962]	0.792934 (0.04405) [18.0012]	0.203824 (0.04694) [4.34207]	0.266460 (0.35227) [0.75642]	0.008243 (0.01027) [0.80267]
GDP(-1)	0.117473 (0.03175) [3.69961]	0.029915 (0.03059) [0.97787]	0.004293 (0.02124) [0.20215]	0.279557 (0.25964) [1.07672]	0.140932 (0.05438) [2.59142]	-0.168973 (0.05796) [-2.91557]	0.825993 (0.43492) [1.89920]	0.006611 (0.01268) [0.52139]
FINANCIAL_MARKET(-1)	0.008757 (0.01015) [0.86240]	0.018757 (0.00978) [1.91726]	0.007603 (0.00679) [1.11940]	-0.001654 (0.08303) [-0.01992]	-0.003923 (0.01739) [-0.22556]	0.029288 (0.01853) [1.58026]	-0.032738 (0.13908) [-0.23538]	0.012698 (0.00405) [3.13147]
POLICY_RATE(-1)	-0.546040 (0.27544) [-1.98241]	0.012789 (0.26537) [0.04819]	-0.173807 (0.18423) [-0.94342]	3.697129 (2.25225) [1.64153]	-0.722508 (0.47176) [-1.53153]	-0.028375 (0.50274) [-0.05644]	4.054924 (3.77271) [1.07480]	0.658056 (0.10999) [5.98285]
QE_EMU_CHANGE	-0.010620 (0.04855) [-0.21877]	0.100760 (0.04677) [2.15434]	-0.014969 (0.03247) [-0.46102]	-0.249841 (0.39695) [-0.62941]	0.019503 (0.08314) [0.23457]	-0.064838 (0.08860) [-0.73177]	-0.859380 (0.66492) [-1.29245]	0.009159 (0.01939) [0.47245]
QE_US_CHANGE	0.072116 (0.09393) [0.76777]	-0.030592 (0.09050) [-0.33805]	-0.091992 (0.06283) [-1.46426]	-0.292481 (0.76804) [-0.38081]	0.282788 (0.16087) [1.75782]	-0.549932 (0.17144) [-3.20775]	0.053913 (1.28654) [0.04191]	-0.104607 (0.03751) [-2.78891]
D2002Q4	-0.191137 (0.82971) [-0.23037]	0.503840 (0.79938) [0.63029]	0.874245 (0.55496) [1.57534]	5.461760 (6.78441) [0.80505]	-1.308554 (1.42106) [-0.92083]	5.302964 (1.51438) [3.50173]	4.921025 (11.3645) [0.43302]	1.160544 (0.33132) [3.50276]
D2009Q1	-2.491887 (0.75128) [-3.31685]	0.031978 (0.72382) [0.04418]	-0.012586 (0.50250) [-0.02505]	5.952369 (6.14310) [0.96895]	1.170460 (1.28674) [0.90963]	-3.287722 (1.37123) [-2.39764]	-3.305652 (10.2902) [-0.32124]	-0.044024 (0.30000) [-0.14674]
D2009Q2	4.554462 (0.81284) [5.60316]	1.020388 (0.78313) [1.30297]	0.163979 (0.54367) [0.30161]	25.16264 (6.64645) [3.78588]	0.091134 (1.39217) [0.06546]	-0.088570 (1.48359) [-0.05970]	17.63637 (11.1334) [1.58410]	1.467783 (0.32459) [4.52203]
D2011Q4	2.227399 (0.56213) [3.96242]	-0.113966 (0.54158) [-0.21043]	0.252173 (0.37599) [0.67070]	1.259861 (4.59645) [0.27409]	0.785842 (0.96277) [0.81623]	-0.224039 (1.02600) [-0.21836]	9.103888 (7.69946) [1.18241]	0.449476 (0.22447) [2.00237]
D2012Q1	1.689606 (0.54634) [3.09261]	-0.132741 (0.52637) [-0.25218]	-0.221650 (0.36542) [-0.60656]	2.273895 (4.46731) [0.50901]	1.742900 (0.93572) [1.86262]	-1.886658 (0.99717) [-1.89201]	2.348037 (7.48314) [0.31378]	0.004929 (0.21816) [0.02259]
D2017Q1	1.667828 (0.56000) [2.97827]	-0.327163 (0.53953) [-0.60639]	0.158753 (0.37456) [0.42384]	-1.773336 (4.57902) [-0.38727]	-1.173948 (0.95912) [-1.22398]	0.480315 (1.02211) [0.46993]	1.503291 (7.67027) [0.19599]	-0.206605 (0.22362) [-0.92391]
D2020Q2	9.990514 (1.02084) [9.78658]	0.634977 (0.98352) [0.64561]	0.085436 (0.68280) [0.12513]	6.492757 (8.34723) [0.77783]	16.26612 (1.74841) [9.30336]	-10.57601 (1.86323) [-5.67617]	9.708715 (13.9823) [0.69436]	1.149152 (0.40764) [2.81901]
D2021Q2	-0.491642 (0.67578) [-0.72752]	0.216596 (0.65107) [0.33268]	-0.008196 (0.45200) [-0.01813]	0.090622 (5.52571) [0.01640]	-3.270391 (1.15742) [-2.82559]	5.297054 (1.23342) [4.29459]	0.054816 (9.25605) [0.00592]	0.108029 (0.26985) [0.40032]
D2021Q4	3.406106 (0.58318) [5.84056]	-0.640551 (0.56186) [-1.14004]	0.840633 (0.39007) [2.15511]	-0.381974 (4.76858) [-0.08010]	-2.237287 (0.99883) [-2.23991]	1.351534 (1.06442) [1.26974]	8.668414 (7.98780) [1.08521]	0.041020 (0.23288) [0.17614]
D2022Q1	-2.822007 (0.63334) [-4.45572]	0.613199 (0.61019) [1.00493]	0.333874 (0.42362) [0.78815]	0.626708 (5.17876) [0.12102]	-0.318233 (1.08474) [-0.29337]	0.570267 (1.15598) [0.49332]	0.160391 (8.67488) [0.01849]	0.371380 (0.25291) [1.46843]

Table 24: U.K. two year model estimation output

Standard errors in () & t-statistics in []

	QE_CHANGE	YIELD_2	INFLATION	EXCHANGE_RATE	FISCAL_POLICY	GDP	FINANCIAL_MARKET	POLICY_RATE
QE_CHANGE(-1)	0.345359 (0.05881) [5.87219]	0.041684 (0.07244) [0.57546]	0.016683 (0.04187) [0.39842]	0.365869 (0.49978) [0.73205]	-0.237057 (0.10678) [-2.22012]	0.374068 (0.11337) [3.29961]	0.820112 (0.85274) [0.96174]	0.011476 (0.02420) [0.47423]
YIELD_2(-1)	-0.138651 (0.10827) [-1.28063]	-0.059080 (0.13335) [-0.44306]	0.111635 (0.07709) [1.44820]	1.570218 (0.92005) [1.70667]	0.224736 (0.19656) [1.14333]	-0.184032 (0.20870) [-0.88182]	0.973224 (1.56979) [0.61997]	0.312923 (0.04455) [7.02410]
INFLATION(-1)	-0.238579 (0.11328) [-2.10610]	-0.049216 (0.13952) [-0.35275]	0.784533 (0.08065) [9.72715]	-2.347019 (0.96264) [-2.43810]	0.513012 (0.20566) [2.49442]	0.613727 (0.21836) [2.81064]	-2.926137 (1.64247) [-1.78155]	-0.062339 (0.04661) [-1.33739]
EXCHANGE_RATE(-1)	-0.052344 (0.01443) [-3.62680]	0.007490 (0.01778) [0.42133]	0.003383 (0.01028) [0.32925]	0.065025 (0.12265) [0.53018]	-0.009816 (0.02620) [-0.37462]	-0.007725 (0.02782) [-0.27768]	0.059904 (0.20926) [0.28626]	0.006273 (0.00594) [1.05621]
FISCAL_POLICY(-1)	-0.010704 (0.02415) [-0.44321]	-0.014614 (0.02975) [-0.49131]	0.028591 (0.01720) [1.66271]	0.105605 (0.20524) [0.51455]	0.802081 (0.04385) [18.2923]	0.209307 (0.04655) [4.49594]	0.248802 (0.35018) [0.71050]	0.006400 (0.00994) [0.64405]
GDP(-1)	0.121777 (0.02983) [4.08231]	0.045595 (0.03674) [1.24101]	0.003426 (0.02124) [0.16129]	0.220702 (0.25350) [0.87063]	0.133028 (0.05416) [2.45629]	-0.161080 (0.05750) [-2.80134]	0.838130 (0.43252) [1.93779]	0.001624 (0.01227) [0.13227]
FINANCIAL_MARKET(-1)	0.010847 (0.00970) [1.11779]	0.019209 (0.01195) [1.60718]	0.007580 (0.00691) [1.09706]	-0.012586 (0.08246) [-0.15262]	-0.004373 (0.01762) [-0.24821]	0.027756 (0.01871) [1.48384]	-0.027755 (0.14070) [-0.19726]	0.012614 (0.00399) [3.15894]
POLICY_RATE(-1)	-0.449090 (0.26125) [-1.71903]	0.062623 (0.32176) [0.19462]	-0.157505 (0.18600) [-0.84678]	3.958140 (2.22004) [1.78291]	-0.754849 (0.47430) [-1.59149]	-0.034579 (0.50358) [-0.06867]	4.132778 (3.78786) [1.09106]	0.672358 (0.10750) [6.25464]
QE_EMU_CHANGE	-0.024810 (0.04597) [-0.53972]	0.135674 (0.05662) [2.39640]	-0.017723 (0.03273) [-0.54151]	-0.285778 (0.39063) [-0.73158]	0.024812 (0.08346) [0.29731]	-0.061818 (0.08861) [-0.69765]	-0.864574 (0.66650) [-1.29719]	0.006181 (0.01891) [0.32676]
QE_US_CHANGE	0.122433 (0.08893) [1.37679]	-0.104455 (0.10952) [-0.95371]	-0.078059 (0.06331) [-1.23289]	-0.060180 (0.75568) [-0.07964]	0.282095 (0.16145) [1.74728]	-0.579995 (0.17141) [-3.38360]	0.122813 (1.28936) [0.09525]	-0.078790 (0.03659) [-2.15324]
D2002Q4	-0.435502 (0.77944) [-0.55874]	0.956197 (0.95999) [0.99605]	0.793850 (0.55495) [1.43048]	3.984188 (6.62361) [0.60151]	-1.235660 (1.41510) [-0.87319]	5.465818 (1.50245) [3.63794]	5.278441 (11.3013) [0.46707]	1.028222 (0.32072) [3.20594]
D2006Q2	1.381659 (0.49991) [2.76384]	0.217365 (0.61570) [0.35303]	0.130559 (0.35593) [0.36682]	6.072846 (4.24815) [1.42953]	-0.733414 (0.90760) [-0.80808]	0.357740 (0.96362) [0.37125]	-2.331988 (7.24824) [-0.32173]	-0.149265 (0.20570) [-0.72564]
D2009Q1	-2.551304 (0.73364) [-3.47759]	0.312754 (0.90358) [0.34613]	0.044851 (0.52234) [0.08587]	7.371410 (6.23442) [1.18237]	1.499973 (1.33195) [1.12614]	-3.444913 (10.6372) [-2.43600]	-1.742934 (1.41417) [-0.16385]	0.178386 (0.30188) [0.59092]
D2009Q2	4.802506 (0.76855) [6.24877]	1.363165 (0.94658) [1.44009]	0.164686 (0.54720) [0.30096]	24.91818 (6.53109) [3.81532]	-0.028793 (1.39534) [-0.02064]	-0.044152 (1.48146) [-0.02980]	17.87333 (11.1434) [1.60394]	1.409422 (0.31624) [4.45675]
D2011Q4	2.426866 (0.52698) [4.60522]	0.001945 (0.64905) [0.00300]	0.189314 (0.37520) [0.50456]	0.450190 (4.47825) [0.10053]	0.715341 (0.95676) [0.74767]	-0.157462 (1.01581) [-0.15501]	9.212818 (7.64083) [1.20574]	0.281818 (0.21684) [1.29964]
D2012Q1	1.667385 (0.51601) [3.23129]	-0.142710 (0.63554) [-0.22455]	-0.249880 (0.36739) [-0.68014]	2.430188 (4.38503) [0.55420]	1.820769 (0.93684) [1.94352]	-1.893434 (0.99467) [-1.90359]	2.381129 (7.48178) [0.31826]	-0.028688 (0.21233) [-0.13511]
D2012Q3	1.644090 (0.50886) [3.23093]	-0.018616 (0.62673) [-0.02970]	0.012126 (0.36230) [0.03347]	3.694765 (4.32424) [0.85443]	0.239407 (0.92385) [0.25914]	-0.897980 (0.98088) [-0.91549]	1.544728 (7.37807) [0.20937]	0.037466 (0.20939) [0.17893]
D2020Q2	9.627429 (0.96025) [10.0260]	1.204991 (1.18268) [1.01887]	-0.066789 (0.68368) [-0.09769]	4.089367 (8.16008) [0.50114]	16.29673 (1.74336) [9.34787]	-10.33280 (1.85097) [-5.58237]	9.344669 (13.9228) [0.67118]	0.866928 (0.39512) [2.19407]
D2021Q2	-0.724885 (0.63908) [-1.13425]	0.744674 (0.78712) [0.94607]	0.012747 (0.45502) [0.02801]	0.251953 (5.43089) [0.04639]	-3.198354 (1.16028) [-2.75653]	5.267604 (1.23190) [4.27600]	-0.109989 (9.26624) [-0.01187]	0.194008 (0.26297) [0.73775]
D2021Q4	3.417251 (0.55341) [6.17489]	-0.279887 (0.68160) [-0.41063]	0.826748 (0.39402) [2.09823]	-0.327909 (4.70284) [-0.06973]	-2.245621 (1.00474) [-2.23503]	1.349693 (1.06676) [1.26523]	8.412006 (8.02403) [1.04835]	0.009804 (0.22772) [0.04305]
D2022Q1	-3.068585 (0.58897) [-5.21007]	0.850422 (0.72540) [1.17235]	0.236660 (0.41934) [0.56436]	0.180414 (5.00503) [0.03605]	-0.184449 (1.06930) [-0.17249]	0.619906 (1.13530) [0.54603]	-0.388148 (8.53963) [-0.04545]	0.231088 (0.24235) [0.95353]

Table 25: U.S. ten year model estimation output

Standard errors in () & t-statistics in []

	QE_CHANGE	YIELD_10	INFLATION	EXCHANGE_RATE	FISCAL_POLICY	GDP	FINANCIAL_MARKET	POLICY_RATE
QE_CHANGE(-1)	0.700876 (0.06538) [10.7207]	-0.009763 (0.05431) [-0.17976]	-0.123660 (0.10127) [-1.22106]	-0.323689 (0.62822) [-0.51525]	-0.049639 (0.08915) [-0.55677]	-0.305268 (0.26904) [-1.13467]	0.418646 (0.86039) [0.48658]	0.080108 (0.06382) [1.25517]
YIELD_10(-1)	0.113804 (0.11435) [0.78839]	-0.166798 (0.11992) [-1.39092]	-0.231414 (0.22361) [-1.03490]	0.416774 (1.38709) [0.30047]	-0.062470 (0.19685) [-0.31735]	-1.613842 (0.59403) [-2.71676]	0.684126 (1.89972) [0.36012]	0.009102 (0.14092) [0.06459]
INFLATION(-1)	-0.183238 (0.07107) [-2.57840]	0.006918 (0.05904) [0.11718]	0.308470 (0.11009) [2.80202]	-0.246957 (0.68290) [-0.36163]	0.155981 (0.09692) [1.60946]	0.712875 (0.29246) [2.43754]	-2.424399 (0.93528) [-2.59216]	0.049979 (0.06938) [0.72039]
EXCHANGE_RATE(-1)	0.014524 (0.01169) [1.24222]	0.008097 (0.00971) [0.83361]	0.008345 (0.01811) [0.46076]	0.065900 (0.11235) [0.58654]	-0.008929 (0.01594) [-0.55998]	0.014382 (0.04812) [0.29890]	0.240108 (0.15388) [1.56039]	-0.010672 (0.01141) [-0.93496]
FISCAL_POLICY(-1)	0.113638 (0.04774) [2.38046]	-0.029513 (0.03966) [-0.74419]	0.202943 (0.07395) [2.74431]	-0.010516 (0.45873) [-0.02292]	0.832588 (0.06510) [12.7891]	0.726598 (0.19645) [3.69859]	1.829099 (0.62826) [2.91137]	0.031111 (0.04660) [0.66757]
GDP(-1)	-0.006728 (0.01301) [-0.51733]	-2.90E - 05 (0.01080) [-0.00268]	0.017762 (0.02015) [0.88163]	0.074810 (0.12498) [0.59860]	0.025505 (0.01774) [1.43804]	0.086062 (0.05352) [1.60798]	0.347550 (0.17116) [2.03053]	-0.013015 (0.01270) [-1.02505]
FINANCIAL_MARKET(-1)	0.014881 (0.00860) [1.72983]	0.015993 (0.00715) [2.23775]	0.025697 (0.01333) [1.92833]	0.104707 (0.08267) [1.26664]	0.006432 (0.01173) [0.54825]	0.226455 (0.03540) [6.39668]	0.005253 (0.11322) [0.04640]	-0.005365 (0.00840) [-0.63877]
POLICY_RATE(-1)	-0.284718 (0.11115) [-2.56147]	0.328265 (0.09234) [3.55487]	0.318727 (0.17219) [1.85104]	-0.889348 (1.06811) [-0.83263]	-0.029666 (0.15158) [-0.19571]	0.617163 (0.45743) [1.34921]	2.187627 (1.46286) [1.49545]	0.594868 (0.10851) [5.48200]
D2002Q4	5.883127 (0.49306) [11.9319]	0.250818 (0.40961) [0.61233]	0.373067 (0.76379) [0.48844]	3.821274 (4.73794) [0.80653]	0.187779 (0.67240) [0.27927]	-0.435507 (2.02905) [-0.21464]	-1.675665 (6.48895) [-0.25823]	0.621910 (0.48134) [1.29203]
D2003Q1	-4.024165 (0.62107) [-6.47937]	-0.046664 (0.51596) [-0.09044]	1.595643 (0.96210) [1.65850]	8.178858 (5.96809) [1.37043]	0.263015 (0.84697) [0.31054]	3.808263 (2.55587) [1.49001]	3.096664 (8.17373) [0.37886]	-0.555132 (0.60632) [-0.91558]
D2009Q2	1.498095 (0.50738) [2.95261]	0.694513 (0.42151) [1.64768]	0.738095 (0.78598) [0.93908]	7.872361 (4.87557) [1.61465]	1.301670 (0.69193) [1.88122]	-3.243838 (2.08799) [-1.55357]	11.06429 (6.67744) [1.65697]	-0.475631 (0.49532) [-0.96024]
D2020Q1	1.667680 (0.51774) [3.22109]	-0.660990 (0.43012) [-1.53677]	-0.448138 (0.80202) [-0.55876]	-2.192451 (4.97510) [-0.44068]	-0.688574 (0.70605) [-0.97524]	-5.416799 (2.13062) [-2.54236]	-8.336737 (6.81376) [-1.22352]	0.760596 (0.50544) [1.50483]
D2020Q2	6.219362 (0.54670) [11.3762]	-0.005329 (0.45417) [-0.01173]	-0.145747 (0.84688) [-0.17210]	4.536561 (5.25339) [0.86355]	9.507337 (0.74555) [12.8729]	-25.40718 (2.24979) [-11.2931]	10.90296 (7.19488) [1.51538]	-0.322407 (0.53371) [-0.60409]
D2020Q3	-6.335479 (0.90990) [-6.96279]	0.329026 (0.75591) [0.43527]	0.271196 (1.40953) [0.19240]	7.864858 (8.74356) [0.89950]	-5.798653 (1.24086) [-4.67309]	28.26269 (3.74448) [7.54783]	-14.38789 (11.9749) [-1.20150]	-1.203674 (0.88828) [-1.35505]
D2021Q2	2.904944 (0.52607) [5.52192]	-0.273461 (0.43704) [-0.62571]	0.912232 (0.81494) [1.11939]	0.269378 (5.05522) [0.05329]	-0.502309 (0.71742) [-0.70016]	2.149585 (2.16493) [0.99291]	-3.764903 (6.92348) [-0.54379]	-0.254576 (0.51357) [-0.49569]
D2021Q3	-4.465953 (0.59058) [-7.56200]	0.256573 (0.49063) [0.52295]	0.060530 (0.91486) [0.06616]	-1.305010 (5.67505) [-0.22996]	-0.963970 (0.80539) [-1.19690]	-3.126236 (2.43037) [-1.28632]	-1.152221 (7.77238) [-0.14825]	-0.436296 (0.57655) [-0.75674]

Table 26: U.S. five year model estimation output

Standard errors in () & t-statistics in []

	QE_CHANGE	YIELD_5	INFLATION	EXCHANGE_RATE	FISCAL_POLICY	GDP	FINANCIAL_MARKET	POLICY_RATE
QE_CHANGE(-1)	0.295730 (0.06449) [4.58560]	0.030530 (0.06213) [0.49137]	0.010294 (0.04314) [0.23863]	0.413278 (0.52733) [0.78371]	-0.200976 (0.11046) [-1.81952]	0.360699 (0.11771) [3.06433]	0.769809 (0.88333) [0.87149]	0.014498 (0.02575) [0.56298]
YIELD_5(-1)	-0.150617 (0.13745) [-1.09580]	-0.017074 (0.13243) [-0.12893]	0.139575 (0.09193) [1.51820]	1.822722 (1.12391) [1.62177]	0.168373 (0.23541) [0.71522]	-0.234666 (0.25087) [-0.93540]	0.484300 (1.88264) [0.25724]	0.360247 (0.05489) [6.56344]
INFLATION(-1)	-0.296574 (0.12130) [-2.44489]	0.006438 (0.11687) [0.05508]	0.772012 (0.08113) [9.51517]	-2.404865 (0.99188) [-2.42455]	0.544510 (0.20776) [2.62086]	0.635630 (0.22140) [2.87092]	-2.912588 (1.66149) [-1.75300]	-0.076257 (0.04844) [-1.57429]
EXCHANGE_RATE(-1)	-0.045069 (0.01556) [-2.89726]	-0.002595 (0.01499) [-0.17316]	0.004588 (0.01040) [0.44096]	0.054172 (0.12720) [0.42589]	-0.015664 (0.02664) [-0.58793]	-0.004713 (0.02839) [-0.16601]	0.073162 (0.21307) [0.34338]	0.006097 (0.00621) [0.98150]
FISCAL_POLICY(-1)	0.015848 (0.02572) [0.61622]	-0.016720 (0.02478) [-0.67479]	0.031668 (0.01720) [1.84092]	0.132408 (0.21030) [0.62962]	0.792934 (0.04405) [18.0012]	0.203824 (0.04694) [4.34207]	0.266460 (0.35227) [0.75642]	0.008243 (0.01027) [0.80267]
GDP(-1)	0.117473 (0.03175) [3.69961]	0.029915 (0.03059) [0.97787]	0.004293 (0.02124) [0.20215]	0.279557 (0.25964) [1.07672]	0.140932 (0.05438) [2.59142]	-0.168973 (0.05796) [-2.91557]	0.825993 (0.43492) [1.89920]	0.006611 (0.01268) [0.52139]
FINANCIAL_MARKET(-1)	0.008757 (0.01015) [0.86240]	0.018757 (0.00978) [1.91726]	0.007603 (0.00679) [1.11940]	-0.001654 (0.08303) [-0.01992]	-0.003923 (0.01739) [-0.22556]	0.029288 (0.01853) [1.58026]	-0.032738 (0.13908) [-0.23538]	0.012698 (0.00405) [3.13147]
POLICY_RATE(-1)	-0.546040 (0.27544) [-1.98241]	0.012789 (0.26537) [0.04819]	-0.173807 (0.18423) [-0.94342]	3.697129 (2.25225) [1.64153]	-0.722508 (0.47176) [-1.53153]	-0.028375 (0.50274) [-0.05644]	4.054924 (3.77271) [1.07480]	0.658056 (0.10999) [5.98285]
QE_EMU_CHANGE	-0.010620 (0.04855) [-0.21877]	0.100760 (0.04677) [2.15434]	-0.014969 (0.03247) [-0.46102]	-0.249841 (0.39695) [-0.62941]	0.019503 (0.08314) [0.23457]	-0.064838 (0.08860) [-0.73177]	-0.859380 (0.66492) [-1.29245]	0.009159 (0.01939) [0.47245]
QE_US_CHANGE	0.072116 (0.09393) [0.76777]	-0.030592 (0.09050) [-0.33805]	-0.091992 (0.06283) [-1.46426]	-0.292481 (0.76804) [-0.38081]	0.282788 (0.16087) [1.75782]	-0.549932 (0.17144) [-3.20775]	0.053913 (1.28654) [0.04191]	-0.104607 (0.03751) [-2.78891]
D2002Q4	-0.191137 (0.82971) [-0.23037]	0.503840 (0.79938) [0.63029]	0.874245 (0.55496) [1.57534]	5.461760 (6.78441) [0.80505]	-1.308554 (1.42106) [-0.92083]	5.302964 (1.51438) [3.50173]	4.921025 (11.3645) [0.43302]	1.160544 (0.33132) [3.50276]
D2009Q1	-2.491887 (0.75128) [-3.31685]	0.031978 (0.72382) [0.04418]	-0.012586 (0.50250) [-0.02505]	5.952369 (6.14310) [0.96895]	1.170460 (1.28674) [0.90963]	-3.287722 (1.37123) [-2.39764]	-3.305652 (10.2902) [-0.32124]	-0.044024 (0.30000) [-0.14674]
D2009Q2	4.554462 (0.81284) [5.60316]	1.020388 (0.78313) [1.30297]	0.163979 (0.54367) [0.30161]	25.16264 (6.64645) [3.78588]	0.091134 (1.39217) [0.06546]	-0.088570 (1.48359) [-0.05970]	17.63637 (11.1334) [1.58410]	1.467783 (0.32459) [4.52203]
D2011Q4	2.227399 (0.56213) [3.96242]	-0.113966 (0.54158) [-0.21043]	0.252173 (0.37599) [0.67070]	1.259861 (4.59645) [0.27409]	0.785842 (0.96277) [0.81623]	-0.224039 (1.02600) [-0.21836]	9.103888 (7.69946) [1.18241]	0.449476 (0.22447) [2.00237]
D2012Q1	1.689606 (0.54634) [3.09261]	-0.132741 (0.52637) [-0.25218]	-0.221650 (0.36542) [-0.60656]	2.273895 (4.46731) [0.50901]	1.742900 (0.93572) [1.86262]	-1.886658 (0.99717) [-1.89201]	2.348037 (7.48314) [0.31378]	0.004929 (0.21816) [0.02259]
D2017Q1	1.667828 (0.56000) [2.97827]	-0.327163 (0.53953) [-0.60639]	0.158753 (0.37456) [0.42384]	-1.773336 (4.57902) [-0.38727]	-1.173948 (0.95912) [-1.22398]	0.480315 (1.02211) [0.46993]	1.503291 (7.67027) [0.19599]	-0.206605 (0.22362) [-0.92391]
D2020Q2	9.990514 (1.02084) [9.78658]	0.634977 (0.98352) [0.64561]	0.085436 (0.68280) [0.12513]	6.492757 (8.34723) [0.77783]	16.26612 (1.74841) [9.30336]	-10.57601 (1.86323) [-5.67617]	9.708715 (13.9823) [0.69436]	1.149152 (0.40764) [2.81901]
D2021Q2	-0.491642 (0.67578) [-0.72752]	0.216596 (0.65107) [0.33268]	-0.008196 (0.45200) [-0.01813]	0.090622 (5.52571) [0.01640]	-3.270391 (1.15742) [-2.82559]	5.297054 (1.23342) [4.29459]	0.054816 (9.25605) [0.00592]	0.108029 (0.26985) [0.40032]
D2021Q4	3.406106 (0.58318) [5.84056]	-0.640551 (0.56186) [-1.14004]	0.840633 (0.39007) [2.15511]	-0.381974 (4.76858) [-0.08010]	-2.237287 (0.99883) [-2.23991]	1.351534 (1.06442) [1.26974]	8.668414 (7.98780) [1.08521]	0.041020 (0.23288) [0.17614]
D2022Q1	-2.822007 (0.63334) [-4.45572]	0.613199 (0.61019) [1.00493]	0.333874 (0.42362) [0.78815]	0.626708 (5.17876) [0.12102]	-0.318233 (1.08474) [-0.29337]	0.570267 (1.15598) [0.49332]	0.160391 (8.67488) [0.01849]	0.371380 (0.25291) [1.46843]

Table 27: U.S. two year model estimation output

Standard errors in () & t-statistics in []

	QE_CHANGE	YIELD_2	INFLATION	EXCHANGE_RATE	FISCAL_POLICY	GDP	FINANCIAL_MARKET	POLICY_RATE
QE_CHANGE(-1)	0.708318 (0.06440) [10.9989]	0.027272 (0.05340) [0.51075]	-0.135859 (0.10113) [-1.34341]	-0.282880 (0.61689) [-0.45856]	-0.043430 (0.08738) [-0.49701]	-0.378926 (0.27597) [-1.37305]	0.517079 (0.85484) [0.60489]	0.077298 (0.06325) [1.22208]
YIELD_2(-1)	-0.067680 (0.18072) [-0.37450]	-0.190045 (0.14984) [-1.26830]	-0.056766 (0.28380) [-0.20002]	0.105882 (1.73118) [0.06116]	-0.423778 (0.24522) [-1.72817]	-1.296300 (0.77446) [-1.67381]	-1.975234 (2.39892) [-0.82339]	0.163597 (0.17750) [0.92168]
INFLATION(-1)	-0.137797 (0.07234) [-1.90473]	0.041090 (0.05998) [0.68503]	0.262290 (0.11361) [2.30873]	-0.322023 (0.69301) [-0.46467]	0.212816 (0.09816) [2.16799]	0.623000 (0.31002) [2.00953]	-2.028513 (0.96031) [-2.11236]	0.020556 (0.07105) [0.28930]
EXCHANGE_RATE(-1)	0.014413 (0.01220) [1.18137]	-0.000316 (0.01012) [-0.03125]	0.007022 (0.01916) [0.36650]	0.042361 (0.11687) [0.36246]	-0.017131 (0.01655) [-1.03484]	0.000953 (0.05228) [0.01822]	0.185670 (0.16195) [1.14649]	-0.008158 (0.01198) [-0.68077]
FISCAL_POLICY(-1)	0.101357 (0.04689) [2.16147]	-0.001366 (0.03888) [-0.03515]	0.218437 (0.07364) [2.96633]	-0.058396 (0.44920) [-0.13000]	0.813288 (0.06363) [12.7821]	0.793053 (0.20095) [3.94649]	1.646741 (0.62245) [2.64556]	0.039284 (0.04606) [0.85295]
GDP(-1)	-0.006746 (0.01292) [-0.52225]	-0.006124 (0.01071) [-0.57186]	0.017884 (0.02028) [0.88169]	0.074883 (0.12373) [0.60521]	0.025771 (0.01753) [1.47047]	0.087276 (0.05535) [1.57676]	0.348609 (0.17145) [2.03325]	-0.013104 (0.01269) [-1.03297]
FINANCIAL_MARKET(-1)	0.013979 (0.00865) [1.61656]	0.007310 (0.00717) [1.01963]	0.026159 (0.01358) [1.92641]	0.132523 (0.08283) [1.59986]	0.008732 (0.01173) [0.74422]	0.220030 (0.03706) [5.93768]	0.034262 (0.11478) [0.29849]	-0.005540 (0.00849) [-0.65229]
POLICY_RATE(-1)	-0.233943 (0.14518) [-1.61143]	0.646492 (0.12037) [5.37084]	0.307773 (0.22798) [1.34999]	-0.705654 (1.39069) [-0.50741]	0.190596 (0.19699) [0.96756]	0.949242 (0.62214) [1.52578]	3.500939 (1.92709) [1.81670]	0.511180 (0.14259) [3.58501]
D2002Q4	5.764691 (0.48576) [11.8674]	0.156033 (0.40276) [0.38741]	0.522960 (0.76282) [0.68556]	3.933550 (4.65319) [0.84535]	0.104427 (0.65911) [0.15844]	0.144866 (2.08165) [0.06959]	-2.516365 (6.44798) [-0.39026]	0.674266 (0.47710) [1.41327]
D2003Q1	-4.099201 (0.61924) [-6.61969]	-0.449246 (0.51343) [-0.87498]	1.658139 (0.97244) [1.70513]	8.228702 (5.93188) [1.38720]	0.119009 (0.84024) [0.14164]	3.808361 (2.65368) [1.43512]	2.174279 (8.21988) [0.26451]	-0.490090 (0.60820) [-0.80580]
D2008Q1	-0.877810 (0.54208) [-1.61935]	-0.313339 (0.44945) [-0.69716]	0.699550 (0.85126) [0.82178]	7.892038 (5.19267) [1.51984]	-0.477597 (0.73553) [-0.64933]	-1.198216 (2.32299) [-0.51581]	0.484024 (7.19554) [0.06727]	0.459814 (0.53241) [0.86365]
D2009Q2	1.545379 (0.50222) [3.07708]	-0.055193 (0.41641) [-0.13254]	0.654979 (0.78868) [0.83048]	7.850495 (4.81091) [1.63181]	1.276333 (0.68145) [1.87296]	-3.743430 (2.15221) [-1.73935]	11.18131 (6.66653) [1.67723]	-0.475419 (0.49327) [-0.96382]
D2020Q1	1.727668 (0.52811) [3.27143]	-0.453020 (0.43787) [-1.03460]	-0.456860 (0.82932) [-0.55088]	-1.923762 (5.05887) [-0.38028]	-0.407846 (0.71658) [-0.56916]	-4.982296 (2.26313) [-2.20150]	-6.656712 (7.01013) [-0.94958]	0.655364 (0.51869) [1.26350]
D2020Q2	5.998329 (0.56601) [10.5976]	-0.331484 (0.46929) [-0.70635]	0.047761 (0.88884) [0.05373]	4.392651 (5.42191) [0.81017]	9.147085 (0.76800) [11.9103]	-25.26622 (2.42554) [-10.4167]	7.826811 (7.51320) [1.04174]	-0.126603 (0.55591) [-0.22774]
D2020Q3	-6.250807 (0.90521) [-6.90538]	-0.459618 (0.75054) [-0.61239]	0.198258 (1.42151) [0.13947]	7.688641 (8.67120) [0.88669]	-5.663867 (1.22825) [-4.61132]	28.24883 (3.87914) [7.28224]	-13.56428 (12.0158) [-1.12887]	-1.269334 (0.88906) [-1.42772]
D2021Q2	2.969222 (0.51857) [5.72577]	-0.089867 (0.42996) [-0.20901]	0.783370 (0.81435) [0.96196]	0.301112 (4.96752) [0.06062]	-0.568630 (0.70364) [-0.80813]	1.282481 (2.22227) [0.57711]	-3.682088 (6.88354) [-0.53491]	-0.241964 (0.50932) [-0.47507]
D2021Q3	-4.585621 (0.57762) [-7.93878]	-0.011122 (0.47893) [-0.02322]	0.242756 (0.90708) [0.26762]	-1.420936 (5.53319) [-0.25680]	-1.005869 (0.78376) [-1.28339]	-2.162754 (2.47532) [-0.87373]	-2.029019 (7.66740) [-0.26463]	-0.402297 (0.56732) [-0.70912]

8.4 D - Impulse Response Functions

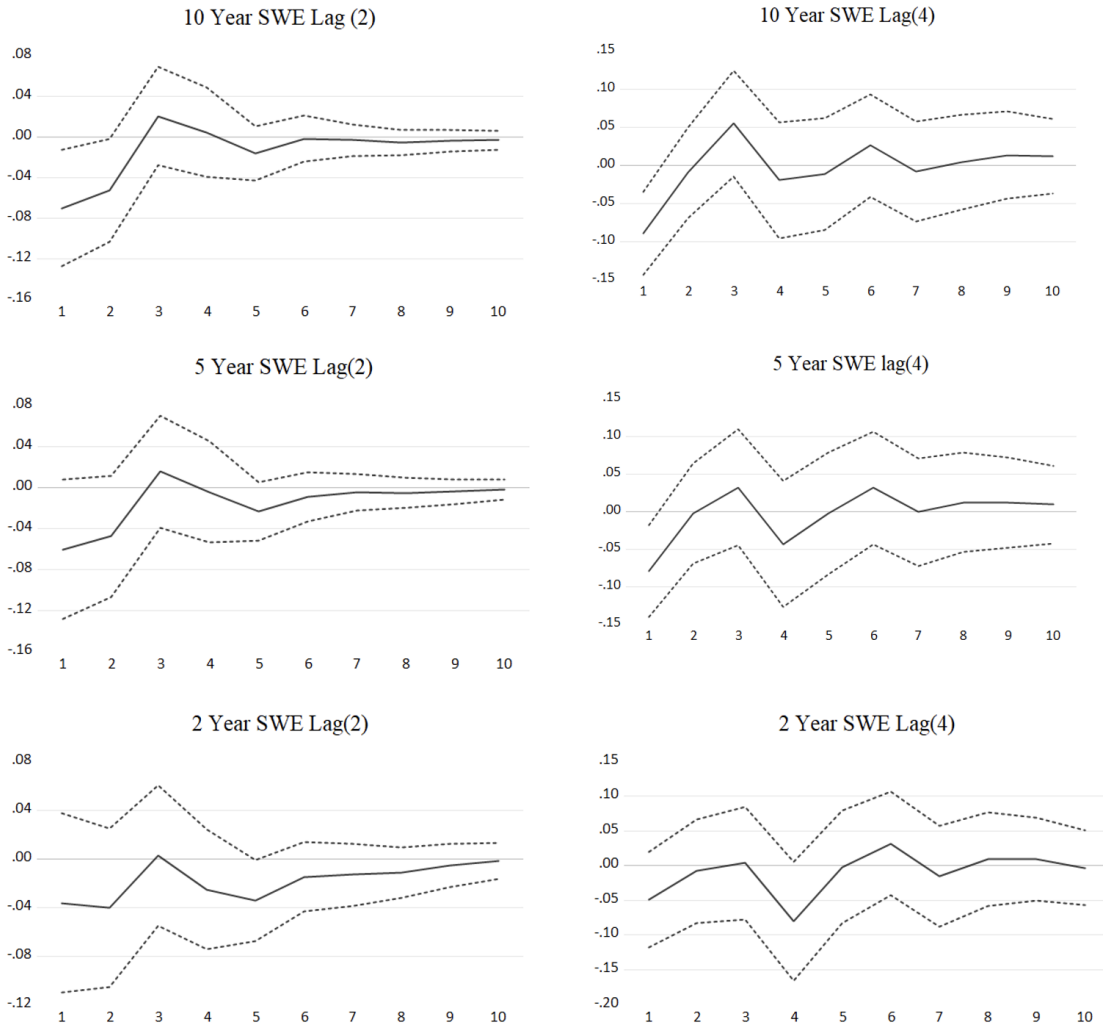


Figure 15: Sweden sensitivity analysis IRFs. Dashed lines indicates the 95 per cent confidence band. x-axis show quarters and y-axis indicates change in percentage points.

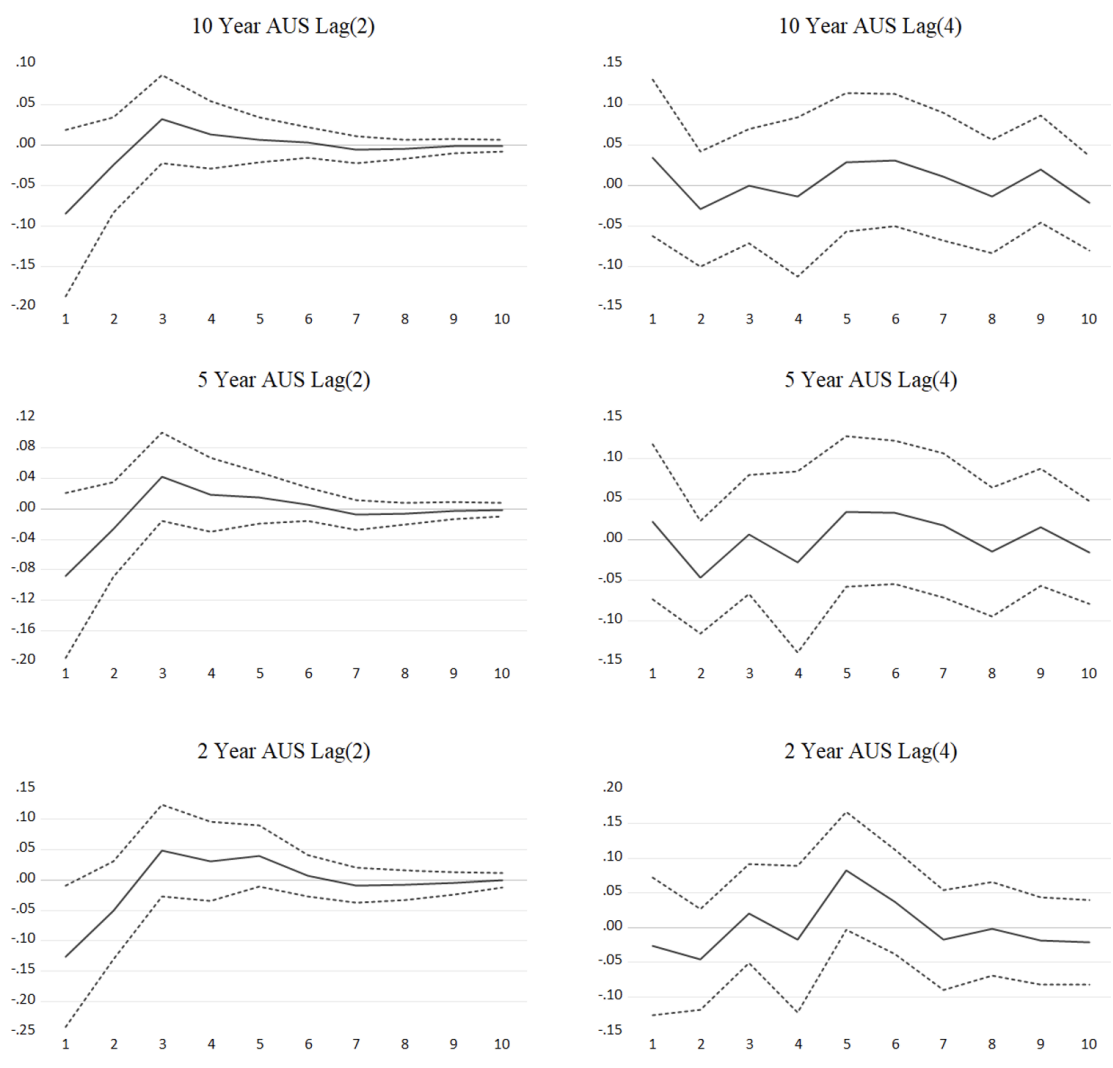


Figure 16: *Australia sensitivity analysis IRFs. Dashed lines indicates the 95 per cent confidence band. x-axis show quarters and y-axis indicates change in percentage points.*

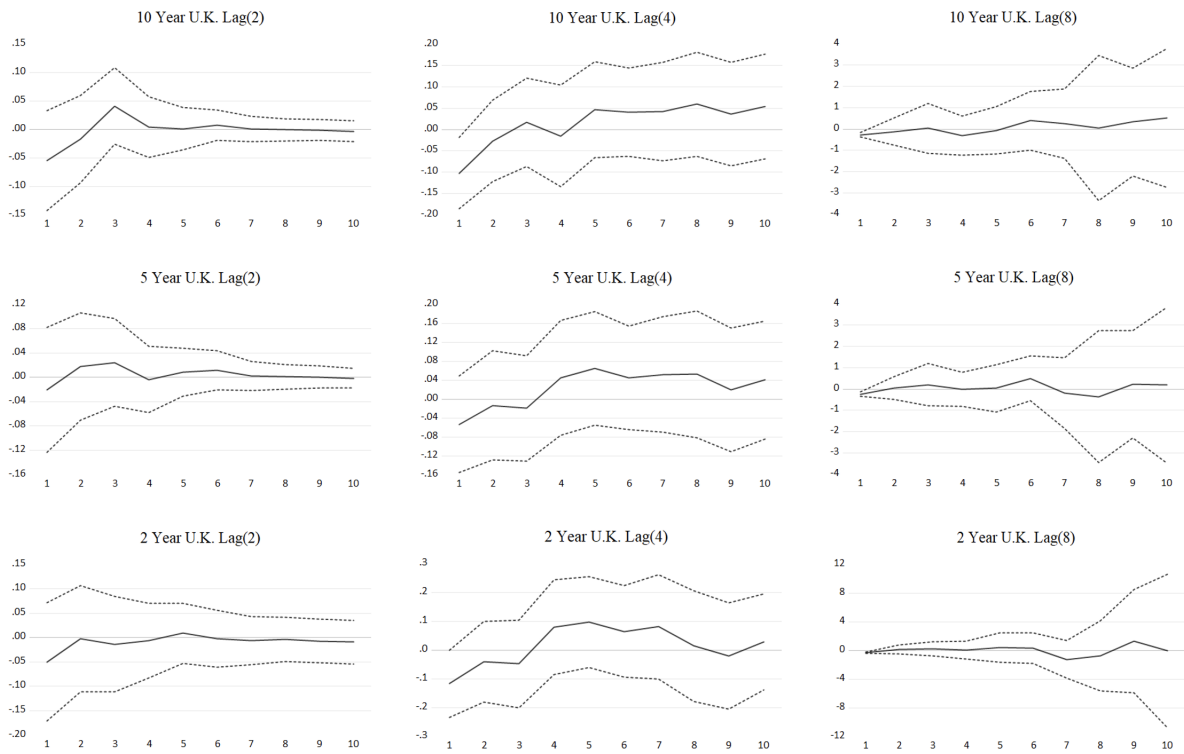


Figure 17: *United Kingdom sensitivity analysis IRFs. Dashed lines indicates the 95 per cent confidence band. x-axis show quarters and y-axis indicates change in percentage points.*

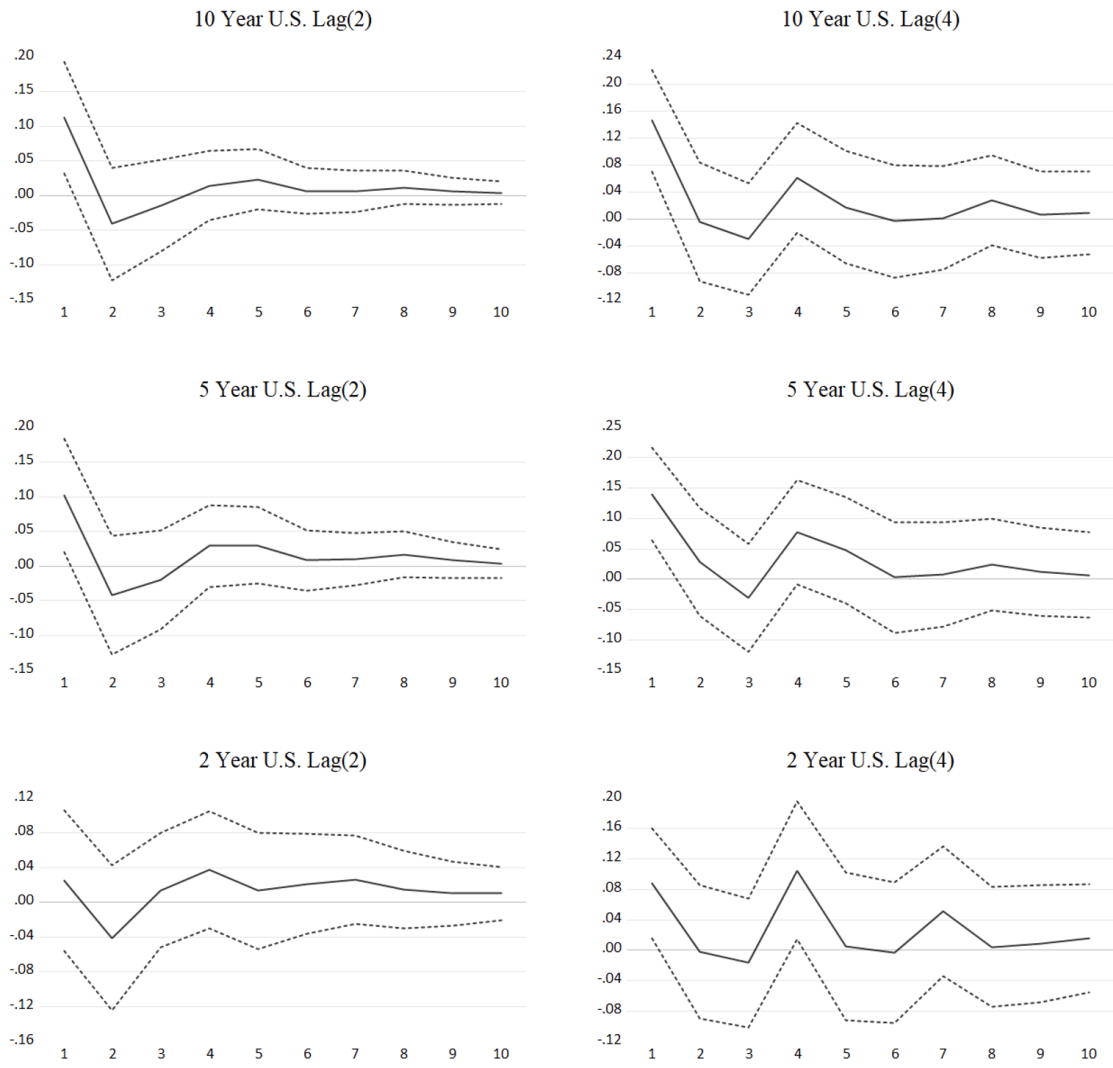


Figure 18: *United States sensitivity analysis IRFs. Dashed lines indicates the 95 per cent confidence band. x-axis show quarters and y-axis indicates change in percentage points.*

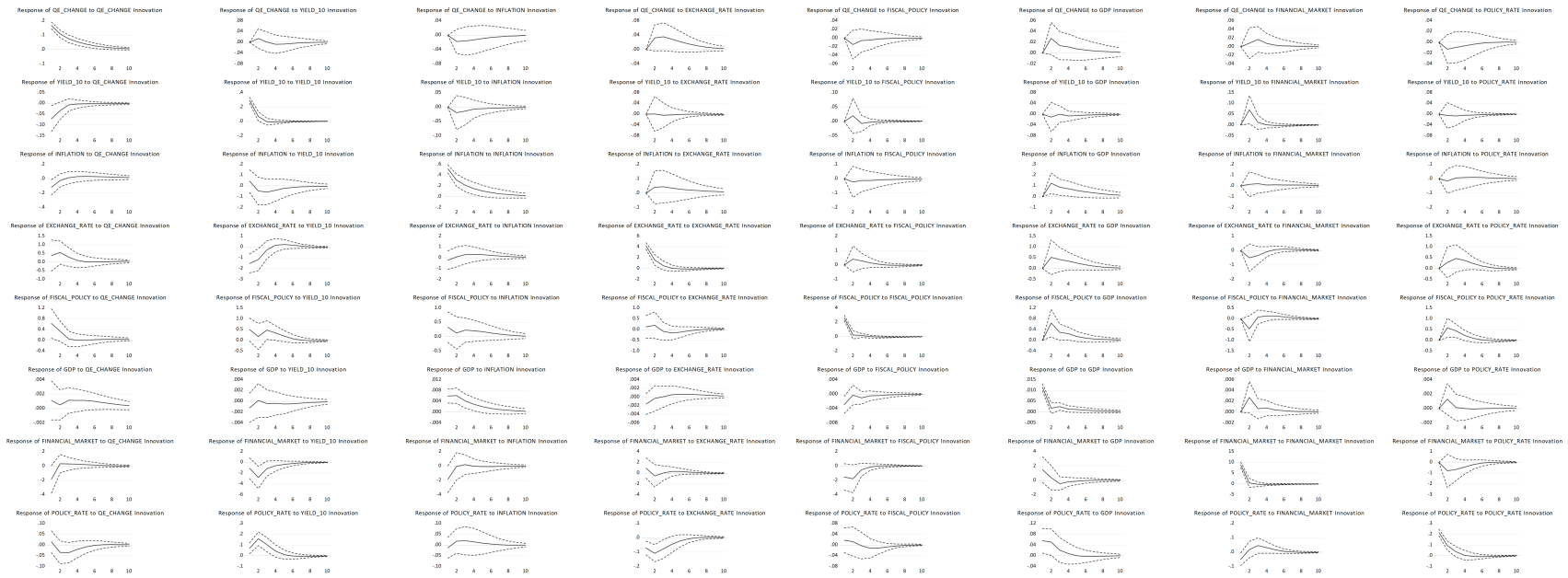


Figure 19: *SWE* ten year model IRFs. Dashed lines indicates the 95 per cent confidence band. *x*-axis show quarters and *y*-axis indicates change in percentage points.

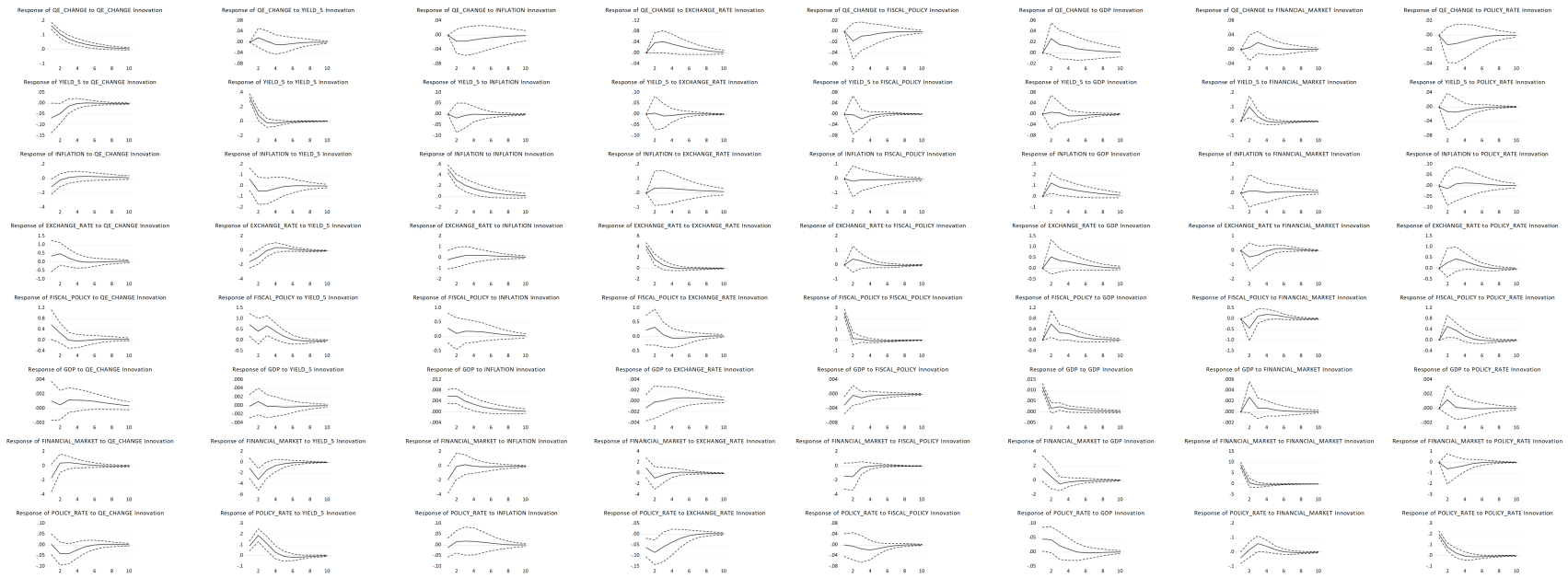


Figure 20: *SWE* five year model IRFs. Dashed lines indicates the 95 per cent confidence band. x-axis show quarters and y-axis indicates change in percentage points.

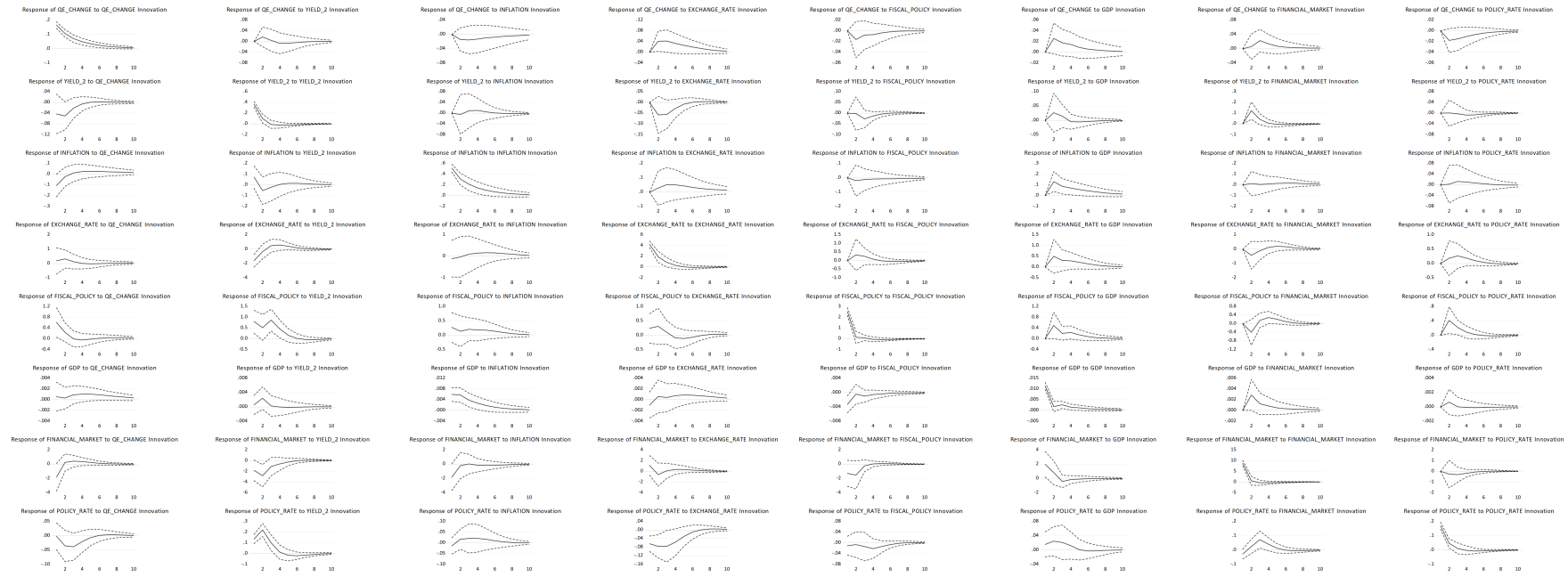


Figure 21: SWE two year model IRFs. Dashed lines indicates the 95 per cent confidence band. x-axis show quarters and y-axis indicates change in percentage points.

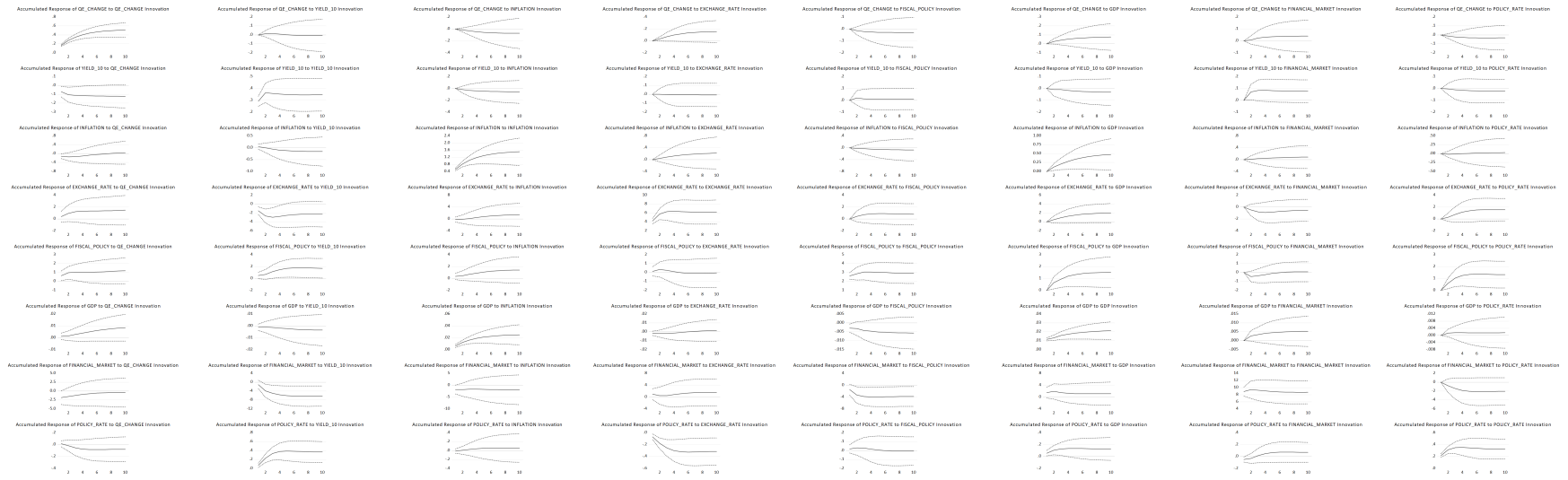


Figure 22: *SWE ten year model accumulated IRFs. Dashed lines indicates the 95 per cent confidence band. x-axis show quarters and y-axis indicates change in percentage points.*

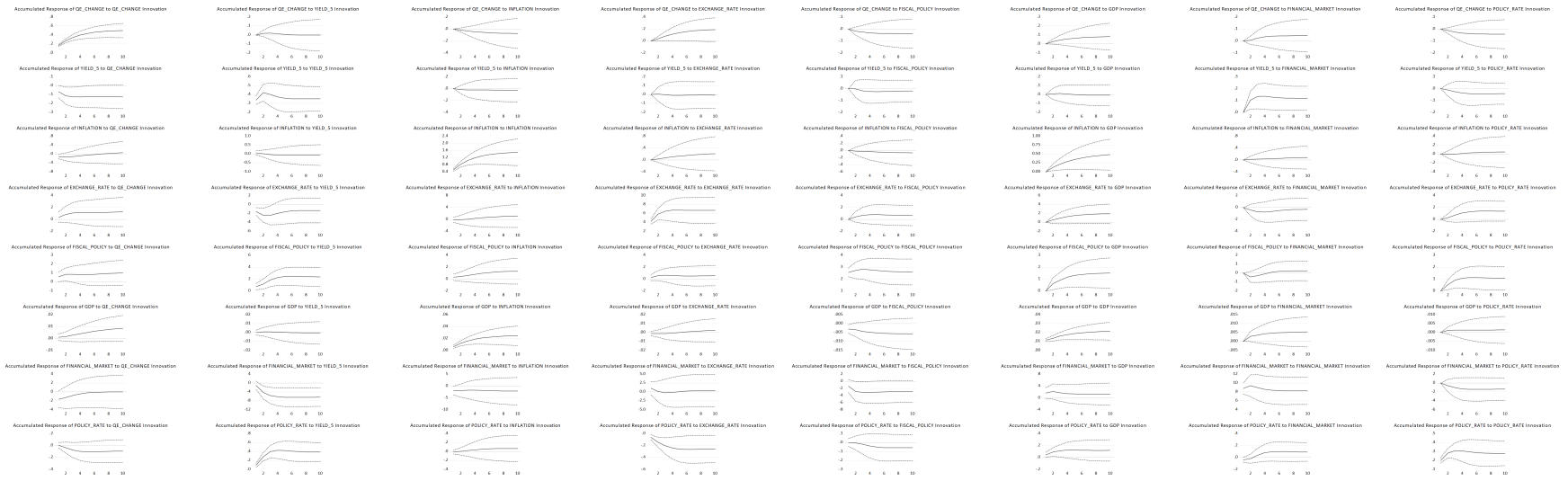


Figure 23: *SWE* five year model accumulated IRFs. Dashed lines indicates the 95 per cent confidence band. *x*-axis show quarters and *y*-axis indicates change in percentage points.

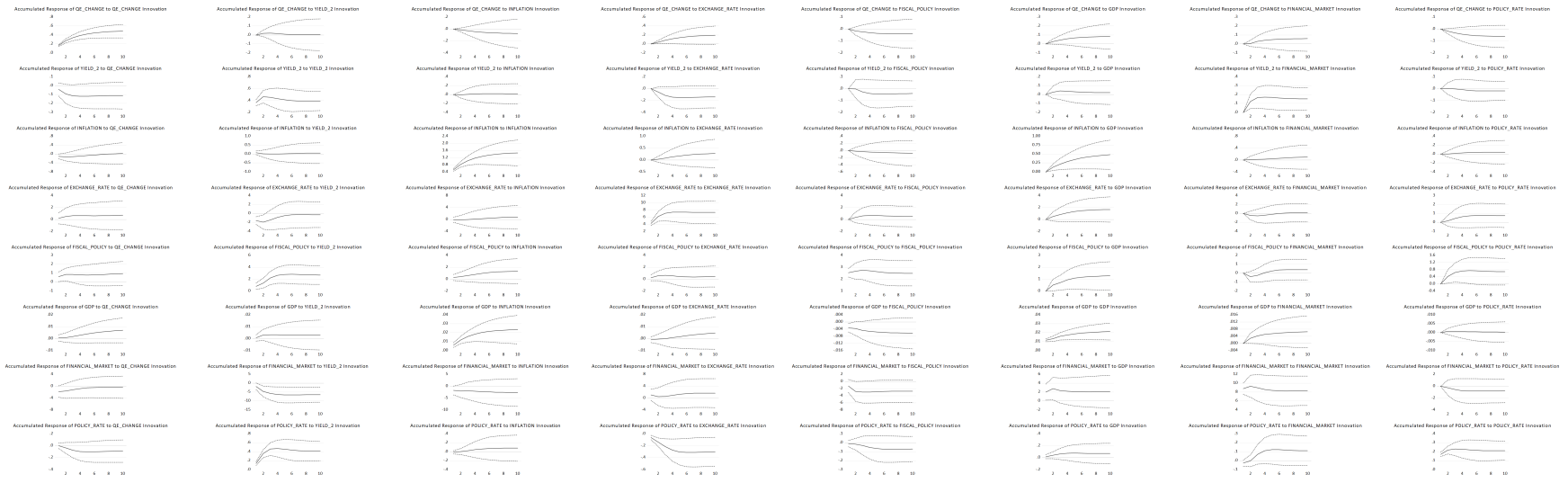


Figure 24: *SWE* two year model accumulated IRFs. Dashed lines indicates the 95 per cent confidence band. *x*-axis show quarters and *y*-axis indicates change in percentage points.

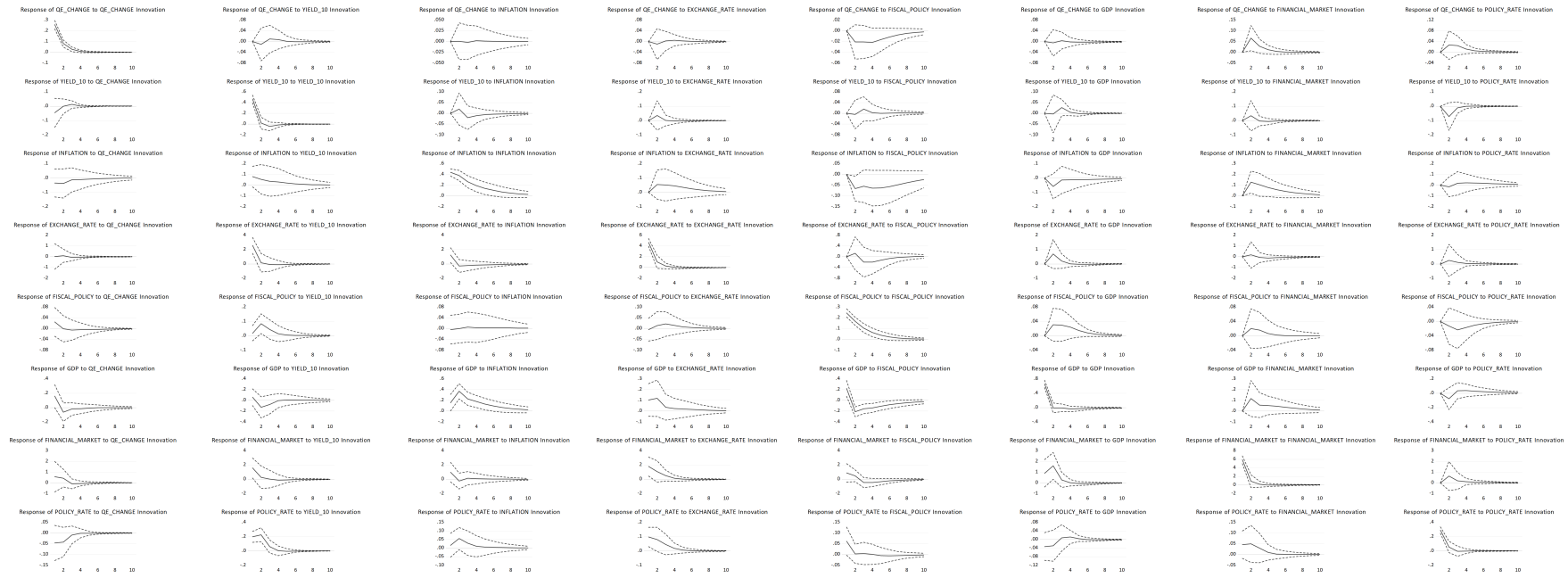


Figure 25: *AUS ten year model IRFs. Dashed lines indicates the 95 per cent confidence band. x-axis show quarters and y-axis indicates change in percentage points.*

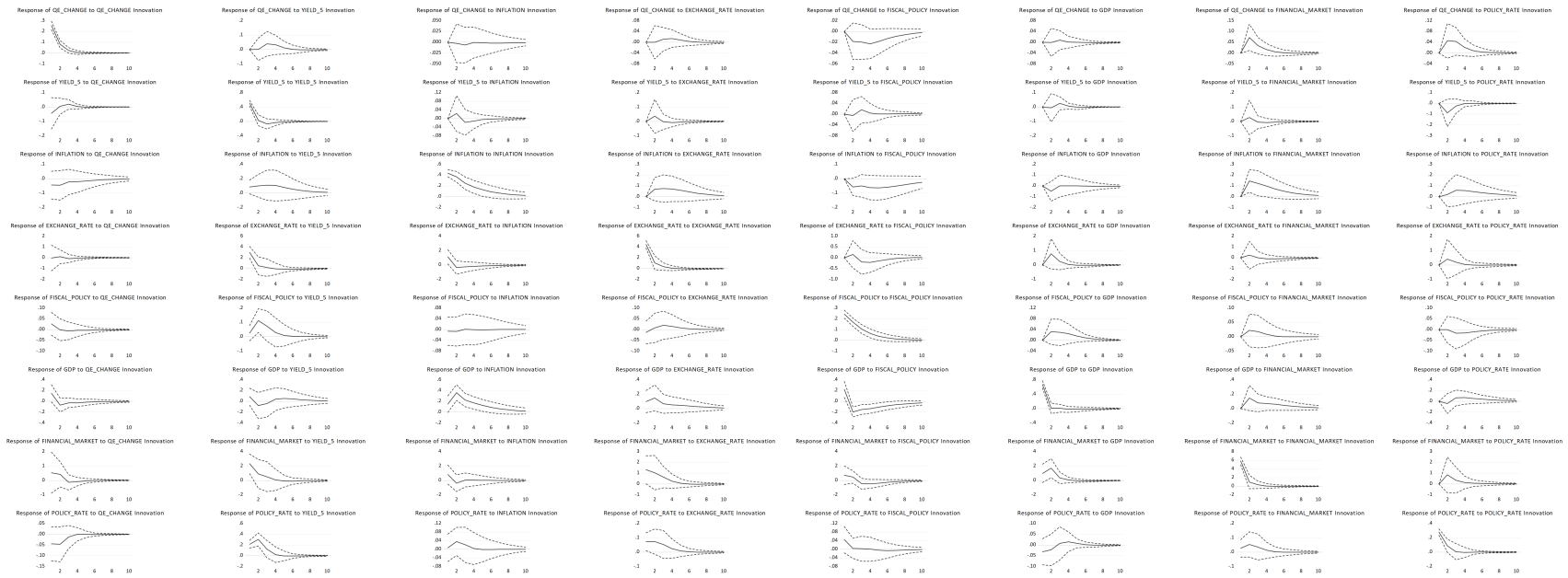


Figure 26: AUS five year model IRFs. Dashed lines indicates the 95 per cent confidence band. x-axis show quarters and y-axis indicates change in percentage points.

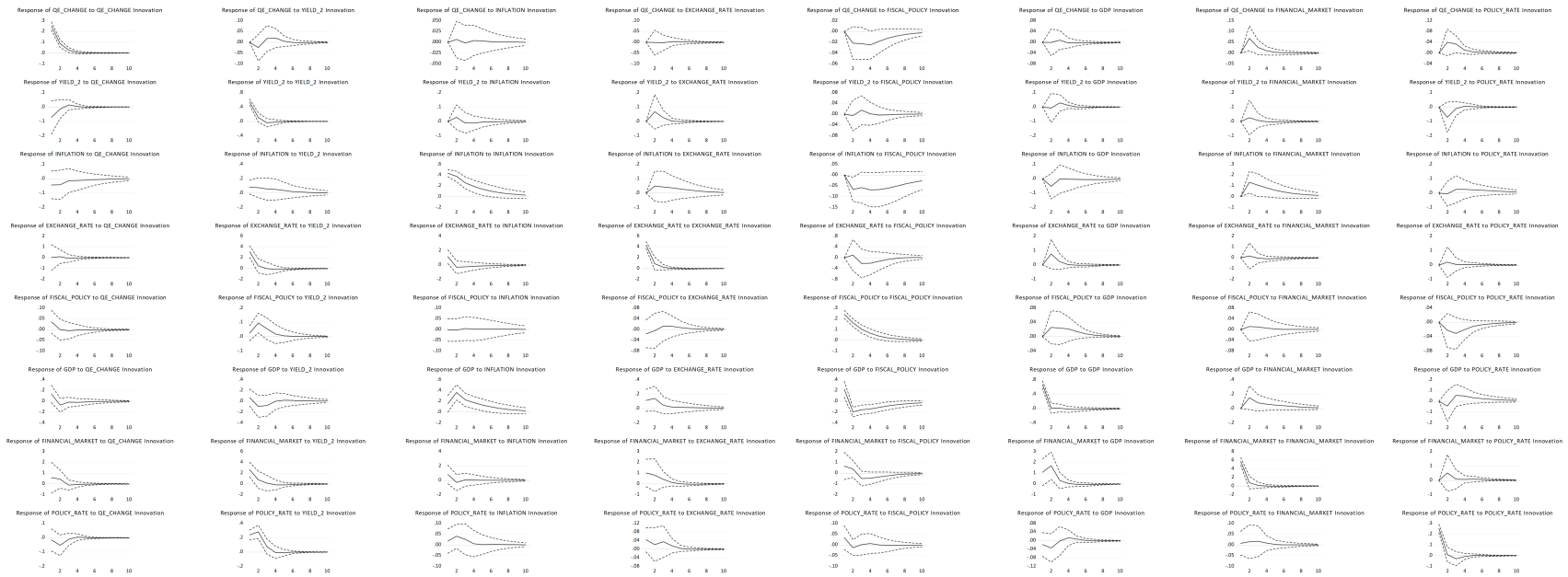


Figure 27: AUS two year model IRFs. Dashed lines indicates the 95 per cent confidence band. x-axis show quarters and y-axis indicates change in percentage points.

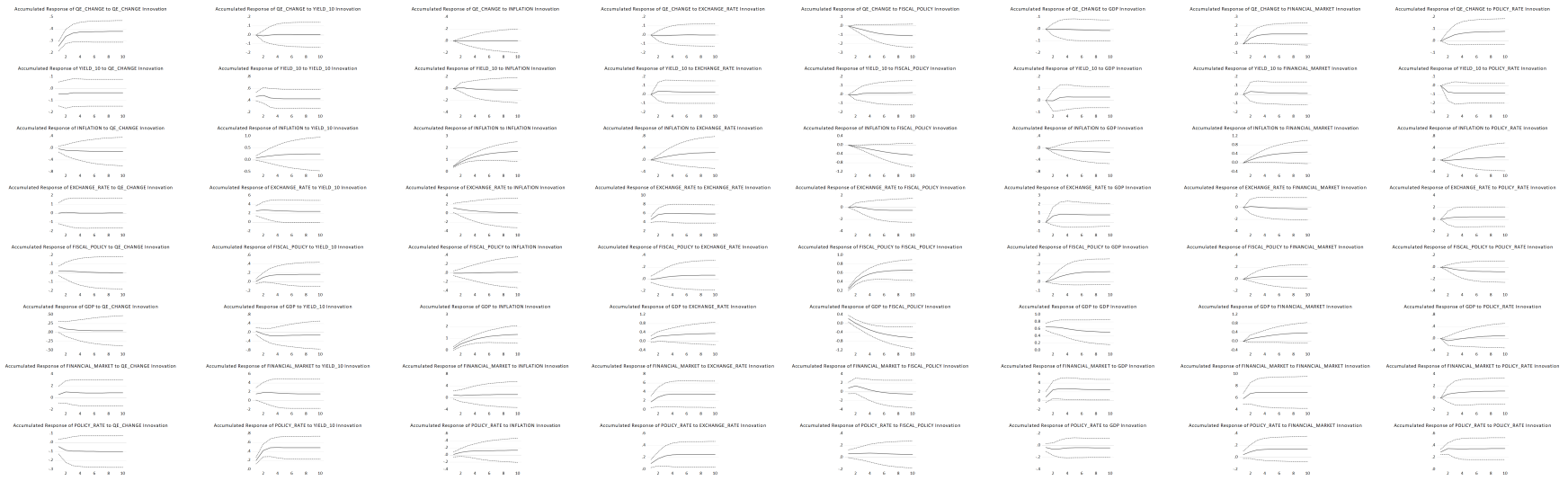


Figure 28: *AUS ten year model accumulated IRFs. Dashed lines indicates the 95 per cent confidence band. x-axis show quarters and y-axis indicates change in percentage points.*

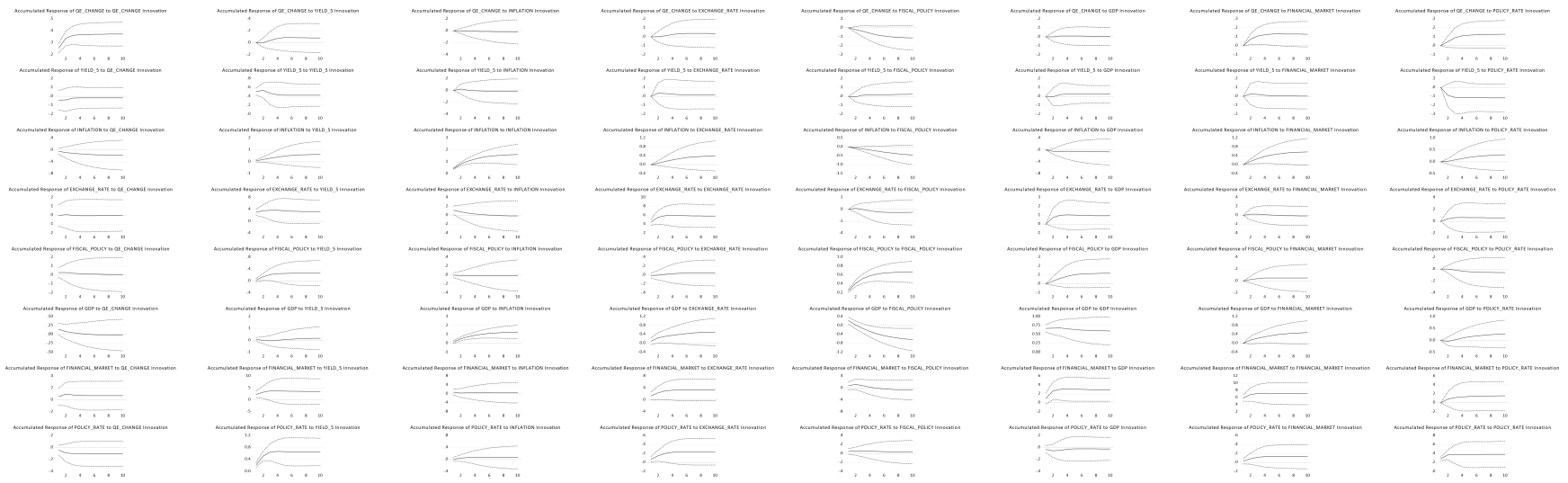


Figure 29: *AUS five year model accumulated IRFs. Dashed lines indicates the 95 per cent confidence band. x-axis show quarters and y-axis indicates change in percentage points.*

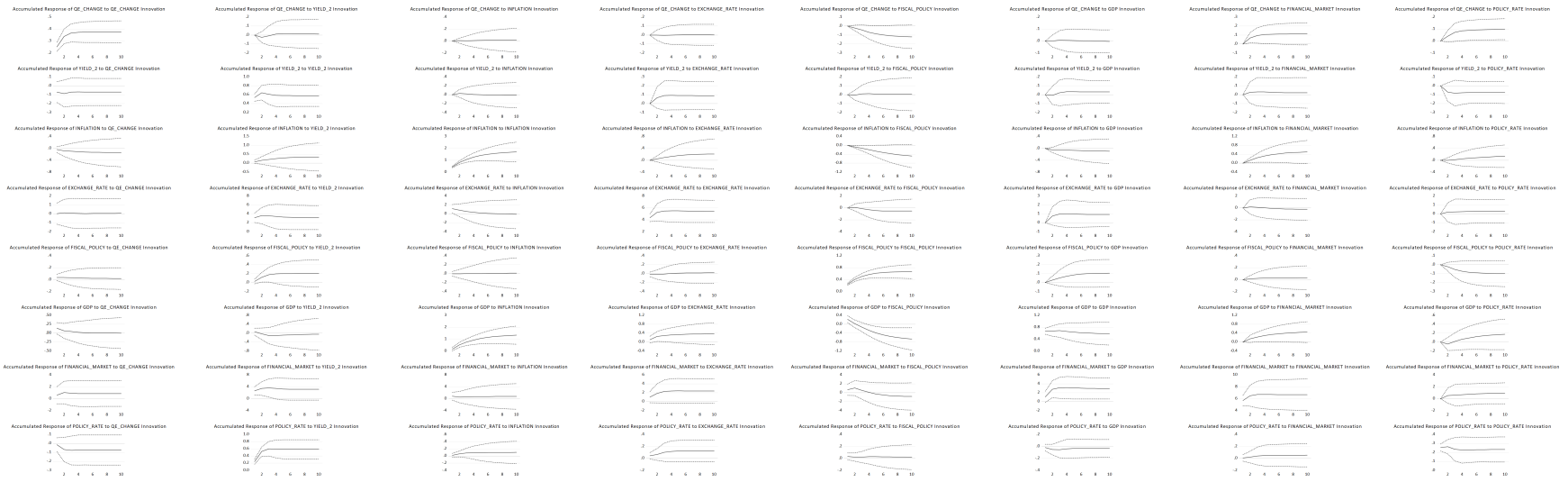


Figure 30: *AUS two year model accumulated IRFs. Dashed lines indicates the 95 per cent confidence band. x-axis show quarters and y-axis indicates change in percentage points.*

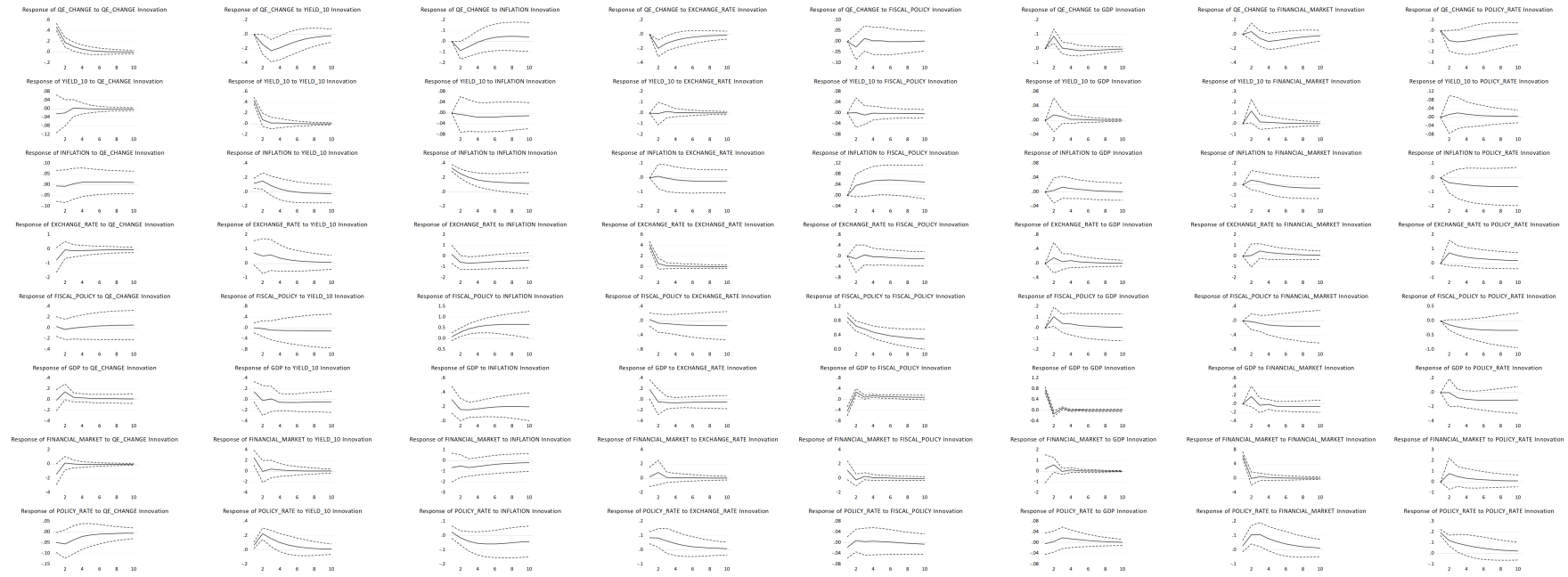


Figure 31: U.K. ten year model IRFs. Dashed lines indicates the 95 per cent confidence band. x-axis show quarters and y-axis indicates change in percentage points.

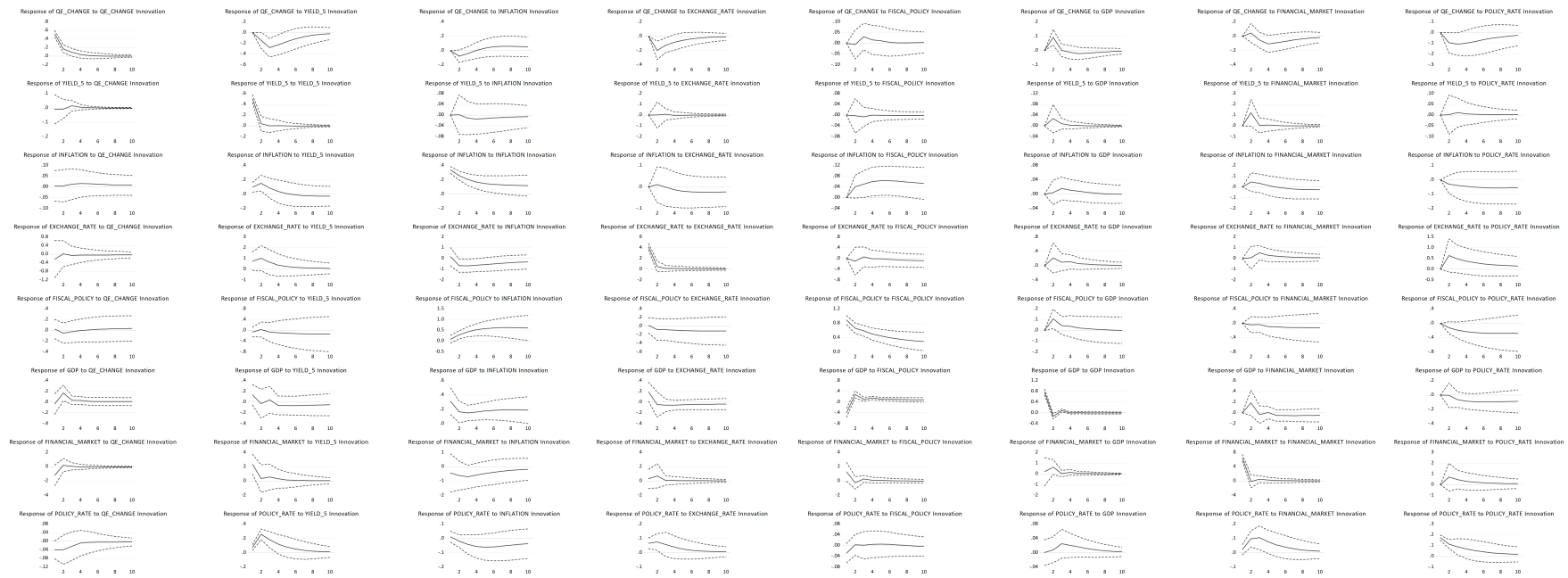


Figure 32: U.K. five year model IRFs. Dashed lines indicates the 95 per cent confidence band. x-axis show quarters and y-axis indicates change in percentage points.

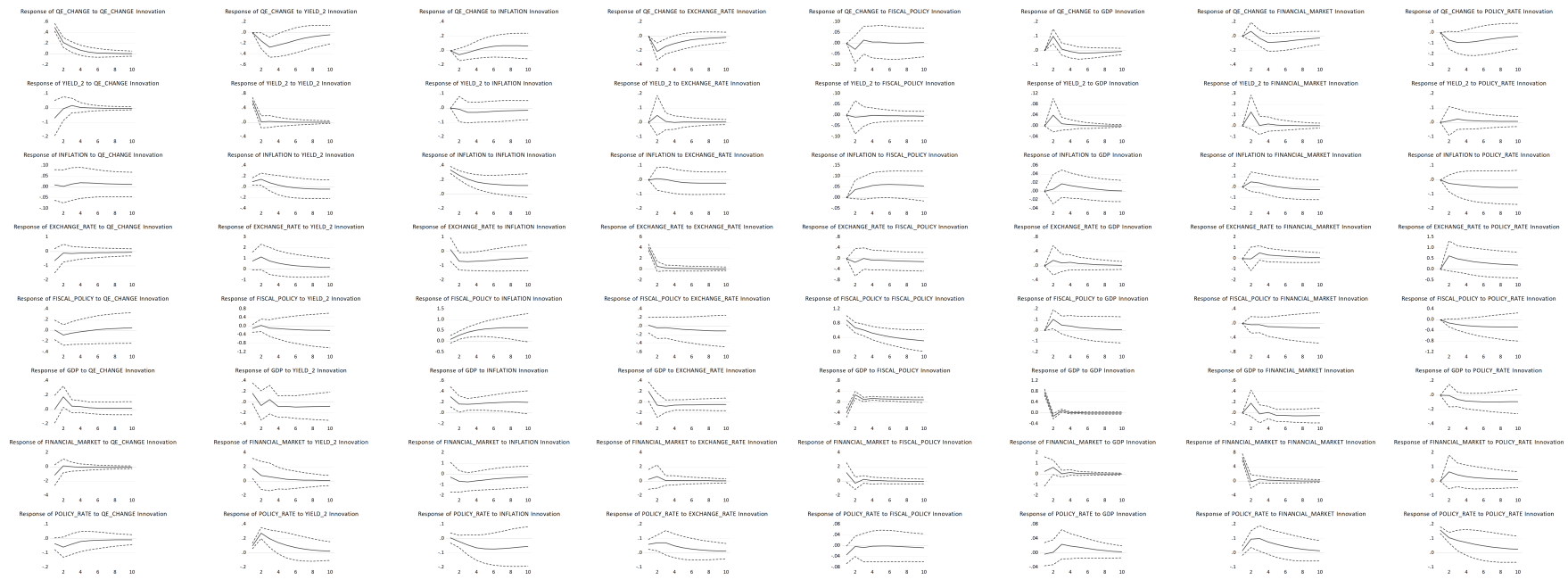


Figure 33: *U.K. two year model IRFs. Dashed lines indicates the 95 per cent confidence band. x-axis show quarters and y-axis indicates change in percentage points.*

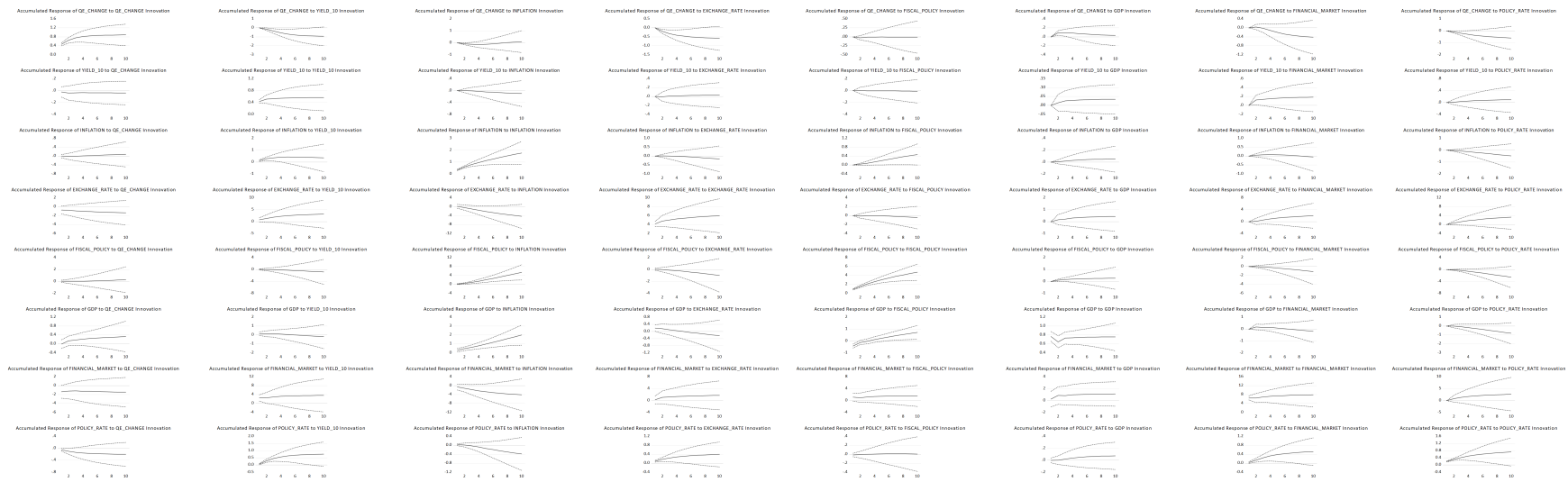


Figure 34: U.K. ten year model accumulated IRFs. Dashed lines indicates the 95 per cent confidence band. x-axis show quarters and y-axis indicates change in percentage points.

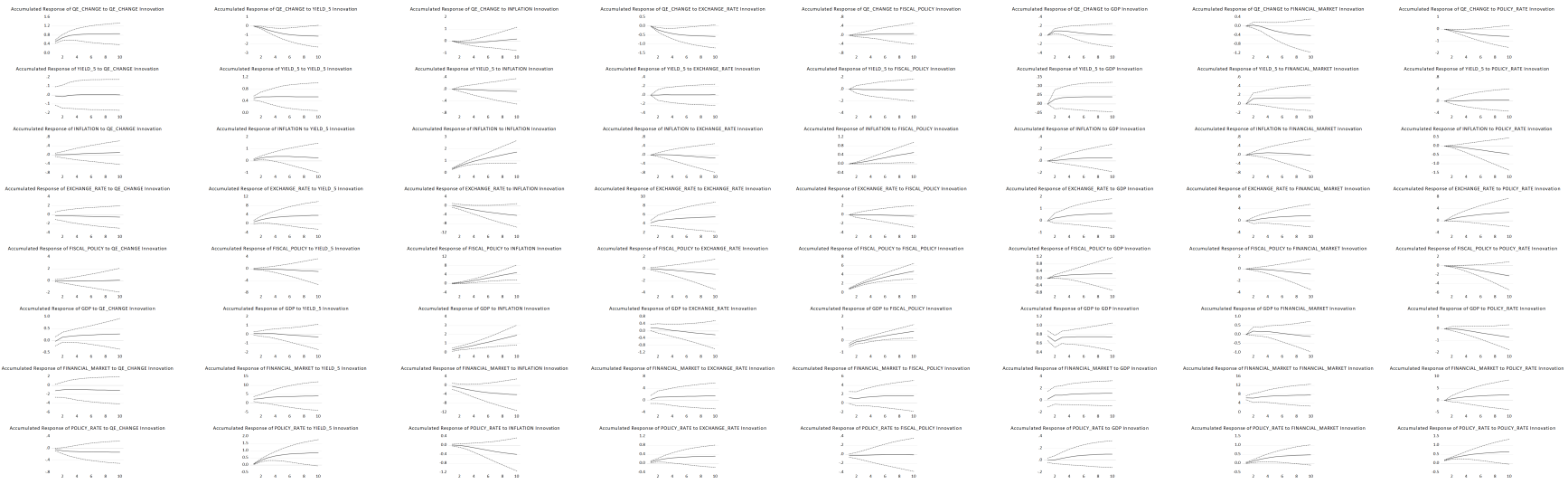


Figure 35: U.K. five year model accumulated IRFs. Dashed lines indicates the 95 per cent confidence band. x-axis show quarters and y-axis indicates change in percentage points.

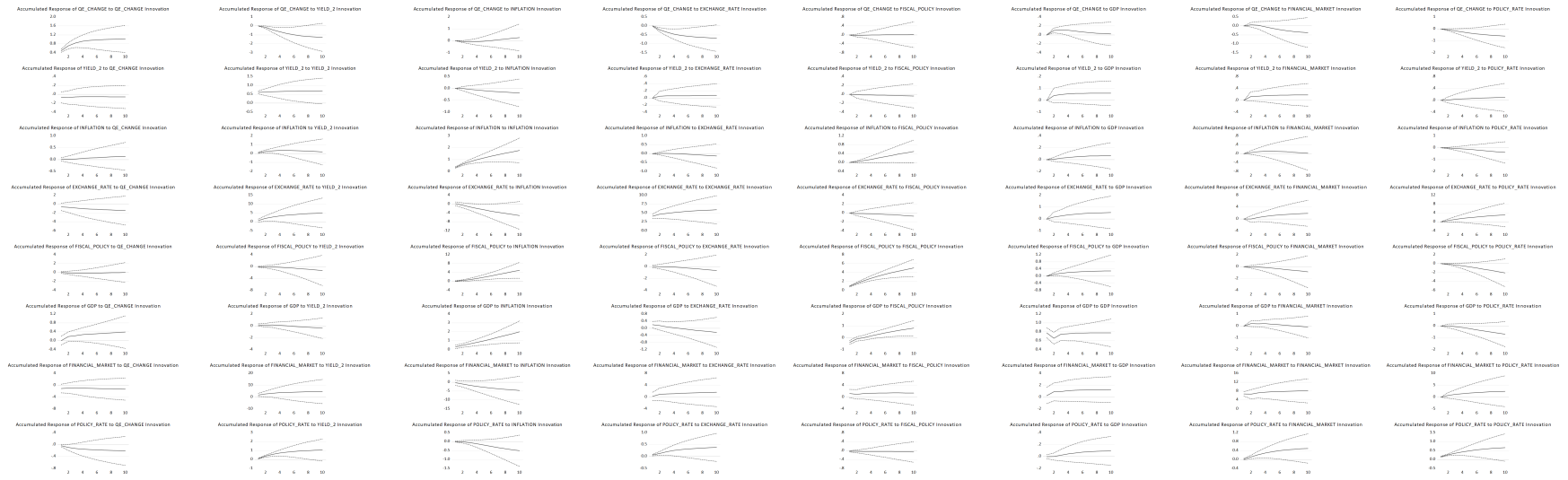


Figure 36: U.K. two year model accumulated IRFs. Dashed lines indicates the 95 per cent confidence band. x-axis show quarters and y-axis indicates change in percentage points.

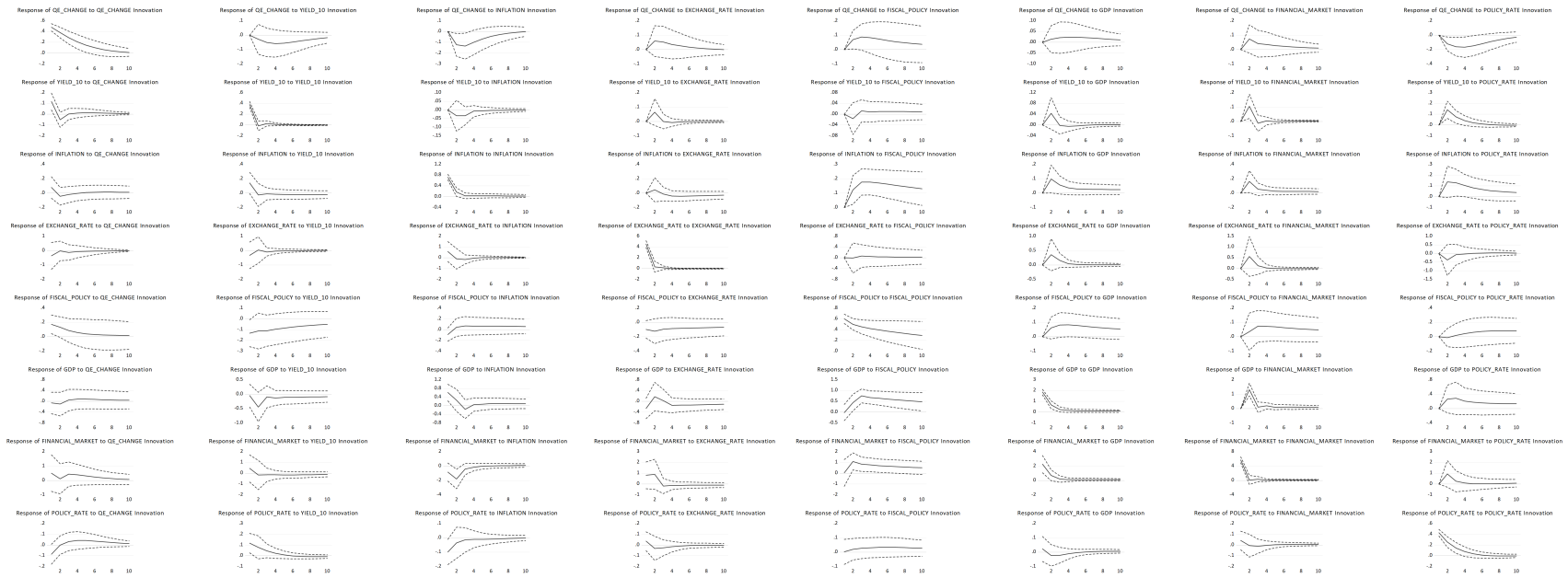


Figure 37: U.S. ten year model IRFs. Dashed lines indicates the 95 per cent confidence band. x-axis show quarters and y-axis indicates change in percentage points.

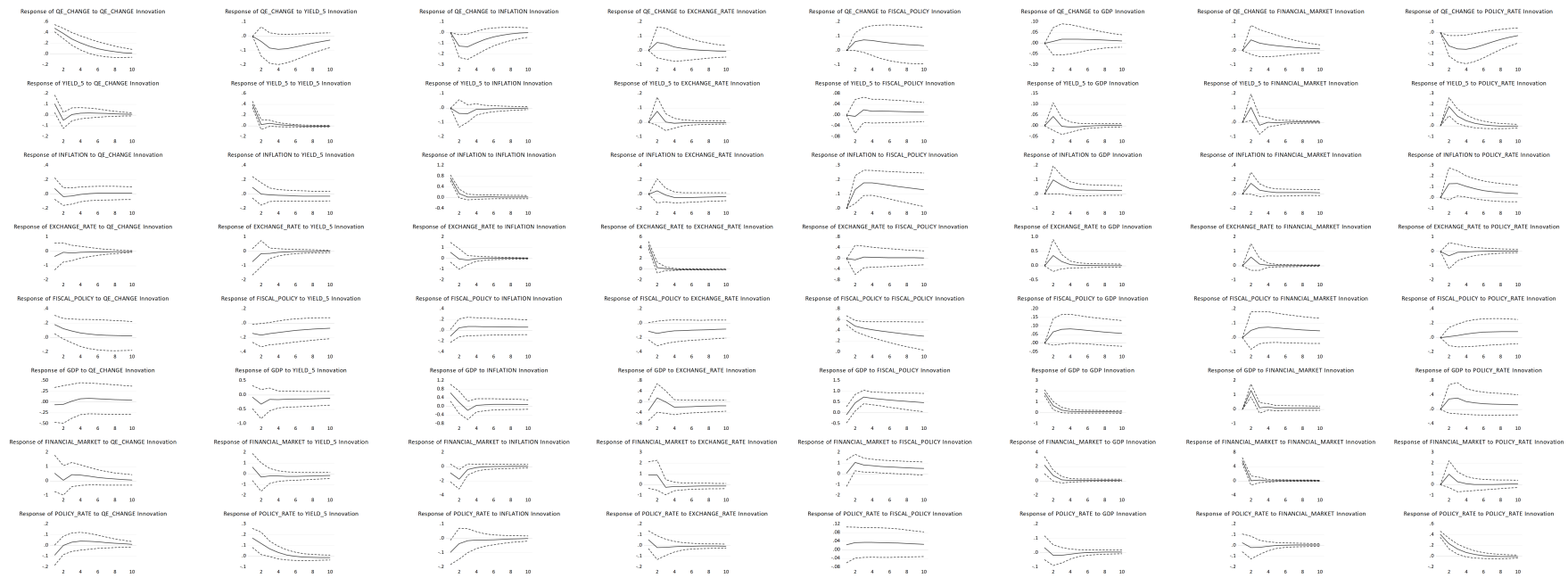


Figure 38: U.S. five year model IRFs. Dashed lines indicates the 95 per cent confidence band. x-axis show quarters and y-axis indicates change in percentage points.

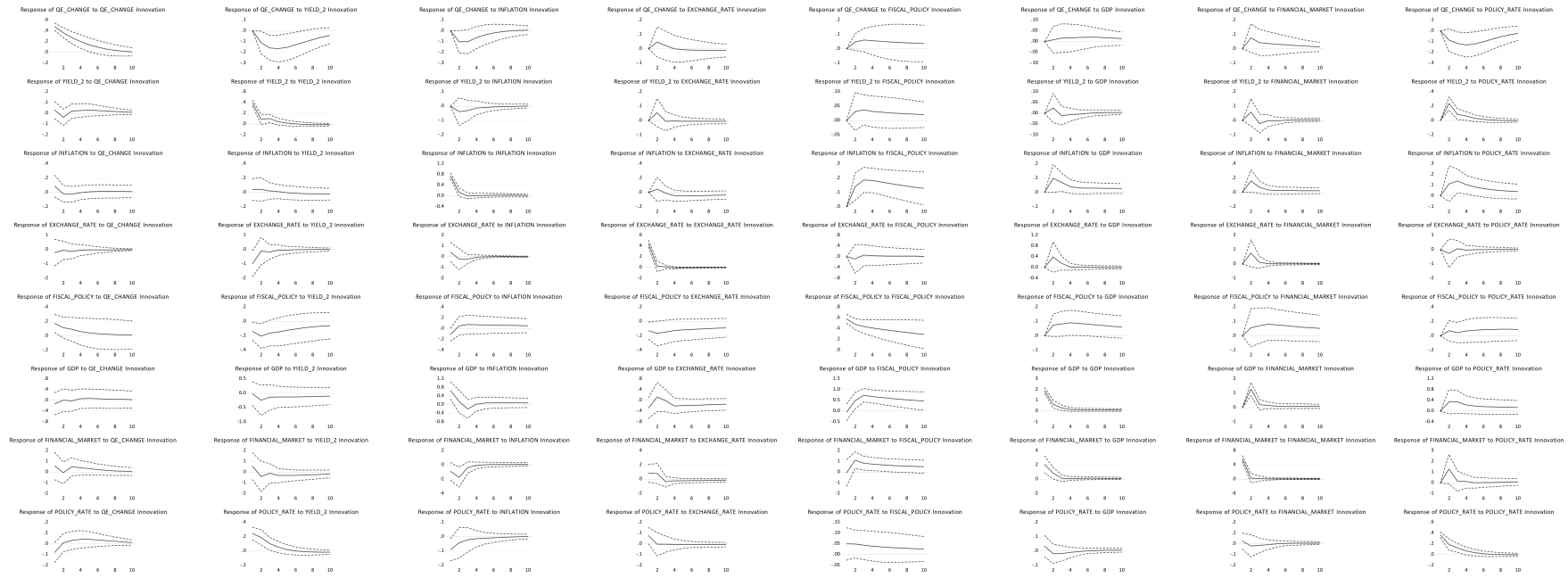


Figure 39: U.S. two year model IRFs. Dashed lines indicates the 95 per cent confidence band. x-axis show quarters and y-axis indicates change in percentage points.

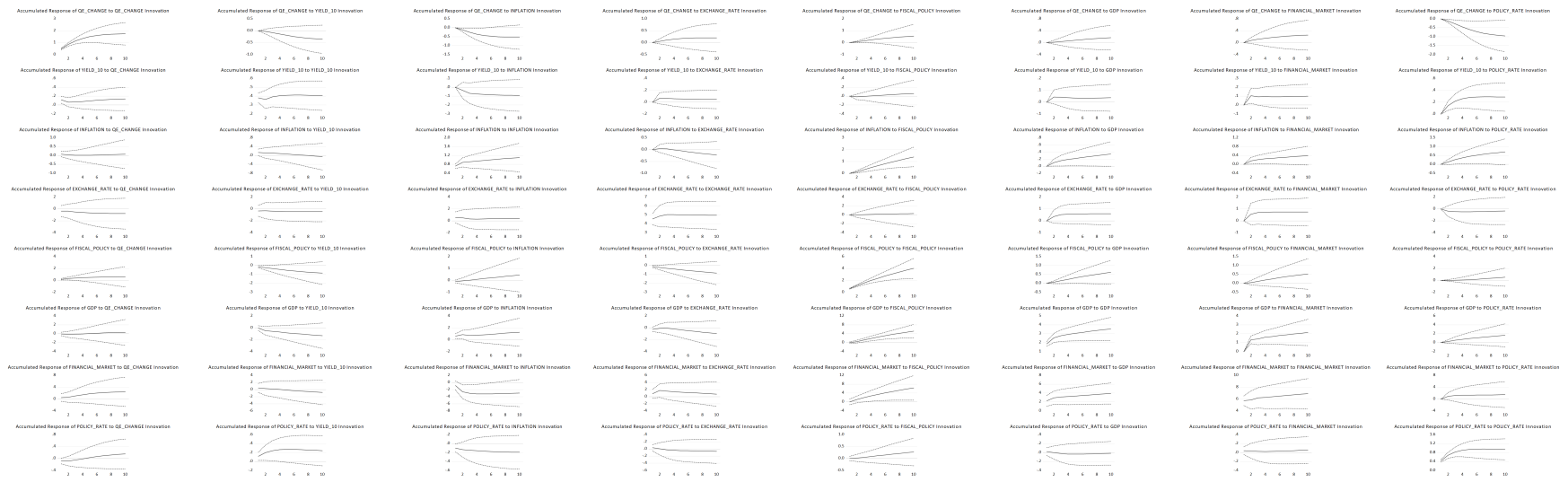


Figure 40: U.S. ten year model accumulated IRFs. Dashed lines indicates the 95 per cent confidence band. x-axis show quarters and y-axis indicates change in percentage points.

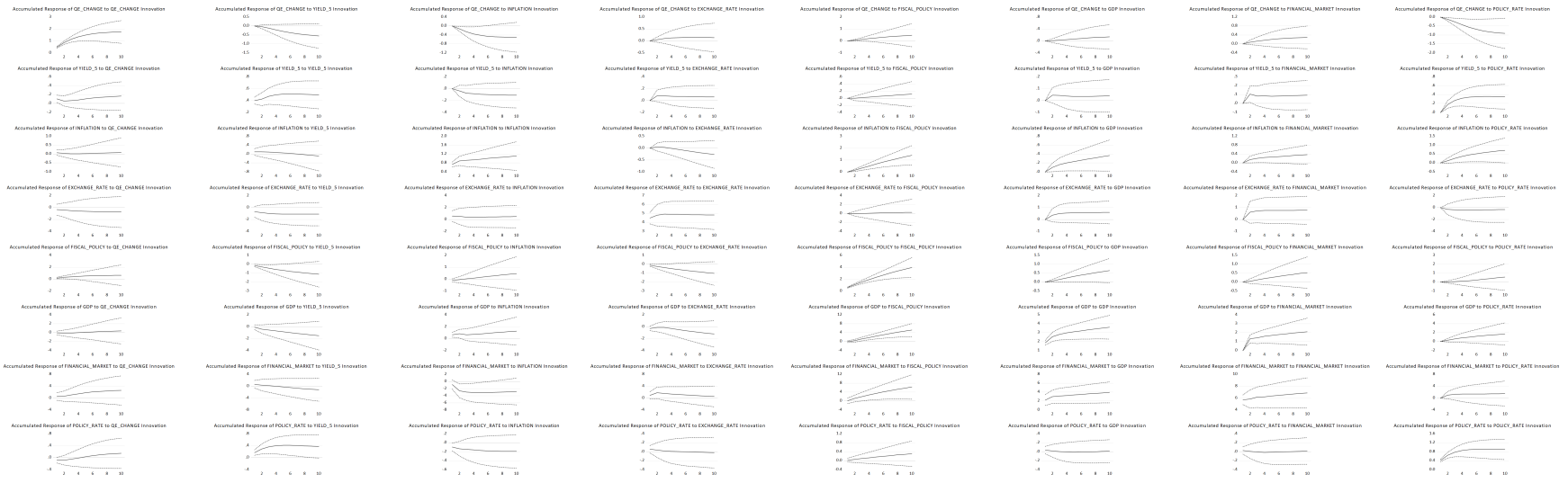


Figure 41: *U.S. five year model accumulated IRFs. Dashed lines indicates the 95 per cent confidence band. x-axis show quarters and y-axis indicates change in percentage points.*

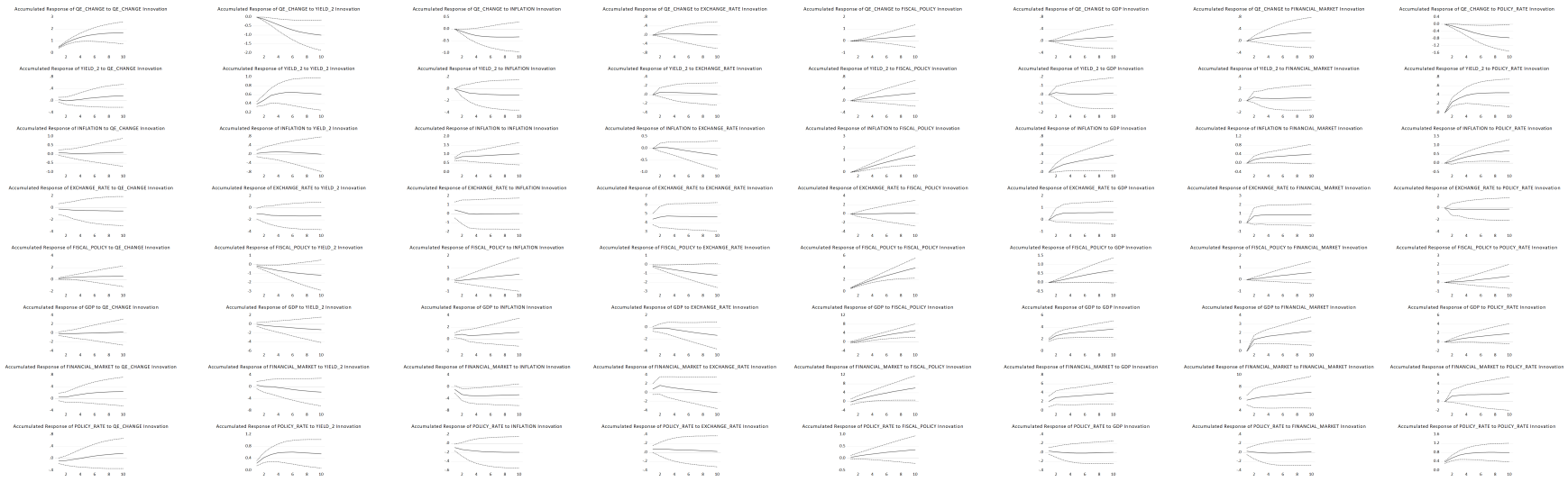


Figure 42: *U.S. two year model accumulated IRFs. Dashed lines indicates the 95 per cent confidence band. x-axis show quarters and y-axis indicates change in percentage points.*