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Addressing household indebtedness: Monetary, fiscal or macroprudential policy?

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ABSTRACT

In this paper, we build a dynamic stochastic general-equilibrium model with housing and household debt, and compare the effectiveness of monetary policy, housing-related fiscal policy, and macroprudential regulations in reducing household indebtedness. Excessive household debt arises due to exuberance shocks on house price expectations, which drive a wedge between the actual and the underlying fundamental value of houses. The estimated model also features long-term fixed-rate borrowing and lending across two types of households, and differentiates between the flow and the stock of household debt. Our main findings can be summarized as follows: (i) Monetary tightening is able to reduce the stock of real mortgage debt, but leads to an increase in the household debt-to-income ratio. (ii) Among the policy tools we consider, tightening in mortgage interest deduction and regulatory loan-to-value (LTV) are the most effective and least costly in reducing household debt, followed by increasing property taxes and monetary tightening. (iii) Although mortgage interest deduction is a broader tool than regulatory LTV, and therefore potentially more costly in terms of output loss, it is effective in reducing overall mortgage debt, since its direct reach also extends to home equity loans. (iv) Lowering regulatory LTV and mortgage interest deductions from their current levels would be welfare improving, while we find weak support for systematic leaning against household imbalances through monetary policy.

1. Introduction

The elevated levels of household debt during the mid-2000 posed significant financial stability and macroeconomic risks to the U.S. economy. Since the rise in household debt was accompanied by a decrease in mortgage underwriting standards and exuberant expectations regarding future house price gains, the U.S. financial system was exposed to a sudden reversal in housing markets. Once the exuberance in housing waned, the decline in house prices and the resulting increase in mortgage defaults put the balance sheets of financial institutions in danger, since many were directly or indirectly exposed to the housing sector. The economic fallout resulting from the financial crisis was also more painful and prolonged relative to a standard recession, as households and financial institutions engaged in a long deleveraging process following the crisis.

How best to prevent household debt from reaching unsustainable levels remains a critical issue of discussion among economists. Policy-makers already possess a suite of tools with the potential to address concerns related to household indebtedness. First, *macroprudential regulations* can be tightened to ensure a decline in household credit; for example, the regulatory loan-to-value

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(LTV) ratio on new mortgage lending can be reduced. Second, in the fiscal realm, *housing-related tax policies* could be tightened; for example, the statutory or effective property tax rates on residential properties can be increased or the tax deductibility of mortgage interest can be curbed.[1] Finally, and arguably as the last line of defense, *monetary policy* can be tightened to induce an increase in mortgage rates and discourage new lending.[2]

In this paper, we assess the effectiveness of the aforementioned policies in reducing household debt, and evaluate their side effects on macroeconomic variables such as output and inflation, using a dynamic stochastic general-equilibrium (DSGE) model with housing and household debt. Table 1 lists the four policies we consider, along with the scope of each policy for addressing household indebtedness. As is well known, macroprudential tools such as regulatory LTV are more targeted toward the housing sector, and therefore potentially have smaller adverse impacts on the rest of the economy. On the other hand, the regulatory LTV ratio applies to regular mortgages on new home purchases, but is generally not binding for loans based on withdrawals of existing home equity. Thus, such a tool may not be effective in reducing overall household debt if home equity withdrawals make up a large part of new mortgage lending. In other words, LTV policy is perhaps too targeted, or not broad enough, to adequately address high household indebtedness.

Housing-related tax policies are also targeted in that their direct effects are only on the housing sector, but these policies may be broader in terms of their reach relative to regulatory LTV. In particular, a reduction in the tax deductibility of mortgage interest would (likely) apply to all existing mortgage borrowers, including those that borrowed in periods prior to the implementation of the new policy. Thus, this policy may potentially have a greater adverse impact on the economy relative to LTV, but on the other hand, this policy may also be more effective in terms of limiting home equity loans, since interest on these loans are also largely deductible when paying income taxes.[3] Similarly, an increase in property taxes would impact all homeowners, including those that have no outstanding mortgage debt; property taxes therefore are even broader in their scope relative to mortgage interest deduction rules. Finally, monetary policy is the broadest tool among the policies discussed here, since a tightening would directly impact the non-housing sectors of the economy and the flow of credit for purposes other than housing.[4]

In this paper, we build a DSGE model with housing and household debt, and consider the effectiveness of the aforementioned policies in reducing household indebtedness. Our model features borrowing and lending across two types of households, as in Iacoviello (2005), but mortgage loans are fixed-rate and are amortized over the long term, similar to Kydland et al. (2016), thereby allowing us to differentiate between the flow and the stock of household debt. This is key for differentiating the effects of policies that apply only to new lending (e.g., regulatory LTV) as opposed to all existing mortgage debt (e.g., mortgage interest deduction). The constraint on borrower households is imposed on the flow rather than the stock of household debt. New mortgage loans finance not only the residential investment of borrower households, but also partly their consumption expenditures, by allowing them to withdraw a portion of their existing home equity each period. Unlike the existing literature, we let the home equity extraction rate be lower than the LTV on new mortgages.[5] Thus, households do not increase their borrowing up to the LTV limit when house prices increase, which implies that household leverage is countercyclical in our model, consistent with the empirical evidence in Adrian and Shin (2010). This feature is also key to dilute the effectiveness of regulatory LTV in addressing household debt, since LTV policy mainly affects new regular mortgages, but not home equity loans taken on top of existing debt. The rest of the model features are standard.

In the model, excessive household debt can be detrimental, and active policy could potentially be welfare improving, due to the presence of exuberance shocks on the house price expectations of agents, which drive a wedge between the actual value of housing and its underlying fundamental value (Bernanke and Gertler, 1999). Since the house price is a key determinant of the tightness of the borrowing constraint faced by borrowers, exuberance in asset prices leads to overborrowing in the model.[6] Our focus in the paper is to analyze the effectiveness of different policy tools in reducing household debt, as well as the welfare implications of implementing these policies. In our estimated model, we find that monetary tightening is able to reduce the stock of real mortgage debt in the short run; in particular, a 100 basis points (bps) tightening in the policy rate results in a peak decline of about 0.2% in the real stock of debt. Given that the response of output to monetary policy is stronger, however, our model implies an increase in the household

[1] In the U.S., property taxation is conducted at the state level; therefore, it may be difficult to implement this policy in a coordinated manner. Nevertheless, similar effects can be obtained by reducing the deductibility of property taxes from personal income tax at the federal level (see Alpanda and Zubairy (2016)).

[2] See Crowe et al. (2011) for a detailed list of policy tools that have been used by different countries in dealing with real estate booms.

[3] In the United States, mortgage interest deduction applies to all first and second mortgages and to the first $100,000 of home equity loans. In the model, home equity loans partly reflect cash-out refinancing, which is also eligible for the mortgage interest deduction.

[4] Similar to monetary policy, the two fiscal policies mentioned above (i.e., mortgage interest deduction and property taxes) can also directly impact capital accumulation, if the changes in these policies also apply to commercial real estate and mortgages financing them. Here, we implicitly assume that these fiscal policies can be applied in a more targeted fashion so as to directly affect residential real estate only. This is unlike conventional monetary policy, which cannot be applied in a more targeted manner.

[5] Given the data reported in Greenspan and Kennedy (2005, 2007), home equity withdrawals (i.e., standard home equity loans taken on top of first liens as well as cash-out refinancing) are about 7% of existing home equity on an annual basis, far below the regulatory LTV ratio on new mortgages. Aggregate data reveal that the average LTV on *new* mortgage loans is significantly higher than the average LTV on all *existing* mortgages. Thus, in the aggregate, borrowers have built up equity over time and have not fully withdrawn from their equity up to the LTV limit each period.

[6] The model also features a pecuniary externality arising from the borrowing constraint and the financial accelerator mechanism. In particular, an increase in asset prices relaxes the borrowing constraints of all borrowers, but this side effect is not internalized by a single agent who is deciding whether to purchase more housing through additional borrowing. Thus, overborrowing can arise in the model when asset prices rise. See Lorenzoni (2008), Korinek (2011), and Bianchi and Mendoza (2010) for more on this pecuniary externality. Note that in these papers, the borrowing constraint is occasionally binding, so active policy has an additional benefit of increasing the amount of time that the borrowing constraint is kept slack. We do not capture this margin in our set-up, and assume the borrowing constraint binds at all times in our estimation and simulations.