Journal of Financial Stability 6 (2010) 230–242

Contents lists available at ScienceDirect

Journal of Financial Stability

journal homepage: www.elsevier.com/locate/jfstabil

The role of liquidity constraints in the response of monetary policy to house prices

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ARTICLE INFO

Article history:
Received 16 January 2009
Received in revised form
23 December 2009
Accepted 12 January 2010
Available online 22 January 2010

JEL classification:
E52
E58
E44

Keywords:
Optimal monetary policy
Liquidity constraints
House prices

ABSTRACT

We analyse the optimal response of monetary policy to house prices in a New Keynesian framework. A positive wealth effect from housing is derived from liquidity constrained consumers. Housing equity withdrawal allows them to convert an increase in housing value into consumption and we show that monetary policy should react to house prices due to their effect on consumption by constrained agents. Moreover, we allow the share of liquidity constrained consumers to vary with house prices. Consequently, the optimal weights on expected inflation, the output gap and house prices in the optimal interest rate rule vary over time too.

1. Introduction

Empirically there is a strong wealth effect on consumption spending. Conventional wisdom is that the marginal propensity to consume out of total net wealth is 3–5 cents per dollar (Altissimo et al., 2005). Furthermore, various studies find a stronger wealth effect of housing than of stock wealth for the US (e.g. Davis and Palumbo, 2001; Case et al., 2005; Carroll et al., 2006). The difference may be explained by the more even distribution of housing wealth than of stock wealth across households, with a owner-occupier rate of nearly 70% in the US and housing representing a larger part of total household wealth than equities (Illing and Klüh, 2004).

From a theoretical perspective it is not straightforward to justify the wealth effect from housing (see e.g. Carroll, 2004). Consider a representative infinitely lived agent who owns the house in which she lives. An exogenous rise in house prices at a constant interest rate just compensates for the higher present value of expected future imputed rents. In this case the change in net wealth is zero and should not have any effect on consumption. Even if the agent moved to a cheaper place, if housing services in the future improved, if higher collateral value resulted in saving on interest payments, or if the agent owned a high-value house but lived in a cheap one, there need not be a wealth effect. Since the agent lives forever any change in net wealth is spread out into the infinite future and should not affect consumption today. However, if the agent is liquidity constrained an increase in the value of the house can serve as additional collateral to borrow against. Housing value serves as a means to bring forward consumption and helps to smooth it over time, even though net worth has not changed.[1] In this case an increase in house prices can lead to an effect on consumption. Some authors argue theoretically and empirically that the process of financial liberalisation since the mid 1980s has increased the proportion of housing collateral that can be used to borrow against (e.g. Attanasio and Weber, 1994; Lustig and van Nieuwerburgh, 2006; Muellbauer et al., 1990; Ortalo-Magné and Rady, 2006). Others stress the role of rising house prices for a given level of financial liberalisation (e.g. Campbell and Cocco, 2007; Carroll, 2004). In the long run the fraction of liquidity constrained homeowners should decrease as financial innovation and liberalisation proceed and increase e.g. the loan-to-value ratio. In the short run the fraction of liquidity constrained agents varies because the

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[1] A wealth effect of housing could also arise with finitely lived agents who do not care about the utility of their descendents. However, the focus here is one the role of liquidity constraints.

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doi:10.1016/j.jfs.2010.01.002

possibility to smooth consumption depends on the level of house prices for given financial instruments. However, some of these constrained agents might be prospective buyers who would be adversely affected by an increase in house prices. We will also take into account their role in modelling the wealth effect.

A sufficient increase in house prices is necessary for homeowners to benefit from the possibility of housing equity withdrawal. Housing equity withdrawal is the difference between net lending secured on housing and households' gross investment in housing (Bank of England). This way homeowners can increase their mortgage, i.e. cash flow, by a fraction of the increase in the value of their house.[2] For some households the extra cash will cover more than desired spending, thereby making them effectively unconstrained. On the other hand there are likely more constrained prospective buyers when house prices are high.

Figs. 1 and 2 depict the real housing wealth per capital along with real house prices for the US and the UK. Housing wealth is constructed by multiplying the number of owner-occupied single-family houses with the corresponding house price index (cf. Case et al., 2005). Evidently the correlation is very high in both cases. The figures suggest that an increase in house prices raises housing wealth almost one for one. For a given income level this should decrease the share of homeowners with liquid assets below a certain threshold. Should an increase in house prices be associated with a rise in income then the share of households with little liquid assets should fall even faster. It is precisely the relation between house prices and the share of liquidity constrained households that will be the central part of our model.

Housing equity withdrawal in the US and the UK has indeed increased considerably in the early 2000s at the same time as house prices and with it housing value increased as documented in Figs. 3 and 4. The simple correlation coefficient of the two series for the US is 0.83, while the one for the UK is smaller at 0.35.

Furthermore, Hurst and Stafford (2004) have shown that households do indeed use housing equity to smooth consumption in the face of an adverse shock such as unemployment.[3] Also Mian and Sufi (2009) find empirical evidence that homeowners do borrow against rising home value and use 25–30% of the proceeds to finance consumption. For an economically significant effect on consumption a sufficiently large fraction of households must be homeowners and liquidity constrained. Figs. 5 and 6 show the distribution of liquid asset and income, respectively, across US homeowners in 2003. Clearly, a non-negligible share of homeowners have liquid assets of at most $1000 and earn at most $30,000 per year.[4]

The objective of this paper is to derive the implications of time-varying liquidity constraints for the optimal conduct of monetary policy. In the short run house prices are volatile and affect the capacity of constrained households to borrow and thereby smooth consumption. On the one hand constrained homeowners can expand consumption, on the other hand there are renters who might cut back on consumption when they have to save a larger amount for buying a house later. However the overall share of constrained agents in the economy is likely to fall as house prices rise. Even though higher house prices might increase the fraction of prospective buyers, these will likely be composed of households that would otherwise buy a house but still be constrained for some time. It is very unlikely that a renter purchases a house and immediately becomes unconstrained.

The contribution of this paper is to take account of the fact that higher house prices temporarily reduce the fraction of constrained households while falling house prices temporarily increase it. It also takes account of the fact that rising house prices affect prospective buyers adversely while existing homeowners benefit. The question asked is how monetary policy should react to house prices and the corresponding time-varying liquidity constraints.

A wealth effect from housing is derived by assuming that young homeowners are liquidity constrained in the sense that they have high permanent income relative to current income as it is typical for the life-cycle pattern of income. To the extent that they are owner-occupiers a rise in house prices enables them to extract the extra value and increase their consumption towards the optimal level as implied by the permanent income hypothesis. This way house prices increase aggregate demand and affect the output gap and inflation. At the same time some young agents are prospective buyers, who actually rent, such that an increase in house prices makes them reduce their consumption. This works against a positive wealth effect from rising house prices and rather suggests higher consumption in the face of falling house prices, i.e. a negative wealth effect.

It has to be stressed that our model and results exclusively apply to economies where something like home equity withdrawal exists. This is the case for the US and the UK. As such our results do not easily carry over to economies where a gain in housing wealth cannot be converted into spendable cash.

Our main results are that monetary policy should react to house price movements due to their effect on consumption by constrained agents, with the sign of the reaction depending on whether existing homeowners with a positive wealth effect outweigh prospective buyers with a negative wealth effect. Moreover, with time-varying liquidity constraints, the optimal weights on expected inflation, the output gap and house price changes are affected because constrained and unconstrained households have different consumption functions. It is one of the main contributions of the paper to work out explicitly this mechanism. To the best of our knowledge this has not been looked at yet. Our results are of interest because they show that it is not only the house prices per se that matter but also their interaction with liquidity constraints and the associated effect on the weight on expected inflation and output in the optimal interest rate rule. This gives additional information to the policy maker about the strength of the optimal interest rate response to house prices. The optimal interest rate response crucially depends on the sensitivities of a change in the share of constrained agents with respect to house prices, expected inflation, the output gap and the interest rate.

The paper is structured as follows. Section 2 relates the paper to the literature. Section 3 sets up a life-cycle model of consumption and derives an IS curve with liquidity constraints. Section 4 derives the optimal monetary policy in a New Keynesian framework and a wealth effect from housing. Section 5 analyses the optimal interest rate response when there are time-varying liquidity constraints. Section 6 concludes.

2. Related literature

The present paper relates to a vast amount of papers analysing the relationship of monetary policy and asset prices. Typically they do not distinguish between different types of assets. Broadly speaking there are two main questions in the context of the optimal response of monetary policy to asset prices. The first is how should monetary policy react to asset prices over and above a conventional

[2] For the construction of housing equity withdrawal from the data, see Greenspan and Kennedy (2005, 2007).

[3] Another use of housing equity would be to reoptimise the financial portfolio and not to spend it on consumption.

[4] Of course, what also matters is the history of assets and income. The percentage of homeowners with liquid assets of at most $1000 and an annual income of at most $30,000 is 0.12 in the sample. For cut-off values of $6200 for liquid assets and $58,800 for income as chosen by Hurst and Stafford (2004) the number is 0.35.