Charles A. Dice Center for Research in Financial Economics

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Dice Center WP 2014-02
Fisher College of Business WP 2014-03-02
Forthcoming in Journal of Financial and Quantitative Analysis

Holdup by Junior Claimholders: Evidence from the Mortgage Market

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October 2017

ABSTRACT

When borrowers are delinquent, senior debtholders prefer liquidation whereas junior debtholders prefer to maintain their option value by delaying resolution or modifying the loan. In the mortgage market, a conflict of interest ("holdup") arises when servicers of securitized senior liens are also the owners of the junior liens on the same property. We show that holdup servicers are able to delay action on the first-lien mortgage. When they do act, servicers are more likely to choose resolutions that maintain their option value, favoring modification and soft foreclosures over outright foreclosures. Holdup behavior is more likely to result in borrower self-curing.

Keywords: Subprime Crisis, Household Finance, Second Liens, Mortgages, Holdup Problem
JEL Classification: G21, G33, H31

The authors would like to thank Fredrik Andersson, Gadi Barlevy, Ted Durant, Ronel Elul, Karen Furst, Dennis Glennon, Bruce Krueger, Mark Levonian, Amit Seru, and seminar participants at the OCC, FIRS, and AREUEA (Chicago) for helpful comments and suggestions. The views in this paper are those of the authors and may not reflect those of the Federal Reserve System, the Federal Reserve Bank of Chicago, or the Office of the Comptroller of the Currency.

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1 Introduction

Conflicts between claimholders at times of borrower delinquency are an important problem in corporate finance. In its simplest form, senior debt holders enjoy the absolute priority rule and are typically quick to liquidate assets because their upside in renegotiating the debt is limited. By contrast, junior debt and equity holders are interested in restructuring obligations of a delinquent borrower because they can benefit from the option value embedded in borrower's continued operations (Warner 1977, White 1983, Bolton and Scharfstein 1996, Ivashina, Iverson, and Smith 2016, among others). The recent boom and bust of the housing market, with its wave of delinquencies, led to similar conflicts in the mortgage market. Many properties in recent years have been mortgaged by two loans, often held by two different institutions,[1] allowing for different incentives for liquidation and renegotiations for the first- and second-lien holders.

Addressing delinquent mortgages has been the key component in restoring the health of the U.S. housing market following the Global Financial Crisis. However, the crisis and its aftermath exposed substantial deficiencies in loss mitigation practices on the institutional, practical, and policy-making levels. Despite the importance of such conflicts of interest, few studies have attempted to provide direct empirical evidence of the existence and quantitative impact of servicer conflicts related to junior-lien ownership. Both policymakers and mortgage investors, therefore, would benefit from understanding the potential impact of servicer conflicts of interest on resolutions of delinquent loans. This information could be used in designing near-term policy initiatives as well as forward-looking servicing market reforms. For private investors, assessing these conflicts could help refine the contractual covenants that govern servicer relationships.

[1] The second-lien home equity market rose from less than $200 billion at the beginning of 2000 to a peak of well over $1 trillion in 2008 (Lee, Mayer, and Tracy 2012). Goodman et al. (2010) report that more than 50% of first-lien mortgages that have been securitized in the private-label market have at least one junior lien attached to them.

While in general first-lien holders have absolute priority over the decision whether to liquidate a delinquent mortgage, holdup problems may arise in the mortgage market in two main cases. The first situation occurs in some U.S. states that allow the older lien to have priority. In those states, refinancing the first lien loan makes it a more recent (younger) loan and thereby makes it dependent on the willingness of the junior lien loan (that becomes the older lien) to go along with the refinancing. Consequently, the junior lien (older) can hold up the decision of the more senior (newer lien). The effects of these laws are studied in Bond, Elul, Garyn, and Musto (2017).

The second holdup scenario, which we study here, arises when the first lien is securitized but the owner of the second-lien loan services the first-lien mortgage on behalf of the investors. This ownership and servicing structure is prevalent in about half of our universe of securitized loans (see also evidence in Engel and McCoy 2011). Since mortgage servicer makes decisions for the first-lien holder, this structure gives substantial power to junior-lien holders (servicers) to decide how to mitigate losses on the senior loan (a variant of the classic "holdup problem").[2] Mayer et al. (2009a), Goodman (2011, 2017), Cordell et al. (2011), and Bond et al. (2017) have all raised questions about this potential conflict of interest. The issue has received considerable media coverage and has led to several legislative proposals aimed at disallowing servicing of first-lien mortgages by entities that own second liens secured by the same property, although none have been passed.[3]

Our paper tests for the existence and effects of holdup in the loss resolution process. In broad terms, "holdup" is defined as any action that benefits a junior-lien holder at the expense of the more senior claimant. We evaluate the claim that servicers who own second-lien mortgages

[2] On one hand, the pooling and servicing agreement (PSA) requires the servicer to act for the benefit of the investors who own the first lien. On the other hand, some actions that are optimal from the first-lien owners' perspective may be suboptimal to the servicer when that servicer is the owner of the second-lien loan.
[3] See, for example, Gretchen Morgenson, "In This Play, One Role is Enough," *New York Times*, August 14, 2010, and Alex Ulam, "Why Second-lien Loans Remain a Worry," *American Banker*, May 2, 2011.

while servicing the first lien on behalf of outside investors ("holdup servicers") have a conflict of interest and therefore may influence the choice of loss mitigation actions to their advantage. Our dataset of matched senior and junior-lien claims and their loss mitigation actions in the event of delinquency allows us to compare these "holdup servicer" mortgages to control groups in which such a conflict of interest is likely to be less intense.

We identify potential holdups by using a unique dataset from the Office of the Comptroller of the Currency (OCC) that matches the first and second liens by the exact property address. The group of mortgages with potential holdups by the junior claimant contains pairs of first- and second-lien mortgages in which (1) the first lien is securitized and delinquent and (2) the servicer of the first-lien is also the owner of the second-lien mortgage. A holdup may arise because loss resolution decisions on the first-lien mortgage are made by a servicer who is also the owner of the second-lien mortgage. We compare this set of mortgages to a similar group of mortgages in which the servicer of the first-lien mortgage and the owner of the second lien are separate entities, eliminating the incentive for holdup.[4]

We document strong evidence that holdup servicers delay loss mitigation actions on first-lien mortgages. In the group that has the potential for holdup, the probability of *no action* increases by 2 to 4 percentage points (4% to 9% in relative terms) during the first six months following delinquency. This effect remains as strong for a longer 12-month horizon, and it is robust to several sample refinements.

Among the mortgages on which servicers took action, we find that holdup is associated with a lower probability of liquidation and a higher probability of modification—actions that

[4] We note that the second-lien holder in the non-holdup group could hold up the modification or refinancing of the first lien by refusing to resubordinate its claim to the new first-lien loan (see evidence in Bond, Elul, Garyn, and Musto 2017). This holdup problem differs from the one we consider in this paper, which results from having the same servicer servicing the first- and second-lien loans.

benefit junior claimants. For the six-month horizon, we find that holdup reduces the likelihood of liquidation by 2 to 4 percentage points (3% to 5% in relative terms). This effect remains strong at the 12-month horizon and is particularly pronounced in a subsample of second liens that remain current on their payments. We also find somewhat higher modification rates among holdup servicers when the first-lien loan was securitized by government-sponsored enterprises (GSEs) such as Fannie Mae and Freddie Mac.

Looking *within* each set of loss mitigation actions, we find that holdup servicers prefer actions that maintain their option value. In the case of liquidation, they are more likely to choose "soft foreclosure" actions, such as a short sale or deed-in-lieu transaction, rather than an outright foreclosure. This choice arguably results in greater recovery values for the junior claims. When modification is chosen, servicers are more likely to modify the attendant second liens as well, although the relative leniency of modification terms on the second liens is similar to that offered by the non-holdup servicers.

An important question is whether actions (or inactions) by holdup servicers have a related effect on borrowers. To answer it, we evaluate the relationship between the incentive to hold up and the performance of first- and second-lien loans. First-lien loans securitized by the GSEs and serviced by holdup servicers are more likely to become current in the *absence* of any action compared with those serviced by non-holdup servicers, suggesting that holdup servicers are more likely to identify borrowers that could self-cure. We also find that in holdup situations, second-lien loans are more likely to remain performing, which is consistent with the idea that holdup servicers encourage second-lien borrowers to stay current, potentially in exchange for avoiding liquidation of their first-lien loan.

Our paper is related to several strands of the literature. First, recent studies have found that securitization could impede renegotiation of delinquent loans (Piskorski et al. 2010, Agarwal et al.

2011a, Zhang 2013): Securitized loans exhibit lower rates of renegotiation and higher rates of liquidation.[5] However, these studies do not identify a specific channel through which the agency frictions resulting from separation of ownership and control in securitization affect loss mitigation actions. Through our unique dataset, we are able to shed light on whether the frictions are exacerbated if the controlling entity (the servicer) also owns an accompanying second-lien note on the delinquent property.

Second, our work is related to the growing body of work that seeks to explain the recent financial crisis and drivers of mortgage foreclosures (e.g., Keys et al. 2010, Mian and Sufi 2009, Campbell et al. 2011, Mayer et al. 2009b, Agarwal et al. 2011b, Agarwal et al. 2011c, Elul 2011). Our paper adds to the literature by documenting the important role of second liens in mortgage foreclosures and renegotiation.

2 Institutional Background

The rapid expansion of the securitization market in the early 2000s led several financial institutions (some of which are banks) to specialize in both mortgage origination and servicing. Most first-lien mortgages that were originated were securitized either by GSEs, like Fannie Mae and Freddie Mac, or in private label securitizations (PLS) (Lee, Mayer, and Tracy 2012). The products of securitization, mortgage-backed securities (MBSs), often end up on the balance sheets of passive investors, such as banks, insurance companies, or pension funds. The actual mortgages are owned by a trust and serviced by a servicer that collects the interest and principal payments and communicates with the homeowners. In the case of delinquency, the servicer will also manage the loss mitigation procedure. Servicers are bound by the Pooling and Servicing Agreement (PSA)

[5] Several commentators have argued that securitization does not fully explain the lack of modifications, especially since the government introduced the Home Affordable Modification Program (HAMP), which should have made modifications easier (Agarwal et al. 2017).

to represent the best interests of the claimants of the trust, the MBS holders. The market evolved in a way that first-lien mortgages were often securitized and sold to investors, and second-lien mortgages were kept on the originators' balance sheets. In our dataset, the owner of the second-lien claim is also the servicer of the first-lien claim. In this scenario, the junior creditor, in its role as servicer, makes loss mitigation decisions for the dispersed senior creditors.

Servicers have several tools for addressing homeowner delinquency (see Agarwal et al. 2011a). The most common broad tool is liquidation. Liquidation can come through foreclosure, a judicial liquidation process that typically takes 12-24 months. Alternatively, servicers can agree with homeowners on a short sale or a deed-in-lieu. In a short sale, the homeowner puts the property up for sale and gives most of the proceeds to the lender (which is the mortgage trust) in a pre-specified manner. In a deed-in-lieu, the homeowner peacefully transfers the property to the lender without going through a judicial foreclosure process. Because delinquency is often associated with a decline in the value of the home, especially during the financial crisis of 2008, liquidation procedures in most cases involve a significant loss relative to the unpaid balance of loans secured by the property.

The servicer has several options other than liquidation. The servicer can choose deferral, abstaining from initiating a foreclosure and implicitly giving the homeowner more time to self-cure. Alternatively, the servicer can engage the borrower and agree on a modification of the mortgages. These agreements often involve extending the term of the loan, reducing the interest, and at times balance forbearance.

When more than one creditor is involved, i.e., a senior and a junior creditor, the different loss mitigation actions can lead to wealth transfers between the different classes of creditors. In general, senior creditors are the first to be paid in a liquidation. Thus, they favor this route. Junior creditors, however, recoup little of their owed debt balance in the process of liquidation. The reason

is that the leverage of a typical first-lien mortgage is very high (typically 80% loan-to-value (LTV)). Therefore, the second-lien finances the slice beyond the first-lien leverage (e.g., between 80% and 100% LTV). Any small change in the value of the house reduces the recoverable value of the second-lien claim. Furthermore, since borrowers often default when they are deep underwater, they enter the loss-mitigation system when the value of the junior claim is nearly- or fully-eliminated.

Not surprisingly, junior creditors prefer loss mitigation actions that allow them to realize the option value, such as deferral or modification. For them, there is little downside and much upside to giving the borrower more time to find the resources to become current. In contrast, senior creditors gain little from an action that leads to an increase in the value of the collateral beyond the face value of their claim. Thus, they prefer to liquidate quickly and let go of the option value.

Holdup servicers' incentives could affect the likelihood of both liquidation and modification. In the case of foreclosures, proceeds from auction sales satisfy the claims of senior-lien holders before any residual is turned over to junior claimants. Because this residual is often small or nonexistent, servicers that own second liens have no incentive to aggressively pursue foreclosure and extinguish their liens for little in return.[6] In the case of non-foreclosure liquidations—deeds-in-lieu and short sales—the servicer does not automatically have to extinguish the second lien, but they need to resolve it in some fashion for the transaction to proceed. Typically, in approving a pre-foreclosure liquidation, the holdup servicer effectively converts its second-lien loan into an unsecured claim, akin to a credit card balance. By doing so, the second-lien holder also gives up the value of receiving a payment in return for releasing its lien (Been et al. 2012).

[6] Eliminating secured interest in the property (the lien) does not necessarily annul the lender's claim for repayment (the promissory note). The ability of a junior-lien lender to pursue collection on the now unsecured debt is governed by state law. For instance, in California, a junior-lien loan that was used to help finance the purchase of the property cannot be collected once the lien is eliminated in foreclosure. However, lenders retain the right to attempt collection on other junior-lien loans.

This action also provides relatively little incentive for the second-lien owner/servicer to trigger the liquidation process (unless the second lien is also seriously delinquent and the owner/servicer has already recognized it as a loss).

In loan modification cases, second liens present a particularly thorny problem.[7] On the one hand, junior-lien holders have a strong incentive to modify the first lien and attain a stronger position for their junior claim. Modification of the first lien without any adjustment to the junior lien would benefit the junior claimants because the borrower's improved financial position frees up additional cash flows to the second-lien holders. However, many PSAs that govern the relationship between loan servicers and investors make it hard to modify the first-lien mortgage unless the second-lien holder resubordinates its claim on it (see e.g., McCoy 2012, Cordell et al. 2011, Pinedo and Baumgardner 2009).[8] The first-lien holders are generally reluctant to agree to a modification that leaves the junior claim intact, because lien priority dictates that junior claimants bear the loss first. Similarly, junior debt holders are not willing to simply extinguish their claims and allow modification to proceed, because there is always a chance that the borrower will become current on the delinquent loan or that collateral value will rise high enough to yield a positive return in the event of foreclosure. The resulting stalemate might be all the more pronounced when the second-lien holder is also the party determining when, whether, and how to proceed with a specific set of loss mitigation actions. Indeed, servicers are not obligated to modify second liens at all.[9]

[7] See Bond et al. (2017) for an extensive analysis of the second-lien holdup problem in the context of mortgage refinancing.

[8] Most legal analysis suggests that modifications of first-lien loans is highly unlikely to trigger loss of seniority (Been at al., 2012). However, because the case law has not been fully settled, first-lien holders generally require second-lien holders to agree to subordinate their claims prior to approving modification (McCoy 2012).

[9] Under the HAMP Second Lien (2MP) program, servicers of second liens are given financial incentives to modify their claims on a *pari passu* basis with first-lien modifications: The second lien is modified in exactly the same fashion as the first-lien loan.

Thus, the second-lien claimant has an incentive to "hold up" any resolution (modification or liquidation) of the mortgage unless it can recover some price above the true value of its claim. The potential for holdup is especially strong when the first lien is securitized, because the ownership structure of the first-claim holders would be dispersed, which significantly hampers negotiations between first- and second-lien holders. Mayer et al. (2009a) discuss this possibility and propose an optimal loan modification strategy.[10]

3 Data

3.1 Source and Address Matching for First-Lien Mortgages and Home Equity Loans

Our objective is to compare loss mitigation actions in two groups of mortgage pairs (first- and second liens on the same property) in which the first lien is delinquent. We construct our sample using three raw data sources.

The first dataset is OCC Mortgage Metrics (MM), which collects data from 14 large banks that service about 56 million (64%) first-lien mortgages in the United States (see Figure 1 for the distribution of delinquent mortgages per servicer). This dataset records various loan attributes as well as precise loss mitigation and performance outcomes beginning in January 2008. We condition the MM dataset to include loans that were securitized either by the GSEs or in private placements. This measure adds to our confidence that we are looking at similar loans (e.g., exposed to similar informational asymmetries) when testing the influence of holdup servicers on loss mitigation actions. This data source has several advantages over existing datasets on mortgage performance, such as McDash, Loan Performance, and BlackBox. First, the existing datasets only

[10] Mayer et al. (2009a) propose a solution to the holdup problem: providing a fee to the second-lien holder to relinquish its control on the modification of the first lien. Beyond the mortgage market, a vast literature has suggested possible solutions to the holdup problem in more general settings (see Mailath and Postelwaite 1990, Posner 2005, Armour and Skeel 2007, and Kominers and Weyl 2011).

show whether a second lien on the property was issued at the same time as the first lien. By contrast, the OCC dataset allows us to match the first and second liens even if the second lien was issued months or years after the first. Second, the OCC dataset allows us to separately identify whether the same or a different entity is servicing the first and second liens, in addition to identifying whether the first lien is being held in the servicer's portfolio or is securitized. Finally, we can precisely track outcomes such as foreclosures and modifications in the OCC data, but the other datasets require some of the outcomes to be imputed.

The second dataset is the OCC Home Equity (HE) database, which contains about 23.2 million second-lien home equity credits (representing about 65% of all home equity credits outstanding). The HE database coverage starts in May 2008. Similar to MM, the HE database contains data on a broad spectrum of loan/borrower attributes measured at the time of loan origination, current measures of loan/borrower attributes, delinquency behavior, and loss mitigation/workout resolutions.

Our third dataset is the OCC Home Equity Crosswalk (HECW). This dataset allows us to match the MM with the HE dataset and identify pairs of mortgages that are secured by the same property. For each home equity account in the dataset from December 2009 through April 2012, the HECW database allows us to link a second-lien home equity loan to a first-lien mortgage by matching exact addresses for each loan in a given month. Each record in the HECW database contains a pair of MM and HE loan numbers, the statement month, and the corresponding ID for each property address (e.g., 1234 Main Street, City X, State Y, and Zip Code 56789). If multiple MM loans or HE loans are found for a single property, the HECW database shows multiple records for that address. For example, if a borrower takes out a first-lien mortgage (loan A), a home equity loan (loan B), and a home equity line of credit (HELOC, loan C) for his/her home, two records will be shown: loan A matching with loan B, and then loan A matching with loan C under the same

property address ID. The match type of both records would be labeled as having one first-lien mortgage and many home equity credit lines.

We use the earliest snapshot of HECW data available (December 2009) to construct the crosswalk between first-lien and junior-lien loans going back to May 2008. By doing so, we obtain a merged MM and HE dataset with a longer history. Through this process, we are able to extract about 2.95 million loan-pairs from May 2008 through April 2012 that have a first-lien mortgage matching only one second-lien loan. These properties account for about 80% of the HECW properties. For these loan-pairs, there are 126 million monthly first-lien loan statements and 94 million second-lien loan statements.

As we are interested in the response of claimholders to borrower distress, we restrict the sample to loans that became seriously delinquent after they entered the matched database. In constructing our sample of distressed loans, we require first-lien loans to be either current or at most 30 days delinquent when the loan-pair first appears in the data. We then define the loan-pair as being distressed when the first-lien (MM) loan becomes seriously delinquent (defined as 60 days past due). At this point, the loan-pair enters our analysis sample. Using this definition, we identify about 0.43 million distressed loan-pairs.

3.2 Empirical Design

To measure the effect of servicer holdup on loss mitigation outcomes, we need to isolate a group of mortgages in which holdup potentially exists and compare it to a group with a similar set of characteristics for which holdup does not exist. The mortgages with the potential for holdup have dispersed ownership of the first-lien claim and are serviced by the second-lien claimholder. This is a very common arrangement in the mortgage market: Originators of first- and second-lien mortgages often securitize the first-lien claim and continue to service them, while retaining the

second-lien claim on their balance sheets. As discussed above, if indeed there is a holdup problem, we anticipate that the servicer, who is also the holder of second-lien claim, will make loss resolution decisions that are favorable to the junior creditor over the senior one. As a shorthand, we call this group "Holdup."

Our control group ("Non-holdup") is composed of pairs of mortgages with similar characteristics in which favoritism pressure does not exist. The debt structure of mortgages in this group consists of a first-lien claim that is securitized, and a second-lien claim that is held by a bank. The difference between the groups is that the first-lien claims for mortgages in the control group are serviced by a third party (as opposed to by the owner of the second-lien claim). In the control group, the servicer is presumably primarily concerned with maximizing the value of the first-lien holders and has no financial interest in the second-lien claims.

A key assumption that we make is that the two groups (holdup and non-holdup) are similar so that comparison in the loss resolution outcomes is credible. While the assignment of the loans to owners and servicers is not random, arguably it is uncorrelated with the prospects of the borrower following default. A similar claim was made in Piskorski et al. (2010) and Agarwal et al. (2011a), who argued that once loans are delinquent, the informational factors that determined their securitization status are moot. In the next subsection, we further compare the two groups.

3.3 Summary Statistics

To provide additional comfort that the holdup and non-holdup groups are similar, we present summary statistics in Table 1. Panel A shows the key borrower and loan characteristics in the groups controlled by holdup and non-holdup servicers at both the 6- and 12-month horizons. Borrowers in our sample have mean FICO scores below 600, as would be expected having just gone through a serious delinquency. More importantly for the design of the study, the entire

distribution of FICO scores appears broadly alike for the groups controlled by holdup and non-holdup servicers for both GSE- and PLS-securitized loans. Figure 2 demonstrates this similarity in a continuous setting of kernel density plots. Panel A of Figure 2 indicates virtually no difference in the distribution of borrower FICO scores across the groups controlled by holdup and non-holdup servicers, whether at the time of loan origination or six months following the delinquency, which is associated with a massive deterioration in credit scores. Furthermore, Panel B of Figure 2 shows similarities in the distributions of loan-to-value ratios on first-lien loans.

As expected, a larger fraction of mortgages securitized via PLS are classified as low-documentation loans compared to GSE-backed loans. Interestingly, for both GSE and PLS loans, the fraction of low-documentation first-lien mortgages is consistently lower in the group of holdup servicers. Another notable difference between PLS and GSE mortgages is the extent to which the second-lien loan is supported by the collateral that would remain after paying off the first lien. PLS loans have much lower equity cushions, on average, than GSE loans. We stress that this measure likely substantially overstates the amount of collateral that would be available for the second-lien holder, because it assumes a no-cost liquidation at the appraised value. Among PLS loans, the group controlled by holdup servicers shows somewhat lower levels of collateral support for the second lien.[11]

Previous studies (Goodman et al. 2011, Lee et al. 2012) have found that a substantial share of second-lien loans remain current for extended periods after the associated first-lien loans

[11] In a separate analysis we analyzed the determinants of the discrepancy in house values (for the same property, at the time of delinquency) between the reports of first- and second-lien holders. For most properties, there is a substantial discrepancy in reported home values. For example, the median absolute difference in home values is in the order of 13%. We found that the discrepancy in reported home values is significantly smaller for holdup servicers. Nevertheless, we find that even in the mortgages serviced by holdup servicer group, there is material discrepancy in valuations. Finally, fixed effects for servicer identity, month of delinquency, origination year, and state as well as mortgage characteristics can explain up to 20% of the variation in the discrepancy in reported home values by the two servicers.

become delinquent. This recent phenomenon has been attributed to households' desire to retain access to a line of credit at times of economic stress. Such credit sources become more important when the first-lien mortgage obligation cannot be sustained, leading to degraded credit scores and subsequent difficulty in initiating new credit lines. Figure 3 corroborates the results of these earlier studies by summarizing the timing of defaults on senior and junior liens backed by the same property. Only a small fraction of properties in our sample—8.8% of those with GSE-backed first-lien mortgages and 7.0% of those with PLS first-lien mortgages—record second-lien delinquencies more than three months *before* the onset of delinquency on the associated first-lien loan. Using a symmetric two-month window to define contemporaneous first- and second-lien defaults, we find that 47.3% of loans in the GSE sample and 49.4% of loans in the PLS sample default simultaneously on both liens. The striking fact, however, is that about an equal share of borrowers in the GSE (27.5%) and the PLS (25.1%) samples remain current on their second-lien loan for more than a year following the default of the associated first-lien mortgage. These values mirror the Lee et al. (2012) estimates of 20–30 percent, which are based on credit bureau data.

An area of concern in comparing the holdup and non-holdup sample is whether they contain a different mix of second-lien loans. As mentioned by several studies (notably, Lee et al. 2012), borrower characteristics and subsequent performance substantially differ between closed-end second-lien (CES) loans and the more traditional home equity lines of credit (HELOCs). CES loans are much more likely to have been originated alongside first liens—so-called piggyback loans—and to have performed similarly to subprime mortgages (especially when they were piggybacked). In contrast, the majority of HELOCs are originated after the first-lien loan, and their performance generally resembles that of prime mortgages. Our dataset allows us to identify HELOCs and CES loans, and to determine whether a given second-lien loan was piggybacked to the first-lien loan at origination. Panel A shows that the share of HELOCs in the PLS sample

serviced by holdup servicers is somewhat higher than in the share serviced by non-holdup servicers, whereas the two corresponding GSE samples contain roughly equal shares of HELOCs. However, we find a substantial difference in shares of piggyback loans: In both the GSE and PLS samples, piggyback loans are more likely to be serviced by holdup servicers. This introduces the possibility of nonrandom selection into the holdup servicer sample on the basis of variables observable to the lender but not the econometrician. We evaluate this possibility in our empirical analysis below.

Because previous research shows that loss mitigation actions are influenced by the type of state law governing foreclosures (Ghent and Kudlyak 2011), we also compare the distribution of loans in the two samples across judicial and non-judicial foreclosure states. We find virtually no difference in the fraction of loans in judicial foreclosure states assigned to holdup and non-holdup servicers for either type of securitization.

Table 1, Panel B, focuses on the outcome variables: the different loss mitigation resolutions. The panel summarizes the frequency of different loss mitigation actions for the groups serviced by holdup servicers and by non-holdup servicers for the 6- and 12-month horizons following delinquency of the first-lien loan. The panel shows that nearly half of all delinquent first-lien loans (45.7%) receive no action from their servicers in the first six months. Among those loans that are acted upon by the servicers, the most common outcome is to be placed into a foreclosure process (about 33.7% of delinquent first-lien loans). Only a small share (6.5%) of loans get fully liquidated (i.e., run through the entire foreclosure process or have a short sale/deed-in-lieu transaction completed) or modified within the first six months. A similar fraction of delinquent first-lien loans gets modified. Over a longer 12-month horizon,[12] the likelihood of inaction is

[12] Loan pairs that are self-cured at the end of the six-month period are removed from the 12-month sample.

reduced to about 28%, with the difference approximately equally distributed between liquidations (voluntary and otherwise) and modifications. During the first six months following delinquency of the first-lien loan, about 36% of second-lien loans remain current, dropping to about 28% for the 12-month horizon.

Across groups, we see that those in the holdup group have a somewhat lower incidence of inaction than those in the non-holdup group. For privately securitized loans, the holdup group has higher unconditional means for delinquent first-lien mortgages being placed into the foreclosure process and a lower incidence of modification. The opposite is true for loans securitized by the GSEs. We also note that second-lien loans in the holdup group are less likely to continue performing at both time horizons.

4 Empirical Results

Our main empirical tests compare loss mitigation resolutions for loan-pairs in the holdup and non-holdup samples. First, we test whether holdup servicers are less likely to take a loss mitigation action. Second, conditional on servicers taking an action, we examine the effects of holdup on the likelihood of pursuing loan modifications or liquidations (forced and voluntary). Third, we evaluate various pathways within each of those choices. For liquidated loans, we assess whether holdup servicers were more likely to engage in voluntary liquidations (short sales and deeds-in-lieu) that maximized the value of their claims. For modified first-lien loans, we evaluate actions on their second-lien counterparts, both along the extensive and the intensive margins. Finally, we look for evidence that servicers' behavior affected the long-term performance of first and second loans.

4.1 Holdup and No Action

During the recent financial crisis, a surprisingly high fraction of loans had no loss mitigation action (Agarwal et al. 2011a). In this subsection, we test whether the holdup problem exacerbates this lack of action. From the perspective of second-lien holders, delaying an action on the first lien allows the second-lien holder to benefit from the borrower's potential recovery. Given that most delinquent borrowers are underwater, an immediate resolution of the first lien has a high likelihood of wiping out the value of the second lien altogether.[13] We therefore predict that the likelihood of no action will be higher when holdup is possible.

To test this hypothesis, we regress an indicator of whether any loss mitigation action was undertaken with respect to the delinquent first-lien mortgage on a holdup servicer indicator and a set of controls. "No action" is defined as having no record of loss mitigation action on file; that is, the first lien did not enter a modification (trial or permanent), start a foreclosure process, or become liquidated. We include a large battery of controls.[14] We cluster standard errors in all regressions by state.

Table 2 presents evidence supporting the holdup hypothesis. The table contains several specifications for regression samples consisting of mortgages in both the holdup and the non-holdup servicer groups. The null hypothesis in these regressions is that servicers, even if they are

[13] As mentioned in the introduction, resolving a delinquent first-lien loan through liquidation eliminates the second lien but not necessarily the promissory note. Resolving such loans through modifications need not impair the second lien altogether, although PSAs often contain clauses that require concurrent action on second-lien loans.

[14] Controls include the following measures captured at the time of first-lien delinquency: an indicator as to whether the second lien has defaulted, indicators for five FICO score buckets, indicators for buckets of the leverage of the first-lien loan, indicators for buckets of the unpaid balance (in dollars) of the first- and second-lien loans, and the fraction of the second-lien loan that could be covered by the current value of the house. They also include indicators for categories of the original terms of the first- and second-lien loans, for whether the first- and second-lien loans had low documentation, for whether the first-lien loan is an ARM, for whether the first- and second-lien loans are interest-only loans, for whether the second-lien loan is a HELOC, for whether the second-lien loan is fully drawn, for whether the second-lien loan is a credit line and is frozen, and for whether the second lien loan is a piggyback loan (i.e., originated within two months of the origination of the first-lien loan). The controls also include a set of dummies for the delinquency quarter, the state in which the secured property is located, the identity of the first-lien servicer, and indicators for the origination year of the first-lien loan.

the owners of the second lien ("holdup servicers"), act in the best interest of their clients (the first-lien owners). Therefore, the null postulates no difference between servicers who are owners of the second-lien mortgage and third-party servicers. Furthermore, one could argue that servicers who act in the best interest of their clients and happen to be the owners of the second liens should exhibit quicker action on loss mitigation actions, because there are presumably fewer legal hurdles within the same organization.

The results support the holdup hypothesis. Table 2 shows that when the same institution handles the first and second liens, the likelihood of no action is significantly higher. Specifically, we show results for the 6- and 12-month horizons as well as splits between loans securitized by GSEs and those with PLSs. In all specifications, the likelihood of no action is higher when holdup is a possibility. The economic magnitude is large. The unconditional probability of no action among PLS loans is 49.8% and 31.2% for six and 12 months, respectively. For GSE loans, the probability of no action is 44.1% and 26.5% for six and 12 months, respectively.[15] For PLS loans, the coefficient on the holdup servicer dummy for the six-month horizon is 4.4 percentage points, translating into a relative increase in the likelihood of inaction of 8.9%. Over the 12-month horizon, the coefficient of 3.1 percentage points corresponds to about a 10% increase. The estimates of the holdup effect for the GSEs point to a 4% (1.7/44.1) and 2.9% (0.8/26.5) higher likelihood of no action.

Overall, these results show the possibility of a holdup reduces the likelihood of any loss mitigation action by 3% to 10%.

[15] These are weighted averages of the statistics of holdup and non-holdup servicers provided in Table 1, Panel B.

4.2 Holdup and No Action: Robustness Checks

We classify servicers of particular mortgages as holdup or non-holdup according to the identities of the lien owners and servicer at the time of delinquency of the first lien. However, the time period of our sample is characterized by substantial industry consolidation, with stronger competitors absorbing firms severely weakened by the financial crisis. If Firm A that services a first-lien mortgage is acquired by Firm B, which owns the second-lien loan, *after* the first-lien loan becomes delinquent, then Firm B could theoretically exercise control over both liens. Yet our approach will fail to categorize this loan-pair as being subject to potential holdup.[16]

To examine whether such potential misclassification affected our results, we conduct a simple robustness check of our results by removing from our sample all of the loan-pairs in which the servicer of either the first- or the second-lien loan was acquired. Acquired servicers account for about 36% of our observations. In the remaining sample, no ambiguity exists about which servicing entity is making loss mitigation decisions and thus no ambiguity exists in identifying holdup cases.

The results of this exercise are shown in Columns (1) to (3) of Table 2, Panel B. Although sample sizes are smaller (especially among PLS loans), the holdup loan-pairs continue to be strongly associated with a higher likelihood of inaction. The magnitudes of the coefficient estimates remain similar to those obtained using the full sample (Table 2, Panel A). We conclude that misclassification due to mergers does not materially affect our results.

[16] We could have identified holdup situations on the basis of a fixed horizon following sample entry or the merger, but this strategy presents its own problems. Even though the acquiring entity becomes the de jure owner of both liens on the date of the merger, the de facto integration of servicing systems and decision-making might take some time and could vary considerably from merger to merger.

As mentioned in the previous subsection, cases in which the second-lien loan continued to be current were less likely to receive any loss mitigation action on the delinquent first-lien mortgage. One might expect this effect to be magnified for holdup servicers, because they might be more aware of the payment status of the second lien and more reluctant to upset the status quo. To evaluate this possibility, we first examine Table 1, Panel B. The panel shows that the fraction of second-lien loans that perform at the end of six- or 12-month period is actually higher for non-holdup servicers than for holdup servicers, in contrast to the argument. Furthermore, we restrict the sample to cases in which the second lien remained current. Once again, we find a strongly positive coefficient on the holdup dummy (Table 2, Panel B, Columns (4) to (6)). However, the magnitude of this effect is not larger in the restricted sample either in absolute or relative terms.[17] These results lead us to conclude that the reason for the no action by holdup servicers is not tied to better performance of the second liens that they own.

As discussed earlier, another potential issue is the high prevalence of piggyback second-lien loans among holdup servicers. This finding raises the possibility that the holdup sample could be different for a variety of unobservable reasons. For example, holdup servicers that issue piggybacks might be fully aware of the combined LTV of their loans and might thus select a different subset of borrowers than non-holdup servicers of piggyback loans. Put differently, holdup servicers of piggyback loans likely have better information about their borrowers, which could explain the difference in their actions following the default. Moreover, because piggyback loans are more likely to be originated for the purpose of financing the home purchase (or refinancing), the ability of the second-lien holder to pursue collection is limited relative to loans used to finance

[17] In an alternative specification, we interacted holdup with an indicator of only the first lien being delinquent, and we got similar results.

other consumption. Thus, differences in the frequency of piggyback loans could result in a different set of observed actions undertaken by servicers.

We check whether the high prevalence of piggyback loans drives our results by repeating our regressions on samples that exclude loan-pairs in which the second lien is a piggyback. The results are presented in Columns (7) to (9) of Table 2, Panel B. Again, we find a higher likelihood of inaction by holdup servicers. The magnitude of the estimates of the holdup effect in the non-piggyback sample is similar to that of the full sample; hence, our results are not driven by piggyback loans.

4.3 Holdup and Liquidations

The findings in the previous section suggest that holdup servicers are more likely to delay or avoid taking any action on delinquent loans. When a loss mitigation action is taken, we expect holdup servicers to sway the decision in favor of actions that maintain the option value of the junior claimholder. Specifically, to best maintain the option value, a holdup servicer would choose modification over liquidation (which means an immediate loss recognition).[18]

In Table 3, we test this prediction by regressing an indicator for whether a loan is liquidated or is in the foreclosure process within six or 12 months post-delinquency on the holdup indicator and the same set of controls used in Table 2. We restrict our sample to loans that went through some loss mitigation action. Among loans with loss-mitigation actions, the three outcome categories are liquidation, modification, and refinancing/loan repayment. The results in Columns (1) to (3) of Table 3, Panel A, show that the six-month likelihood of liquidation or foreclosure of the first-lien loan is significantly lower—by 2.3 to 4.0 percentage points—among loans for which holdup is a possibility. This effect is present for both PLS and GSE loans, although it appears to

[18] Even if the servicer were still able to pursue collection efforts or if the second-lien loan remained current, the loss of a lien renders the second-lien loan unsecured, subjecting the lender to higher capital charges.

be larger and more persistent for the latter subgroup. (Panel B of Table 3 presents results over a longer 12-month horizon.) Liquidation is a common loss resolution action (51% to 74% of cases); therefore, in relative terms, the likelihood of liquidation or foreclosure is 3% to 5% lower. This result is consistent with the idea that first-lien servicers who have a stake in the second-lien loan use their power to hold up liquidations and foreclosures. Columns (4) to (6) show the results of a similar exercise in which the sample is further limited to properties with a delinquent first lien but a still-performing second-lien loan. In cases of performing second liens, the effects of potential holdup are somewhat stronger, as expected: Holdup servicers are in less of a rush to liquidate properties while the junior-lien loan they own continues to perform.

There are two types of liquidations: involuntary liquidations, which are forced on the borrower by the sheriff or court, and voluntary liquidations, which allow borrowers to negotiate in advance the terms upon which they will surrender the collateral (e.g., short sales and deeds-in-lieu). A senior claimholder prefers a quick liquidation, because a quick sale at a discount[19] often covers most or all of the unpaid balance. Conversely, a junior claimholder prefers a softer liquidation method that takes longer and potentially can yield a higher recovery value.

We next test whether holdup servicers lean toward softer methods. The OCC data allow us to identify the specific type of liquidation action taken by the servicer. We classify liquidations as involuntary (foreclosures) or voluntary (short sales and deeds-in-lieu). Involuntary liquidations result in automatic extinguishment of the junior liens (though not the claims themselves). By contrast, non-foreclosure liquidations require the junior-lien holder to resolve its claim in some fashion before the transaction can proceed. Hence, non-foreclosure liquidations create an opportunity for the junior claimant to receive a payment in return for releasing its lien (Been et al.

[19] Properties that are sold in an involuntary liquidation, namely foreclosure, are realized at a discount of over 30% relative to their market value (Campbell et al. 2011).

2012). Consequently, we would expect the holdup servicers to prefer this path if liquidation is chosen.

Columns (7) to (9) of Table 3, Panel A, present the regression results on the subsample of delinquent loans chosen for liquidation. We find that among such loans, holdup servicers indeed prefer the path of voluntarily negotiated liquidations. The economic magnitude of this effect is substantial: Holdup servicers are 18%–21% more likely to select voluntary liquidations relative to the unconditional mean.

In summary, our results indicate that while liquidation is a common loss resolution practice, servicers pursue it less often when they have a vested interest in maintaining the value of the junior claim on the property. Furthermore, conditional on selecting a liquidation route, holdup servicers choose softer methods that are more likely to result in greater value for the second-lien claimholder.

4.4 Holdup and Modifications

Next, we explore servicers' propensity for loan modification when they are in the position to hold up the process. Whether holdup servicers favor modifications of first-lien loans is subject to debate. Legally, the second lien is not automatically extinguished once the first lien is modified. Therefore, modification of the first-lien loan could be favorable to the owner of the second-lien loan because it improves the borrower's overall cash flows, thereby making repayment of the second lien more likely. In practice, modification of the first lien may lead to a deadlock. In many cases, the PSAs do not allow the first lien to be modified without the second lien being extinguished or modified. Second-lien holders, however, may be reluctant to relinquish their claim. In comparison, when the same servicer has control over both first and second liens, it may be able to push a modification through.

In Table 4, Panel A, we test the proposition that holdup servicers will favor modification of the first lien (Columns (1) to (3)) or second lien (Columns (4) to (6)). As in Table 3, we restrict the sample to loan-pairs in which some loss mitigation action was taken. In Columns (1) to (3), we regress a modification dummy of the first-lien mortgage on the holdup indicator and the usual set of controls and fixed effects. The results are mixed. We find no evidence of holdup effects for PLS loans over the six-month horizon following delinquency, but we do find a positive effect for GSE loans. Over a longer horizon (Table 4, Panel B), the estimated effect for GSE loans remains positive and sizable, suggesting a 16% relative increase in the modification rate of holdup servicers. However, the estimate for the PLS loan sample becomes significantly negative though small in magnitude.

The difference in results for GSE and PLS loans potentially reflects differences in the institutional arrangements governing loan modifications in cases where multiple liens are present. Decisions on GSE loans are well coordinated across investors due to the uniformity of GSE servicing arrangements and their market power. In comparison, in PLS originations, investors are dispersed and the coordination mechanism is poor. The difference may give holdup servicers greater latitude in their decisions about modifying PLS loans compared with GSE loans.

We next turn to the question of whether, conditional on modification of the first-lien mortgage, the holdup servicers are less likely to modify their second liens. Although such behavior can maximize value for the holdup servicer, their ability to do so is circumscribed by the servicing arrangements. The empirical results, presented in Table 4, Panel A, Columns (4) to (6), suggest that such arrangements might be affecting servicer choice. We find that holdup servicers are *more* likely to modify junior liens conditional on modifying the senior claims. This result is consistent with the fact that holdup servicers are more aware of the presence of the second lien (or verifying that a junior lien exists is cheaper and easier for them) and are thus bound by servicing agreements

to take action on second-lien loans. Point estimates in Panel A suggest that this effect is large, varying between 15% and 30% relative to the unconditional mean. We also note that servicers appear to be able to avoid taking action on a large share of second-lien loans following modification of the first lien.

In Panel B of Table 4, we repeat the analysis for the 12-month horizon. The results are very similar to those in Panel A, except that the magnitude of the effects is slightly smaller.

4.5 Holdup and Modification Terms

As shown in the previous subsection, holdup servicers are more likely to jointly modify both liens. These actions might still maximize the value of holdup servicers' claims, especially if they are able to modify their second-lien loans on relatively favorable terms. We look for evidence of preferential holdup among second-lien loans owned by holdup servicers.

We measure the generosity of modification terms as the reduction in the modified loan payment relative to the original amount. This metric is well-defined for first-lien loans that have preset amortizing payments. However, second-lien loans present a potential problem, because some only require minimum payments, which are less sensitive to changes in loan terms. To partially mitigate the resulting imprecision, we aggregate modified loans into three categories: those whose required payment increased following modification, did not change, and decreased.

Table 5 presents summary statistics from this exercise for GSE and PLS loans, stratified by whether the servicer making modification decisions was subject to holdup concerns. Among GSE loans (Panel A), we fail to detect any appreciable difference in the distribution of outcomes between holdup and non-holdup servicers. Among PLS loans (Panel B), we find a *lower* incidence of modifying second-lien loans on preferential terms among holdup servicers, which is compensated by their higher propensity to modify both liens on similar terms. The *pari passu*

treatment of senior and junior liens in the dataset is not necessarily surprising given the existence of the 2MP program introduced by the U.S. Treasury in 2010. Under the program, servicers of second-lien loans receive monetary incentives to match the terms of HAMP modifications extended to the first-lien loans backed by the same property. Note that modifying second liens on equal or better terms than the first-lien mortgages runs counter to the principle of seniority and could thus be regarded as favorable to the second lien. On net, we do not detect any statistically measurable differences in the propensity of holdup servicers to offer favorable second-lien modifications.

4.6 The Effects of Holdup on Borrower Welfare

Our earlier results show that holdup servicers are less likely to act on delinquent first-lien mortgages owned by investors. When they do act, holdup servicers favor modifications over liquidations, especially when the second lien is still performing. Thus, holdup factors appear to affect the distribution of cash flows between first- and second-lien holders. An important question is whether holdup also affects borrowers' welfare or whether it is simply a wealth transfer between first- and second-lien holders.

To answer this question, we examine the performance of loans conditional on holdup. If holdup servicers are better than non-holdup servicers in identifying borrowers with superior prospects of resuming payments, their delay of loss mitigation and particularly liquidation actions is beneficial. Similarly, borrowers would benefit if such servicers are better able to identify loans for which modification is more likely to lead to sustainable loan performance.

We begin with the first lien. In Table 6, we regress an indicator for whether the first lien is performing in months 7 through 12 following its delinquency on a holdup indicator and the rest of the controls. We first perform this regression on a subsample of loans whose first lien saw no

action over the first six months following delinquency. The results in Columns (1) to (3) suggest that holdup servicers were indeed better able to identify borrowers that could self-cure in the absence of servicer action. The economic magnitude of these effects is non-negligible: 1.5% (or 11% in relative terms) for PLS loans and 0.9% (4% in relative terms) for GSE loans.

In Columns (4) to (6), we restrict the sample to loans that were modified within the first six months. The point estimates suggest that holdup servicers were also more likely to extend modifications to borrowers with ex post better loan performance. Again, the effects are somewhat stronger for PLS loans (8% in relative terms) than for GSE loans (3% in relative terms).

We next test the performance of the second lien over the same horizon. This test is important beyond the welfare question, because holdup servicers might encourage borrowers to stay current on their second-lien loans *in exchange* for avoiding liquidation of the first-lien loan. In Table 7, we examine performance of second-lien loans among those loan-pairs for which only the first lien was delinquent at the outset. Columns (1) and (2) indicate that in this sample, second-lien loans of holdup servicers perform 2.2% better for PLS loans, but that no material effect arises for second-lien loans attached to GSE securitizations. We then repeat the exercise but partition the sample into cases in which the first lien received no action over the first six months and cases in which the first lien was modified. Among GSE-backed loans (Column (4)), this decomposition fails to identify any holdup effects. For PLS loan-pairs (Column (3)), we find that second-lien loans of holdup servicers are more likely to remain current, both when they waited to take any first-lien action and when they modified the first lien. These findings are consistent with the idea that holdup servicers convince borrowers to stay current on their second liens in exchange for avoiding liquidation of the first-lien loan.

5 Conclusion

In this paper, we present novel evidence showing that the seniority structure in mortgage lending affects loss mitigation outcomes. In particular, we find evidence of systematic differences in loss mitigation actions taken by servicers who own the second-lien loan and who service both loans. Our findings suggest that such "holdup" servicers are less likely to take actions that jeopardize the value of their own claims. Specifically, holdup servicers are more likely to delay any action on delinquent first-lien mortgages, lowering the likelihood of foreclosures. When they do take action, their loss mitigation approaches are skewed away from liquidations, especially in instances where the associated second-lien loan continue to perform. When such servicers do pursue liquidation, they are somewhat more likely than non-holdup servicers to use the short sale and deeds-in-lieu approaches, which give them greater bargaining power in the foreclosure process. Our results also suggest that holdup increases the likelihood of modifications for GSE-backed loans and that it increases the likelihood of concurrent modification of second-lien loans.

In the context of corporate finance literature, our results provide further evidence that junior claimants use their agency power to influence loss resolution decisions when they can. While it is hard to put a dollar number on the wealth transfer from senior to junior claimholders, the fact that junior claimants were willing to breach their fiduciary duty to first-lien investors (which is costly due to legal exposure) speaks of the high potential magnitude of the wealth transfer.

The welfare implications of our results are far from straightforward. On the one hand, the actions of holdup servicers appear to maximize the value of their junior claims, possibly at the expense of the senior-lien holders. On the other hand, the holdup servicers appear to be better at identifying first-lien loans that self-cure, and their delay in taking loss mitigation actions on such loans improves the value of the first-lien loans as well. Our results further show that some second-

lien loans owned by holdup servicers are more likely to continue performing, consistent with the idea that these servicers encourage second-lien holders to remain current on their loans in exchange for avoiding liquidation.

References

Agarwal, Sumit, Gene Amromin, Itzhak Ben-David, Souphala Chomsisengphet, and Douglas D. Evanoff, 2011a, The Role of Securitization in Mortgage Renegotiation, *Journal of Financial Economics* 102(3), 559–578.

Agarwal, Sumit, Gene Amromin, Itzhak Ben-David, Souphala Chomsisengphet, Tomasz Piskorski, and Amit Seru, 2017, Policy Intervention in Debt Renegotiation: Evidence from the Home Affordable Modification Program, *Journal of Political Economy,* forthcoming.

Agarwal Sumit, Gene Amromin, Itzhak Ben-David, and Serdar Dinc, 2011b, Legislation and Mortgage Foreclosures, Working Paper, The Ohio State University.

Agarwal, Sumit, Yan Chang, and Abdullah Yavas, 2011c, Securitization and Adverse Selection in Mortgage Lending, *Journal of Financial Economics* 105(5), 640–660.

Armour, John and David Skeel, 2007, Who Writes the Rules for Hostile Takeovers, and Why? The Particular Divergence of U.S. and U.K. Takeover Regulation, *Georgetown Law Journal* 95(6), 1727–1794.

Been, Vicki, Howell Jackson, and Mark Willis, 2012, Sticky Seconds – the Problems Second Liens Pose to the Resolution of Distressed Mortgages, *NYU Journal of Law and Business* 9:71, 71–123.

Bolton, Patrick, and David S. Scharfstein, 1996, Optimal Debt Structure and the Number of Creditors, *Journal of Political Economy* 104(1), 1-25.

Bond, Philip, Ronel Elul, Sharon Garyn-Tal, and David Musto, 2017, Does Junior Inherit? Refinancing and the Blocking Power of Second Mortgages, *Review of Financial Studies* 30 (1), 211–244.

Campbell, John Y., Stefano Giglio, and Parag Pathak, 2011, Forced Sales and House Prices, *American Economic Review* 101(5), 2108–2131.

Cordell, Larry, Karen Dynan, Andreas Lehnert, Nellie Liang, and Eileen Mauskopf, 2011, The Incentives of Mortgage Servicers and Designing Loan Modifications to Address the Mortgage Crisis, in *Lessons from the Financial Crisis: Causes, Consequences, and Our Economic Future*, ed. Robert W. Kolb, Hoboken, NJ: John Wiley & Sons, Inc.

Elul, Ronel, 2011, Adverse Selection in Mortgage Markets, Working Paper, Federal Reserve Bank of Philadelphia.

Engel, Kathleen, and Patricia McCoy, 2011, The Subprime Virus: Reckless Credit, Regulatory Failure, and Next Steps, Oxford: Oxford University Press.

Ghent, Andra C., and Marianna Kudlyak, 2011, Recourse and Residential Mortgage Default: Evidence from US States, *Review of Financial Studies* 24(9), 3139–3186.

Goodman, Laurie S., 2011, National Mortgage Servicing Standards and Conflicts of Interest, Testimony to the Subcommitee on Housing, Transportation and Community Development of the Senate Committee of Banking, Housing, and Urban Affairs, May 11, 2011.

Goodman, Laurie S., 2017, Examining Lien-Position Conflicts, *MortgageOrb.com,* June 3, 2011.

Goodman, Laurie S., Roger Ashworth, Brian Landy, and Lidan Yang, 2011, Strategic Default and 1st/2nd Lien Payment Priority, Industry Report, Amherst Mortgage Insight.

Goodman, Laurie S., Roger Ashworth, Brian Landy, and Ke Yin, 2010, Second Liens: How Important? *Journal of Fixed Income* 20(2), 19–30.

Ivashina, Victoria, Benjamin Iverson, and David C. Smith, 2016, The Ownership and Trading of Debt Claims in Chapter 11 Restructurings, *Journal of Financial Economics* 119(2), 316-335.

Keys, Benjamin, Tanmoy Mukherjee, Amit Seru, and Vikrant Vig, 2010, Did Securitization Lead to Lax Screening? Evidence from Subprime Loans, *Quarterly Journal of Economics*, 125, 307–362.

Kominers, Scott Duke, and E. Glen Weyl, 2011, Concordance among Holdouts, Working Paper, University of Chicago.

Lee, Donghoon, Christopher Mayer, and Joseph Tracy, 2012, A New Look at Second Liens, Working Paper, FRB-NY and Columbia University.

Mayer, Christopher, Edward Morrison, and Tomasz Piskorski, 2009a, Essay: A New Proposal for Loan Modifications, *Yale Journal on Regulation* 26(2), 417–429.

Mayer, Christopher, Karen Pence, and Shane M. Sherlund, 2009b, The Rise in Mortgage Defaults, *Journal of Economic Perspectives* 23(1), 27–50.

Mailath, George J., and Andrew Postelwaite, 1990, Asymmetric Information Bargaining Problems with Many Agents, *Review of Economic Studies* 57(3), 351–367.

McCoy, Patricia A., 2012, Barriers to Foreclosure Prevention during the Financial Crisis, *Arizona Law Review* 55, 723–773.

Mian, Atif and Amir Sufi, 2009, The Consequences of Mortgage Credit Expansion: Evidence from the U.S. Mortgage Default Crisis, *Quarterly Journal of Economics* 124(4), 1449–1496.

Pinedo, Anna T., and Amy Moorhus Baumgardner, 2009, Federal Mortgage Modification and Foreclosure Prevention Efforts, *Uniform Commercial Code Law Journal* 41(4), 319–345.

Piskorski, Tomasz, Amit Seru, and Vikrant Vig, 2010, Securitization and Distressed Loan Renegotiation: Evidence from the Subprime Mortgage Crisis, *Journal of Financial Economics* 97, 369–397.

Posner, Richard A., 2005, Foreword: A Political Court, Harvard Law Review 119(1), 31–102.

Warner, Jerold B., 1977, Bankruptcy, Absolute Priority, and the Pricing of Risky Claims, *Journal of Financial Economics* 4(3), 239–276.

White, Michelle J., 1983, Bankruptcy Costs and the New Bankruptcy Code, *Journal of Finance* 38(2), 477–488.

Zhang, Yan, 2013, Does Loan Renegotiation Differ by Securitization Status? A Transition Probability Study, *Journal of Financial Intermediation* 22(3), 513–527.

Table 1. Summary Statistics

The table presents summary statistics for the subsamples used in the paper. Panel A shows summary statistics for the holdup and non-holdup groups for the 6- and 12-month horizons. Panel B shows statistics about the loss mitigation actions for the holdup and non-holdup samples, by investor type.

Panel A: Summary Statistics

	Private-Label Securitizations (PLS)				Government Sponsored Entity Securitizations (GSE)			
Horizon:	6 months		12 months		6 months		12 months	
Servicer:	Holdup	Non-holdup	Holdup	Non-holdup	Holdup	Non-holdup	Holdup	Non-holdup
Current borrower and loan characteristics								
FICO group 1 (<300)	3%	4%	3%	4%	5%	6%	5%	6%
FICO group 2 (300-579)	21%	22%	21%	22%	27%	27%	27%	27%
FICO group 3 (580-659)	22%	23%	22%	23%	23%	23%	23%	23%
FICO group 4 (660-719)	24%	25%	24%	25%	21%	21%	22%	22%
FICO group 5 (720-779)	21%	20%	22%	20%	17%	17%	17%	16%
FICO group 6 (>780)	8%	6%	8%	6%	6%	5%	6%	5%
CLTV group 1 (<80)	27%	22%	27%	22%	36%	36%	36%	35%
CLTV group 2 (80-99)	21%	22%	21%	22%	24%	23%	24%	23%
CLTV group 3 (100-119)	18%	19%	18%	19%	15%	14%	15%	14%
CLTV group 4 (>120)	27%	26%	27%	26%	19%	18%	19%	18%
CLTV group 5 (missing)	8%	11%	8%	11%	6%	10%	7%	10%
1st lien unpaid balance group 1 (<$133K)	14%	11%	14%	11%	28%	26%	28%	26%
1st lien unpaid balance group 2 ($133-217K)	15%	18%	15%	18%	30%	31%	30%	31%
1st lien unpaid balance group 3 ($218-341K)	17%	22%	17%	22%	28%	31%	29%	31%
1st lien unpaid balance group 4 (>$341K)	53%	49%	53%	49%	13%	11%	13%	11%
1st lien unpaid balance group 5 (missing)	0%	0%	0%	0%	0%	0%	0%	1%
2nd lien unpaid balance group 1 (<$28K)	15%	13%	15%	13%	29%	25%	29%	25%
2nd lien unpaid balance group 2 ($29-49K)	19%	19%	19%	19%	29%	26%	29%	26%
2nd lien unpaid balance group 3 ($50-83K)	28%	27%	28%	27%	24%	25%	24%	25%
2nd lien unpaid balance group 4 (>$83K)	36%	39%	36%	40%	17%	22%	17%	22%
2nd lien unpaid balance group 5 (missing)	2%	2%	2%	2%	2%	2%	2%	2%
Loan terms at origination								
1st lien term group 1 (<= 15 yrs)	4%	2%	4%	2%	7%	6%	7%	6%
1st lien term group 2 (20-30 yrs)	93%	95%	93%	95%	92%	93%	92%	93%
1st lien term group 3 (>30 yrs)	4%	3%	4%	3%	2%	0%	2%	0%
2nd lien term group 1 (<= 10 yrs)	37%	30%	36%	30%	35%	28%	34%	29%
2nd lien term group 2 (10 - 15 yrs)	11%	17%	12%	17%	14%	16%	14%	16%
2nd lien term group 3 (15 - 25 yrs)	5%	11%	5%	11%	7%	15%	7%	14%
2nd lien term group 4 (> 25 yrs)	33%	31%	33%	31%	37%	30%	37%	30%
2nd lien term group 5 (missing)	14%	11%	15%	12%	7%	11%	8%	11%
1st lien is low doc	62%	73%	63%	73%	43%	56%	43%	57%
2nd lien is low doc	77%	80%	77%	81%	70%	71%	71%	72%
1st lien is ARM	56%	57%	56%	57%	20%	18%	21%	19%
1st lien is interest only (IO)	42%	43%	42%	44%	17%	17%	18%	18%
2nd lien is interest only (IO)	56%	51%	56%	51%	46%	45%	45%	45%
Legal characteristics								
1st lien is non-recourse	55%	56%	55%	56%	38%	38%	38%	38%
2nd lien is non-recourse	2%	2%	2%	2%	2%	2%	2%	2%
1st lien is judicial state	30%	27%	30%	27%	42%	39%	42%	39%
Second-lien characteristics								
2nd lien is HELOC	63%	65%	63%	66%	54%	61%	53%	62%
2nd lien is piggyback (within 2mo of 1st lien)	59%	37%	59%	36%	54%	33%	54%	33%
2nd lien is fully drawn	15%	12%	15%	13%	11%	10%	11%	10%
2nd lien is frozen	42%	45%	41%	46%	36%	41%	35%	42%
2nd lien UPB covered by home equity (avg.)	21%	20%	21%	19%	33%	35%	33%	35%

Table 1. Summary Statistics (Cont.)

Panel B: Loss Mitigation Actions in Holdup and Non-holdup Samples

		Private-Label Securitizations (PLS)		Government Sponsored Entity Securitizations (GSE)		GSE + PLS Securitizations
	Servicer:	Holdup	Non-holdup	Holdup	Non-holdup	All
	N =	35,348	50,784	123,439	96,473	306,044
Action on 1st lien within 6 months	1st lien					
	No action	46.4%	52.2%	43.7%	44.7%	45.7%
	In foreclosure process	33.9%	30.3%	33.2%	36.0%	33.7%
	Liquidated	6.4%	4.1%	7.3%	6.8%	6.5%
	Modified	5.0%	8.8%	6.6%	5.9%	6.5%
	Repayment/Prepaid (incl. voluntary liq)	8.3%	4.6%	9.2%	6.7%	7.5%
	2nd lien performing at the end of horizon	32.3%	37.3%	34.5%	39.0%	36.1%
	N =	33,087	47,856	115,597	89,791	286,331
Action on 1st lien within 12 months	1st lien					
	No action	28.2%	33.3%	25.9%	27.4%	27.9%
	In foreclosure process	31.8%	31.7%	28.7%	31.4%	30.4%
	Liquidated	18.9%	13.8%	19.1%	18.8%	18.1%
	Modified	10.1%	14.9%	14.5%	13.4%	13.7%
	Repayment/Prepaid (incl. voluntary liq)	11.0%	6.4%	11.7%	9.0%	9.9%
	2nd lien performing at the end of horizon	24.5%	26.9%	27.2%	30.1%	27.7%

Table 2. Holdup and No Action

The table shows the results of regressions of an indicator of whether the first-lien loan had no action on determinants. All regressions are ordinary least squares regressions. The sample includes first-lien mortgages serviced by holdup servicers and by non-holdup servicers. In Panel A, Columns (1) to (3) measure the dependent variable over the six-month period from the time the loan was identified as distressed. Columns (4) to (6) measure the dependent variable over the 12-month period from the time the loan was identified as distressed. The sample covers loans that became distressed between December 2009 and April 2012. *Holdup Servicer* indicates whether the mortgage is serviced by a holdup servicer. Panel B repeats the regressions in Panel A on a number of different subsamples: (a) a subsample limited to the servicers that do not get acquired during our sample period, which removes ambiguity about which entity exercised control over loss mitigation decisions; (b) a subsample limited to loan-pairs in which the second lien remained performing during the first six months following the delinquency of the first lien; and (c) a subsample that excludes piggyback second-lien loans, which helps to evaluate the possibility that piggyback-issuing holdup servicers have an informational advantage over non-holdup servicers of piggyback loans. Standard errors are clustered at the state level. Controls include the following measures captured at the time of first-lien delinquency: an indicator of whether the second lien has defaulted, indicators for five FICO score buckets, indicators for buckets of the leverage of the first-lien loan, indicators for buckets of the unpaid balance (in dollars) of the first- and second-lien loans, and the fraction of the second-lien loan that could be covered by the current value of the house. They also include indicators for categories of the original terms of the first- and second-lien loans, for whether the first- and second-lien loans had low-documentation, for whether the first-lien loan is an ARM, for whether the first- and second-lien loans are interest-only loans, for whether the second-lien loan is a home equity line of credit, for whether the second-lien loan is fully drawn, for whether the second-lien loan is a credit line and is frozen, and for whether the second-lien loan is a piggyback loan (i.e., originated within two months of the origination of the first-lien loan). The controls also include a set of dummies for the delinquency quarter, the state in which the secured property is located, the identity of the first-lien servicer, and indicators for the origination year of the first-lien loan.

Panel A: Holdup and No Action on Delinquent Mortgages

Dependent variable:	No action on 1st lien within…					
Horizon:	6 months			12 months		
Sample:	PLS	GSE	All	PLS	GSE	All
	(1)	(2)	(3)	(4)	(5)	(6)
Unconditional mean	49.8	44.1	45.7	31.2	26.5	27.8
Holdup Servicer (0/1)	4.419***	1.742***	4.581***	3.082***	0.757**	3.112***
	[5.626]	[6.583]	[5.788]	[4.622]	[2.418]	[4.701]
× GSE (0/1)			-2.889***			-2.368***
			[-3.557]			[-3.267]
1st lien controls	Yes	Yes	Yes	Yes	Yes	Yes
2nd lien controls	Yes	Yes	Yes	Yes	Yes	Yes
1st lien servicer FE	Yes	Yes	Yes	Yes	Yes	Yes
Delinquency quarter FE	Yes	Yes	Yes	Yes	Yes	Yes
Year of origination FE	Yes	Yes	Yes	Yes	Yes	Yes
State FE	Yes	Yes	Yes	Yes	Yes	Yes
GSE Indicator	No	No	Yes	No	No	Yes
Observations	86,132	219,912	306,044	80,943	205,388	286,331
Adj R^2	0.135	0.152	0.148	0.120	0.128	0.127

Table 2. Holdup and No Action (Cont.)

Panel B: Holdup and No Action: Robustness Checks

Dependent variable:	No action on 1st lien within 6 months of default								
Sample:	Servicers that do not get acquired			2nd lien is current during first 6 months			No piggyback 2nd liens		
Investor type:	PLS	GSE	Combined	PLS	GSE	Combined	PLS	GSE	Combined
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Unconditional mean	41.3	43.9	43.3	55.1	55.5	55.4	51.3	45.4	47.0
Holdup Servicer (0/1)	3.428***	1.522***	3.502***	3.141***	1.702***	3.141***	4.489***	2.217***	4.623***
	[5.516]	[6.702]	[5.708]	[4.737]	[3.987]	[4.765]	[5.609]	[7.617]	[5.655]
× GSE (0/1)			-1.987***			-1.438*			-2.436***
			[-3.050]			[-1.834]			[-2.842]
1st lien controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
2nd lien controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
1st lien servicer FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Delinquency quarter FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year of origination FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
State FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
GSE Indicator	No	No	Yes	No	No	Yes	No	No	Yes
Observations	41,997	152,789	194,786	30,354	80,240	110,594	46,580	122,144	168,724
Adj R^2	0.122	0.159	0.152	0.105	0.095	0.097	0.131	0.135	0.135

Table 3. Choice of Loss Mitigation Conditional on Action

The table shows the results of regressions of an indicator of whether the first-lien loan had a liquidation or foreclosure in process conditional on being acted upon within 6 or 12 months of delinquency (Panels A and B, respectively) on a set of controls and the holdup servicer indicator. The sample contains the groups of first-lien mortgages that are serviced by holdup and by non-holdup servicers. The sample covers loans that became distressed between December 2009 and April 2012. *Holdup Servicer* indicates whether the mortgage is serviced by a holdup servicer. Columns (1) to (3) present the baseline case for all delinquent first-lien loans that received some loss mitigation action. Columns (4) to (6) restrict the sample to loan-pairs in which the second lien remained performing during the relevant action horizon. Columns (7) to (9) show the regressions of an indicator for voluntary liquidation outcomes (short sales or deeds-in-lieu) conditional on the first-lien loan being liquidated. All regressions are ordinary least squares regressions. All regressions include the same set of controls as in Table 2. Standard errors are clustered at the state level. *t*-statistics are presented in brackets. *, **, and *** denote two-tailed significance at the 10%, 5%, and 1% levels, respectively.

Panel A: Probability of Liquidation and Foreclosure Process, Six-Month Horizon

Dependent variable:	Liquidation + Foreclosure process						Voluntary liquidation		
Horizon:	6 months			6 months			6 months		
Sample restriction:	Any action taken			Any action on 1st lien; 2nd lien			Liquidated		
Sample:	PLS	GSE	All	PLS	GSE	All	PLS	GSE	All
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Unconditional mean	73.4	74.4	74.1	54.7	50.8	51.9	8.9	6.5	7.1
Holdup Servicer (0/1)	-2.264***	-3.988***	-2.317***	-4.325***	-5.691***	-4.325***	1.851***	1.172***	1.851***
	[-4.295]	[-15.391]	[-4.515]	[-4.102]	[-7.268]	[-4.130]	[4.444]	[6.595]	[4.501]
× GSE (0/1)			-1.654***			-1.367			-0.680
			[-2.835]			[-1.047]			[-1.518]
1st lien controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
2nd lien controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
1st lien servicer FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Delinquency quarter FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year of origination FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
State FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
GSE Indicator	No	No	Yes	No	No	Yes	No	No	Yes
Observations	43,220	122,870	166,090	13,619	35,722	49,341	31,712	91,357	123,069
Adj R^2	0.166	0.229	0.212	0.162	0.202	0.192	0.132	0.083	0.100

Table 3. Choice of Loss Mitigation Conditional on Action (Cont.)

Panel B: Probability of Liquidation and Foreclosure Process, 12-Month Horizon

Dependent variable:	Liquidation + Foreclosure process						Voluntary liquidation		
Horizon:	12 months			12 months			12 months		
Sample restriction:	Action taken			Action on 1st lien; 2nd lien current			Liquidated		
Sample:	PLS	GSE	All	PLS	GSE	All	PLS	GSE	All
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Unconditional mean	69.2	66.5	67.2	45.3	38.1	40.0	17.2	11.8	13.3
Holdup Servicer (0/1)	-1.316***	-3.992***	-1.329***	-3.875***	-4.508***	-3.875***	2.695***	2.081***	2.700***
	[-3.014]	[-12.429]	[-3.102]	[-3.456]	[-8.295]	[-3.480]	[6.311]	[9.732]	[6.356]
× GSE (0/1)			-2.653***			-0.633			-0.623
			[-4.924]			[-0.512]			[-1.308]
1st lien controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
2nd lien controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
1st lien servicer FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Delinquency quarter FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year of origination FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
State FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
GSE Indicator	No	No	Yes	No	No	Yes	No	No	Yes
Observations	55,681	150,858	206,539	12,745	36,515	49,260	38,542	100,373	138,915
Adj R^2	0.161	0.213	0.200	0.157	0.190	0.185	0.143	0.111	0.126

Table 4. Holdup and Modification

The table explores holdup servicers' propensity to modify the first and second liens relative to non-holdup servicers. Panel A shows the results of regressions of an indicator for whether the first-lien loan was modified (Columns (1) to (3)) or the second-lien loan was modified (Columns (4) to (6)) within six months of delinquency. Panel B shows similar results for a horizon of 12 months. In Columns (4) to (6), the sample is limited to loan-pairs in which the first lien was modified during the first 6 or 12 months following delinquency. All regressions are ordinary least squares regressions and include the same set of controls as in Table 2. The sample encompasses the holdup and non-holdup groups. The sample covers loans that became distressed between December 2009 and April 2012. *Holdup Servicer* indicates whether the observation belongs to the holdup group. Standard errors are clustered at the zip code level. *t*-statistics are presented in brackets. *, **, and *** denote two-tailed significance at the 10%, 5%, and 1% levels, respectively.

Panel A: Modification of Delinquent First- and Second-Lien Mortgages within Six Months

Dependent variable:	Modification of 1st lien within 6 months			Modification of 2nd lien within 6 months		
Sample restriction:	Action taken			1st lien modified		
Sample:	PLS	GSE	All	PLS	GSE	All
	(1)	(2)	(3)	(4)	(5)	(6)
Unconditional mean	14.5	11.2	12.1	14.1	15.4	15.0
Holdup Servicer (0/1)	-0.517	2.167***	-0.492	4.142***	3.130***	4.135***
	[-1.036]	[7.290]	[-1.005]	[3.998]	[5.612]	[4.014]
× GSE (0/1)			2.652***			-0.990
			[4.611]			[-0.846]
1st lien controls	Yes	Yes	Yes	Yes	Yes	Yes
2nd lien controls	Yes	Yes	Yes	Yes	Yes	Yes
1st lien servicer FE	Yes	Yes	Yes	Yes	Yes	Yes
Delinquency quarter FE	Yes	Yes	Yes	Yes	Yes	Yes
Year of origination FE	Yes	Yes	Yes	Yes	Yes	Yes
State FE	Yes	Yes	Yes	Yes	Yes	Yes
GSE Indicator	No	No	Yes	No	No	Yes
Observations	43,220	122,870	166,090	6,194	13,580	19,774
Adj R^2	0.182	0.147	0.159	0.116	0.102	0.107

Table 4. Holdup and Modification (Cont.)

Panel B: Modification of Delinquent First- and Second-Lien Mortgages within 12 Months

Dependent variable:	Modification of 1st lien within 12 months			Modification of 2nd lien within 12 months		
Sample restriction:	Action taken			1st lien modified		
Sample:	PLS	GSE	All	PLS	GSE	All
	(1)	(2)	(3)	(4)	(5)	(6)
Unconditional mean	18.8	19.1	19.0	17.8	21.4	20.5
Holdup Servicer (0/1)	-0.918**	2.896***	-0.908**	2.673**	3.378***	2.677**
	[-2.603]	[8.539]	[-2.613]	[2.428]	[3.606]	[2.441]
× GSE (0/1)			3.797***			0.708
			[7.783]			[0.491]
1st lien controls	Yes	Yes	Yes	Yes	Yes	Yes
2nd lien controls	Yes	Yes	Yes	Yes	Yes	Yes
1st lien servicer FE	Yes	Yes	Yes	Yes	Yes	Yes
Delinquency quarter FE	Yes	Yes	Yes	Yes	Yes	Yes
Year of origination FE	Yes	Yes	Yes	Yes	Yes	Yes
State FE	Yes	Yes	Yes	Yes	Yes	Yes
GSE Indicator	No	No	Yes	No	No	Yes
Observations	55,681	150,858	206,539	9,537	26,448	35,985
Adj R^2	0.153	0.143	0.145	0.110	0.087	0.094

Table 5. Holdup and Relative Generosity of Second-Lien Modifications

This table presents the distribution of the relative generosity of modifications for first- and second-lien loans. The sample is limited to loan-pairs in which both liens were modified. Generosity of modifications is defined in terms of the reduction in required monthly payments relative to the original loan. Modified loans are aggregated into five broad categories: those whose required payment increased following modification, did not change, decreased by less than 20%, decreased between 20% and 40%, or decreased by more than 40%. Panel A presents the distribution of payment reductions when mortgages in which the first-lien is backed by the GSE. Panel B presents the distribution of payment reductions when mortgages in which the first-lien is securitized by through PLS. Two-tailed statistical significance of the difference in means between holdup and non-holdup servicers is denoted by *, **, and *** for the 10%, 5%, and 1% levels, respectively.

Panel A: Distribution of Payment Reductions When First Lien Is Backed by GSEs

	Payment reduction for second-lien relative to first-lien			
Payment reduction category:	Greater	Similar	Smaller	N
Holdup Servicers	35.3%	21.5%	43.2%	2,731
Non-holdup Servicers	35.6%	21.5%	42.9%	1,310
Difference:	-0.4%	0.0%	0.3%	

Panel B: Distribution of Payment Reductions When First Lien Is Securitized through PLS

	Payment reduction for second-lien relative to first-lien			
Payment reduction category:	Greater	Similar	Smaller	N
Holdup Servicers	36.1%	28.1%	35.9%	563
Non-holdup Servicers	49.2%	18.2%	32.6%	801
Difference:	-13.1%***	9.8%***	3.3%	

Table 6. Holdup and First-Lien Loan Performance

The table shows the results of regressions of an indicator of whether the first-lien loan performs after 12 months on determinants. The evaluation period covers months 7 through 12 following delinquency. In cases where no action was taken on the delinquent first-lien mortgage (Columns (1)–(3)), an indicator value of 1 corresponds to loans self-curing by the end of the 12-month period. In cases in which the delinquent first loan was modified (Columns (4)–(6)), the value of 1 corresponds to the modified loan continuing to perform by the end of the 12-month period following the original delinquency. All regressions are ordinary least squares regressions. The sample contains the groups of second-lien mortgages that are serviced by holdup servicers and by non-holdup creditors. The sample covers loans that became distressed between December 2009 and April 2012. *Holdup Servicer* indicates whether the mortgage is serviced by a holdup servicer. All regressions are ordinary least squares regressions and include the same set of controls as in Table 2. Standard errors are clustered at the zipcode level. *t-statistics* are presented in brackets. *, **, and *** denote two-tailed significance at the 10%, 5%, and 1% levels, respectively.

Dependent variable:	First-lien loan performs after…					
Horizon:	12 months			12 months		
Sample restriction:	No action taken at month = 6			Modified loans at month = 6		
Sample:	PLS	GSE	All	PLS	GSE	All
	(1)	(2)	(3)	(4)	(5)	(6)
Unconditional mean	13.2	21.4	18.9	58.3	78.7	72.3
Holdup Servicer (0/1)	1.466**	0.876***	1.470**	4.473**	2.401***	4.424**
	[2.074]	[3.080]	[2.166]	[2.277]	[3.056]	[2.236]
× GSE (0/1)			-0.596			-1.964
			[-0.822]			[-0.920]
1st lien controls	Yes	Yes	Yes	Yes	Yes	Yes
2nd lien controls	Yes	Yes	Yes	Yes	Yes	Yes
1st lien servicer FE	Yes	Yes	Yes	Yes	Yes	Yes
Delinquency quarter FE	Yes	Yes	Yes	Yes	Yes	Yes
Year of origination FE	Yes	Yes	Yes	Yes	Yes	Yes
State FE	Yes	Yes	Yes	Yes	Yes	Yes
GSE Indicator	No	No	Yes	No	No	Yes
Observations	39,867	89,100	128,967	6,035	13,319	19,354
Adj R^2	0.113	0.125	0.131	0.216	0.169	0.223

Table 7. Holdup and Second-Lien Loan Performance

The table shows the results of regressions of an indicator of whether the second-lien loan continues to perform in months 7 through 12 following the first-lien delinquency. The sample is limited to loan-pairs for which the second lien was performing at the time of first-lien mortgage delinquency. Columns (1) and (2) show the results for the sample that includes all first-lien loans regardless of their loss mitigation disposition. Columns (3) and (4) restrict the sample to those loan-pairs in which the first lien received no loss mitigation action in the first six months, and Columns (5) and (6) restrict the sample to pairs in which the first lien was modified during the first six months. All regressions are ordinary least squares regressions and include the same set of controls as in Table 6. The sample contains the groups of second-lien mortgages that are serviced by holdup and by non-holdup servicers. The sample covers loans that became distressed between December 2009 and April 2012. Standard errors are clustered at the zip code level. *t*-statistics are presented in brackets. *, **, and *** denote two-tailed significance at the 10%, 5%, and 1% levels, respectively.

Dependent variable:	Second-lien loan still performing after…					
Horizon:	12 months		12 months		12 months	
Sample restriction:	All loans		No action taken at month = 6		Modified loans at month = 6	
Sample:	PLS	GSE	PLS	GSE	PLS	GSE
	(1)	(2)	(3)	(4)	(5)	(6)
Unconditional mean	66.6	71.4	68.5	73.9	77.3	85.0
Holdup Servicer (0/1)	2.211***	0.419	1.612**	-0.871*	4.421*	0.188
	[3.190]	[0.902]	[2.029]	[-1.775]	[2.000]	[0.141]
1st lien controls	Yes	Yes	Yes	Yes	Yes	Yes
2nd lien controls	Yes	Yes	Yes	Yes	Yes	Yes
1st lien servicer FE	Yes	Yes	Yes	Yes	Yes	Yes
Delinquency quarter FE	Yes	Yes	Yes	Yes	Yes	Yes
Year of origination FE	Yes	Yes	Yes	Yes	Yes	Yes
State FE	Yes	Yes	Yes	Yes	Yes	Yes
Observations	27,185	71,216	15,298	41,002	3,519	8,528
Adj R^2	0.070	0.064	0.076	0.072	0.090	0.078

Figure 1. Distribution of Servicer Size in Sample

This figure provides the distribution of servicer size by the number of loan-pairs that are serviced.

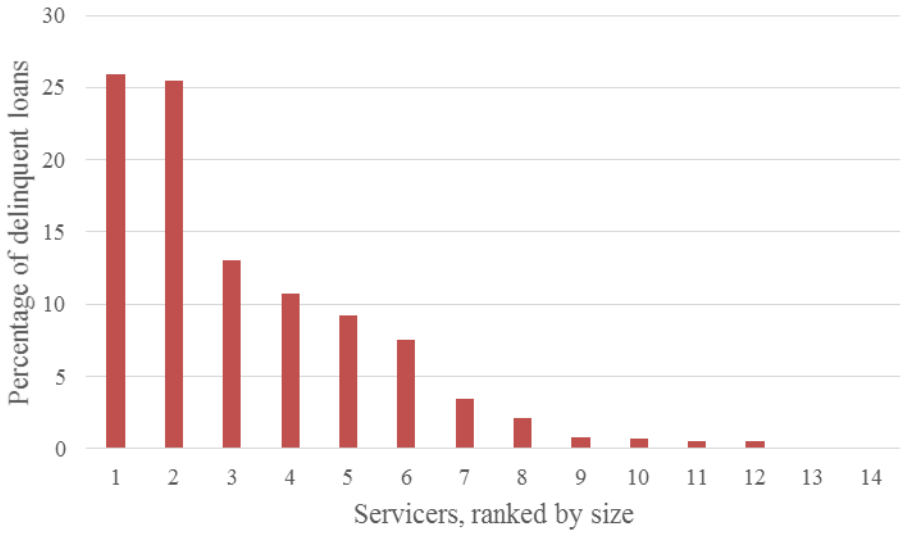
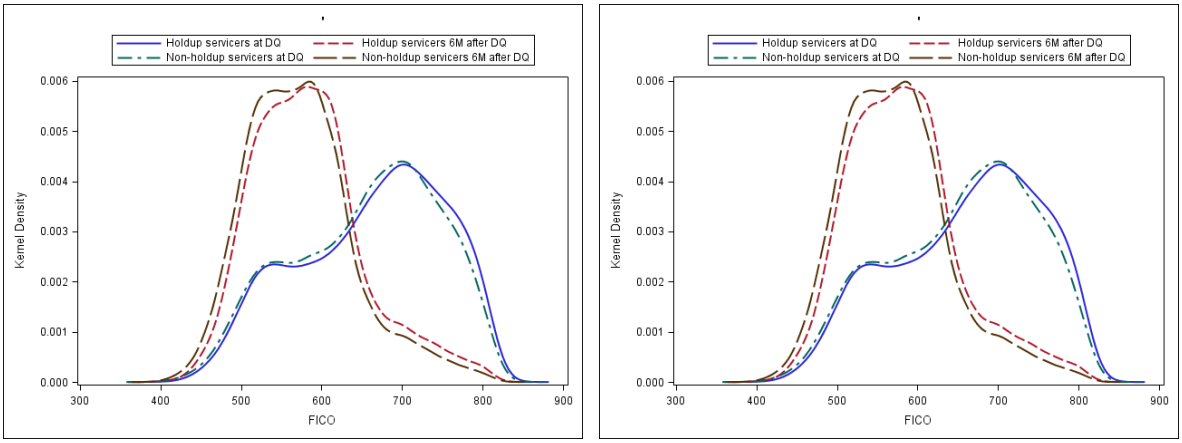


Figure 2. Distribution of FICO Scores and First-Lien Loan-to-Value Ratios

The top panels of the figure plot estimated kernel densities of FICO scores for the groups serviced by holdup servicers and non-holdup servicers at two points in time: origination and in six months following loan delinquency. The top left panel presents the results for GSE-securitized loans, and the top right panel presents the results for PLS loans. The bottom panels repeat this exercise for first-lien loan-to-value ratios (LTV).

Panel A. FICO Scores Kernel Densities

GSE loans PLS loans



Panel B. First-Lien LTV Ratio Kernel Densities

GSE loans PLS loans

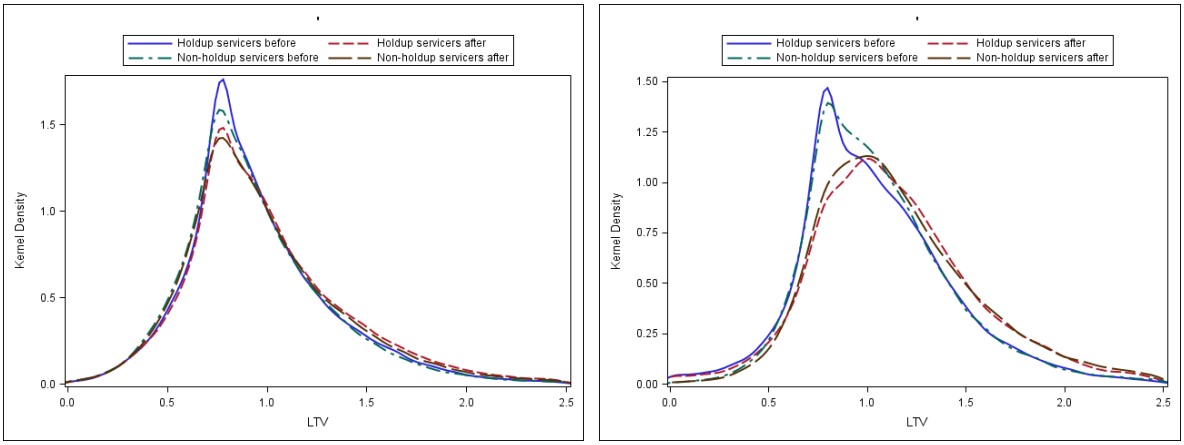


Figure 3. Timing of Second-Lien Loan Delinquency Relative to Delinquency on the Associated First-Lien Loan

This figure depicts the distribution of when the second-lien loan becomes delinquent relative to the delinquency on the associated first-lien loan. The results are presented separately for borrowers whose first-lien loans are securitized through the GSEs and those whose first-lien loans are securitized through PLSs.