



# Spillover effects of subprime mortgage originations: The effects of single-family mortgage credit expansion on the multifamily rental market <sup>☆</sup>



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## ABSTRACT

The dramatic expansion in subprime mortgage credit fueled a remarkable boom and bust in the US housing market and created a global financial crisis. Even though considerable research examines the housing and mortgage markets during the previous decade, how the expansion in mortgage credit affected the rental market remains unclear; and yet, over 30 percent of all U.S. households reside in the rental market. Our study fills this gap by showing how the multifamily rental market was adversely affected by the development of subprime lending in the single-family market before the advent of the 2007/2008 subprime induced financial crisis. We provide evidence for a fundamentals based linkage by which the effect of an innovation in one market (i.e. the growth in subprime mortgage originations) is propagated through to another market. Using a large database of residential rental lease payment records, our results confirm that the expansion in subprime lending corresponds with an overall decline in the quality of rental payments. Finally, we present evidence showing that the financial performance of multifamily rental properties reflected the increase in rental lease defaults.

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## 1. Introduction

The United States of America experienced a remarkable housing boom and bust during the previous decade that spawned a global financial crisis in 2007 and 2008. Due to the profound, lasting

and wide-ranging effects of this crisis, economists have focused considerable attention on the crisis' causes and their possible spillovers to other sectors. As a result, many theories exist that attempt to explain the growth in homeownership and mortgage credit. For example, Glaeser (2010) ties the seeds of the housing boom and bust to policies that created direct and indirect subsidies designed to promote homeownership. Other studies have suggested that the housing boom resulted from interest rate policies that were pursued by the Federal Reserve in an effort to stimulate the economy following the dot-com recession in 2001 as well as from foreign capital being invested in U.S. mortgage-backed securities.<sup>1</sup> The majority of research on the causes and consequences of the housing

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<sup>1</sup> For example, the Financial Crisis Inquiry Commission (2011) provides evidence linking Federal Reserve interest rate policies between 2001 and 2003 with the goal of supporting the housing market. In addition, the report documents that mortgage credit expanded in part due to purchases by foreign banks and funds of U.S. mortgage-back securities.

and financial crisis focuses attention on the relation between homeownership policies and mortgage markets.<sup>2</sup> Thus, even though considerable research examines the housing and mortgage markets during the previous decade, how the expansion in mortgage credit affected the rental market remains unclear; and yet, over 30 percent of all U.S. households reside in the rental market.<sup>3</sup> Our study fills this gap by showing how the residential rental market was adversely affected by the development of subprime lending long before the advent of the 2007/2008 subprime induced financial crisis.

The support for homeownership policies and subsidies is often justified by citing numerous benefits or externalities conferred upon society by homeowners. For example, DiPasquale and Glaeser (1999) demonstrate that homeownership creates positive “social capital” by encouraging higher voter turnout while Glaeser and Shapiro (2003) note that homeownership creates barriers to mobility that fosters greater civic participation. However, recent evidence by Engelhardt et al. (2010) casts doubt on the role of homeownership in promoting civic involvement. Other studies have linked owner occupied housing to positive benefits for children (Haurin et al. (2002); and Green and White (1997)) and greater investment in maintenance and upkeep of the housing stock (Galster, 1983; and DiPasquale and Glaeser, 1999.) Furthermore, Coulson et al. (2001) and Glaeser and Shapiro (2003) document that increases in local homeownership rates are tied to substantial increases in housing values. More recently, Coulson and Li (2013) build on this literature to document that the transition from renting to owner-occupied status produces approximately \$1,300 per year in external benefit in a typical neighborhood.

While the benefits of homeownership are widely acknowledged, the costs associated with policies designed to promote the housing market and homeownership can be substantial. For example, numerous studies have focused on the direct costs arising from the mortgage interest deduction (MID) as well as the implicit costs associated with overconsumption of housing that results from the MID subsidy.<sup>4</sup> In addition, Glaeser (2010) notes that homeownership subsidies related to the mortgage market provide little or no benefit to lower income families that tend to be renters. Furthermore, Ambrose and Goetzmann (1998) and Goetzmann and Spiegel (2002) examine the “investment” aspect of homeownership and conclude that policies promoting greater homeownership may inadvertently lead households to significant under diversified investment portfolios.

We expand on these studies of homeownership externalities by focusing on the impact that growth in mortgage credit, and by extension, growth in the homeownership rate, during the housing boom of the previous decade had on the risk of the rental housing sector. In particular, we examine how subprime lending created ripple effects across the residential rental market. Our results demonstrate how the expansion in mortgage credit altered the underlying risk profile of the rental population, which in turn increased rents. Thus, our analysis illustrates the importance of considering second order effects when evaluating public policies.

To place our study in context, we note that the housing boom and bust of the previous decade arose from a number of features

that provide the ability to examine how changes in one market may impact other related markets. For example, Chomsisengphet and Pennington-Cross (2006), Mayer and Pence (2008), Danis and Pennington-Cross (2008), Greenspan and Kennedy (2008), Yuliya and Hemert (2009), Longstaff (2010), Gorton (2010), and many others, have documented how the 2007/2008 financial crisis began as a result of rising defaults among U.S. subprime mortgages, implying a connection between a small sector of the mortgage market and the broader financial system. In other areas, economists have demonstrated that the expansion in mortgage credit through securitization and growth in subprime lending contributed to the housing price boom (Mian and Sufi, 2009), reduced the incentives to screen borrowers (Keys et al., 2010; Agarwal et al., 2012; and Greenspan, 2010), and created incentives for borrowers to misrepresent asset values (Ben-David, 2011). Thus, while many studies have focused on the spillover effects of subprime lending to other areas of the housing and mortgage markets (i.e. house price growth, foreclosure and loss mitigation, appraisal, etc.), the fundamental spillover effects of subprime mortgage origination activity on other markets remains unclear.

To illustrate the connection between subprime mortgage credit expansion and residential rental risk, Fig. 1 displays the basic default hazard curves for a random sample of multifamily leases distributed between 2001 and 2006 in markets that experienced low and high subprime activity.<sup>5</sup> As expected, the hazard curves show a steep increase in defaults during the first months, reaching a maximum at around month five, and a slower downward trend as leases are removed from the sample after the first default event is observed. As noted in Table 1, the insignificant coefficient for *SUBPRIME*, the subprime dummy identifying high-subprime MSAs, for the years 2002 and 2003 indicates no difference in the lease default hazard curves between the low and high subprime MSA. However, for years 2004 through 2006, both Fig. 1 and Table 1 show statistically higher incidences of lease defaults in the high-subprime MSAs.<sup>6</sup> In addition, the evolution of hazard curves in the high subprime MSAs (Fig. 2) shows a pattern of increasing lease defaults coinciding with the growth in subprime lending.<sup>7</sup>

Our formal analysis rests on the fundamental decision households make regarding housing consumption, the decision to rent or own. The housing tenure choice literature views owning and renting as substitutes, with household characteristics and financial considerations playing an important role in housing demand and tenure choice decisions (Henderson and Ioannides, 1983; Ioannides and Rosenthal, 1994). Since most households typically borrow the bulk of the purchase price of their home, the availability of mortgage financing influences these decisions as well.<sup>8</sup> Thus, the sustained growth in mortgage lending from 2001 to 2006, attributed in part to the interaction of looser underwriting

<sup>2</sup> The primary homeownership policies center on providing access and support to the nation's mortgage market and include the mortgage interest deduction, the Federal Housing Administration (FHA) mortgage insurance program, and the creation of the secondary mortgage market through the sponsorship of mortgage related government sponsored enterprises (Fannie Mae and Freddie Mac).

<sup>3</sup> According to the Joint Center for Housing Studies (2013), 31 percent of households in 2004 resided in the rental market. Following the financial crisis, fully 35 percent, or 43 million households resided in the rental market by the end of 2012.

<sup>4</sup> See Aaron (1972), Rosen (1979, 1985), Poterba (1984), Poterba (1992), Mills (1987), Glaeser et al. (2010), and Poterba and Sinai (2008). Glaeser (2010) also points out that policies designed to promote homeownership tend to encourage excessive investment in housing and by extension, increases urban sprawl.

<sup>5</sup> Section 3 describes the lease data in greater detail. We classified MSAs covered by RentBureau into quartile groups according to the percentage of purchase subprime mortgage originations from 2001 to 2006. MSAs in the bottom (top) quartile are classified as low (high) subprime areas. We then drew a random sample of 27,500 leases from the MSAs in the top and bottom quartiles. Table 1 reports the estimated coefficients for the simple Cox (1972) proportional hazard models that produced the hazard curves in Fig. 1 where a lease default is defined as the first occurrence of a missed rent payment.

<sup>6</sup> The lease default rates were 31%, 44%, and 28% higher in the high-subprime MSAs compared to the low-subprime MSAs in 2004, 2005, and 2006, respectively.

<sup>7</sup> The crossing of hazard curves after month 12 reflects the fact that most residential leases are for 12 months initially and are renewed only if the building manager is satisfied with the renter's performance. Since not all leases are renewed at expiration, the appropriate observation period for this analysis is 12 months.

<sup>8</sup> For example, Linneman and Susan (1989), Duca and Rosenthal (1994), Haurin et al., 1997, and Linneman et al. (1997) among others show that borrowing constraints, both wealth and income related, limit households' propensities to become homeowners. More recently, Callem et al. (2010) also emphasize the primary adverse effects of credit impairment and lack of credit history on homeownership.

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