Business cycle implications of mortgage spreads

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ABSTRACT

How do aggregate quantities at the business cycle frequency respond to shocks to the spread between residential mortgage rates and government bonds? Using a structural VAR approach, we find that mortgage spread shocks impact the real economy by both economically and statistically significant magnitudes: a 100 basis point decline in the spread causes a peak increase in consumption, residential investment and GDP by 1.6 percent, 6.2 percent and 1.9 percent, respectively. Presumably, these effects are magnified when the policy rate is held fixed, as was the case in the US during the recent implementation of unconventional monetary policy.

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1. Introduction

What are the quantitative business cycle effects of time variation in the residential mortgage interest rate spread? Surprisingly, this question is almost unexplored in the existing literature despite the substantial cyclical variation of this spread in the data. While Hubbard and Mayer (2009), Guerrieri and Lorenzoni (2011) and Hall (2011a,b) all have referenced the issue, none have empirically documented the relationship between mortgage spreads and aggregate quantities. We define the mortgage spread as the difference between the average interest rate on newly issued mortgages at a given maturity and the government bond rate of the corresponding maturity. By using this definition, we separate the mortgage spread from the term premium. We restrict our analysis to the prime mortgage market. This is not because we think that subprime mortgages are unimportant, but rather because the two markets merit separate analysis.

Why might mortgage rates affect the macroeconomy? Theoretically, the mortgage rate, and thus the mortgage spread, potentially affects aggregate economic variables through several channels: (i) house prices and residential investment through the user cost of housing, (ii) as one relevant rate in the consumption/savings decision and, (iii) the post-interest disposable income of any household with a mortgage. If house prices are affected by mortgage spreads, then housing wealth and collateral values are also affected. In the presence of binding collateral constraints or, more generally, if credit extension is decreasing in household leverage, mortgage spreads will influence spending decisions through this collateral channel.

The motivation for exploring the business cycle effects of residential mortgage spread variation – and, more specifically, innovations to this spread – is threefold. First, this paper seeks to contribute to the general understanding of what drives business cycles and document the quantitative importance of mortgage spread innovations for aggregate variables.[1] Second, if the mortgage spread affects aggregate variables, then monetary policy should take that into account. Accordingly, the

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[1] A closely related issue is that if mortgage spread variation has non-negligible importance, existing models that abstract from it are misspecified. This problem is probably most severe for estimated structural models that address the role of housing for the business cycle, e.g. Iacoviello and Neri (2010) and Walentin (2014).

analysis herein also explores how monetary policy historically has responded to mortgage spread innovations. This paper thereby complements Cúrdia and Woodford's (2009) analysis which addresses how monetary policy optimally is conducted in a stylized model with one lending spread that applies to all types of loans. Third, and perhaps most importantly, this paper's research question has bearings on unconventional monetary policy intended to affect the business cycle through the mortgage spread, such as the Federal Reserve's recent purchases of mortgage backed securities (MBS). To our knowledge, this paper is unique in that it empirically quantifies the business cycle effects of mortgage spread innovations without relying on a specific theoretical model.

The US is the primary country of study over the sample period 1983q1–2011q4. We start by documenting the substantial time variation in the mortgage spread and that the spread is countercyclical. Furthermore, the maximum absolute cross-correlation occurs when the mortgage spread leads GDP by 2–3 quarters. In other words, the spread is lowest immediately prior to GDP peaks and highest immediately prior to GDP troughs. A very similar pattern has been documented by Kydland et al. (2012) for nominal mortgage rates.

Our main exercise is inspired by Gilchrist et al.'s (2009) and Gilchrist and Zakrajšek's (2012) work on the macroeconomic effects of corporate bond spreads. The role of innovations to mortgage spreads for business cycles is documented by estimating a structural vector autoregression (SVAR). The baseline SVAR includes the following seven variables in levels: consumption, residential investment, GDP, the consumer price index, the mortgage spread, the policy interest rate, and house prices. The identifying restriction is that mortgage spread shocks do not affect aggregate quantities or consumer prices on impact but are allowed to contemporaneously affect the policy rate and house prices.

The mortgage spread impulse responses obtained are consistent with the simple theoretical relationships mentioned above. They are also consistent with an interpretation of mortgage spread shocks as credit supply shocks: aggregate quantities and house prices all decrease following a positive innovation to the spread. A mortgage shock of 100 basis points (bps) yields a decrease of 1.6 percent in consumption, 6.2 percent in residential investment, and 1.9 percent in GDP. These responses are gradual and reach a trough after more than one year. House prices respond faster and decline by 2.6 percent. A 100 bps mortgage spread shock yields a fast and strong 184 bps offsetting response of the policy rate. From the point of view of unconventional monetary policy these results provide a lower bound. The reason is that in a setting where the policy rate is fixed and cannot accommodate the mortgage shock, such as during the recent zero-lower bound period in the US, the responses of all other variables will be stronger.

The importance of mortgage spread shocks is moderate in terms of variance decomposition at business cycle frequencies. Roughly 10 percent of consumption, GDP and house price variation is due to the spread shock at short horizons. In terms of variance decomposition the mortgage spread shock is as important for the business cycle as the excess (corporate) bond premium shock documented in Gilchrist and Zakrajšek (2012).

We find similar results for the UK and Sweden. Mortgage spread innovations also appear both statistically and economically important for these countries. Furthermore, they induce the same qualitative dynamics. However, the mortgage spread shock is more important for aggregate quantities and house prices in these countries compared to the US and its impact is faster. This difference may be due to the much shorter duration of the typical mortgage contract in the UK and Sweden compared to the US.

Our results are robust to several variations in both the SVAR specification and the sample period. Perhaps most importantly, the importance of mortgage spread innovations is not diminished when a corporate bond spread is controlled for in the VAR. We use an alternative measure of the mortgage spread that accounts for the prepayment option in US mortgages. We change the basic identification approach by using sign restrictions. For a given size of the mortgage spread shock, effects on aggregate quantities are larger for both of these alternative specifications.

To aid in the interpretation of the mortgage spread shock, we estimate a SVAR specification where the quantity of mortgage debt outstanding is added to our baseline VAR. Mortgage spread shocks drive the price and the quantity of credit in opposite directions. This corroborates other indications that mortgage spread shocks should be interpreted as credit supply disturbances.

The takeaways from this paper are the following: (i) business cycle fluctuations are affected by financial frictions in the residential mortgage market, (ii) innovations in the mortgage spread predominantly capture movements in credit supply and are moderately important for business cycle variation in aggregate quantities and house prices, (iii) in general, the policy rate appears to partially offset mortgage spread innovations, and (iv) if unconventional monetary policy in the form of asset purchases in mortgage markets succeeds in affecting the mortgage spread, then it has sizable effects on aggregate quantities and house prices.[2] Similarly, macroprudential policies that affect the mortgage spread will have sizable business cycle effects.

The paper is organized as follows. The remaining part of this section describes the related literature. Section 2 characterizes the mortgage spread. Section 3 contains the quantitative exercises and results. Robustness exercises are documented in Sections 4 and 5 concludes. Online appendices contain additional material.

1.1. Related literature

Although their primary focus differs, three papers clearly relate to the present paper as they include empirical analysis of the effects of a household borrowing spread on the macroeconomy. Both Darracq Pariès et al. (2011) and Gerali et al. (2010)

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[2] The literature indicates that this type of policy action indeed affects the mortgage spread. See Fuster and Willen (2010), Hancock and Passmore (2011) and Krishnamurthy and Vissing-Jorgensen (2011).