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Identifying sources of macroeconomic and exchange rate fluctuations in the UK

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A B S T R A C T

Using quarterly data for the period 1985:1–2011:1, this paper uses a stylised, open economy, structural VAR model to identify the types of shocks responsible for macroeconomic fluctuations in the UK economy. The stylised model implies a set of short-run restrictions that allow for the identification of the shocks. The importance of each shock is determined by examining forecast-error variance decompositions, impulse response functions, and implied long-run (or permanent) effects. The results presented here imply that two shocks (called the technology and IS shocks) are relatively more important than other shocks. Monetary shocks do exhibit long-run monetary neutrality, but clearly monetary policy is not responsible for a meaningful share of output and employment fluctuations during the sample period. The estimated VAR and structural disturbances imply that the model accurately reflects the UK economy. There is little evidence of a price puzzle or an exchange rate puzzle (evidence against uncovered interest rate parity) in response to an unexpected monetary policy tightening.

1. Introduction

During any recession it is important for policymakers to know which shocks to the economy are most likely to be the source or underlying cause of the recession and whether these shocks are of external or domestic origin. Like other advanced-country central banks, the Bank of England (BOE) in

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the UK has responded to the current economic slowdown by implementing a very accommodating monetary policy having kept the policy rate (BOE base rate) at a record low of 0.5% since March 2009. Is this response reasonable given the types of shocks that are the likely cause of the current slowdown? That is, is the current economic slowdown largely the result of a productivity shock or largely the result of a demand shock? Or are the shocks that caused the current slowdown policy-induced in the context of the UK as a small open economy?

To shed some light on the above questions, this paper examines the sources of macroeconomic and exchange rate fluctuations in the UK economy for the period 1985:1–2011:1 using a five-variable, structural vector-autoregression (VAR) model. This paper finds that two structural shocks (called the technology and IS shocks) have been the primary cause of fluctuations in the unemployment rate and output in the UK, jointly explaining at least 85% of the forecast-error variance of these two variables. The same two shocks jointly explain about 43% of the forecast-error variance of the nominal effective exchange rate (NEER) of the British pound and 29% of the variance of the Bank of England's base interest rate. A counterfactual simulation shows that these responses of the bank rate and the exchange rate have tended to reduce fluctuations in both the unemployment rate and output growth. These results imply that monetary and exchange rate policies in the UK have tended to stabilize output.

The paper employs a sample period that begins in 1985 because of data availability for the nominal effective exchange rate. This is not necessarily a drawback because monetary policy in the UK for several years before 1985 emphasized monetary targeting to control inflation and placed very little emphasis on the exchange rate. For a short period after 1985 interest rates were being used to support the exchange rate – making exchange-rate policy more important than monetary targeting because of the UK's participation in the European Exchange Rate Mechanism (ERM). In October 1992 Britain left the ERM and adopted a new framework for monetary policy (King, 1997), which according to Adam et al. (2005) resulted in new institutional arrangements that allowed there to be a change in emphasis from exchange rate stabilization (1985–1990) to inflation targeting (1992–1997 and 1997–2003). In contrast, Nelson (2009) argues that the objectives of UK policymakers essentially have remained unchanged over five decades. Although he acknowledges there have been changing views on the expected inflation term in the Phillips curve, it is his position that this has not affected policy objectives. Given these conflicting views on the stability of British monetary policy during the period 1985:1–2011:1, we re-estimate our model employing only the post-1992 sub-period as a robustness check.

We use a stylised model to motivate our structural decompositions. It includes a productivity equation, a demand function (where aggregate demand depends on the level of unemployment, inflation and the interest rate), an exchange rate augmented Phillips curve, a monetary policy rule and an exchange rate equation (uncovered interest parity (UIP) condition). The aim is to use this simple model with five key macroeconomic variables, namely the unemployment rate, real GDP growth, inflation, the Bank of England base rate, and the nominal effective exchange rate (NEER). The model implies a set of short-run, over-identifying restrictions which can be used to test its consistency with the data. While much of the VAR literature employs a closed economy framework to identify structural shocks (Bernanke and Mihov, 1998; Gali, 1999; Cover et al., 2006), there are several studies of small open economies that highlight the exchange rate as a transmission mechanism for monetary policy shocks,[1] while Peersman (2011) finds that the exchange rate is an independent source of shocks for the UK economy. In contrast we find that shocks to the exchange rate have had little effect on the unemployment rate and output in the UK, suggesting that flexible exchange rates largely have insulated the British economy from external shocks.[2,3] Indeed, as mentioned above, we find that the

[1] See, for example, Cushman and Zha (1997) who examine Canada; Kim and Roubini (2000) who study G7 countries; Del Negro and Schorfheide (2009) who use a DSGE setting. Bjørnland (2008) finds that there is interdependence between monetary policy and the exchange rate in Norway.

[2] For an alternate approach for identifying external shocks see Enders and Hurn (2007) who use foreign output (US GDP) to identify an external shock for Australia. We believe that it is more appropriate to use the exchange rate.

[3] One might also wish to include the exchange rate in a small structural VAR for purposes of examining exchange-rate pass-through. Our model, however, is not suitable for examining this issue. Gagnon and Ihrig (2004) report no significant relationship between monetary policy and exchange-rate pass-through. See also Choudhri et al. (2005), Shambaugh (2008), and Engel (2009) for additional discussions of this issue.