The role of house prices in the monetary policy transmission mechanism in small open economies

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ABSTRACT

We analyse the role of house prices in the monetary policy transmission mechanism in Norway, Sweden and the UK, using structural VARs. A solution is proposed to the endogeneity problem of identifying shocks to interest rates and house prices by using a combination of short-run and long-run (neutrality) restrictions. By allowing the interest rate and house prices to react simultaneously to news, we find the role of house prices in the monetary transmission mechanism to increase considerably. In particular, house prices react immediately and strongly to a monetary policy shock. Furthermore, the fall in house prices enhances the negative response in output and consumer price inflation that has traditionally been found in the conventional literature. Moreover, we find that the interest rate responds systematically to a change in house prices. However, the strength and timing of response varies between the countries, suggesting that housing may play a different role in the monetary policy setting.

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1. Introduction

The recent U.S. subprime crisis and the subsequent financial crisis have increased the focus on asset price developments, especially among central banks. This is primarily due to the central collateral role of asset prices such as prices of dwellings. For while central banks have managed to keep inflation in check through inflation targeting, they have not managed to prevent asset prices from bursting and having negative real effects. The current crisis is no exception (see IMF, 2009). Hence, asset prices can be an important *source* of macroeconomic fluctuations that an inflation targeting central bank may want to respond to, see e.g., Bernanke et al. (2000) and Bernanke and Gertler (1989).

However, asset prices are not only considered as sources of disturbances. Due to their role as stores of wealth, they could also be important *transmitters* of shocks since they react quickly to news (including monetary policy announcements), as emphasized in Zettelmeyer (2004), Rigobon and Sack (2004) and Bernanke and Kuttner (2005) among others. Hence, with their timely response to economic shocks, asset prices may be important indicators of the monetary policy stance. Understanding the role of asset prices in the transmission mechanism of monetary policy may therefore

be crucial for the implementation of an efficient monetary policy strategy.

In this paper, we analyse the role of house prices in the monetary transmission mechanism in three small open economies, Norway, Sweden and the UK, using a structural vector autoregressive (VAR) model. We focus on housing as it is the most important asset for households in industrialized countries. Unlike other assets, housing has a dual role of being both a store of wealth and a durable consumption good. Consequently, a shock to house prices may therefore affect the wealth of homeowners. As the value of collateral rises, this will also increase the availability of credit for borrowing-constrained agents. Finally, increased house prices may have a stimulating effect on housing construction (due to the Tobin's *q* effect). In total, a shock to house prices may therefore affect real growth and ultimately consumer prices, making house prices an important forward-looking variable that the monetary policymaker may want to monitor.[1]

The common procedure for analysing the effect of monetary policy on economic variables has usually been the structural VAR approach. A major challenge when incorporating asset prices like housing into a VAR model, though, is how to identify the system, as both the interest rate and asset prices may respond simultaneously (within the quarter) to news. Most of the VAR studies that

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[1] Greenspan (2001) also spurred interest in this topic, by suggesting that house prices have gained attention in the formulation of the monetary policy strategy.

incorporate house prices identify the system by placing recursive, contemporaneous restrictions on the interaction between monetary policy and house prices (see e.g., Assenmacher-Wesche and Gerlach, 2008a,b; Goodhart and Hofmann, 2001; Iacoviello, 2005; Iacoviello and Minetti, 2003, 2008; Giuliodori, 2005). In particular, they either assume that house prices are restricted from responding immediately to monetary policy shocks (Goodhart and Hofmann, 2001; Giuliodori, 2005), or that monetary policy is restricted from reacting immediately to innovations in house prices (Assenmacher-Wesche and Gerlach, 2008a,b; Iacoviello, 2005; Iacoviello and Minetti, 2003, 2008[2]). Yet, both restrictions are potentially wrong, the first as theory predicts that asset prices such as housing are forward looking and will respond quickly to monetary policy news[3] and the second because it restricts the policy maker from using all the current information when designing monetary policy. Although the issue as to whether there is any gain from responding to house price movements over and above output and inflation is still unresolved,[4] ruling out the possibility that Central banks have responded, may imply that these studies have produced a numerically important bias in the estimate of the degree of interdependence between monetary policy and house prices.

Another issue to be considered is to what extent one should allow for other asset prices when analysing the role of house prices in the monetary transmission mechanism. For the open economy, the exchange rate may be a relevant candidate. It plays a significant part in the formulation of monetary policy in the open economy (being an important influence on the overall level of prices), and is itself also influenced by monetary policy. Hence, monetary policy and exchange rate interactions may be substantial, each reacting to news in the other, as emphasized recently by Faust and Rogers (2003), Bjørnland (2009) and Bjørnland and Halvorsen (2008).

Hence, we analyse the effects of monetary policy shocks on house prices while also including the exchange rate into the model. By incorporating additional asset prices such as the exchange rate, the role of housing will be set in a wider context. However, including additional asset prices also comes at a cost, as the problem of simultaneity will now also relate to the new variables. Previous studies analysing the role of house prices, have therefore either ignored additional asset prices (Iacoviello, 2005), assumed the exchange rate to be exogenous (Giuliodori, 2005) or assumed a recursive order among the asset prices, so that all asset prices respond with a lag to monetary policy shocks (Assenmacher-Wesche and Gerlach, 2008a,b; Goodhart and Hofmann, 2001).

In contrast, we will allow for full simultaneity between all asset prices and monetary policy.[5] To identify all shocks, we will use an identification that restricts the long-run multipliers of shocks, but leaves the contemporaneous relationship between the interest rate and asset prices intact. For the three open economies, identification is achieved by assuming that monetary policy shocks can have no long-run effect on the level of the real exchange rate or on real gross domestic output (GDP). These are standard neutrality assumptions that hold for large classes of models in the monetary policy literature (see Obstfeld, 1985; Blanchard and Quah, 1989; Clarida and Gali, 1994). Similar restrictions have also recently been found to be highly successful in alleviating the exchange rate puzzle in several small open economies, see Bjørnland (2009). Identified in this way, house prices and exchange rates can now respond immediately to all shocks, while the monetary policymaker can consider news in all asset prices, when designing an optimal monetary policy response. Note, that we have not restricted the long-run effects of monetary policy shocks on house prices, as we believe this to be much more of a controversial issue that we would like to examine rather than impose at the outset.

Once allowing for a contemporaneous relationship between the interest rate and asset prices, the remaining VAR can be identified using standard recursive zero restrictions on the impact matrix of shocks. That is, we build on the traditional closed economy VAR literature (Sims, 1980; Christiano et al., 1999, 2005, among many others), in that a standard recursive structure is identified between macroeconomic variables and monetary policy, so variables such as output and inflation do not react contemporaneously to monetary shocks, whereas the monetary policymaker might respond immediately to macroeconomic news. That monetary policy affects domestic variables with a lag, is consistent with the transmission mechanism of monetary policy emphasized in the theoretical set up in Svensson (1997). These restrictions are therefore less controversial and studies identifying monetary policy without these restrictions have found qualitatively similar results, see for example Faust et al. (2004). Furthermore, by using a combination of restrictions, we will allow for a contemporaneous interaction between monetary policy and asset price dynamics, without having to resort to methods that deviate extensively from the established view of how one identifies monetary policy shocks in the literature (Christiano et al., 1999, 2005).

Our findings suggest that, following a contractionary monetary policy shock, house prices fall immediately. Yet, we find the impact of monetary policy shocks on housing to be small in comparison to the magnitude of fluctuations in house prices. Furthermore, we find the interest rate to respond systematically to changes in house prices. However, the strength and timing of the response varies from one country to another, indicating that housing may play a different role in the monetary policy setting.

The paper is organised as follows. Section 2 describes housing and mortgage market characteristics in the three countries, whereas in Section 3, the VAR methodology is explained. In Section 4 we discuss the empirical results. Section 5 concludes.

2. The housing and mortgage markets

The substantial financial liberalization process of the 1980s embraced the markets for housing finance and thereby increased the scope of spillovers from the housing market to the wider economy in many countries; see IMF (2008, 2009). Furthermore, the credit market liberalization also made house prices more responsive to monetary policy shocks, see Iacoviello and Minetti (2003).

However, although most countries has increased their exposure to housing, the role of housing in the business cycle depends on a series of factors, most important, households' access to mortgage credit. To measure the diversity of households' access to mortgage credit across countries, the IMF (2008) has constructed a synthetic mortgage market index. The index is based on indicators such as

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[2] Iacoviello and Minetti (2008) also identify a model using a common trends approach.

[3] Iacoviello (2005) develops and estimates a monetary business cycle model with nominal loans and collateral constraints tied to housing values. The monetary business cycle model clearly implies an instant response in house prices to a monetary policy shock.

[4] See IMF (2009) for a recent analysis that suggests that monetary policymakers should put more emphasis on macrofinancial risks posed by among others bursting housing bubbles.

[5] See Bjørnland and Jacobsen (2008) for a more detailed discussion and application to the U.S.