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## Regional Science and Urban Economics

journal homepage: [www.elsevier.com/locate/regec](http://www.elsevier.com/locate/regec)Mortgage recourse provisions and housing prices<sup>☆</sup>Robert R. Reed<sup>a,\*</sup>, Amanda LaRue<sup>a</sup>, Ejindu S. Ume<sup>b</sup><sup>a</sup> University of Alabama, USA<sup>b</sup> Miami University-Ohio, USA

## ARTICLE INFO

## Keywords:

Housing  
Mortgage default  
Recourse  
Strategic default

## ABSTRACT

In light of the large swings in housing prices in the United States in recent years, there has been considerable interest in trying to understand the various factors which led to the boom and bust of the housing market. In this paper, we explore the impact of the legal environment from provisions for mortgage default across U.S. states. To do so, we develop a rigorous framework with microeconomic foundations for financial intermediaries. To be specific, we introduce a housing market and a residential mortgage market in the Diamond and Dybvig framework which emphasizes the role of depository institutions to help depositors manage idiosyncratic liquidity risk. Notably, we think of non-recourse provisions as a legal arrangement to protect risk-averse homeowners from the loss of housing value. While housing demand should be higher in markets where mortgage borrowers have full insurance, lenders also adjust the amount of mortgage credit provided to protect their risk-averse depositors. Thus, a priori, there is not an obvious connection between mortgage recourse provisions and housing prices. To draw further insights into the issue, we proceed to look at empirical evidence on housing prices at the MSA-level using the Case-Shiller Home Price Index. Once one controls for regional level unobservables, the evidence suggests that the demand side factors dominate in which prices are higher in non-recourse states, following the prediction from the model that the demand for mortgages would be higher. We next move to obtain more concrete predictions from our theoretical framework with calibration exercises to study the effects of mortgage recourse. Upon calibrating the model to match some stylized evidence on housing market conditions, the theoretical predictions are consistent with the regression analysis. In this manner, our work sheds numerous insights into the implications of the legal landscape regarding mortgage default for housing market activity.

## 1. Introduction

There have been a number of explanations for the recent housing bubble in the United States. Historically low interest rates adopted around the time of the 2001 recession and subsequent weak, jobless recovery have often been cited.<sup>1</sup> Another potential explanation involves government policies to promote housing, especially lower income groups. For example, the Federal Housing Enterprises Regulatory Reform Act of 1992 states: “The purpose of these goals is to facilitate the development in both Fannie Mae and Freddie Mac

of ... day-to-day operations to service the mortgage finance needs of low-and moderate-income persons, racial minorities and inner-city residents.”<sup>2</sup>

Other explanations focus on developments in financial markets. [Bernanke \(2005\)](#) argues that much of the appreciation of housing prices was a reaction to a “global savings glut” in which the United States ran large current account deficits. For a variety of reasons, large flows of funds came to the United States from the developing world at a time when business spending was low. As a result, much of the capital was invested in the residential sector of the economy. Another possibility

<sup>☆</sup> We thank two anonymous referees for their valuable comments and suggestions.

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<sup>1</sup> In December 2000, the target for the federal funds rate stood at 6.5%. In January 2001, the Federal Open Market Committee lowered the target by 100 basis points partly in response to weak business spending. This began a period of unprecedented (at the time) monetary policy accommodation in which the target was lowered all the way to 1% in June 2003. Though the level of accommodation was pulled back beginning a year later, the target has not returned to the rates of the year 2000.

<sup>2</sup> In particular, the Department of Housing and Urban Development (HUD) set a goal target of 40% in 1996 for mortgages to low-moderate families. The number was raised a range of 50%–55% from in 2001–2004. It was further increased to a range of 51%–56% from 2005 to 2008.

<https://doi.org/10.1016/j.regsciurbeco.2018.05.005>

Received 27 April 2016; Received in revised form 23 May 2018; Accepted 24 May 2018

Available online 18 July 2018

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was the rise of the “shadow” banking sector in which non-traditional financial intermediaries acquired large amounts of assets, especially in the housing sector.<sup>3</sup> Notably, Gorton and Metrick (2012) present evidence showing that around 80% of subprime mortgages were financed through securitizations in which large pools of mortgage loans were sold to special purpose vehicles. As a consequence, mortgage-related debt became the largest fixed income market in the United States from 2004 to 2006. Finally, the proliferation of the 30 year fixed rate mortgage has been cited as it allowed borrowers to finance higher priced homes through smaller mortgage payments. According to data from the Federal Housing Finance Agency, the average term to maturity on conventional loans was 24.1 years in 1985. By comparison, in 2007, it was more than 5 years longer at 29.2 years.

Another argument is that the cost of strategic default was too low. That is, homeowners without ‘skin in the game’ could simply choose to walk away as housing conditions started to deteriorate. For example, Feldstein (2008) argues: “The ‘no recourse’ mortgage is virtually unique to the United States. That’s why falling house prices in Europe do not trigger defaults, since the creditors’ potential to go beyond the house to other assets or to a portion of payroll earnings is enough to deter defaults.” However, in 2009, Nevada became a limited recourse state in order to protect mortgage borrowers. Thus, there is considerable debate surrounding the legal landscape of the mortgage market. One might argue that borrowers in states without recourse provisions would be tempted to borrow more as it would be relatively easy for them to strategically default on their mortgage obligations. Alternatively, policymakers might consider that protections for mortgage holders are vitally important to protect risk-averse borrowers from weak housing market conditions.<sup>4</sup>

The objective of this paper is to study the implications of the legal environment regarding mortgage default for housing market activity. In many states, lenders have the ability to pursue a deficiency judgement against a mortgage borrower who defaults. In other states, ‘non-recourse’ states, lenders cannot. Thus, there are significantly different option values to strategic default across the United States.

In order to carefully address this issue, it is important that one develop a rigorous general equilibrium modeling framework capable of illuminating the incentives of different groups of participants in mortgage lending and housing market activity. In this manner, the connections from housing market outcomes to the banking sector and overall economy may be formally developed. To begin, it is critical that the model incorporate a well-defined motivation for financial intermediation in order to adequately articulate the incentives of financial intermediaries and their mortgage lending behavior. That is, following Smith (2003), ‘intermediation should be taken seriously.’ Towards this goal, we follow a tradition in the microeconomics of financial institutions which emphasizes that financial intermediaries are firms who pool resources so that agents can achieve outcomes which would not be possible at the individual level. For example, Diamond (1984) and Williamson (1986) show how intermediaries can promote credit market activity by pooling funds among lenders in a way that avoids duplica-

<sup>3</sup> Geithner (2008) suggests that overnight tri-party repos funded approximately \$2.5 trillion of assets in early 2007. Boulware et al. (2014) study the impact of monetary policy shocks on activity in the repo market. In addition, Boulware and Reed (2014) look at the impact of changes in monetary policy on commercial paper market activity which is also cited as an explanation for the growth in housing market activity prior to the financial crisis.

<sup>4</sup> As is well-known, the recent housing boom has not been limited to the United States. Consequently, other economies have also struggled with the appropriate implementation of public policies aimed at the housing market. For example, Garriga et al. (2016) provide extensive documentation of policies adopted to target the housing market during its development in China. In related work, Peng and Wang (2009) suggest that the optimal housing policy involves complete elimination of property taxes.

tion of effort in monitoring the activities of borrowers.

By comparison, Diamond and Dybvig (1983) demonstrate that intermediaries can promote risk-sharing because consumers are subject to idiosyncratic liquidity risk. In fact, they show that in the absence of intermediation, there would not be any risk-sharing between individuals. However, perfectly competitive financial institutions pool deposits together and efficiently distribute funds upon the realizations of liquidity shocks among depositors. Given the attention to liquidity risk in the most recent crisis, we choose to model intermediation following Diamond and Dybvig’s seminal contribution. Further, though the scope for monitoring firm behavior as in Diamond and Williamson is large, it has less relevance in the housing sector where borrowers would find it difficult to hide the monetary value and proceeds from the sale of their homes.

In contrast to the Diamond and Dybvig model, the return to the bank’s funding opportunities is endogenous in our setup as we construct a general equilibrium framework which incorporates a housing market and mortgage market. In our framework, the mortgage market has two different groups of participants. On the one hand, financial intermediaries obtain resources to lend by issuing short-term liabilities to risk-averse depositors who may withdraw funds at any point in time. On the other hand, potential homebuyers seek access to mortgage credit in order to purchase homes.

Interestingly, the model incorporates the possibility of strategic default among mortgage borrowers. Risk-averse mortgage borrowers are also subject to idiosyncratic shocks to the value that they obtain from homeownership. If they experience negative utility shocks, the value of owning declines and borrowers may be better off choosing to default on paying back their mortgages. The decision to ‘walk away’ from their mortgage debt obligations depends on the legal environment regarding mortgage default.<sup>5</sup> If intermediaries do not have the ability to impose a default penalty, the cost of strategic default is very low. That is, non-recourse provisions provide full-insurance to risk-averse mortgage borrowers against the loss of housing value. Effectively, the risk is transferred from borrowers to risk-averse depositors who provide resources to intermediaries to extend mortgage funding. In this manner, non-recourse provisions introduce distortions in the banking sector and interrupt the ability of depository institutions to promote risk pooling among their depositors. On the other hand, the decision of a borrower to default is non-trivial if lenders can exact larger penalties for default.

In our general equilibrium framework, borrowers choose the amount of housing demand to maximize their expected lifetime utility.

<sup>5</sup> There is also an emerging empirical literature that studies the incidence of strategic default. For example, Foote et al. (2008) conduct a rigorous examination of the behavior of underwater homeowners in Massachusetts in 1991. In particular, they contend that negative equity is not a sufficient condition for strategic default. Instead, they conclude that most underwater homeowners will not choose to default unless they experience a “double trigger,” an adverse life event such as a divorce or health shock along with the position of negative equity. Bhutta et al. (2010) expand upon Foote et al. by studying non-prime borrowers across four different states: Arizona, California, Florida, and Nevada. Their analysis also supports the “double trigger” hypothesis. Moreover, they find that homeowners do not strategically default unless they owe more than 60% above the value of their home.

In contrast to previous analysis, Ghent and Kudlyak (2011) offer evidence indicating that strategic default is a prevalent occurrence. Notably, they find that borrowers in non-recourse states are more likely to default – especially, at high appraisal values. For example, individuals with homes appraised between \$500,000 and \$750,000 were more than twice as likely to default in states which protect mortgage borrowers. In addition, Demiroglu et al. (2014) conclude that underwater homeowners are more likely to default in states where the foreclosure process is friendly to borrowers. In comparison to the existing literature which examines the incidence of strategic default in mortgage markets, our objective is to show the implications of legal recourse and the possibility of strategic default for conditions in the housing market.

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