

# UK MONETARY AND CREDIT POLICY AROUND THE RADCLIFFE REPORT

David Aikman, Oliver Bush and Alan M. Taylor

December 2015

PRELIMINARY AND INCOMPLETE

PLEASE DO NOT QUOTE OR DISTRIBUTE WITHOUT PERMISSION

## Abstract

The Radcliffe Report (1959) was the most important statement of the British establishment view that monetary policy was not up to the task of macroeconomic stabilisation and should be complemented by policies which acted directly on lending. It was published during a three decade-long experiment of using credit policies alongside changes in the policy rate. These non-price tools are similar to policies now being considered by macroprudential policymakers. We describe what these tools were and how they were used and use a largely hand-collected dataset and a novel identification strategy – factor-augmented local projections (FALPs) – to investigate their effects.

We find that, contrary to the views of Radcliffe Committee members, the impact of changes in the policy rate on activity and prices was of the same direction and of similar order of magnitude as found for later periods in the UK and USA. Further, monetary policy shocks appear to have had an important bearing on the path of inflation, particularly in the 1970s. Our results hint at a negative effect of credit policy on output via a supply channel, although the robustness of these results is questionable. Our results call into question policymakers' reliance on credit policies to stabilise output, inflation and the trade balance and raise questions about the consequences of this reliance on macroeconomic outcomes over this period. In contrast, our results suggest that policies that act directly on lending may be more suitable than monetary policy for financial stability policymakers.

David Aikman (Bank of England)

Oliver Bush (Bank of England and London School of Economics)

Alan M Taylor (UC Davis, NBER and CEPR)

The views expressed in this paper are those of the authors and not necessarily those of the Bank of England. The authors wish to thank Saleem Bahaj, Matthieu Chavaz, James Cloyne, Angus Foulis, Julia Giese, Peter Sinclair and Eugene White for helpful conversations and Casey Murphy, Consgor Osvay and Jenny Spyridi for excellent research assistance.

*But, when all has been said on the possibility of monetary action and of its likely efficacy, our conclusion is that monetary measures cannot alone be relied upon to keep in nice balance an economy subject to major strains from both without and within. Monetary measures can help, but that is all.<sup>1</sup>*

## **SECTION 1: INTRODUCTION**

The Report of the Committee on the Working of the Monetary System (1959), also known as the Radcliffe Report, was a publication of major importance in the history of UK monetary policy. Commissioned by the Chancellor and the outcome of two years of hearings, the Report was a wide-ranging survey of the structure and operation of the UK monetary and financial system. The number of academic citations it received within ten years of publication – around 2000<sup>2</sup> including a paper marking its tenth anniversary by Anna Schwartz (1969) – is testament to the stir it caused in academia. Whether or not it led to immediate significant changes in UK policymaking, it merits a chapter in the official history of the Bank of England (Capie, 2010), not least because it is an excellent guide to official thinking at the time. Ten years on, the Bank of England stated clearly that ‘the approach to policy has been similar to that of the Radcliffe Committee’<sup>3</sup> and arguably it took until the Thatcher Government for the Radcliffean approach to be abandoned completely.

What was the Radcliffean approach to monetary policymaking? First of all, don’t trust monetary policy to achieve the objectives of full employment, stable prices and external balance. The Report concluded that money was highly substitutable for other financial assets and therefore the effects of the policy rate on the demand for goods would be so small that relying on it alone to stabilise the domestic economy would ‘increase drastically the range of movements of rates of interest’.<sup>4</sup> Given the implications of such a policy for the volatility of gilt prices, the Committee warned that ‘there can be no reliance on this weapon [the policy rate] as a major short-term stabiliser of demand’.<sup>5</sup> The Bank of England still felt in 1969 that ‘in the present state of our knowledge, it looks unlikely that we shall ever be able to rely

---

<sup>1</sup> Committee on the Working of the Monetary System (1959), paragraph 514, page 183.

<sup>2</sup> Based on a Google Scholar search.

<sup>3</sup> Bank of England (1969).

<sup>4</sup> Committee on the Working of the Monetary System (1959), paragraph 489, page 174.

<sup>5</sup> Committee on the Working of the Monetary System (1959), para 498, page 177.

primarily on monetary policy for short-term stabilisation of the economy and the balance of payments'.<sup>6</sup>

Second, use instruments which work more directly on lending alongside Bank Rate. By affecting the liquidity positions of lenders, these tools could influence 'the state of liquidity of the whole economy', of which the supply of money was merely a part. In the twenty years that followed Radcliffe, alternative monetary policy tools included debt management, calls for special deposits (similar to remunerated reserve requirements), restrictions on the terms of hire purchase lending, qualitative guidance over and quantitative limits on lending and calls for supplementary special deposits (the 'Corset', similar to unremunerated reserve requirements). Many of the policies under consideration by today's macroprudential policymakers are strikingly similar to these credit policies.

The focus of this paper is the use and effects of monetary and credit policies in the three decades around the Radcliffe Report. In light of the consensus that has since developed on the significant effects of monetary policy in normal times (Romer and Romer, 2013), we would be surprised to find that Radcliffe Committee members were right to be as sceptical as they were about monetary policy. Nevertheless, even critics of the Report paint a picture in which movements in the policy rate was offset by simultaneous increases in the money supply to prevent falls in gilt prices (Hodgman, 1971). Other reasons for smaller effects also spring to mind. First, the exchange rate channel was shut down for over half this period as Bretton Woods was still operating. So monetary policy did not stimulate exports and rotate domestic demand towards domestically-produced goods and services. Second, monetary policy may have had less impact on bond yields than in more recent periods as market participants found it harder to make inferences about the implications of a change in the policy rate for the future path of monetary policy.<sup>7</sup> If these hypotheses have some truth to them, the effects of monetary policy over our period of study (the 1950s, 60s and 70s) may have been smaller than in other periods.

In contrast to monetary policy, there is far less literature on credit policies using modern methods to which we can compare and contrast our results. Two recent examples are Elliott et al (2013) and Monnet (2012 and 2014a). Elliott et al document the extensive use of credit policies in the US from the 1920s onwards. A range of tools were used in the US including

---

<sup>6</sup> Bank of England (1969).

<sup>7</sup> Ellis et al (2014) find that bond yields reacted more to policy shocks after inflation targeting was introduced in the UK.

loan to value ratios and maturity limits, margin requirements, interest rate ceilings, reserve requirements and moral suasion to reduce lending in booms. Elliott et al's preliminary analysis finds that tighter credit policies lowered consumer debt, while loosening did not raise it. In France, reserve and liquidity requirements and credit ceilings were frequently used. Monnet also documents the used on non-standard monetary measures such as individual bank discount ceilings. Monnet finds that a tightening in non-price monetary and credit policy leads to a fall in lending, output and prices and an improvement in the current account balance. Outside of France and the US, Monnet (2014b) describes the widespread use of similar credit policies in Europe, with the notable exception of Germany.

The main contributions of this paper are to catalogue the use of credit policies in the UK, to assemble a new monthly UK macroeconomic dataset covering the 50s, 60s and 70s, to introduce a novel identification strategy which we call factor-augmented local projections and to estimate the effects of UK monetary and credit policies over this period.

In Section 2, we document the various credit policies that were used in the UK and show how, as envisaged by the Radcliffe Report, they tended to be varied to support changes in the policy rate.

In the remainder of the paper, we investigate the effects of changes in monetary and credit policy. Section 3 describes our approach to identification which relies on factors to summarise the data available to policymakers and local projections to trace out impulse response functions (IRFs).

In Section 4, we discuss the data used, in particular our new monthly dataset from 1952 to 1979.

Section 5 presents our estimates of the effect of tighter monetary and credit policy on measures of lending, output, inflation and external balance. As three of the five objectives of monetary policy according to the Radcliffe Report were maintaining price stability, steady economic growth and strengthening the external position,<sup>8</sup> our results cast light directly on the contribution monetary and credit policies could have made to meeting the objectives as laid out by the Radcliffe Committee. Our results suggest that increases in the policy rate depressed manufacturing output and consumer prices and improved the trade balance. The effects of credit policies are harder to discern, but we found robust evidence of a significant

---

<sup>8</sup> Committee on the Working of the Monetary System (1959), paragraph 69, page 22.

negative impact on bank lending and some results consistent with a depressing effect on output via a supply channel.

In Section 6 we use our estimated IRFs to decompose the shocks driving lending, output and inflation in the 1960s and 1970s. We find that monetary and credit policies were not dominant drivers of credit and output cycles, but played an important role in the pickup in inflation in the 1970s.

In Section 7 we investigate the effect of monetary and credit policies on variables which may be important indicators of systemic risk. While credit policies may be less well-suited to achieving monetary stability than monetary policy, our evidence suggests they may be better-suited to achieving financial stability.

Section 8 concludes and raises further related questions of interest.

## SECTION 2: DESCRIPTION AND USE OF TOOLS

### 2.1 Description of credit policy tools

Four main cyclical credit policy tools were used over this period:

- special deposits;
- hire purchase restrictions over minimum downpayment and maximum repayment terms;
- credit ceilings;
- and the supplementary special deposits scheme (the ‘Corset’).

Banks over this period were also subject to various other liquidity requirements, including a uniform minimum liquidity ratio and cash ratio (Bank of England, 1962a). However, the calibration of these requirements was largely unchanged over the period, and so they have been excluded from this analysis.<sup>9</sup>

#### 2.1.1 *Special deposits*

In July 1958, the Bank of England announced that quantitative ceilings on bank credit – which had been in effect for the London clearing banks since 1955 – were being discarded in favour of a new tool of credit restraint: the special deposits scheme. The scheme was first employed nearly two years later in April 1960 and, despite initially being looked on as ‘a temporary arrangement pending the recommendation of the Radcliffe Committee’ (Capie, 2010), became a frequently-used lever of macroeconomic influence until its abandonment in 1980.

The role of special deposits was to influence the liquidity of the banking system and hence its ability to expand credit. Banks were requested to place deposits at the Bank of England, in an amount proportional to their deposit base, at an interest rate close to the Treasury bill rate.<sup>10</sup> They were given a period of time to comply with such requests: about 60 days on average when policy was being tightened and about 20 days when policy was loosened. The

---

<sup>9</sup> From 1946, the clearing banks agreed to maintain a minimum reserve-to-deposit ratio of 8 per cent. From 1951, the clearing banks agreed to maintain a liquid asset ratio of reserves, call money and Treasury and commercial bills of 28-32 per cent of their deposit liabilities; from 1957, this agreement was made more precise when the liquid asset ratio was set at a minimum of 30 per cent; in 1968, this was reduced to 28 per cent (Capie and Webber, 1985).

<sup>10</sup> There was no statutory basis for these requests; rather, the tool was operated on what amounted to a voluntary basis.

tool was intended to work by acting on banks' minimum liquidity ratios: special deposits did not count as liquid assets for the purposes of calculating these ratios, so when the tool was applied, a bank whose liquidity ratio was near the minimum would be forced either to curtail its advances or sell investments (mainly government securities). Over time, the authorities attempted to restrict banks' degrees of freedom in adjusting to these calls by requesting that they were not met by selling investments. The scope of the scheme was limited for practical reasons to the London and Scottish clearing banks; at the time, these institutions held roughly 85 per cent of sterling deposits in the UK economy.

### *2.1.2 Hire purchase controls*

Hire purchase, the practice of purchasing durable goods via instalment credit, had become an increasingly important source of finance for consumer durables by the late 1950s and the sector was growing rapidly. For instance, nearly a quarter of all new cars purchased at this time – and a much higher proportion of second-hand vehicles – were bought on hire purchase. The Board of Trade, a government department, exercised control over the terms of hire purchase credit by stipulating minimum downpayments and maximum repayment periods for different categories of goods. These controls were used actively for much of the 1950s and despite the Radcliffe Report's verdict that they were suitable for use only for short periods at times of emergency, continued to be employed by the Board of Trade throughout the 1960s and 70s until their removal in 1982.

The principal advantage of hire-purchase controls lay in the reach they provided beyond the clearing banks to the specialist hire-purchase finance companies that funded approximately three-quarters of the stock of hire-purchase debt. While the larger finance houses took some advances from banks, the majority of their funding came from issuing deposits.<sup>11</sup> Controls on clearing banks' advances therefore had only a small effect on the provision of hire-purchase credit by finance companies. Applying controls to banks through special deposits, but not to the finance houses, therefore generated competitive distortions and was a constant source of grievance for members of the Committee of the London Clearing Banks (Capie, 2010). The Bank shared this concern; on the first occasion that special deposits were called, it described the desirability 'that restraint should be applied not only to the banks, but as widely as possible over the whole field of short-term lending' (Bank of England, 1960).

---

<sup>11</sup> In June 1962, deposits accounted for nearly two-thirds of the large companies' liabilities; smaller finance houses, by contrast, were much more reliant on bank advances to fund their balance sheets. See Bank of England (1962b).

A second purported advantage of hire-purchase controls was that they could be targeted: terms were frequently varied by particular classes of good (eg cars, furniture etc) depending on where problems were emerging. The flip-side of this flexibility, however, is that policy measures often appeared to be unduly interventionist.

### *2.1.3 Credit ceilings*

Credit ceilings were frequently used in the 1960s and 70s as an emergency tool to reduce aggregate demand when balance of payments deficits reached crisis proportions. Direct requests to the deposit banks to restrict their advances had been made at various times in the 1950s. These had been a source of general dissatisfaction, particularly at the Bank. Yet, with the sterling crisis of 1964, they were back on the agenda as the more orthodox tools were thought inadequate; thereafter, they remained an almost continuous feature of the landscape until the Competition and Credit Control reforms of 1971.

The modalities of lending ceilings were typically set out in letters from the Governor of the Bank to the main banking and finance associations. The first such request took the form of a purely qualitative guidance, highlighting that ‘the rate of increase in advances should decline’ and specifying exempted loan categories the authorities wished to see favoured, such as those funding exports or the manufacturing industry. Later requests contained explicit quantitative ceilings on the permissible rate of growth of advances over a specified period.

The practical difficulties of implementing a regime of credit ceilings were colossal. One problem lay in extending the scope of the restraint beyond the clearing banks to relevant nonbank financial intermediaries. Restraint letters were sent to the Finance Houses Association, the Acceptance Houses Committee and the London Discount Market Association, but the Bank had no formal power to enforce its requests to these nonbanks. A second problem arose when the clearing banks repeatedly overshot their lending targets, a fact that they plausibly put down to customers making use of existing credit facilities (Goodhart, 2014).<sup>12</sup> As a result of these facilities, a significant component of aggregate lending was demand-determined.

---

<sup>12</sup> The lending targets had no statutory basis, as was common with most financial regulation of the time. According to Capie (2010), the possibility of issuing a formal directive was raised, but dropped for fear of ‘changing the nature of the relationship between the Bank and the banks’.



#### *2.1.4 Supplementary special deposits*

The supplementary special deposits (SSD) scheme imposed penalties on banks whose interest-bearing eligible liabilities grew faster than a prescribed rate.<sup>13</sup> The penalties took the form of requirements to lodge non-interest-bearing supplementary special deposits with the Bank; these penalties were large and became progressively more severe the greater the excess over the prescribed growth of eligible liabilities and they ranged from 5-50 per cent as the amount of excess growth increased. This had the effect of forcing banks either to accept lower profits or even losses on additional lending, or else to widen their lending margins. The scheme applied in principle to all ‘listed’ banks and deposit-taking finance houses operating in the UK, but small institutions and Northern Irish banks were exempt.

The scheme had loopholes. First, since the discount houses were not subject to the SSD scheme, money at call held by the banks with the houses (a reserve asset) could be redesignated as money not at call (not a reserve asset), thereby reducing the banks’ total interest-bearing eligible liabilities. These transactions could continue until the banks’ excess reserve assets were exhausted. Second, banks could fund discount houses’ purchases of commercial bills or other assets from the banks, in effect shifting lending from the banks to the discount houses. Ultimately, these transactions were constrained by the so-called ‘undefined assets multiple’ – essentially a leverage ratio for the discount houses. There is some evidence that these loopholes were exploited: SSD penalties were paid only when the banking system as a whole was under reserve asset pressure and the discount houses were close to their undefined assets limits.

## **2.2 Use of tools**

### *2.2.1 Creating an aggregate credit policy index*

To show how credit policies were varied and estimate their effects, we have constructed a credit policy index. The first step is to create sub-indices for the four categories of policy listed above. The special deposits tool was varied on a continuous scale (percentages of deposits / eligible liabilities), so no judgement is needed here. Although banks were given notice of calls for special deposits (typically around 60 days), we expect that their behaviour

---

<sup>13</sup> Interest-bearing eligible liabilities were essentially equal to interest-bearing sterling deposits. They were taken to be the marginal source of funding to meet fluctuations in the demand for credit.

would be affected immediately, so we use the timing of announcement rather than implementation.

For hire purchase controls, we create an index, defined as the weighted average of controls applied to cars and other goods; within each category of good we follow Allard (1974) in using an index of the weighted average of the required downpayment and the implied monthly instalment, ie

$$HP_t = \omega_1 \left( \omega_2 d_t^{\text{non-car}} + (1 - \omega_2) \left( \frac{1 - d_t^{\text{non-car}}}{T_t^{\text{non-car}}} \right) \right) + (1 - \omega_1) \left( \omega_2 d_t^{\text{cars}} + (1 - \omega_2) \left( \frac{1 - d_t^{\text{cars}}}{T_t^{\text{cars}}} \right) \right)$$

where the  $\omega$ s are the weights, the  $d$ s are the required downpayments and the  $T$ s are the limits on the repayment periods. We set  $\omega_1 = 0.5$  and  $\omega_2 = 0.25$ .

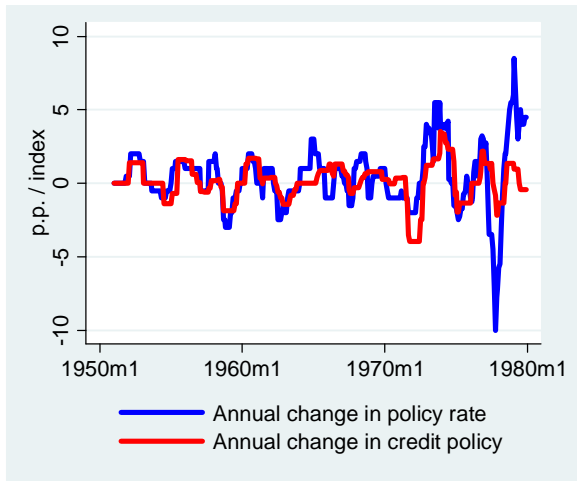
For the ‘discrete’ policy tools in our set – credit ceilings and the supplementary special deposits scheme – the coding task is a little less straightforward. One issue concerns how to treat policy expectations. Consider a situation in which the authorities apply a credit ceiling at time  $t$  and accompany this with a statement that the ceiling will remain in force until  $t + T$ . Obviously this should be classified as a ‘1’ at  $t$ , but what about at  $t + T$ ? One could apply a ‘-1’ upon removal of the ceiling on the grounds that policy is now looser; alternatively one could apply a ‘0’, taking the view that the removal of the ceiling was baked in at  $t$  and hence should not be treated as a fresh impetus when it occurs. The former is more consistent with how we code special deposits and hire purchase controls above: market participants are likely to have had some expectation about the likely duration of these policies, which we do not take into account in our coding scheme. So, in what follows, we effectively ignore expectations when coding these policy actions, and instead apply ‘1’s and ‘-1’s as and when policy changes occur. A variant of this issue occurs when a credit ceiling is extended beyond its original expected termination date. Consistency with the above dictates that the extension, provided the terms are exactly as before, is treated as a ‘0’.

### 2.2.2 *Relationship between monetary, credit policy and macroeconomic variables*

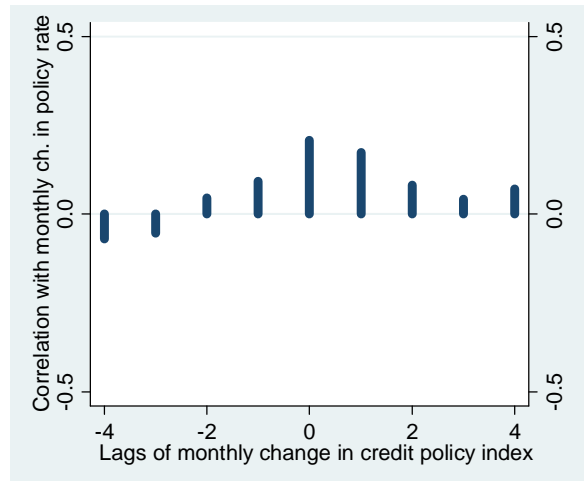
In line with the thinking at the time of the Radcliffe Report, credit policies were used to support the policy rate. Chart 1 shows a positive relationship between annual changes in the

policy rate and in our credit policy index. At a monthly frequency, the correlation is not particularly high, with a contemporaneous correlation coefficient of 0.2 (Chart 2). This is important for us to be able to investigate the effects of monetary and credit policy separately.

**Chart 1: Policy rate and credit policy**



**Chart 2: Policy cross-correlogram**



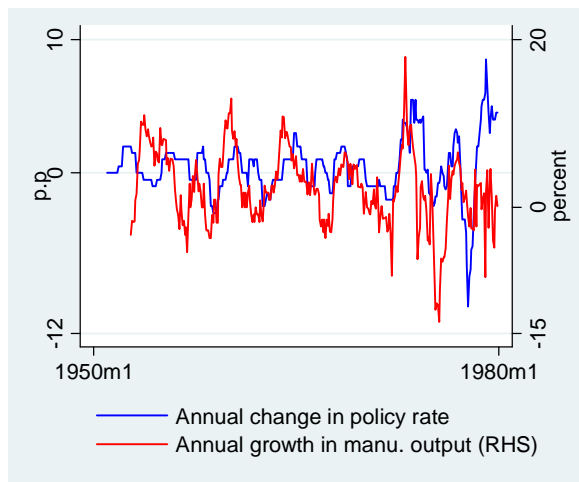
In our sample, there were two very different regimes as far as the reaction function of monetary and credit policies was concerned. Up until the early 1970s, there was a clear nominal anchor provided by the Bretton Woods exchange rate system. The ongoing risk of exchange rate crises, which crystallised several times over the period, disciplined the use of monetary policy, with sharp tightenings often related to pressure on sterling. The left-hand portions of Charts 3, 4 and 5 show the tight correlations between policy and measures of the three policy objectives laid out in the Radcliffe Report.

Following the end of Bretton Woods, the monetary policy framework was far less clear and the relationship between policy and its objectives much looser. The clear overheating following the exit from the dollar peg and the introduction of Competition and Credit Control (which amongst other things broke up the bank cartel and loosened credit policies) was followed by tighter policy, but several large moves in policy (notably the loosening cycle in 1977) seem difficult to relate to control of activity, inflation or even money. This may be related to the attempt of policymakers to use price and incomes policies to control inflation, which many still regarded as a non-monetary phenomenon.

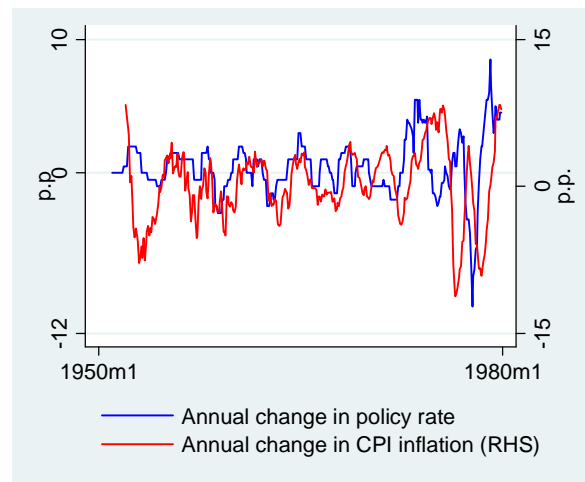
In sum, monetary and credit policies were clearly used together, but the relationship is far from one-to-one and they were used systemically for at least part of this period (consistent

with Batini and Nelson's (2009) finding for UK monetary policy over the period). This necessitates an identification strategy which can overcome the omitted variable bias described in the next section.

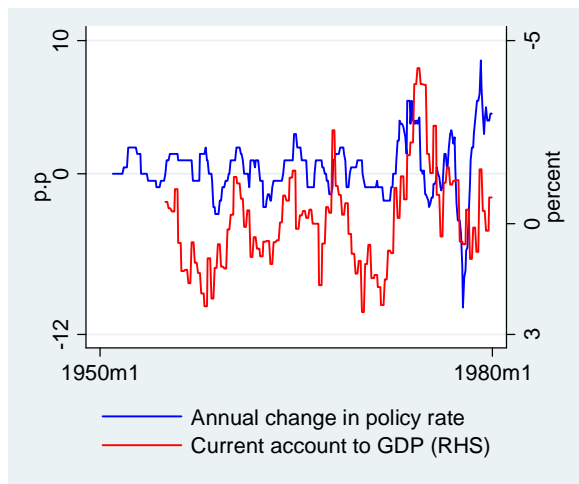
**Chart 3: Policy and manu. output**



**Chart 4: Policy and inflation**



**Chart 5: Policy and the current account**



### **SECTION 3: IDENTIFICATION STRATEGY**

The basic challenge for identifying the effects of monetary policy on macroeconomic variables such as output and inflation is that policymakers tend to set policy in order to stabilise them. Naïve regressions of variables of interest on policy will likely yield biased estimates of the effects of policy because it is set on the basis of expectations of the variables it seeks to impact. For example, it is often observed that prices tend to rise following increases in policy rates. This probably reflects policymakers tightening monetary policy because they expect high inflation, rather than monetary policy causing prices to rise.

One way of trying to overcome this problem is to use forecasts of the variables to which policymakers were reacting. Romer and Romer (2004) introduced this technique to the monetary policy literature. They collect ‘Greenbook’ forecasts compiled by the staff of the Federal Reserve Board and show that the Federal Funds Rate varies with lags and forecasts of output, inflation and unemployment and changes in these forecasts since the previous set. They purge the policy rate series of this systematic component to obtain a series of monetary policy shocks which they then use to estimate the effects of monetary policy on output and inflation. As Cochrane (2004) points out, using forecasts to help identify the effects of policy is particularly attractive: they deal with the underlying problem of omitted variable bias very precisely by controlling for its source (policymakers’ expectations of the variables they seek to affect), while leaving in movements in policy unrelated to forecasts, leaving plenty of variation to identify the effects of policy.

Although we have collected forecasts for UK macroeconomic variables, they are not monthly and they do not systematically coincide with policy changes. This limits the size of our dataset to such an extent that we prefer an alternative, but similar, strategy of using factor methods to summarise the information on which policymakers likely based both their expectations and their policy actions. We compare the results using the former method in Annex 2.

The use of factors in the macroeconomic literature was boosted by Stock and Watson’s (2002) finding that forecasting performance can be improved by using factors extracted from large datasets. For example, Bernanke and Boivin (2003) find that Fed forecasts could be improved by such techniques. Bernanke et al (2005) used these findings to identify the effects of monetary policy in a VAR, in what they termed a FAVAR (factor-augmented vector autoregression).

Rather than estimating a VAR, we integrate factors into the local projection approach popularised by Jordà (2005). Local projections are more flexible than multi- and univariate autoregressions, not least because the user does not need to take a stance on the number of autoregressive lags to be included, something which Coibion (2012) finds makes a large difference to the size of the estimated effects of monetary policy. We refer to our approach as a factor-augmented local projection (FALP) method.

We proceed in two steps. The first step is to estimate the factors  $F_{i,t}$  from a large dataset using a principal component approach. The second is to estimate a series of local projections, regressing our response variables against policy variables and conditioning on the factors:

$$\Delta y_{t,t+h} = \alpha_h + \beta_h \Delta policy_t + \gamma_{1,h} \Delta policy_{t-1} + \gamma_{2,h} policy_{t-1} + \sum_{i=1}^I \sum_{j=1}^J \eta_{h,i,j} F_{i,t-j} + \zeta_h controls_t + \varepsilon_{h,t}$$

where  $y$  is our response variable (eg log output),  $h$  is the horizon of the local projection,  $policy$  is a vector of policies (policy rate and the credit policy index described in Section 2) and controls include month dummies. We run the regression above at horizons up to four years and chart the coefficients  $\beta_h$ , each of which is an estimate of the average effect of a change in policy at the particular horizon in question.

The timing assumptions in our specification are more conservative than in VARs. We assume both that the policymaker does not react to data contemporaneously and that there is no contemporaneous effect of policy on our response variables. Our motivation for this is that some policy changes took place early in the month and others right at the end. For policy changes early in the month, it is unrealistic to assume that policymakers could observe evolution of the data in that month. Conversely, it is unrealistic to expect movements in response variables (aside from some asset prices) during a month in which a policy change was made late on.

We also need to take a stance on the number and lags of the factors we use. We follow Stock and Watson (2002) by using the Bayesian Information Criterion (BIC) to choose both. In fact, the BIC suggests different numbers of factors and lags for different response variables and horizons. Rather than vary the specification across horizons and response variables, we choose the most parsimonious specification (three factors and only one lag – ie  $I = 3, J = 1$ ) for our baseline results and show how the results differ in Annex 2.

Standard errors are calculated using the Newey-West estimator, with the lag correction increasing in the horizon in question. We have not yet factored in the uncertainty stemming from the estimation of the factors, but will do so in a later version.

## SECTION 4: DATA

One key contribution of this paper is a new monthly macroeconomic dataset for the UK from 1952 to 1979. This 62-variable dataset was used to estimate the factors used in the local projections. The data span most of the key series which policymakers followed then and now, although because the dataset is monthly it is somewhat light on measures of demand and output, many of which are only produced at quarterly frequency. Table A1 in Annex 1 lists the full dataset used in the FALP and describes the transformations we performed before estimating the factors.

The series in the monthly dataset were pulled together from a wide variety of intermediate sources, although a high proportion of the series was originally published by the UK Central Statistical Office or the Bank of England. About half of the series were manually transcribed at least in part from original publications. The most frequently used secondary sources were Hills et al (2015) and Thomson Reuters Datastream.

We obtained Bank Rate and Minimum Lending Rate (the main policy rate from 1972 to the end of our period of study) from the Bank of England website and manually collected data on calls for special deposits from editions of *Financial Statistics* published by the Central Statistical Office. Data on hire purchase regulation came from the *National Institute Economic Review* and various publications by the Board of Trade, which operated the policy. The series on the introduction and removal of credit ceilings and the supplementary special deposits scheme were put together based on *Bank of England Quarterly Bulletin* accounts.

A further contribution of ours is to collect data on forecasts of output, inflation and the current account between 1960 and 1979. As detailed official forecasts were not published over this period, we collect unpublished Treasury forecasts from the National Archive and supplement these with forecasts from the National Institute of Economic and Social Research (NIESR) (following Cloyne and Hürtgen, 2014).

Treasury forecasts tended to be produced three times a year, although we have also included some draft forecasts in other months. NIESR forecasts were published quarterly except in 1960 and 1961 when they were published every other month. We have collected forecasts for output, inflation and the current account by hand and digitalised them. Our dataset contains 95 complete sets of forecasts.



## SECTION 5: MAIN RESULTS ON THE EFFECTS OF POLICY

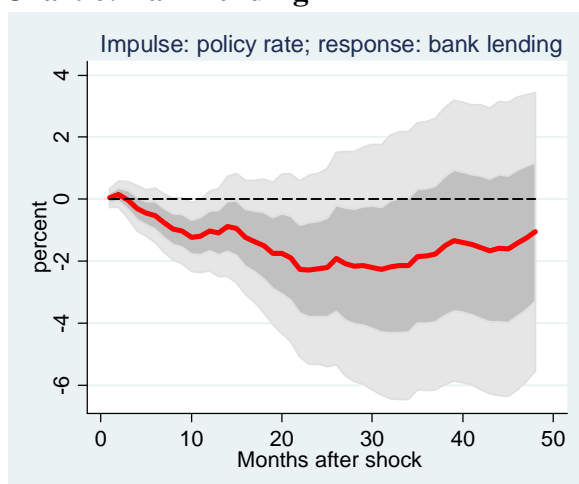
Given policymakers' focus on output, inflation and external balance as targets of policy and of lending as the key intermediate variable, we focus our analysis on measures of these.

We subject all our results to a battery of robustness tests and summarise the results below to give the reader a sense of our confidence in them. The first concerns the number and lags of the factors used as control variables. In this exercise, we show the range of IRFs for the full range of factor/lag combinations suggested by the BICs (three factors and one lag to seven factors and two lags). The second compares the results for policy changes before September 1971 and after August 1971. There are good reasons why the results may differ given the change in exchange rate regime and the structure of the banking system (following Competition and Credit Control). Nevertheless, this might still yield information on the robustness of results. The final check is a comparison between our FALP approach and an approach in keeping with Romer and Romer (2004), in which we use forecasts of GDP, inflation and the current account balance rather than / as well as our factors. Annex 2 contains all the charts for these exercises and in this section we summarise the results.

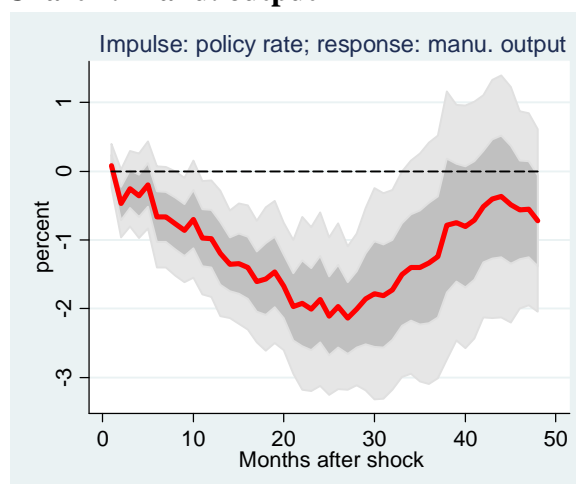
### 5.1 Results for policy rate

The four impulse responses for monetary policy are shown in Charts 6-9.

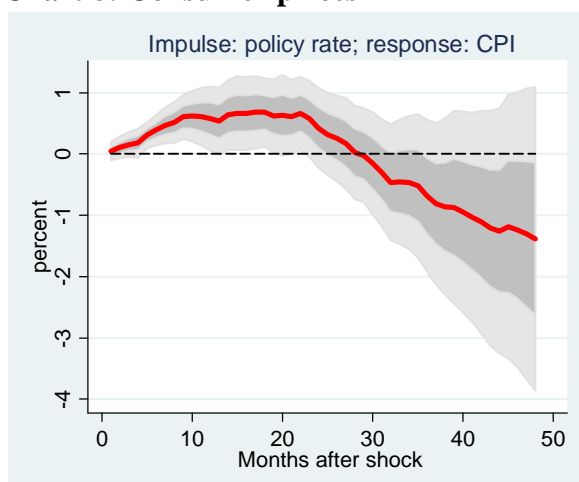
**Chart 6: Bank lending IRF**



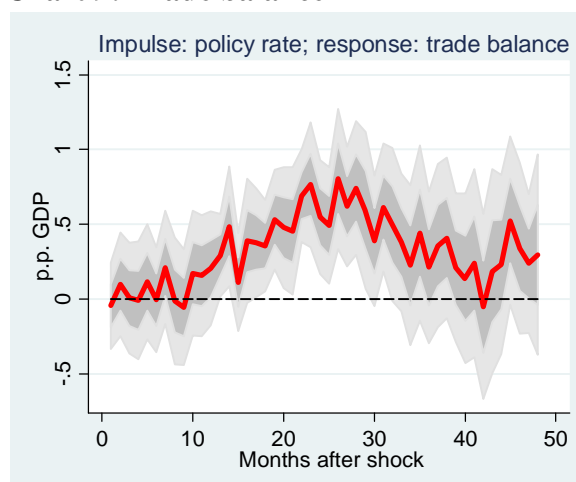
**Chart 7: Manu. output IRF**



**Chart 8: Consumer prices IRF**



**Chart 9: Trade balance IRF**



The IRFs show responses to a 1p.p. increase in the policy rate. The dark shading shows one standard error confidence intervals and the light, two.

The results are broadly in line with the empirical literature on the effects of monetary policy. Bank lending and manufacturing output fall temporarily following a tightening in policy. Our results for consumer prices show the common price puzzle at 1-2 year horizons and although the central response falls steeply further out, the IRF is very imprecisely estimated. The trade balance improves temporarily. Quantitatively, our results for output and inflation are very similar to Cloyne and Hürtgen's study of UK monetary policy from 1975 to 2007, although our error bands for inflation are significantly wider. Our results are within the range of the US literature, with larger responses than Bernanke et al and smaller responses than Romer and Romer.

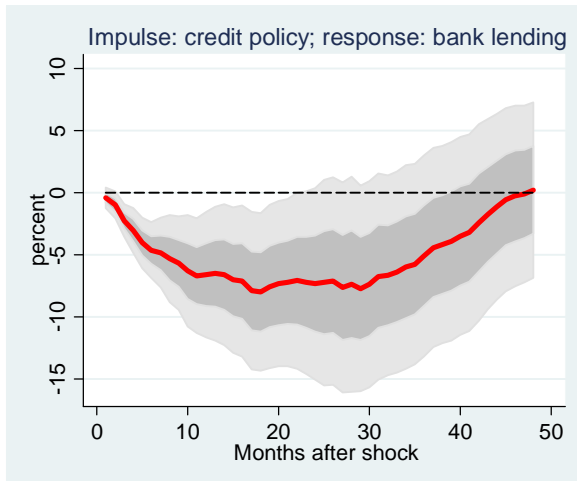
The robustness exercises do not give us cause to doubt our qualitative results, with the possible exception of bank lending, whose IRF is sensitive to the number of factors and lags (Chart A1) and is very different in the two subsamples (Chart A9 and A10). Quantitatively, the responses tend to be somewhat larger in the early subsample (Charts A9-A16). The FALP and Romer and Romer approaches yield very similar results (Charts A25-A32), with the exception of bank lending (for which there is no forecast). Before taking this as complete vindication of these approaches, we note that the IRFs for the combined approach tend to be larger and more tightly estimated (Charts A41-A44), especially for inflation, for which the price puzzle disappears. This fits with Bernanke and Boivin's finding that a combination of factors and Fed staff forecasts outperform the two individual components.

In sum, we interpret our results as showing that the Radcliffe Committee members were wrong to doubt the efficacy of conventional monetary policy: it *could* be used to affect the three key policy objectives of stable output and prices and external balance.

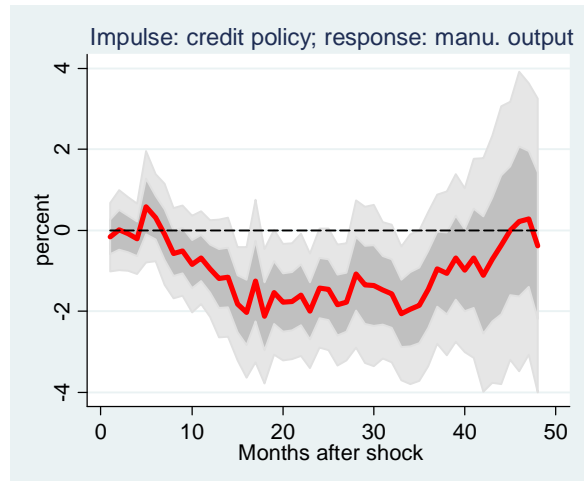
## 5.2 Results for credit policy

The four credit policy IRFs are shown in Charts 10-13.

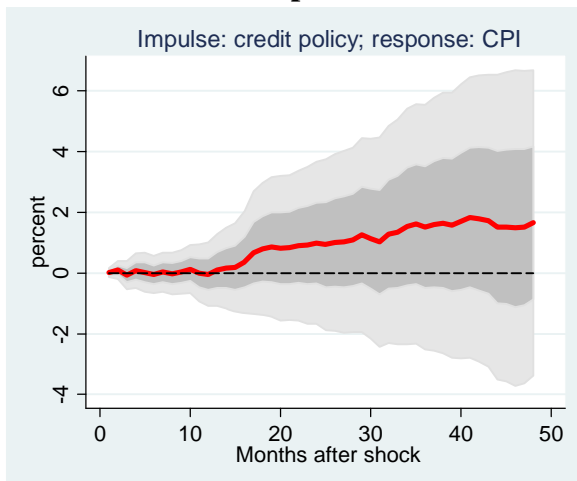
**Chart 10: Bank lending IRF**



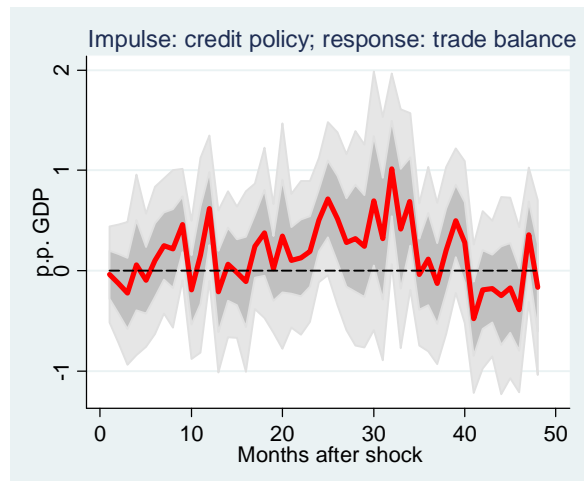
**Chart 11: Manu. output IRF**



**Chart 12: Consumer prices IRF**



**Chart 13: Trade balance IRF**



The IRFs show responses to a 1p.p. increase in the credit policy index. The dark shading shows one standard error confidence intervals and the light, two.

The IRFs suggest that credit policy changes had quantitatively large negative effects on bank lending, reduced manufacturing output and left consumer prices and the trade balance broadly unchanged.

Taken at face value, these results suggest that there may be a supply channel at work.

Interestingly, this is in line with Glocker and Towbin's (2012) theoretical work on the effects

of reserve requirements. They find that a shock to reserve requirements reduces lending and output, but leaves prices broadly unchanged or higher.

However, the robustness exercises caution us not to put too much weight these results. The IRFs look quite different across the two subsamples (Charts A17-A24) and in the sample with forecasts available (A33-A44), although it should be noted that this constrained sample includes a low number of credit policy changes. This might suggest that the credit policies became less effective over time as the financial system developed. However it might also suggest difficulties in estimating the impact of credit policy.

One result is quite robust: bank lending falls significantly in response to a credit policy tightening in most of the IRFs presented. At this stage of our analysis, we judge this to be our main result for credit policy changes. While our results hint at an impact on output via a supply channel, we would like to see more evidence consistent with this (eg evidence on the transmission mechanism or from other countries).

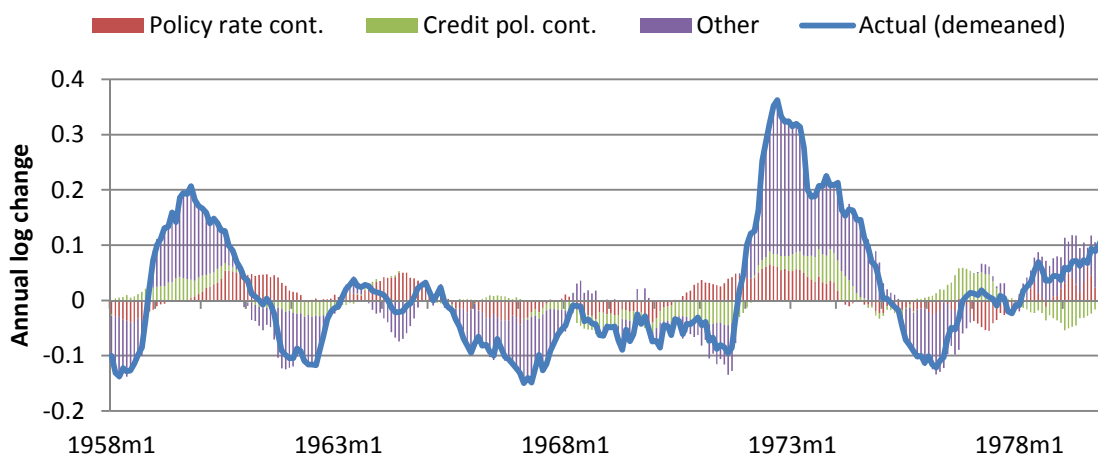
In sum, it is far from clear that credit policies were reliable tools for policymakers seeking to affect output, prices and the trade balance.

## SECTION 6: ROLE OF MONETARY AND CREDIT POLICIES IN UK MACROECONOMIC DEVELOPMENTS

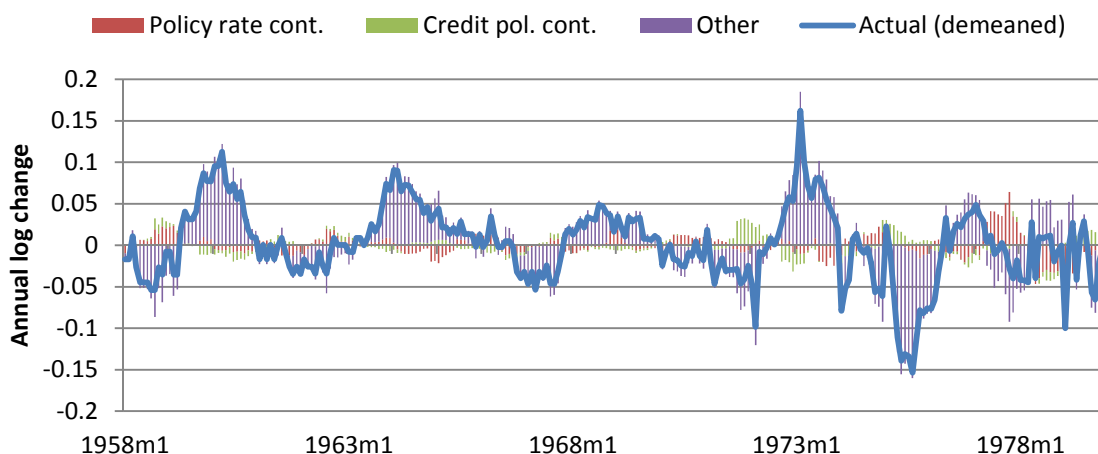
In this section, we take our baseline IRFs (Charts 6-13) at face value and assess the contribution of monetary and credit policy shocks to bank lending, output and inflation over the 1960s and 1970s. For the purposes of this analysis, we assume a stable reaction function over the period. Of course this is most unlikely to be a realistic assumption given the change in the monetary policy regime and we intend in future work to re-run the analysis below allowing for the possibility of a change in the reaction function.

Charts 14 and 15 suggest that monetary and credit policy shocks were not major drivers of bank lending and manufacturing output over the 1960s and 1970s. Although both had quantitatively significant roles in explaining the path of bank lending, they were swamped by other shocks. This is particularly the case in the few years following 1971, when we suspect that the Competition and Credit Control reform had a major impact on lending.

**Chart 14: Historical decomposition of bank lending**



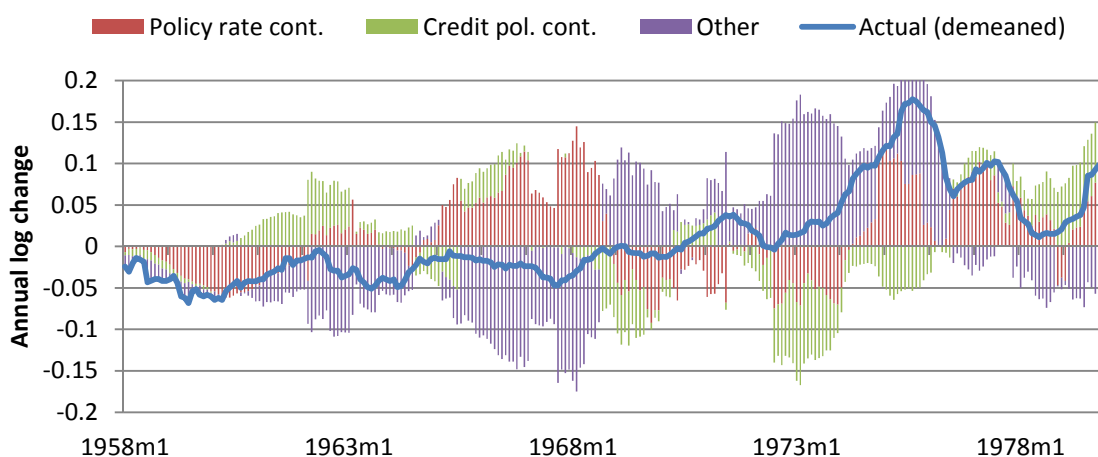
**Chart 15: Historical decomposition of manufacturing output**



In contrast, Chart 16 suggests that both monetary and credit policy shocks were important drivers of inflation over the period. Before 1973, they appeared to stabilise inflation but starting from 1974, monetary policy shocks contributed to the high rate and high volatility of inflation.

Chart 16 also hints at a role for credit policy in explaining the pickup in inflation. While monetary policy shocks contributed somewhat less to the inflation of the late 1970s than the mid 1970s, credit policy shocks contributed more. This is because credit policy shocks turned positive, leading – according to our central estimates – to a rise in prices. Even if this is an exaggeration of the truth, policymakers’ belief that credit policies would help dampen inflation may have given them false comfort that the overall policy mix was sufficiently tight.

**Chart 16: Historical decomposition of consumer prices**

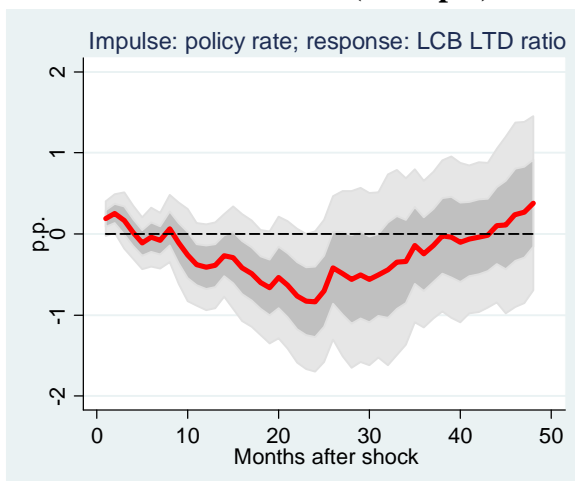


## SECTION 7: IMPLICATIONS FOR MONETARY AND MACROPRUDENTIAL POLICY TODAY

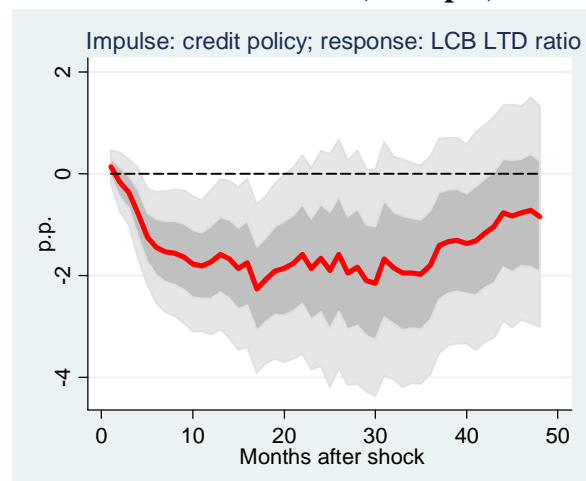
Even though it is far from clear that credit policies were used successfully around the time of the Radcliffe Report, policymakers today might be able to learn from the experience. Central banks are embarking on a period of using macroprudential policies alongside monetary policy. There is an active debate about the efficacy of macroprudential tools and the appropriate role for monetary policy in securing financial stability (eg Stein, 2013, Svensson, 2015 and Williams, 2014). Some of the macroprudential tools under consideration today are quite similar to the tools discussed in this paper. For example, liquidity regulations are similar to special and supplementary special deposits, while product tools such as loan to value regulations are similar to hire purchase controls. And just as today, these tools were used alongside the policy rate, although today policymakers are seeking to achieve a different objective with macroprudential policy: financial stability.

At this juncture, there is much uncertainty about how to measure systemic risk and hence the efficacy of macroprudential policy. Nevertheless, a number of authors have found that systemic banking crises are routinely preceded by deteriorations in non-financial private sector balance sheets (eg Schularick and Taylor, 2012) and Bush et al (2015) find that bank balance sheets and indicators of risk appetite have also tended to signal crises. Given this, we investigate the effects of both monetary policy and credit policy on measures of bank balance sheets (the loan to deposit ratio of London Clearing Banks), non-financial balance sheets (the broad credit to GDP ratio) and risk appetite (the spread between debentures (medium-term corporate debt instruments) and gilts).

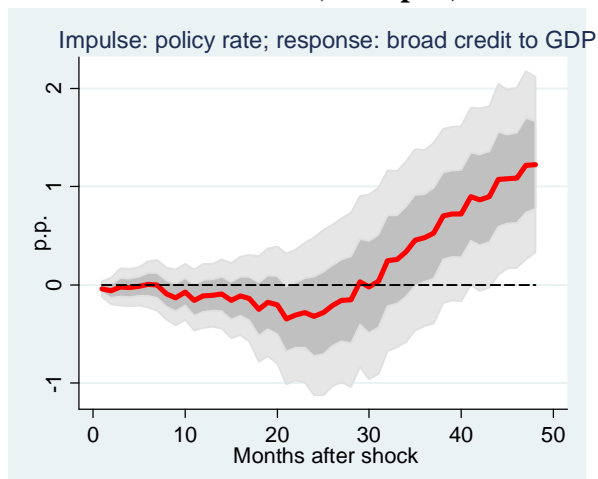
**Chart 17: LCB LTD IRF (mon. pol)**



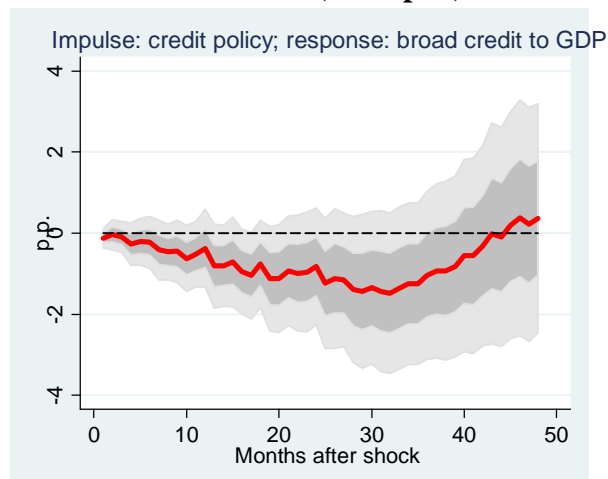
**Chart 18: LCB LTD IRF (cred. pol)**



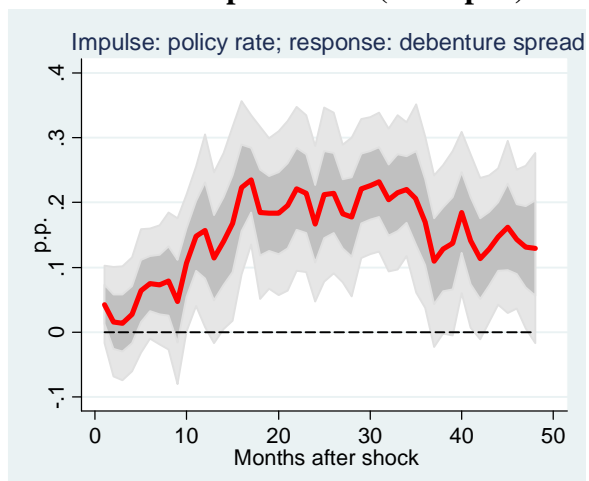
**Chart 19: C/GDP IRF (mon. pol.)**



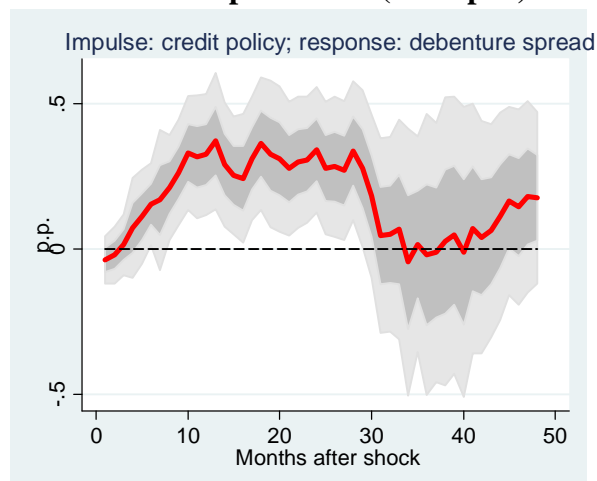
**Chart 20: C/GDP IRF (cred. pol.)**



**Chart 21: Deb. spread IRF (mon. pol.)**



**Chart 20: Deb. spread IRF (cred. pol.)**



The IRFs show responses to a 1p.p. increase in the policy rate / credit policy index. The dark shading shows one standard error confidence intervals and the light, two.

Charts 17-20 show the results of this exercise. Both policies appear to raise debenture spreads significantly. However, the impact of credit policy on bank balance sheets is estimated to be more persistent than for monetary policy and the impact on the credit to GDP ratio is negative, unlike for monetary policy which is zero or positive (at medium to long lags, the fall in nominal GDP outweighs the fall in nominal lending).

Although these results are subject to the same caveats as above and are probably more vulnerable to the Lucas Critique given credit policies were not used to limit systemic risk, these results suggest that credit policies may be better suited to financial stability policymakers than monetary policy. And coupled with the large uncertainty about their impact on output and particularly inflation, this points towards relying first and foremost on



macroprudential policy to achieve financial stability aims and monetary policy to achieve monetary stability.

## SECTION 8: CONCLUSION

In this paper, we find evidence that the members of the Radcliffe Committee were wrong to be sceptical about the effectiveness of monetary policy. It was a powerful tool that could be used to meet three of Radcliffe's five objectives of monetary policy, albeit not necessarily simultaneously. Using a novel technique and a new dataset, we show that increases in the policy rate had negative effects on manufacturing output and probably consumer prices in the 1950s, 1960s and 70s and that they also had significantly positive impacts on the trade balance to GDP ratio. Credit policies may have depressed output via a supply channel, but these results are not robust. Neither monetary nor credit policy shocks appear to have been major drivers of lending and output over the 1960s and 1970s, but our estimates suggest that monetary policy shocks bore significant responsibility for the pickup in inflation in the 1970s. To the extent that policymakers thought they could rely on credit policies to dampen inflation, they may also have had important roles.

Although this paper leaves significant uncertainty as to the effects of credit policies on output and inflation, we do present fairly strong evidence that credit policies reduced bank lending. At the same time, we estimate that credit policy shocks had persistently beneficial effects on measures of bank balance sheet resilience and non-financial private sector balance sheets. Our results give some support to the view that macroprudential policy may be better suited to achieving financial stability than monetary policy.

This paper itself has yielded interesting insights into the period and raises three groups of questions. First, were the views of Radcliffe Committee members reasonable given the state of knowledge at the time? And, relatedly, were these views still reasonable in 1969 when the Bank of England repeated them? Schwartz (1969) claims that while it was difficult to challenge the Radcliffe Committee in 1959, the evidence for monetary policy potency had expanded greatly over the course of the decade (not least because of her research).

Second, how much truth is there in our conjecture that policymakers incorrectly viewed credit policies as substitutes to policy rate (ie meaning less variation in the policy rate was required), in turn reducing the overall efficacy of policy?

Third, if policymakers had little faith in monetary policy to ensure domestic stability, why were the 1960s relatively stable?<sup>14</sup> Did the Bretton Woods regime force adequate monetary

---

<sup>14</sup> Balance of payments crises notwithstanding.

policy, even though policymakers did little to acknowledge this? Or was fiscal policy an important part of the story?

## REFERENCES

- Allard, R (1974), 'An Economic Analysis of the Effects of Regulating Hire-Purchase', *Government Economic Service Occasional Paper*, No. 9.
- Bank of England (1960), 'Commentary', *Bank of England Quarterly Bulletin*, Vol. 1. No. 1, pages 3–17.
- Bank of England (1962a), 'Bank liquidity in the United Kingdom', *Bank of England Quarterly Bulletin*, Vol. 2. No. 4, pages 248–255.
- Bank of England (1962b), 'Sources of funds of hire purchase companies 1958-62', *Bank of England Quarterly Bulletin*, Vol. 2. No. 4, pages 256–262.
- Bank of England (1969), 'The operation of monetary policy since the Radcliffe Report', *Bank of England Quarterly Bulletin*, Vol. 9, No. 4, pages 448–460.
- Batini, N and Nelson, E (2009), *The U.K.'s rocky road to stability*, New York: Nova Science Publishers.
- Bernanke, B, and Boivin, J (2003), 'Monetary policy in a data-rich environment', *Journal of Monetary Economics*, Vol. 50, No. 3, pages 525–546.
- Bernanke, B, Boivin, J and Elias, P (2005), 'Measuring the Effects of Monetary Policy: A Factor Augmented Vector Autoregressive (FAVAR) approach', *Quarterly Journal of Economics*, Vol. 120, No. 1, pages 387–422.
- Bush, O, Guimaraes, R and Stremmel, H (2015), 'Beyond the credit gap: price and quantity of risk indicators for macroprudential policy', mimeo.
- Capie, F (2010), *The Bank of England: 1950s to 1979*, Cambridge: Cambridge University Press.
- Capie, F and Webber, A (1985), *A Monetary History of the United Kingdom, 1870-1982*, Volume 1, London: Allen and Unwin, 1985.
- Cloyne, J and Hürtgen, P (2014), 'The macroeconomics effects of monetary policy: a new measure for the United Kingdom', *Bank of England Working Paper*, No. 493.

Cochrane, J (2004), ‘Comments on “A new measure of monetary shocks: Derivation and implications” by Christina Romer and David Romer’,

<http://gsbwww.uchicago.edu/fac/john.cochrane/research/>.

Coibion, O (2012), ‘Are the Effects of Monetary Policy Shocks Big or Small?’, *American Economic Journal: Macroeconomics*, Vol. 4, No. 2, pages 1–32.

Committee on the Working of the Monetary System (1959), *Report*, London: HM Stationery Office.

Elliott, D, Feldberg, G and Lehnert, A (2013), ‘The History of Cyclical Macroprudential Policy in the United States’, *Finance and Economics Discussion Series*, Federal Reserve Board, No. 29.

Ellis, C, Mumtaz, H and Zabczyk, P (2014), ‘What Lies Beneath? A Time-varying FAVAR Model for the UK Transmission Mechanism’, *The Economic Journal*, Vol. 124, pages 668–699.

Glocker, C and Towbin, P (2012), ‘Reserve Requirements for Price and Financial Stability: When Are They Effective?’, *International Journal of Central Banking*, Vol. 8, No. 1, pages 65–113.

Goodhart, C (2014), ‘Competition and Credit Control’, *Financial Markets Group Special Paper*, No. 229.

Hills, S, Thomas, R and Dimsdale, N (2015), ‘Three Centuries of Data - Version 2.2’, [www.bankofengland.co.uk](http://www.bankofengland.co.uk).

Hodgman, D (1971), ‘British techniques of monetary policy: A critical review’, *Journal of Money, Credit and Banking*, Vol. 3, No. 4, pages 760–779.

Jordà, Ò (2005), ‘Estimation and Inference of Impulse Responses by Local Projections’, *American Economic Review*, Vol. 95, No. 1, pages 161–182.

Monnet, E (2012), ‘Monetary Policy without Interest Rates: Evidence from France's Golden Age (1948 to 1973) Using a Narrative Approach’, *European Historical Economics Society Working Paper*, No. 32.

Monnet, E (2014a), 'Monetary Policy without Interest Rates: Evidence from France's Golden Age (1948 to 1973) Using a Narrative Approach', *American Economic Journal: Macroeconomics*, Vol. 6, No. 4, pages 137–169.

Monnet, E (2014b), 'The diversity in national monetary and credit policies in Western Europe under Bretton Woods', in *Central banks and the nation states*, Feiertag, O and Margairaz, M (eds), Paris, Sciences Po, forthcoming.

Romer, C and Romer, D (2004), 'A New Measure of Monetary Shocks: Derivation and Implications', *American Economic Review*, Vol. 94, No. 4, pages 1055–1084.

Romer, C and Romer, D (2013), 'The Most Dangerous Idea in Federal Reserve History: Monetary Policy Doesn't Matter', *American Economic Review*, Vol. 103, No. 3, pages 55–60.

Schularick, M and Taylor, A (2012), 'Credit Booms Gone Bust: Monetary Policy, Leverage Cycles, and Financial Crises, 1870-2008', *American Economic Review*, Vol. 102, No. 2, pages 1029-61.

Schwartz, A (1969), 'Why Money Matters', *Lloyds Bank Review*, No. 24, pages 1–16.

Stein, J (2013), 'Overheating in the credit markets: origins, measurement and policy responses', speech given at the 'Restoring Household Financial Stability after the Great Recession: Why Household Balance Sheets Matter' research symposium sponsored by the Federal Reserve Bank of St. Louis, St. Louis, Missouri.

Stock, J and Watson, M (2002), 'Macroeconomic forecasting using diffusion indexes', *Journal of Business & Economic Statistics*, Vol. 20, No. 2, pages 147–162.

Svensson, L (2015), 'Monetary policy and macroprudential policy: different and separate', mimeo.

Williams, J (2014), 'Financial stability and monetary policy: happy marriage or untenable union?', *FRBSF Economic Letter*, No. 17.

## ANNEX 1: Monthly dataset

Table A1 shows the 62 variables in our monthly dataset. Variables were seasonally adjusted and transformed where appropriate. The second column below shows the transformation, with ‘1’ indicating no transformation and ‘2’ indicating that the log difference was taken.

**Table A1**

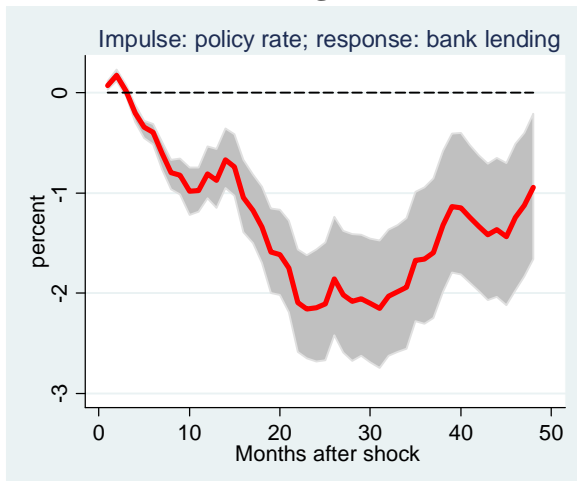
| <i>Domestic demand and output</i> |   |   | <i>Financial markets</i>         |   |                                     |
|-----------------------------------|---|---|----------------------------------|---|-------------------------------------|
| 1                                 | 2 | Index of production                         | 27                               | 2 | £ per \$                            |
| 2                                 | 2 | Mining and quarrying output                 | 28                               | 2 | FF per \$                           |
| 3                                 | 2 | Manufacturing output                        | 29                               | 2 | DM per \$                           |
| 4                                 | 2 | Food, drink and tobacco output              | 30                               | 1 | Dollar forward margin               |
| 5                                 | 2 | Textiles output                             | 31                               | 2 | Stock prices                        |
| 6                                 | 2 | Chemicals output                            | 32                               | 1 | Dividend yield                      |
| 7                                 | 2 | Metals output                               | 33                               | 1 | Treasury bill yield                 |
| 8                                 | 2 | Engineering output                          | 34                               | 1 | 10 year gilt yield                  |
| 9                                 | 2 | Other manufacturing output                  | 35                               | 1 | Consol yield                        |
| 10                                | 2 | Gas, water and electricity output           | 36                               | 1 | Call rate                           |
| 11                                | 1 | Number of days lost to industrial stoppages | 37                               | 1 | Bank deposit rate                   |
| 12                                | 2 | Retail sales volume                         | 38                               | 1 | Trade bill rate                     |
| 13                                | 2 | Retail stocks value                         | 39                               | 1 | Bank bill rate                      |
| 14                                | 2 | Retail durables value                       | 40                               | 1 | Debenture yield                     |
| 15                                | 2 | Number of dwellings started                 | 41                               | 2 | Gold price                          |
| 16                                | 2 | Number of new vehicle registrations         | 42                               | 2 | Oil price                           |
|                                   |   |   | 43                               | 2 | Commodity prices                    |
| <i>Labour market</i>              |   |   | <i>Money, credit and banking</i> |   |                                     |
| 17                                | 2 | Manufacturing employment                    | 44                               | 2 | M0                                  |
| 18                                | 2 | Other employment in the industrial sector   | 45                               | 2 | M2                                  |
| 19                                | 1 | Vacancies                                   | 46                               | 2 | Bank lending                        |
| 20                                | 1 | Unemployment rate                           | 47                               | 2 | LCB claims on BoE                   |
| 21                                | 2 | Economy-wide hours                          | 48                               | 2 | LCB deposits                        |
| 22                                | 2 | Manufacturing hours                         | 49                               | 2 | LCB advances                        |
|                                   |   |   | 50                               | 2 | LCB investments                     |
| <i>Trade and reserves</i>         |   |   | 51                               | 1 | LCB excess liquid assets / deposits |
| 23                                | 2 | Goods export volume                         | <i>Prices</i>                    |   |                                     |
| 24                                | 2 | Goods import volume                         | 52                               | 2 | Import prices                       |
| 25                                | 1 | Trade balance to GDP ratio                  | 53                               | 1 | Terms of trade                      |
| 26                                | 2 | FX reserve to GDP ratio                     | 54                               | 2 | Producer input prices               |
|                                   |   |   | 55                               | 2 | Producer output prices              |
|                                   |   |   | 56                               | 2 | Economy-wide average wages          |
|                                   |   |   | 57                               | 2 | Manufacturing average wages         |
|                                   |   |   | 58                               | 2 | Consumer prices                     |
|                                   |   |   | <i>Foreign variables</i>         |   |                                     |
|                                   |   |   | 59                               | 2 | US industrial production            |
|                                   |   |   | 60                               | 2 | US consumer prices                  |
|                                   |   |   | 61                               | 1 | US Treasury bill yield              |
|                                   |   |   | 62                               | 1 | US long-term bond yield             |

## ANNEX 2: Robustness

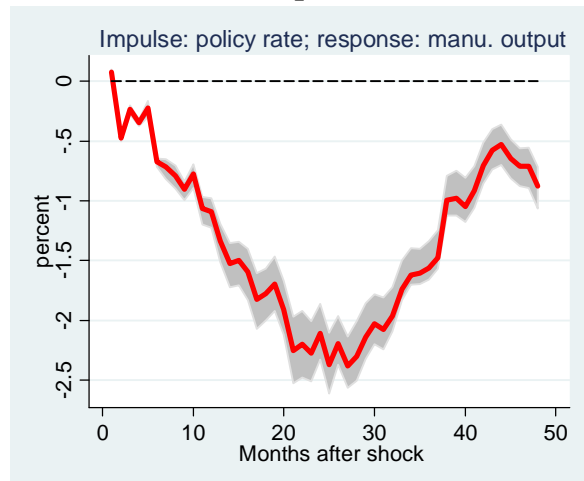
Robustness of the results to different numbers / lags of the factors (see notes at the end of the charts)

### Policy rate

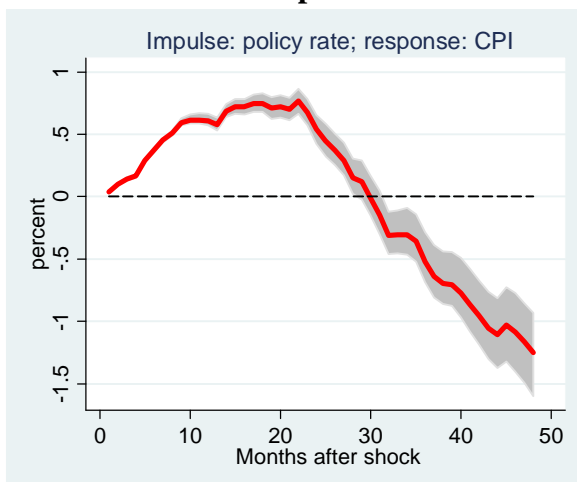
**Chart A1: Bank lending IRF**



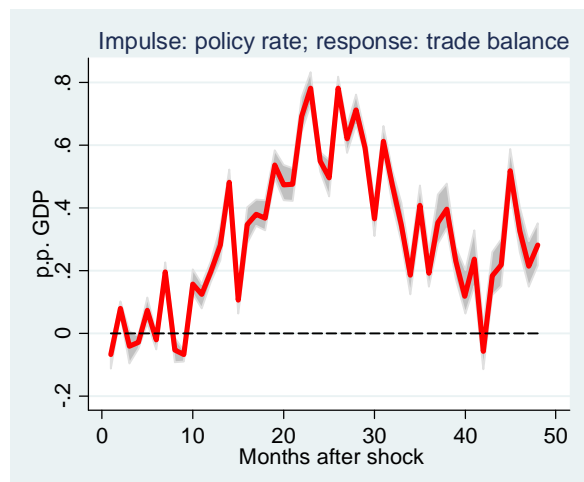
**Chart A2: Manu. output IRF**



**Chart A3: Consumer prices IRF**



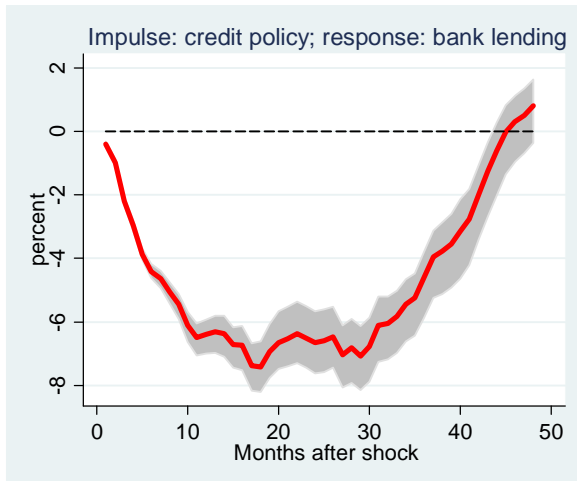
**Chart A4: Trade balance IRF**



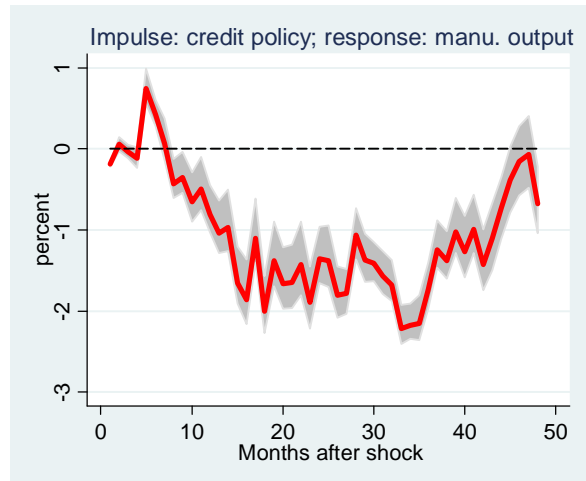


**Credit policy**

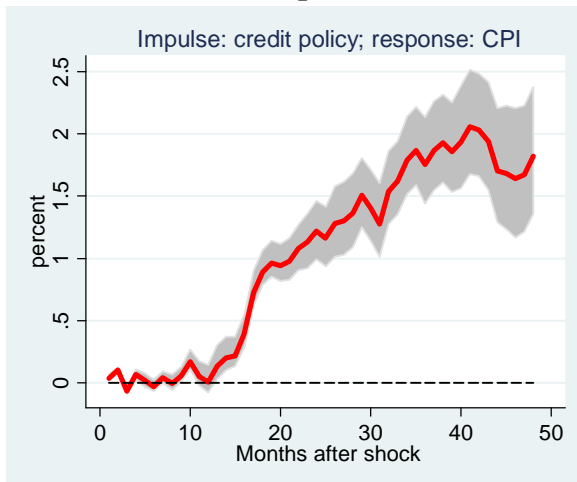
**Chart A5: Bank lending IRF**



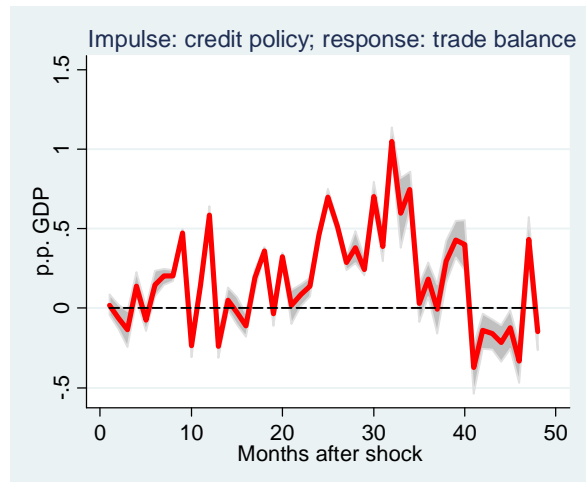
**Chart A6: Manu. output IRF**



**Chart A7: Consumer prices IRF**



**Chart A8: Trade balance IRF**

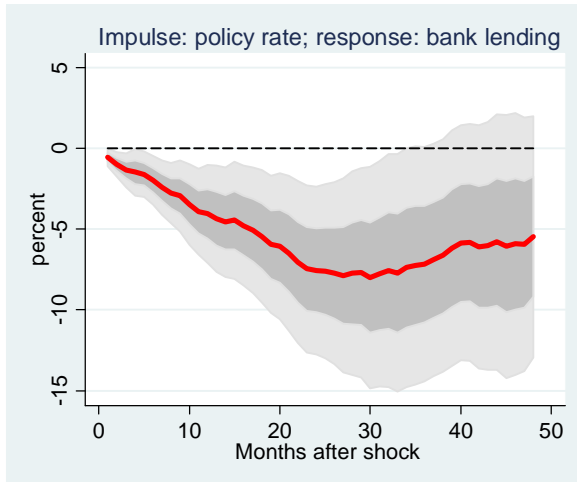


Each of these IRFs shows the range of *central estimates* as we varied the number of factors and lages from three factors with one lag to seven factors with two lags.

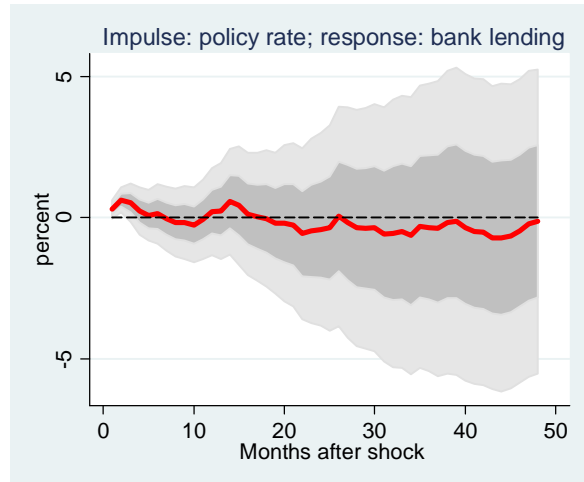
## Robustness to different time periods

### Policy rate

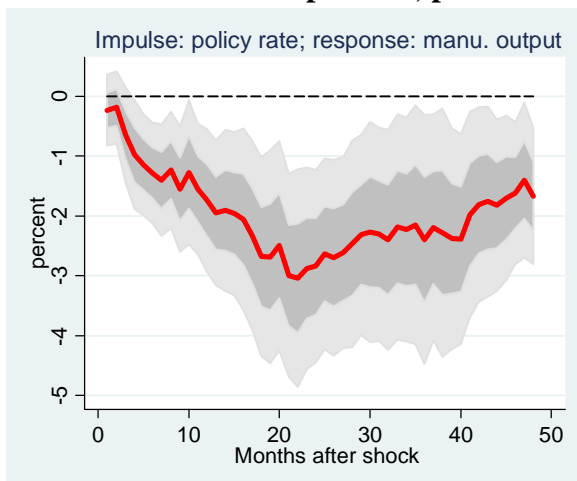
**Chart A9: Bank lending IRF, pre 09/71**



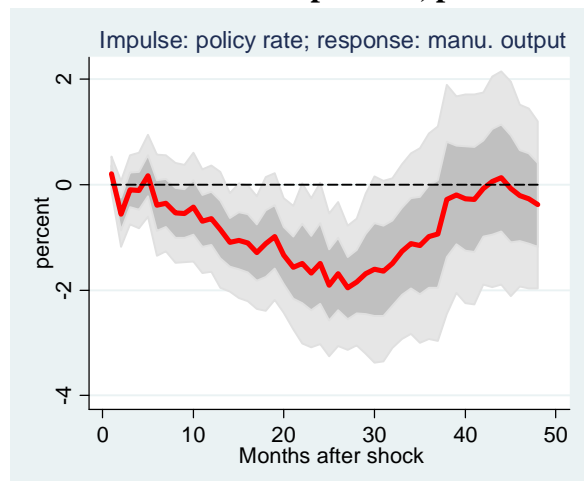
**Chart A10: Bank lending IRF, post 08/71**



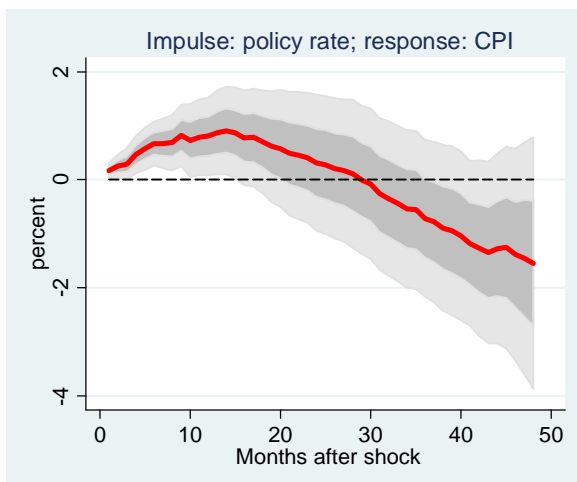
**Chart A11: Manu. output IRF, pre 09/71**



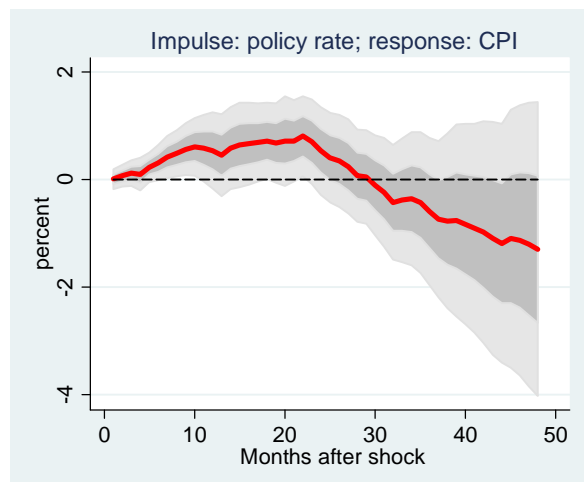
**Chart A12: Manu. output IRF, post 08/71**



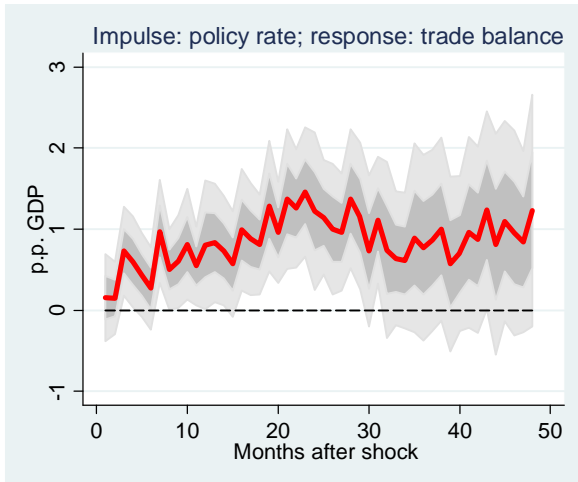
**Chart A13: Consumer prices IRF, pre 09/71**



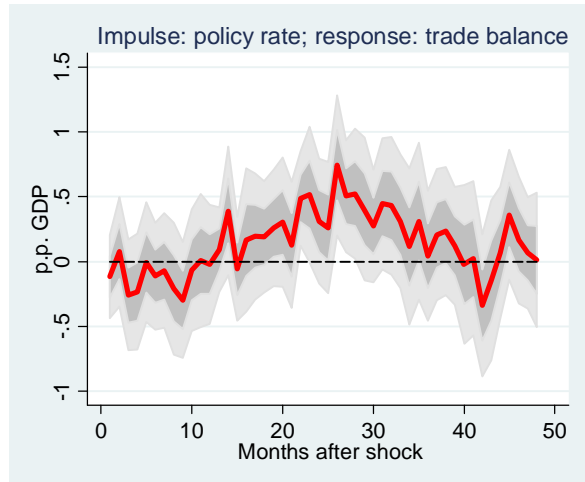
**Chart A14: Consumer prices IRF, post 08/71**



**Chart A15: Trade balance IRF, pre 09/71**

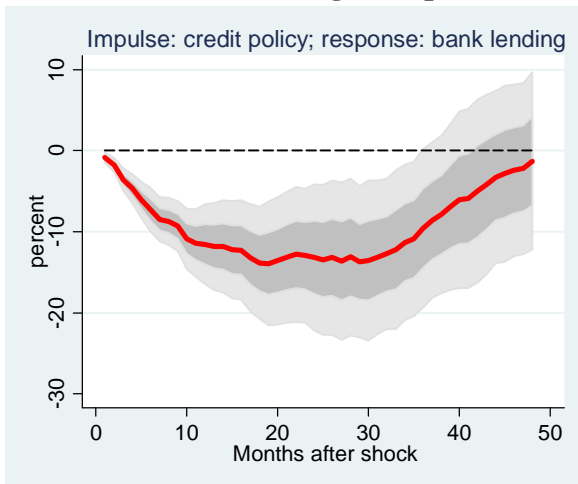


**Chart A16: Trade balance IRF, post 08/71**

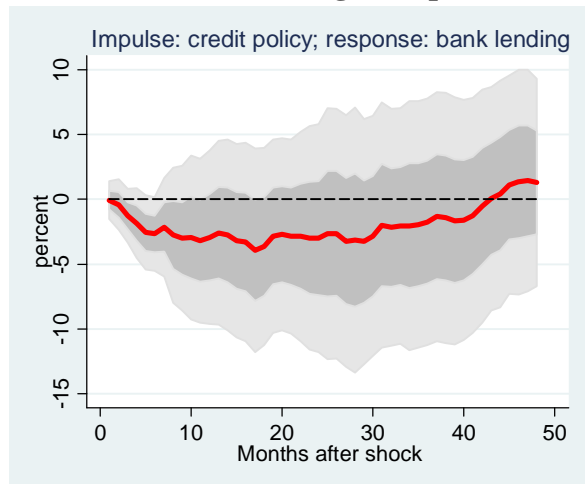


**Credit policy**

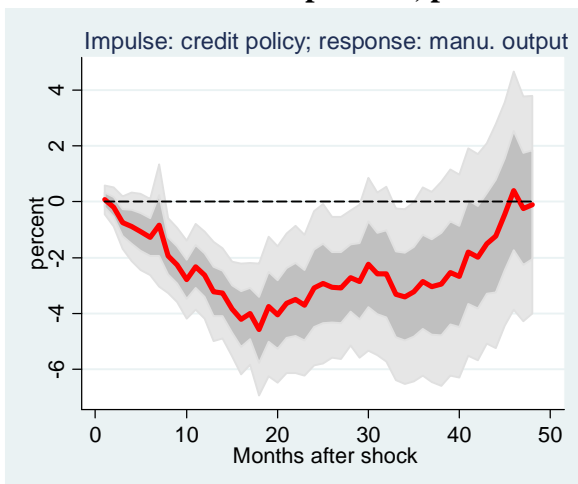
**Chart A17: Bank lending IRF, pre 09/71**



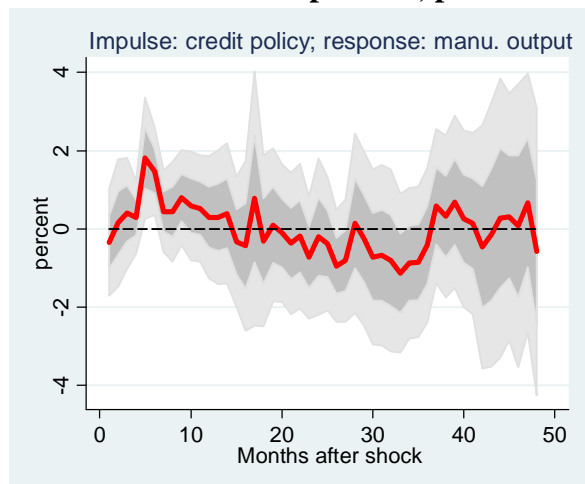
**Chart A18: Bank lending IRF, post 08/71**



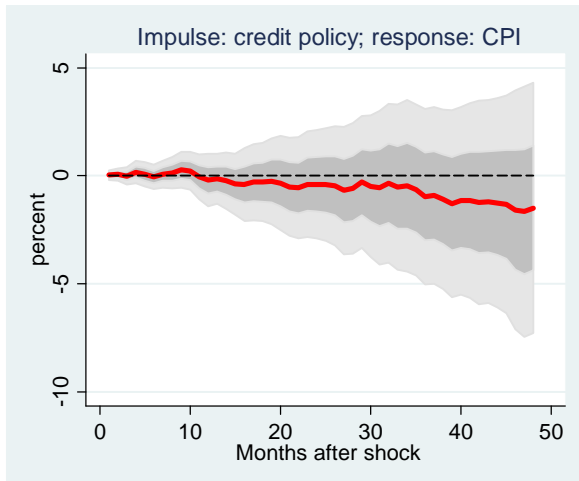
**Chart A19: Manu. output IRF, pre 09/71**



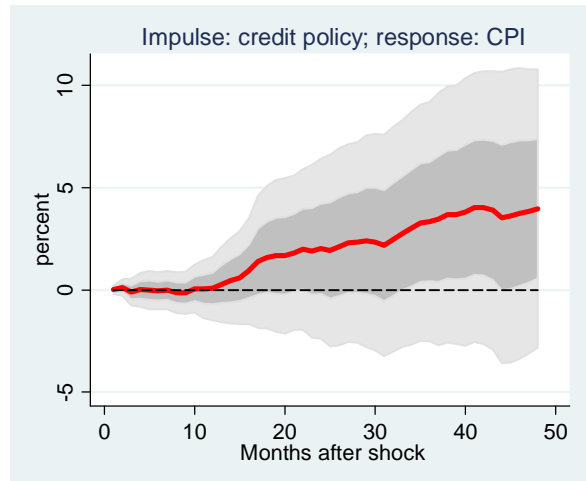
**Chart A20: Manu. output IRF, post 08/71**



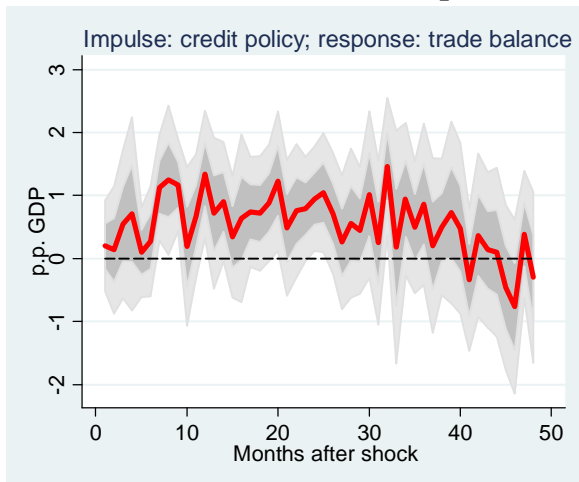
**Chart A21: Consumer prices IRF, pre 09/71**



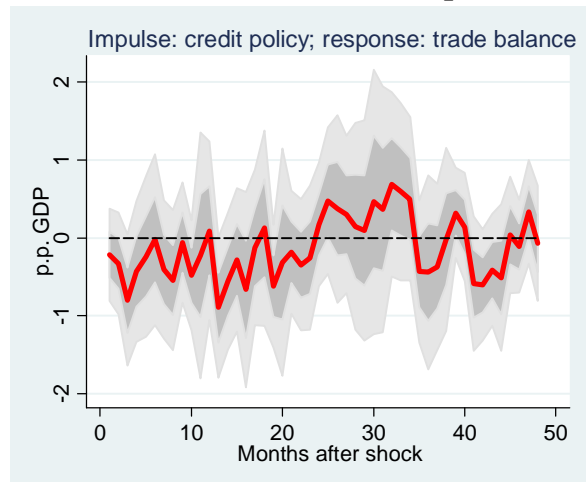
**Chart A22: Consumer prices IRF, post 08/71**



**Chart A23: Trade balance IRF, pre 09/71**



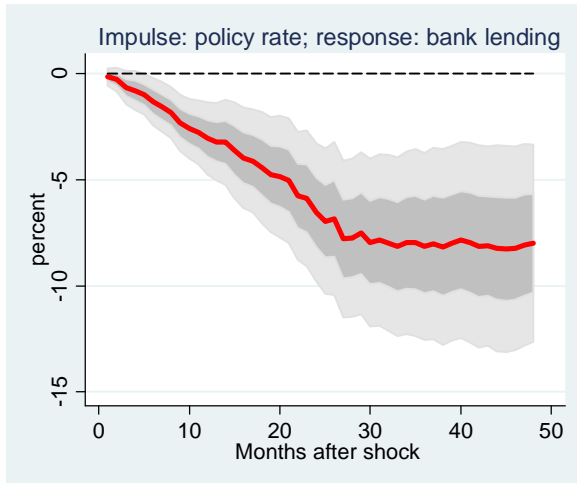
**Chart A24: Trade balance IRF, post 08/71**



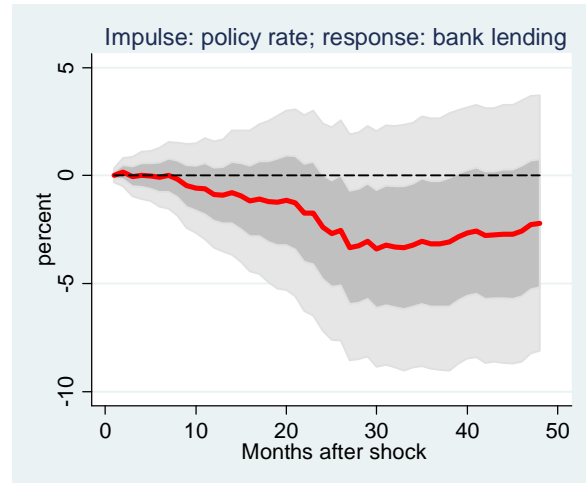
## Comparison with Romer & Romer approach

### Policy rate

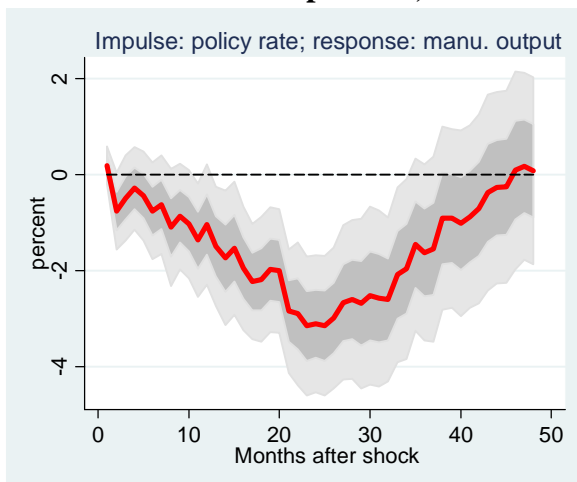
**Chart A25: Bank lending IRF, FALP**



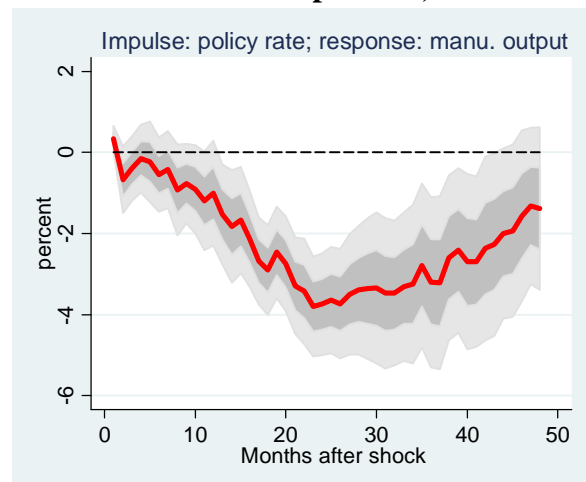
**Chart A26: Bank lending IRF, R & R**



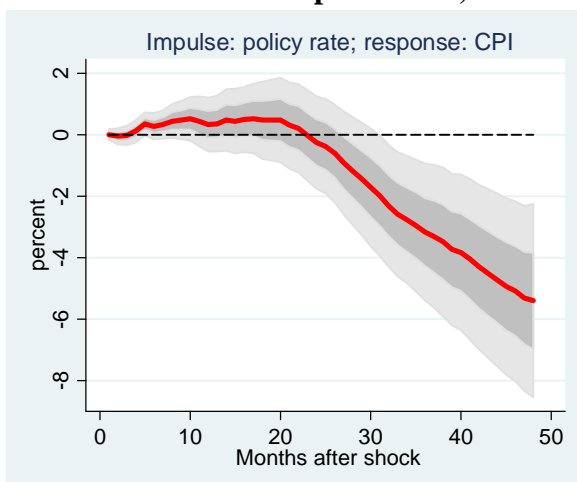
**Chart A27: Manu. output IRF, FALP**



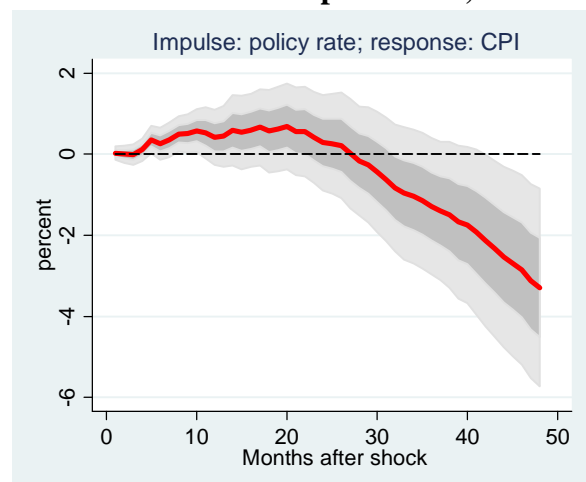
**Chart A28: Manu. output IRF, R & R**



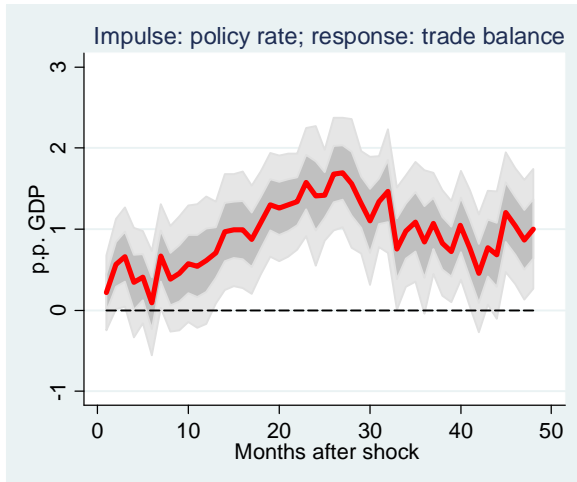
**Chart A29: Consumer prices IRF, FALP**



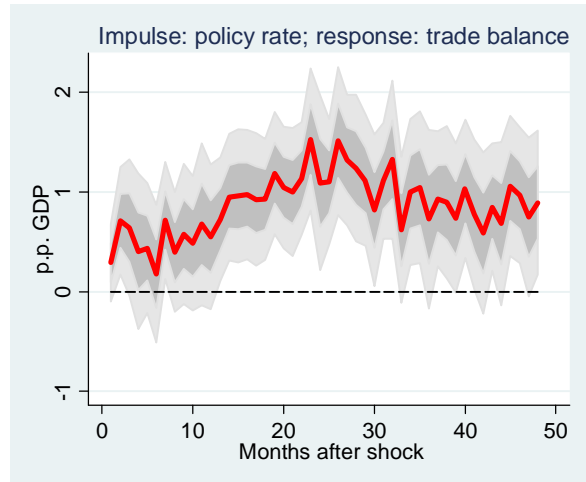
**Chart A30: Consumer prices IRF, R & R**



**Chart A31: Trade balance IRF, FALP**

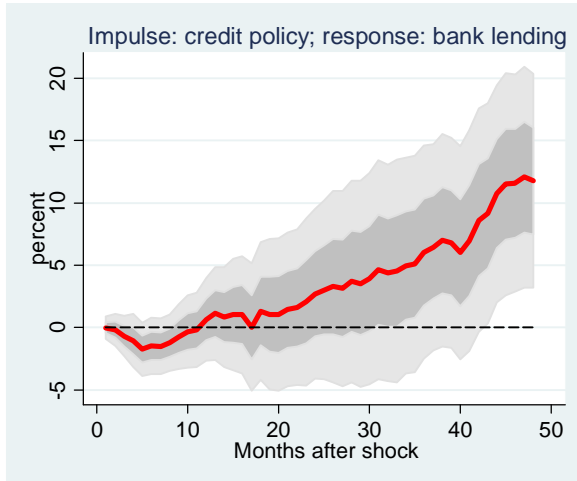


**Chart A32: Trade balance IRF, R & R**

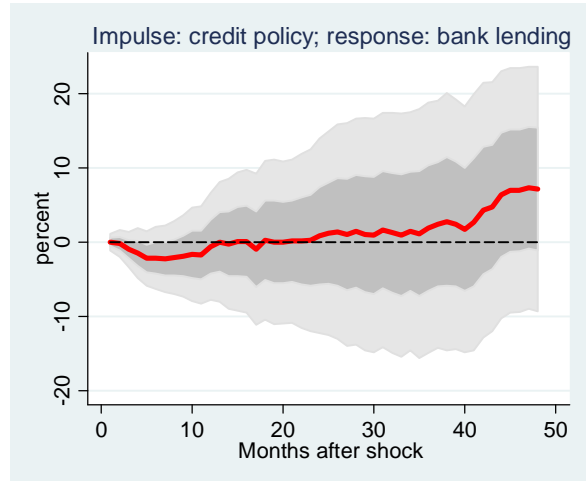


**Credit policy**

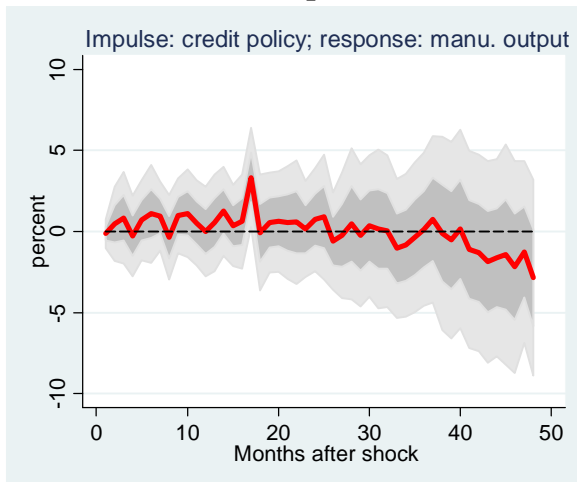
**Chart A33: Bank lending IRF, FALP**



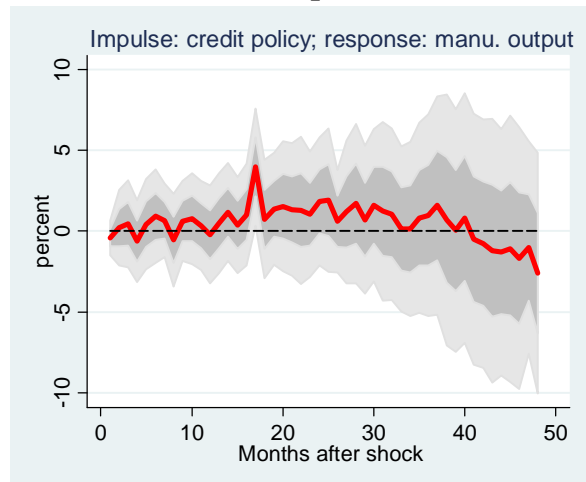
**Chart A34: Bank lending IRF, R & R**



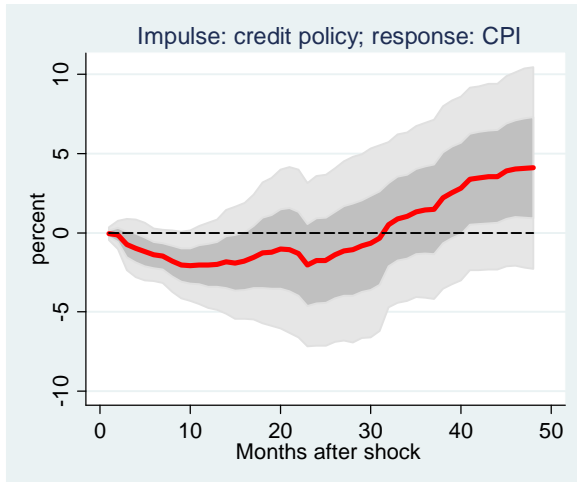
**Chart A35: Manu. output IRF, FALP**



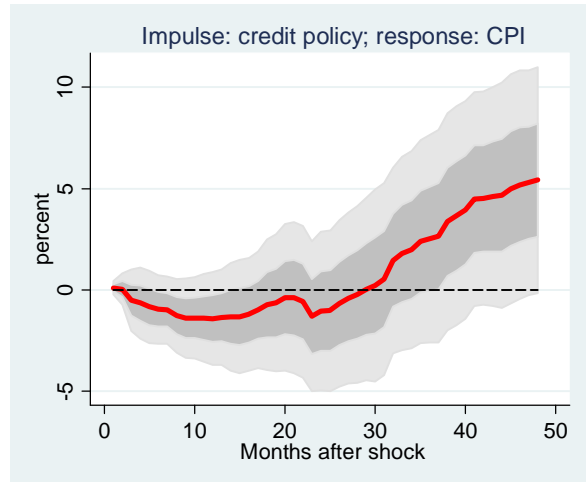
**Chart A36: Manu. output IRF, R & R**



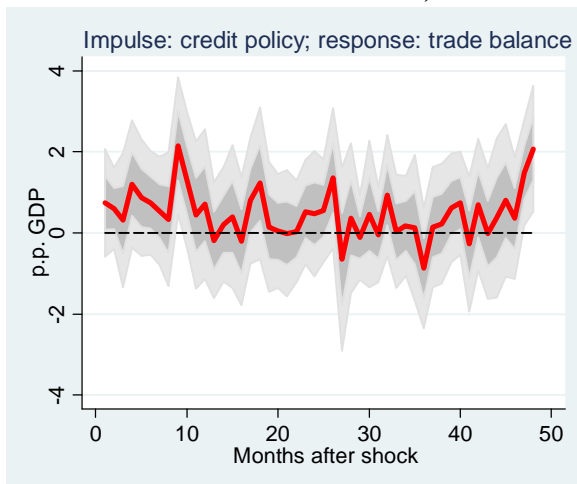
**Chart A37: Consumer prices IRF, FALP**



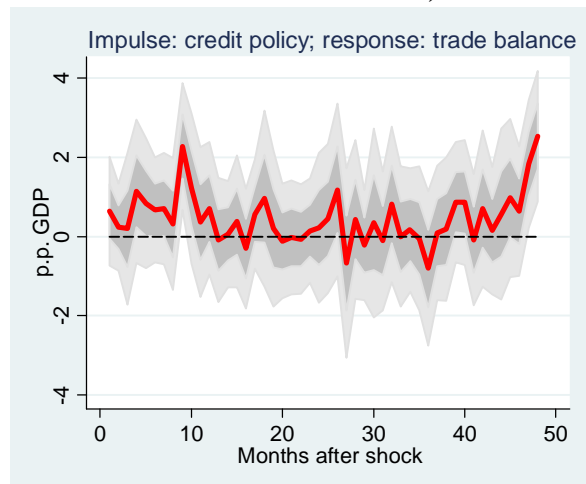
**Chart A38: Consumer prices IRF, R & R**



**Chart A39: Trade balance IRF, FALP**



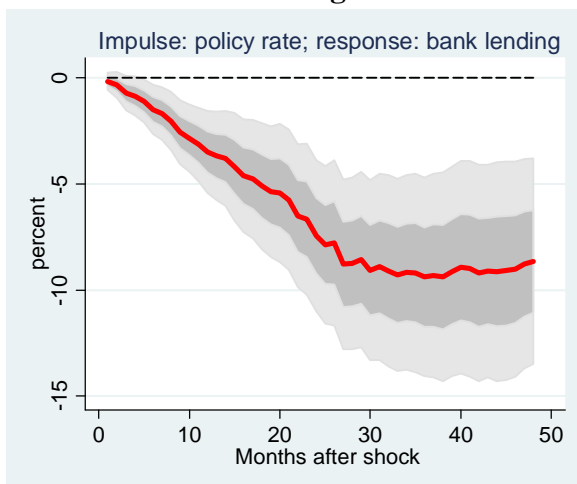
**Chart A40: Trade balance IRF, R & R**



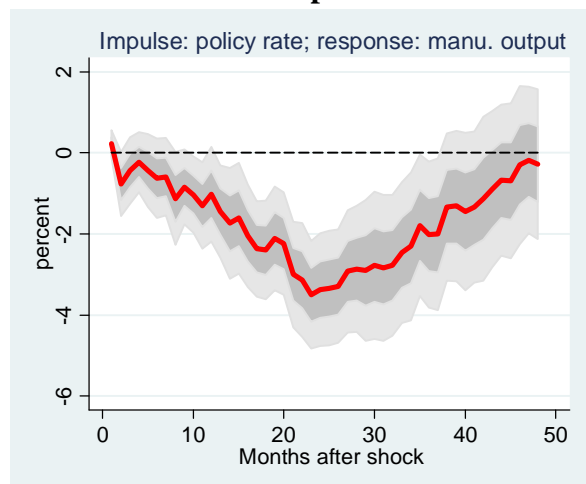
**FALP and R & R combined**

**Policy rate**

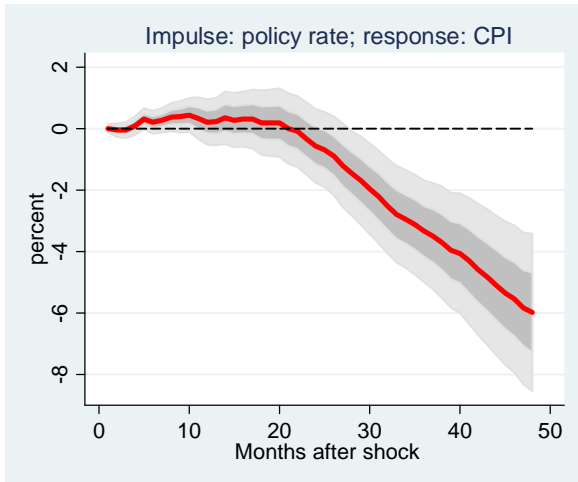
**Chart A41: Bank lending IRF**



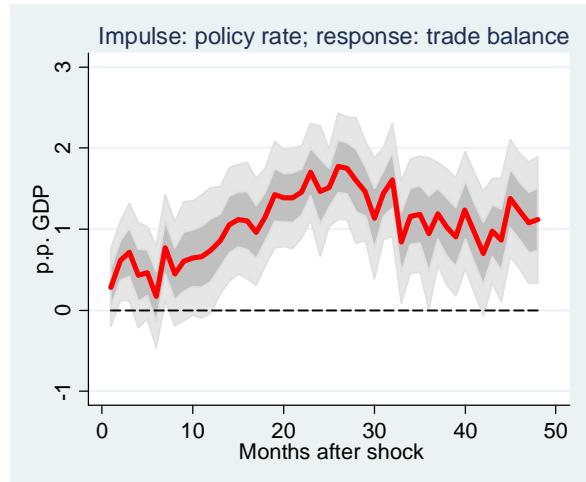
**Chart A42: Manu. output IRF**



**Chart A43: Consumer prices IRF**

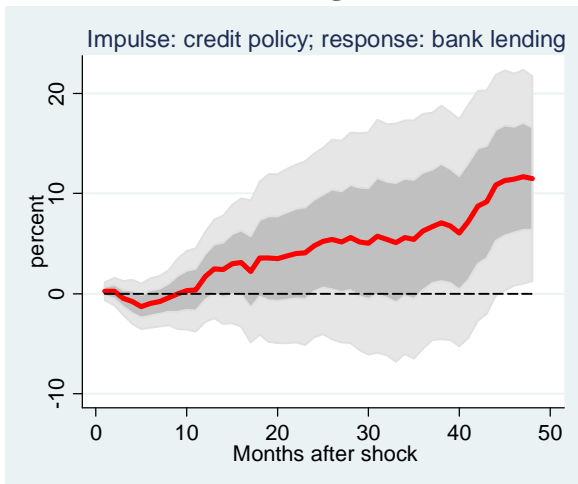


**Chart A44: Trade balance IRF**

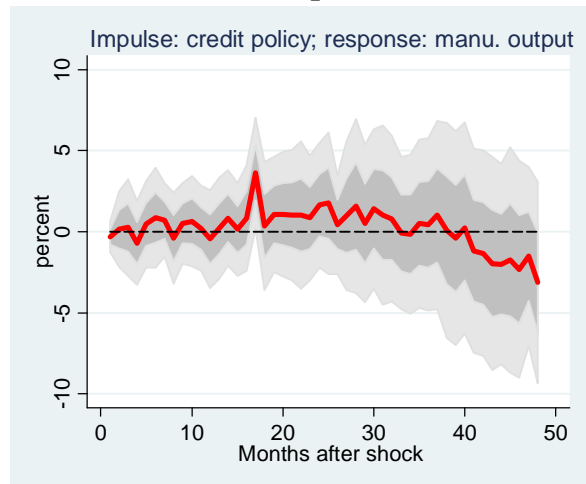


**Credit policy**

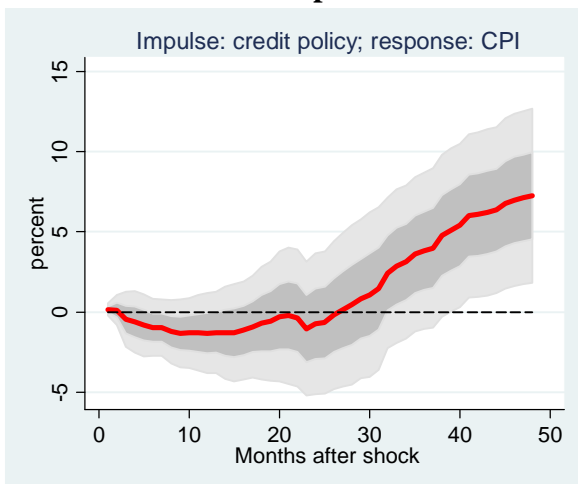
**Chart A45: Bank lending IRF**



**Chart A46: Manu. output IRF**



**Chart A47: Consumer prices IRF**



**Chart A48: Trade balance IRF**

