



WORKING PAPERS

RESEARCH DEPARTMENT

**WORKING PAPER NO. 09-21
SECURITIZATION AND MORTGAGE DEFAULT:
REPUTATION VS. ADVERSE SELECTION**

Ronel Elul
Federal Reserve Bank of Philadelphia

First version: April 29, 2009
This version: September 22, 2009

RESEARCH DEPARTMENT, FEDERAL RESERVE BANK OF PHILADELPHIA

Ten Independence Mall, Philadelphia, PA 19106-1574 • www.philadelphiafed.org/research-and-data/

SECURITIZATION AND MORTGAGE DEFAULT¹

Ronel Elul²

Federal Reserve Bank of Philadelphia

First Version: April 29, 2009

This version: November 17, 2009

¹ The author thanks Mitchell Berlin, Philip Bond, Paul Calem, Larry Cordell, Will Goetzmann, Bob Hunt, David Musto, Leonard Nakamura, Richard Rosen, Amit Seru, Anthony Sanders, Nick Souleles, and Paul Willen, as well as participants at the Wharton Macro Finance Lunch, the FDIC Mortgage Default Symposium, and the Yale Financial Crisis Conference. I am particularly indebted to Bob O’loughlin and Ted Wiles for outstanding research support.

² Research Department, Federal Reserve Bank of Philadelphia, Ten Independence Mall, Philadelphia, PA 19106. Email: ronel.elul@phil.frb.org. Tel: (215) 574-3965. The views expressed in this paper are those of the author and do not necessarily represent policies or positions of the Federal Reserve Bank of Philadelphia nor the Federal Reserve System. This paper is available free of charge at: www.philadelphiafed.org/research-and-data/publications/working-papers/.

SECURITIZATION AND MORTGAGE DEFAULT

ABSTRACT

The academic literature, the popular press, and policymakers have all debated securitization's contribution to the poor performance of mortgages originated in the run-up to the current crisis. Theoretical arguments have been advanced on both sides, but the lack of suitable data has made it difficult to assess them empirically. We examine this issue by using a loan-level data set from LPS Analytics, covering approximately three-quarters of the mortgage market from 2003-2007, and including both securitized and non-securitized loans.

We find evidence that privately securitized loans do indeed perform worse than similar, non-securitized loans. Moreover, this effect is concentrated in prime mortgage markets. For example, a typical prime ARM loan originated in 2006 becomes delinquent at a 20 percent higher rate if it is privately securitized, *ceteris paribus*. By contrast, subprime loan performance does not seem to be worse for most classes of securitized loans.

INTRODUCTION

The recent dramatic increase in mortgage default rates, particularly for subprime loans, has led many to blame securitization. Simply put, the argument is that since the majority of subprime loans were securitized, issuers had less incentive to screen those loans, and this encouraged a decline in lending standards. This argument has featured prominently in the popular press and has also been echoed by policymakers.³ For example, the recently released U.S. Treasury report on regulatory reform notes that “[t]he lack of transparency and standards in markets for securitized loans helped to weaken underwriting standards.” and the report goes on to propose that issuers be required to maintain a 5 percent stake in any securitization. The argument has also found support in recent academic work, for example, Dell’Ariccia, Igan, and Laeven (2008), Mian and Sufi (2009), and Keys, et al. (2009).⁴

On the other hand, others (most prominently, Gorton, 2008) have pointed out that issuers retained substantial exposure even after the mortgages are securitized. Some of this was explicit, since issuers often continued to service mortgages they had sold, or they retained senior tranches of CDOs containing these mortgages. But it was also implicit; the clearest evidence of this can be found in the credit card ABS market. For example, Higgins and Mason (2004) document instances in which issuers of credit card ABS have taken back non-performing loans (Higgins and Mason, 2004) despite not being contractually required to do so. Similarly, Gorton and Souleles (2007) show that prices paid by investors in credit card ABS take into account issuers’ ability to bail out their ABS. Thus, issuers’ incentives need not necessarily be misaligned with those of investors. This view is also supported by earlier work on the securitization of prime

³ http://www.financialstability.gov/docs/regs/FinalReport_web.pdf

⁴ See also Nadauld and Sherlund (2009), who argue that house price appreciation facilitates securitization, and that underwriters tended to purchase lower credit-quality subprime mortgages in those ZIP codes that experienced the highest house price appreciation.

mortgages. (See Ambrose, et al., 2005, who found that securitized loans tended to perform *better* than similar non-securitized loans.)

One difficulty with most of the recent academic work is that the data used do not allow researchers to easily compare individual securitized and non-securitized loans. Dell’Ariccia, Igan, Laeven (2008) and Mian and Sufi (2009) instead use local-level aggregate securitization rates, an approach that makes interpreting their results difficult, since it is difficult to distinguish the effect of securitization from that of other local conditions.

Keys, et al. (2009) use loan-level data, but only for securitized loans (from the Loan Performance ABS database). So they must use an instrumental variables approach to characterize loans that are “harder” to securitize (those with credit scores just below 620) and find that these loans are indeed less likely to default, *ceteris paribus*. While this is indeed an ingenious approach, several issues arise. First, this instrument is rather weak, since many subprime MBS did indeed contain substantial numbers of loans below this cutoff. For example, in the New Century securitization studied by Ashcraft and Schuermann (2008), 57 percent of all loans have FICO scores below 620. Furthermore, work by Krainer and Laderman (2009) and Bubb and Kauffmann (2009) suggests that this “620-discontinuity” also appears to affect the performance of *non-securitized* loans.⁵ Relative to our paper, however, the key limitation of their approach is that Keys, et al (2009) can only examine the effect of securitization for a very narrow subset of loans — those in the neighborhood of their cutoff. And, indeed, they find a significant effect only for a small subsample of loans — subprime mortgages with low or no documentation of income. By contrast, our approach allows us to examine a much broader segment of the

⁵ Some of these criticisms are addressed by additional analyses that the authors undertake in the paper. In particular, they also examine the introduction, and repeal, of anti-predatory lending laws in Georgia and New Jersey. The results of this latter analysis are consistent with those of their primary approach; during the period that these laws were in force, loans with credit scores slightly above 620 default a higher rates than those with scores slightly below.

mortgage market. In particular, our main result - that *prime* securitized loans are the ones that performed worse – certainly could not be established with using a dataset that required restricting attention to loans with FICO scores around 620.

In this paper we take a more direct approach, one that avoids many of these problems. We use the LPS data set, which includes both securitized loans and those held in portfolio by the original lender. We find evidence that for prime mortgages, private securitized loans indeed perform worse than portfolio loans; for instance, for loans originated in 2006, the two-year default rate is at least 20 percent higher, on average. Given the large number of prime loans that were originated over this period, this difference in default rates is economically significant. By contrast, securitized subprime loans do not appear to have defaulted at higher rates than similar non-securitized loans. As we discuss below, this relative difference in performance between prime and subprime loans may be driven by two factors. First, subprime loans are likelier to have been subject to greater scrutiny by investors, whereas prime loans would have been presumed to be of higher quality.⁶ In addition, very few subprime loans were actually held in portfolio, further reducing the benefit to the lenders from cream-skimming and also increasing lenders' risk from doing so.

Our analysis also breaks down the effect of securitization by origination year. We find some evidence that this effect grows over time. In particular, for the largest segment of the market, prime FRMs, securitized loans originated in earlier years perform no worse, and sometimes better, than similar non-securitized loans. However, this effect decreases over time, and beginning with the 2006 vintage, such loans actually become delinquent at higher rates than non-securitized loans. Our interpretation is that while in earlier years reputational effects were

⁶ Similarly, Adelino (2009) finds evidence that investors scrutinized AAA-rated MBS tranches less carefully than lower-rated ones.

sufficient to sustain underwriting standards, as loan volumes increased, and the future of the housing market became more and more tenuous, the current benefit from originating questionable loans outweighed the future costs, and this led to a deterioration in issuers' incentives to properly underwrite loans. We should stress, however, that our results do not rule out the possibility that investors understood that such a deterioration in standards had taken place and that the prices paid for the loans, or that the structures of the MBS, reflected this additional risk (see Gorton and Souleles, 2007, for an example of this in credit card securitizations, and also Adelino, 2009).

DATA DESCRIPTION

Introduction

We use loan-level data from the LPS Applied Analytics Inc, data set.⁷ Other researchers have used this data set to study foreclosure outcomes; see Piskorski, Seru, and Vig (2009) and Foote et al. (2009); a more detailed description of the data may also be found in the latter paper. These data are provided by the servicers of the loans and include nine of the top 10 servicers.

As Table 1 demonstrates, coverage in LPS is approximately 75 percent of that in HMDA.

Table 1: First Mortgage Originations: LPS vs. HMDA

	LPS	HMDA
2004	7.2m	10.2m
2005	7.4m	10.5m
2006	6.4m	8.6m
2007	5.1m	6.9m

⁷ This data set is also commonly known as the “McDash” data.

However, as can be seen from Table 2, subprime loans appear to be somewhat underrepresented in early years, at least as compared to the Loan Performance (LP) data.⁸

Table 2: Subprime Share of Originations⁹

	LPS	LP	HMDA
2003	2.7%	7%	
2004	8.5%	16%	14%
2005	9.2%	18%	25%
2006	17.3%	16%	28%
2007	13.4%	-	18%

In order to make the analysis cleaner, we focus on 30-year, owner-occupied first-lien mortgage loans.¹⁰ We drop observations with missing data and obvious outliers. To reduce survival bias, we also restrict attention to loans that entered the LPS data set within 12 months of their origination date. Taken together, these restrictions eliminate 10-20 percent of the data we begin with. We also consider only loans originated from 2003-2007, since LPS coverage was more limited before 2003, and we want to have a sufficiently long time horizon following origination.¹¹ We then follow these loans through March 2009.

We consider the following products: fixed-rate mortgages (FRM), 5-year ARMs, 3-year ARMS, and 2/28 ARMs.¹² These three classes of ARMs were chosen because, taken together, they make up over 60 percent of all the adjustable-rate mortgages originated in the LPS data set

⁸ The HMDA data do not break out loans by prime vs. subprime, so the HMDA shares in Table 2 are for reference only, and are not directly comparable to LP and LPS.

⁹ Loan Performance statistics are from Mayer and Pence (2008). The HMDA share is the fraction of “higher-priced” loans in first-lien originations; pricing was first reported in HMDA in 2004.

¹⁰ For the estimations reported in the paper, we also dropped FHA and VA loans. Including them did not materially change the results.

¹¹ We also repeated our analysis while restricting it to loans originated in 2005-2007; the results did not change significantly and are not reported here.

¹² That is, with the initial interest rate fixed for the first five years of the loan, or the first three years, or the first two years, respectively.

over this time period. For each class we break down the sample into prime and subprime loans (as reported by the servicers). Note that there is no separate category for Alt-A loans; depending on the issuer, they may be classed as either prime or subprime. We also further break down the FRM into prime conforming, prime jumbo, and subprime loans, as securitization patterns are very different in these markets. Except for prime conforming FRM, where we draw a 25 percent random sample, we used all of the loans available in the LPS data set that met our criteria.

The LPS data set is divided into a “static” file, whose values generally do not change over time, and a “dynamic” file. The static data set contains information obtained at the time of underwriting, such as the loan amount, house price, (origination) FICO score, documentation status, source of the loan (e.g., whether it was broker-originated), property location (zip code), type of loan (fixed-rate, ARM, prime, subprime, etc.), the prepayment penalty period (if any), and the termination date and termination status if the loan has indeed terminated. The termination types include “paid off,” foreclosure (and other negative termination events such as REO sale), and the transfer of the loan to another servicer.

The dynamic file is updated monthly, and among other variables, it contains the status of the loan (current, 30 days delinquent, 60 days, etc.), the current interest rate (since this changes over time for ARMs), current balance, and investor type (private securitized, GNMA, FNMA, FHLMC, portfolio). The investor type variable is discussed in greater detail below.

We also generate several additional variables. First, we define a loan as being “in default” if it is 60+ days delinquent or if it experienced a negative termination event.¹³ This is a relatively early definition of default, as compared to a foreclosure, which can occur many months later. We use this early definition for several reasons. First, state laws governing foreclosure differ widely,

¹³ We use the Mortgage Bankers Association (MBA) definition of delinquency: a loan increases its delinquency status if a monthly payment is not received by the end of the day immediately preceding the loan’s next payment due date.

and this can have an effect on the length of time it takes to conclude a foreclosure.¹⁴ Also, whether a delinquent loan is securitized or not may also affect the ease of modifying it and hence of avoiding foreclosure (Piskorski, Seru, and Vig, 2009);¹⁵ thus, we choose to focus on the initial stages of distress.

In addition, we estimate the current house price by applying the FHFA house price index¹⁶ to the house value reported at origination and use this, together with the updated principal balance, to compute an estimate of the current loan-to-value ratio at quarterly frequency. We also calculate the house price appreciation in the region over the four years *prior* to the origination date of the loan to capture the effect of a runup in house prices on lending standards (see Dell’Ariccia et al, 2008 and Goetzmann et al , 2009).

Now, the LPS dataset does not include any information on the identity of the lender. In order to rule out the possibility that our results are being driven by a few lenders who were known to securitize risky loans (and something that investors could have adjusted for in the price they paid), we merge the LPS dataset with the Home Mortgage Disclosure Act data (HMDA).¹⁷ We use this to construct (anonymous) lender fixed effects.

¹⁴ Many papers have studied the effect of these state laws on foreclosure outcomes; for example, Ghent and Kudlyak (2009) use the LPS data to address laws that restrict deficiency judgments.

¹⁵ And see Foote, et al. (2009) for an opposing view

¹⁶ For properties located within an MSA we use the MSA-level index, while for those not in an MSA we use the “rural” index (or the state-level index when the rural index is not available).

¹⁷ Our procedure is similar to that described in Haughwout, Mayer and Tracy (2009). Mortgages were matched based on the ZIP code of the property, the date when the mortgage originated (within 5 days), the origination amount (within \$500), purpose of the loan (purchase, refinance or other), the type of loan (conventional, VA guaranteed, FHA guaranteed or other), occupancy type (owner occupied or non-owner occupied), and lien status (first lien or other). The match rate was 48%.

The Investor Type

Since the investor type is a key variable in our analysis, we now discuss it in more detail. First note that the investor type is dynamic: nearly half of all loans are initially recorded as “portfolio” loans and are only then subsequently securitized, typically within several months. So we must define the investor type carefully so as to capture the “intended” investor type at the time of origination. Roughly speaking, we adopted the most common investor type during the first year of the loan’s life; we restricted attention to the first year in order to more closely capture the intended investor type when the loan was originated.¹⁸ Table 3 compares this “final” investor type to the one reported at loan origination.

Another issue is that a loan may also end up in a lender’s portfolio not by design, but rather precisely because it has defaulted. First, loans that default while they are still “in-pipeline” cannot be securitized through normal channels.¹⁹ In addition, lenders are sometimes contractually obligated to take back any loans that experience “early default,” that is, loans that default in the first three months.²⁰ We will show below that this is a particular concern for subprime loans, especially in the later vintages. As we discuss, to address this possibility we repeat our analysis after dropping any loans that defaulted within three months of origination.

¹⁸ More precisely, for a given loan the investor type used was constructed as follows. We considered all investor types that occur during the first year of a loan’s life. We then denoted an investor type to be “admissible” if it matches the modal investor type over the 12 months following the date on which it first appears. We then selected the admissible investor type that occurred first. Note that for almost all loans, there was only a single admissible investor type. On average, the investor type was determined within three months of the origination date.

¹⁹ Although there was also a small ‘scratch-and-dent’ securitization market during part of this time period.

²⁰ We are grateful to Amit Seru for highlighting the importance of this. See Piskorski, Seru, and Vig (2009) for further detail.

Table 3: Initial and “Final” Investor Types

	PRIME				SUBPRIME			
	FHA	GSE	Private Securitized	Portfolio	FHA	GSE	Private Securitized	Portfolio
Investor Type at Origination	2.8%	24.8%	22.8%	49.5%	0.1%	5.7%	52.8%	41.4%
“Final” Investor Type	9.0%	59.3%	22.4%	9.3%	0.1%	7.4%	84.1%	8.4%

Some Stylized Facts

Before we begin our formal analysis, it is useful to establish a few facts about the data. First, Table 4 reports the distribution of loans by investor type, for each product. We can see that prime ARMs represent an ideal laboratory for studying the effect of securitization, since issuers distributed their loans across all three investor types. Conversely, observe that the vast majority of subprime loans were privately securitized.

Table 4: Investor Type by Product

		GSE	Private Securitized	Portfolio	# of Loans
FRM	Prime	78.6%	15.6%	5.7%	17.9 m
	Jumbo	-	89.7%	10.3%	0.8 m
	Subprime	19.1%	74.1%	6.7%	0.8 m
	Lowdoc	80.7%	16.7%	2.5%	1.6 m
5 Yr ARMs	Prime	40.4%	35.2%	24.3%	2.2 m
	Subprime	17.9%	77.8%	4.2%	0.03 m
3 Yr ARMs	Prime	38.5%	35.5%	26.0%	0.6 m
	Subprime	0.0%	95.3%	4.7%	0.3 m
2/28 ARMs	Prime	0.1%	95.4%	4.5%	0.4 m
	Subprime	0.1%	91.0%	8.9%	0.8 m

It is also useful to simply compare default rates across the different investor types, as we do in Table 5.²¹ Notice that loans held in private securitizations do indeed seem to default at higher rates than other loans. However, this does not take account of differences in observable risk factors between these loans. For example, as we have already seen, private securitization was concentrated in the subprime market. Thus, a formal analysis is needed.

Table 5: Termination Status by Investor Type

	Entire Sample	FHA	GSE	Private Securitized	Portfolio
Paid Off or Did Not Terminate in Sample	93.5%	92.4%	97.3%	85.4%	89.6%
Defaulted	1.7%	2.6%	0.6%	3.8%	1.6%
Transferred to Other Servicer	4.8%	5.3%	2.1%	10.8%	9.1%

ESTIMATION AND RESULTS

We estimate a Cox proportional hazard model, with 60-day delinquency (“default”) as the dependent variable, by subsample.²² Estimating each subsample separately is important, as the shape of the hazard function for a fixed-rate mortgage, for example, is likely to be quite different than that for a 2/28 ARM. In each case, we estimate the following models: (i) a “base-case”, which includes the entire set of data in this subsample, (ii) the subsample of those loans which did not default early (discussed further below), (iii) a model with MSA-fixed effects,²³ (iv) models for broker-originated and non-brokered loans, and (v) a model with lender fixed-effects.

²¹ For the purposes of this table (only), “default” refers to the termination of the loan, and not to 60-day delinquency.

²² Prepayments are treated as censored observations. In the absence of unobserved heterogeneity, the estimates we obtain would be the same as in a competing risks model.

²³ For tractability, we restrict attention to loans originated in the top twenty-five MSA’s.

We include a rich set of control variables: borrower characteristics (FICO score), loan characteristics (interest rate, refinancing, documentation type, initial LTV,²⁴ mortgage insurance), origination channel (broker, correspondent), local economic conditions (county unemployment rate,²⁵ and house price appreciation rate prior to origination), and our estimate of current LTV described above. We also include fixed effects for the year of loan origination, as well as their interactions with the investor type; these are our key variables of interest. Descriptions of these variables, and their means across the subsamples, can be found in Table 6.

We now discuss our results; our key variable of interest - the private securitization coefficients – is also summarized in Figure 2 and Table 11.

Prime ARMs

We begin with a discussion of the results for prime ARMs, as they represent the best laboratory for studying the effects of private securitization. We focus, in particular, on 5-year and 3-year ARMs, which are split roughly evenly between all three investor types. We defer the 2/28 prime ARMs to our discussion of subprime ARMs below, as these were essentially subprime loans in all but name (for example, the mean FICO scores were far below those for other prime ARMs, and nearly all loans were in private securitizations).

Turning first to Panel A of Table 7, which reports the coefficients for the control variables, the results generally conform to our intuition. Broker-originated and low-doc loans are riskier. A borrower with a higher FICO score is less likely to default, while loans with higher initial interest rates, larger loans, and loans with private mortgage insurance (PMI), are all

²⁴ Origination LTV is modeled with a linear spline which can differ based on whether the origination LTV is below, equal to, or above 80 percent..

²⁵ County unemployment rates are from the Bureau of Labor Statistics.

riskier. As others have found,²⁶ high house price appreciation in the four years prior to the mortgage origination date is associated with a higher likelihood of default. This coefficient may capture the impact of a housing boom on lending standards. Loans in areas with higher unemployment rates are riskier.

We control for both current and origination LTV,²⁷ where the current LTV is the ratio of the current principal balance and an estimate of the current house price. In every case loans with higher current LTV are riskier. The results for initial LTV vary by subsample. For the 5-year ARMs, higher initial LTV has a positive association with delinquency. By contrast, for 3-year ARMs the effect of initial LTV on default is negative - this may reflect screening on unobservables.²⁸ In addition, loans originated at precisely 80 percent LTV default at slightly higher rates; this is likely due to the existence of unobserved "piggyback" (second) mortgages.

The coefficients on the dummy variables for origination year, and their interactions with the investor type, are reported in Panel B of the table. The baseline origination year is 2003, and the baseline investor type is a portfolio loan (recall that we dropped FHA and VA loans). The coefficients for loans originated in subsequent years are positive; that is, loans originated after 2003 are riskier, after controlling for difference in risk and house prices changes. This is consistent with other work: see for example, Demyanyk and Van Hemert (2009).

Our main interest, however, is in the marginal contribution of private securitization. These coefficients are positive and significant for all years. They are also economically significant. One way to see this is to note that the contribution of securitization to default risk is in fact greater than that of broker-origination. To further assess this, Table 11 reports the average

²⁶ For example, Dell'Ariccia, Igan, and Laeven (2008) and Nadauld and Sherlund (2009).

²⁷ Recall that origination LTV was modeled as a spline, with an additional dummy variable at 80% LTV.

²⁸ Similar results have been observed in other contexts; for example, Berger and Udell (1990) find that riskier business loans tend to have more collateral.

two-year cumulative delinquency rate for loans originated in 2006, as well as the securitization coefficient for that year from the Cox regression. For example, for a typical prime 5-year ARM, private securitization would raise the delinquency rate by over 20 percent, from 14.6 percent to 18.4 percent.

As reported in Table 6, a substantial fraction of 5-year ARMs are Option-ARM or Interest-Only (IO) mortgages, which are more risky loans. It can also be established that IO's, in particular, were more heavily securitized. So we re-estimate the model after dropping these loans, in order to determine if the positive coefficient is simply due to the correlation of the securitization variables with observable risk factors. We verify that this is not the case - restricting attention to "plain-vanilla" 5-year ARMs actually makes the securitization coefficients larger.

We also split our sample into the broker-originated loans and those that were not originated through a broker, so as to explore whether the origination channel affected the securitization decision, as some have suggested. We find no evidence that the origination channel differentially affects the impact of securitization for Prime ARMs.

Finally, we re-ran the estimation for several subsamples. First, with MSA fixed effects, to verify that our results do not simply reflect higher securitization rates in riskier areas. Also, for the subsample we were able to match, with lender fixed effects. In each of these cases, there was no qualitative change in the securitization coefficients.

Prime Fixed-Rate Mortgages

We now turn to the most standard of products, Conforming Prime FRM. These results are reported in Table 8. The coefficients for the control variables, which can be found in panel A of the table, are very similar to those for Prime ARMs.

As above, we focus on the interactions between the dummy variables for origination year and investor type, which are in Panel B of Table 8. The coefficients on the loans held by the GSEs (FNMA and FHMLC) are negative through 2006 – that is, these loans are less likely to become delinquent, *ceteris paribus*. However, for loans originated in 2007 the coefficient is strongly positive; these loans are over 30% more likely to default. This is likely the result of the GSE's well-publicized expansion of their market share in 2007, after private securitizers exited the market.

Turning now to the marginal contribution of private securitization, observe that in 2003-2005, securitized loans are less risky (a negative coefficient). However, this coefficient steadily increases over time, and, starting with loans originated in 2006, the contribution of private securitization to default is in fact positive.

We also split our sample into the broker-originated loans and those that were not originated through a broker, so as to explore whether the origination channel affected the securitization decision, as some have suggested. Here our results differ from those for prime ARMs. In the boom years of 2005 and 2006, the securitization coefficients are indeed higher for the brokered-loans, although this is not the case for other years.

The results for jumbo FRM are, for the most part, similar to those for the conforming loans. One difference is in the securitization coefficients. The coefficients are smaller than those for the conforming loan market; this is consistent with our hypothesis that the marginal impact of

securitization is smaller in markets in which securitization was more important. As above, the effect of securitization is stronger from brokered loans than from those not originated through brokers, and indeed, the difference between brokered and non-broker-originated loans is much larger for these jumbo loans than for conforming fixed-rate loans.

Subprime Mortgages and Early Default

We now review the results for subprime mortgages, beginning with 2/28 and 3-year subprime ARMs. These results are reported in Table 9. For the most part, the estimated coefficients for the control variables are qualitatively similar to those for their prime-ARM counterparts. The key difference is in the securitization coefficients – we will show that for subprime loans the impact of securitization is negligible.

We begin by noting that the “base case” results actually have negative coefficients in the boom years of 2005-2006, which implies that securitized loans originated in these years actually perform *better* than similar loans held in portfolio. We now demonstrate, however, that these negative coefficients are an artifact of early defaults. As discussed above, loans that become delinquent early cannot be securitized (or may be returned to the originator by investors). This can bias the definition of “intended” investor type; while a loan may have indeed been intended to be securitized, it may have ended up in portfolio precisely because it defaulted.

This is evident in Figure 1 below, where we plot the early-default rates for two representative samples: 2/28 subprime ARMs and 5/1 Prime ARMs. In both cases, early default rates increase in the final years of the dataset. However, the increase is much greater for the subprime loans; by 2006 the fraction of 2/28 subprime ARMs loans that defaulted within the first three months following origination reached 9 percent. More striking, however, are the

differences by investor type; nearly 20 percent of portfolio loans originated in 2006 and 2007 defaulted early, over twice the rate for securitized loans. By contrast, the prime ARMs exhibit early default rates that are a tiny fraction of the levels reached by the subprime loans, and it is not until 2007 that these early defaults are concentrated in portfolio loans.

To control for the possible effect of early defaults on the investor type, we re-run our estimations, but now excluding those loans that became delinquent within three months of origination.²⁹ This raises the securitization coefficients for the subprime ARMs, and the negative coefficients observed in the base-case model become statistically insignificant (with some even changing sign). Also note that excluding early defaults has very little effect on the results for the prime samples (see Tables 7 and 8), since they contain fewer of these early defaults.

We conclude by briefly discussing the results for subprime fixed-rate mortgages in Table 8. By contrast to the subprime ARMs, the securitization coefficients in the base-case regressions are not significantly negative. Dropping the early defaults, moreover, leads to significant positive coefficients in 2006 and 2007. As such, these results resemble those for the prime FRM more closely. However, the coefficients become negative or insignificant when we add the lender fixed effects, so the positive coefficients in the earlier regressions are likely to have been driven by a few lenders. Furthermore, the market may well have been aware of the loan quality for these lenders and accounted for this when pricing these loans.

As a final, cautionary note, it is important to stress that drawing inferences between securitized and non-securitized subprime mortgages, particularly for ARMs, is difficult, because only a very small fraction of these loans were held in portfolio. And we have already seen that a

²⁹ We also drop loans with small balances (<\$50,000), since these are also less likely to be securitized. We thank Paul Calem for this suggestion.

substantial fraction of these portfolio loans were early defaults - it is not possible to rule out that many of the others were also not special in some way.³⁰

Low-Doc vs. Full-Doc Loans

We also estimate the model separately for "full-doc" and "lowdoc" loans in each subsample. The motivation is to assess the results of Keys, et al (2009), who found that securitized subprime lowdoc loans (with FICO scores in the neighborhood of 620) were more likely to default. Their hypothesis, in particular, is that lenders took advantage of the relative importance of 'soft' information for these loans, which they could observe better than could investors. While there is indeed variation in the securitization coefficients across the results reported in Table 10, we find no consistent differences between lowdoc and full-doc loans. One interesting finding, however, is that low FICO scores have a greater impact on subprime lowdoc delinquency rates than they do for similar full-doc loans; this is consistent with the results in Jiang et al (2009).

CONCLUSIONS

Using a data set that covers approximately 75 percent of loan originations from the years 2003-2007, and that includes private securitized, GSE, and mortgages held in portfolio, we have shown that prime private securitized loans originated at the peak of the bubble performed significantly worse than similar, non-securitized, loans. The results are particularly striking for markets such as prime ARMs, in which issuers held non-negligible amounts of loans in portfolio. This suggests that adverse selection may have been present in the prime mortgage market, and that it may have contributed to a deterioration in underwriting standards.

³⁰ In addition, as we have pointed out, the coverage of subprime loans in the LPS data was not as broad in early years.

In contrast to previous work, however, we find little evidence that securitized subprime loans were riskier, once we control for early defaults. We suggest that the difference in results between the prime and subprime samples may be due to two factors. First, investors were aware of risks in subprime markets and may have scrutinized loans without the “prime” imprimatur more carefully. In addition, “cherry picking” would have been riskier for subprime lenders who were heavily dependent on securitized pools to hold their loans.

REFERENCES

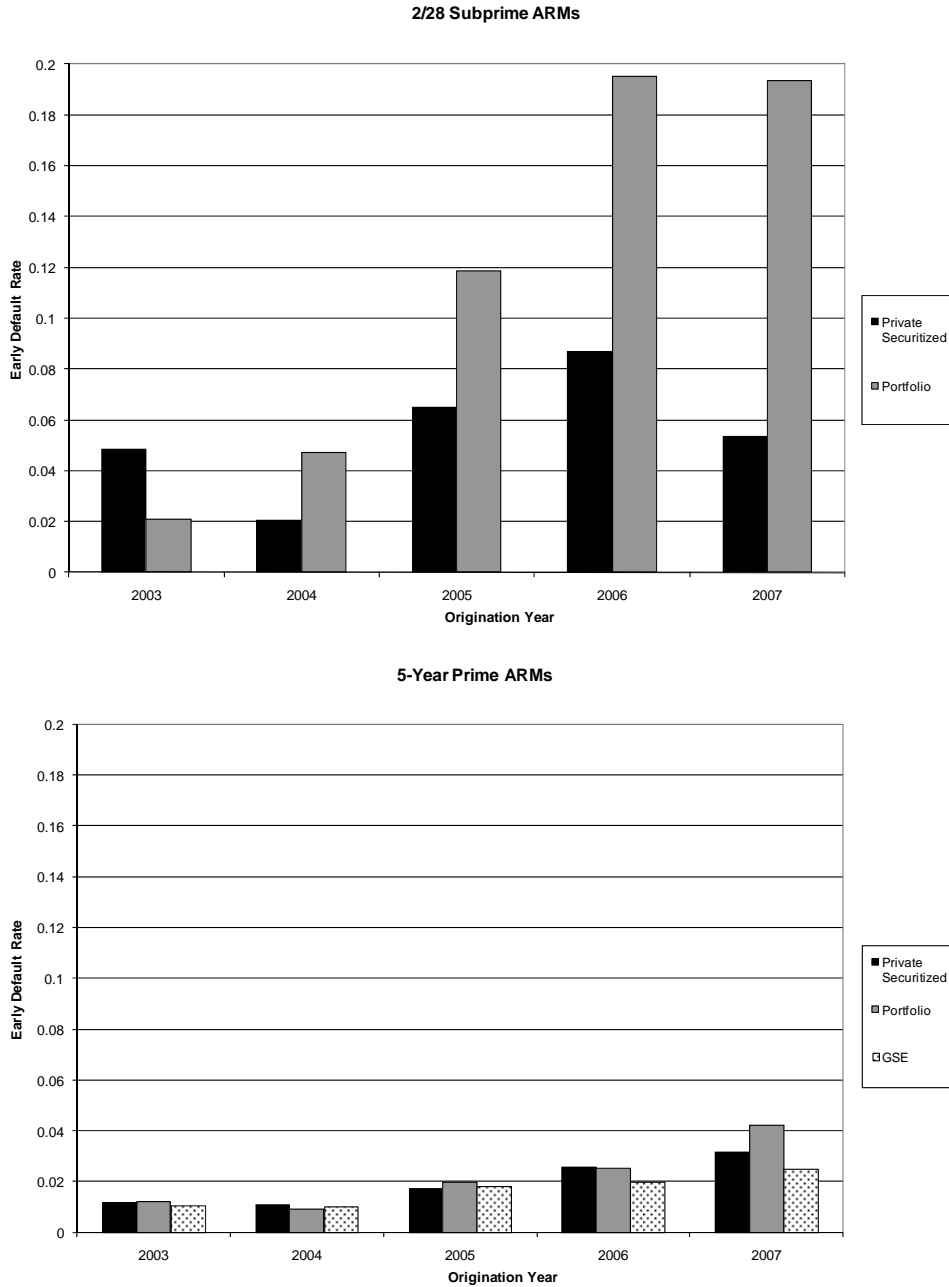
- Adelino, Manuel (2009), "How much do investors rely on ratings? The case of mortgage backed securities," Manuscript.
- Ambrose, Brent, Michael LaCour-Little, and Anthony Sanders (2005), "Does Regulatory Capital Arbitrage, Reputation, or Asymmetric Information Drive Securitization?," *Journal of Financial Services Research*, 28:1.
- Ashcraft, Adam, and Til Schuermann (2008), "Understanding the Securitization of Subprime Mortgage Credit," Federal Reserve Bank New York Staff Report #318.
- Berger, Allen N., and Gregory F. Udell (1990), "Collateral, Loan Quality, and Bank Risk," *Journal of Monetary Economics*, 25:1.
- Bhardwaj, Geetesh and Sengupta, Rajdeep (2009), "Where's the Smoking Gun? A Study of Underwriting Standards for US Subprime Mortgages," Federal Reserve Bank of St. Louis Working Paper No. 2008-036B.
- Bubb, Ryan and Alex Kaufman (2009), "Securitization and Moral Hazard: Evidence from a Lender Cutoff Rule," Federal Reserve Bank of Boston Public Policy Paper 09-5.
- Dell'Ariccia, Giovanni, Deniz Igan, and Luc Laeven (2008), "Credit Booms and Lending Standards: Evidence from the Subprime Mortgage Market," IMF Working Paper WP/08/106.
- Demyanyk, Yuliya, and Otto Van Hemert (2009), "Understanding the Subprime Mortgage Crisis," Forthcoming, *Review of Financial Studies*.
- Foote, Christopher L., and Kristopher Gerardi, Lorenz Goette, and Paul S. Willen (2009), "Reducing Foreclosures," Federal Reserve Bank of Boston Public Policy Discussion Paper 09-2.

- Ghent, Andra, and Marianna Kudlyak (2009), “Recourse and Residential Mortgage Default: Theory and Evidence from US States,” Federal Reserve Bank of Richmond Working Paper 09-10.
- Goetzmann, William N., Liang Peng, and Jacqueline Yen (2009), “The Subprime Crisis and House Price Appreciation,” Yale ICF Working Paper No. 1340577.
- Gorton, Gary (2008), “The Panic of 2007,” Yale ICF Working Paper No. 08-24.
- Gorton, Gary, and Nicholas S. Souleles (2007), "Special Purpose Vehicles and Securitization," in Rene Stulz and Mark Carey (eds.), *The Risks of Financial Institutions*. Chicago: University of Chicago Press.
- Haughwout, Andrew, Christopher Mayer and Joseph Tracy (2009), “Subprime Mortgage Pricing: The Impact of Race, Ethnicity, and Gender on the Cost of Borrowing,” Federal Reserve Bank of New York Staff Report No. 368.
- Higgins, Eric, and Joseph Mason (2004), “What Is the Value of Recourse to Asset Backed Securities? A Study of Credit Card Bank ABS Rescues,” *Journal of Banking and Finance* 28, 857-874.
- Jiang, Wei, Ashlyn Nelson, and Edward Vytlacil, (2009), “Liar’s Loan? Effects of Loan Origination Channel and Loan Sale on Delinquency,” manuscript, Columbia University.
- Keys, Benjamin, Tanmoy Mukherjee, Amit Seru, and Vikrant Vig (2009), “Did Securitization Lead to Lax Screening? Evidence from Subprime Loans,” forthcoming, *Quarterly Journal of Economics*.
- Krainer, John, and Elizabeth Laderman (2009), “Mortgage Loan Securitization and Relative Loan Performance,” Federal Reserve Bank of San Francisco Working Paper 2009-22.

- Mayer, Christopher and Karen Pence (2008), “Subprime Mortgages: What, Where, and to Whom?,” FEDS Working Paper 2008-29.
- Mian, Atif, and Amir Sufi (2009), “The Consequences of Mortgage Credit Expansion: Evidence from the U.S. Mortgage Default Crisis,” forthcoming, Quarterly Journal of Economics.
- Nadauld, Taylor, and Shane Sherlund, (2009), “The Role of the Securitization Process in the Expansion of Subprime Credit,” Fisher College of Business Working Paper 2009-03-009.
- Piskorski, Tomasz, Amit Seru and Vikrant Vig (2009), “Securitization and Distressed Loan Renegotiation: Evidence from the Subprime Mortgage Crisis,” Chicago Booth School of Business Research Paper No. 09-02.

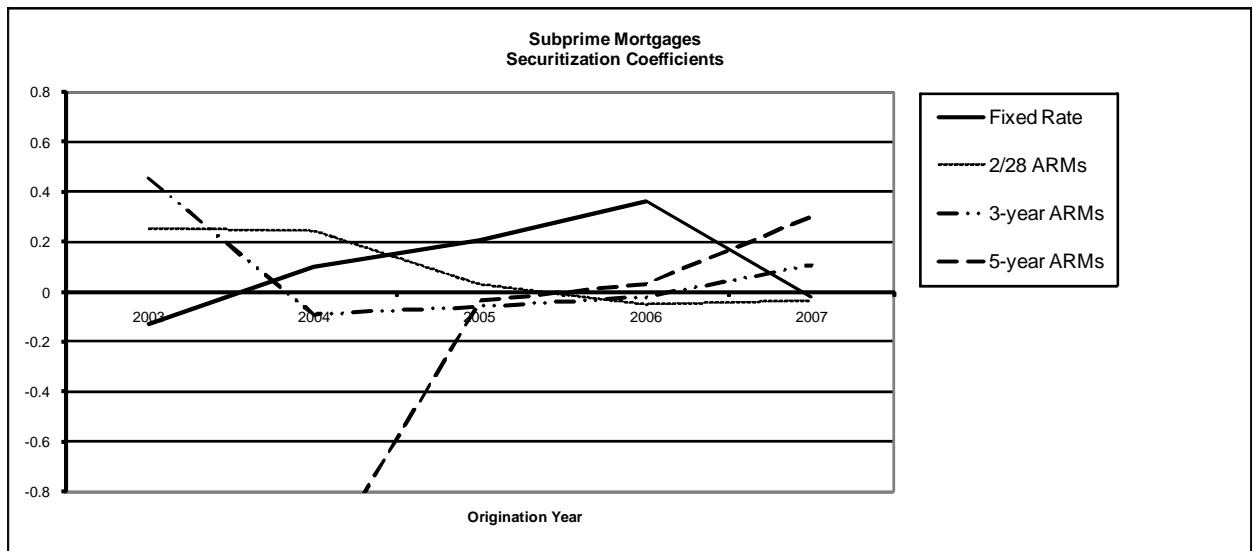
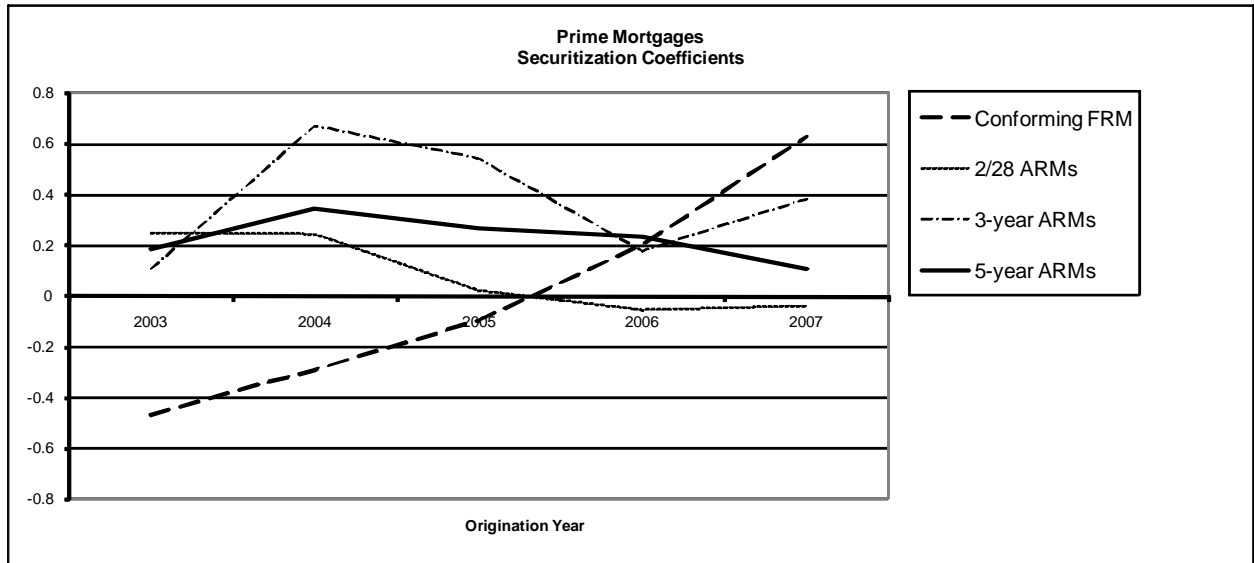
APPENDIX – FIGURES AND TABLES

Figure 1: Early Default Rates, by Origination Year³¹



³¹ This figure plots the early default rates for 2/28 Subprime ARMs and 5-year Prime ARMs, by origination year and investor type. “Early Default” is defined as a 30+ day delinquency within three months of origination. GSE loans represented a negligible fraction of 2/28 originations and were dropped.

Figure 2: Coefficients on Private Securitization, by Origination Year³²



³² This figure plots the securitization coefficients from the ‘no early default’ estimates in Tables 7-9.

Figure 6: Variable Definitions and Summary Statistics

Variable	FRM			5-Year		3-Year		2-Year	
	Prime	Jumbo	Subprime	Prime	Subprime	Prime	Subprime	Prime	Subprime
FICO Score (at origination)	718	732	617	727	656	714	607	637	609
Loan Amount (\$100,000)	183	567	179	320	243	261	186	231	194
Current Interest Rate (%)	6.14	6.13	7.72	5.55	7.15	5.21	7.46	7.50	7.89
Margin Once Adjusting (%; ARMs ONLY)	-	-	-	2.38	4.64	2.53	5.10	5.27	5.39
Jumbo Loan (Dummy)	0.00	1.00	0.06	0.26	0.16	0.19	0.08	0.14	0.09
Lowdoc Loan (Dummy)	0.13	0.09	0.06	0.22	0.15	0.23	0.03	0.14	0.09
Broker-originated (Dummy)	0.15	0.16	0.19	0.20	0.37	0.23	0.30	0.19	0.20
Correspondent-originated (Dummy)	0.34	0.22	0.17	0.20	0.05	0.25	0.17	0.02	0.12
Option-ARM Loan (Dummy)	-	0.02	0.00	0.14	0.41	0.09	0.05	0.20	0.16
Interest-Only Loan (Dummy)	-	0.13	0.03	0.50	0.39	0.35	0.23	0.27	0.16
Transferred from other Servicer	-	0.15	0.33	0.09	0.55	0.16	0.21	0.75	0.41
Prepayment Penalty Active (Dynamic)	0.00	0.03	0.92	0.02	0.20	0.04	0.54	0.17	0.35
PMI (Loan has Private Mortgage Insurance; Dummy)	0.19	0.03	0.04	0.08	0.02	0.12	0.01	0.03	0.07
Refinancing (Dummy)	0.44	0.46	0.70	0.38	0.55	0.48	0.55	0.32	0.50
Cash-out Refinancing (Dummy)	0.14	0.13	0.47	0.10	0.37	0.10	0.47	0.06	0.32
LTV at Origination (%)	73	71	78	73	77	74	81	93	81
Current LTV Estimate (Decimal)	0.64	0.63	0.72	0.65	0.66	0.64	0.74	0.76	0.75
County Unemployment Rate (%)	5.3	5.0	5.4	4.8	4.9	5.1	5.1	5.1	5.0
HPI Appreciation: 4 years before Orig.	0.40	0.58	0.44	0.54	0.52	0.49	0.48	0.58	0.51
Defaulted in-sample	0.07	0.08	0.34	0.09	0.27	0.12	0.35	0.43	0.39
Paid Off-in Sample	0.29	0.27	0.31	0.38	0.33	0.64	0.55	0.43	0.50
Early Default	0.02	0.02	0.06	0.02	0.05	0.02	0.04	0.04	0.06

Table 7 (Panel A): Prime ARMs

	5/1 ARMs						3-yr ARMs						2/28 ARMs						
	Base Case	No Early Default	No IO or Option ARM	MSA Dummies	Lender Dummies	Broker	Non-Broker	Base Case	No Early Default	MSA Dummies	Lender Dummies	Broker	Non-Broker	Base Case	No Early Default	MSA Dummies	Lender Dummies	Broker	Non-Broker
FICO at origination	-0.00974*** (0.0000605)	-0.00964*** (0.0000627)	-0.0122*** (0.000143)	-0.00969*** (0.0000823)	-0.0107*** (0.000106)	-0.00969*** (0.000144)	-0.00962*** (0.0000697)	-0.00823*** (0.000096)	-0.00830*** (0.000100)	-0.00839*** (0.000128)	-0.00896*** (0.000181)	-0.00869*** (0.000233)	-0.00810*** (0.000110)	-0.00276*** (0.000060)	-0.00274*** (0.000062)	-0.00234*** (0.000082)	-0.00258*** (0.000214)	-0.00337*** (0.000225)	-0.00268*** (0.000065)
Loan Amt. (\$100,000)	0.0239*** (0.001180)	0.0229*** (0.001250)	-0.00573 (0.005650)	0.0198*** (0.001530)	0.0156*** (0.00186)	0.0240*** (0.002500)	0.0224*** (0.001430)	0.0251*** (0.002990)	0.0244*** (0.002980)	0.0240*** (0.002970)	0.0221*** (0.00598)	0.0121 (0.006250)	0.0307*** (0.003680)	0.146*** (0.003580)	0.144*** (0.003620)	0.147*** (0.004930)	0.116*** (0.0105)	0.111*** (0.013400)	0.146*** (0.003790)
Jumbo Loan	-0.012500 (0.00865)	-0.0297*** (-0.00891)	-0.154*** (0.0288)	-0.0104 (0.0113)	-0.0292 (0.0153)	-0.0886*** (0.0199)	-0.0126 (0.00993)	0.0507*** (0.016500)	0.0451*** (0.016800)	0.0808*** (0.019700)	0.0514 (0.0343)	0.0641 (0.035200)	0.0353 (0.019600)	-0.102*** (0.012900)	-0.102*** (0.013200)	-0.0870*** (0.016100)	-0.049 (0.0438)	-0.165*** (0.053500)	-0.0902*** (0.013600)
Low-doc Loan	-0.0422*** (0.00696)	-0.0520*** (0.00725)	-0.0615*** (-0.0162)	-0.0532*** (-0.00934)	0.107*** (0.0124)	0.0970*** (0.0134)	-0.118*** (0.00895)	0.00626 (0.011800)	-0.0159 (0.012300)	-0.0308 (0.016200)	0.0717*** (0.025)	-0.00755 (0.025000)	-0.00174 (0.014500)	0.185*** (0.010200)	0.151*** (0.010700)	0.167*** (0.013800)	0.0646 (0.090)	0.0432 (0.025500)	0.229*** (0.012100)
Broker-originated	0.194*** (0.00724)	0.186*** (0.00756)	0.202*** (0.0177)	0.170*** (0.00978)	0.211*** (0.0114)			0.194*** (0.013700)	0.203*** (0.014200)	0.185*** (0.019000)	0.217*** (0.0231)			0.179*** (0.040000)	0.246*** (0.042700)	0.364*** (0.058100)	-0.331 (0.235)		
Correspondent	-0.0183* (0.00764)	-0.0260** (0.00790)	-0.0349* (0.0155)	-0.00982 (0.0104)	0.157*** (0.040)		-0.0351*** (0.00797)	0.0202 (0.013900)	0.022 (0.014400)	0.0398* (0.019300)	0.316*** (0.0556)		0.0294* (0.014600)	0.168*** (0.036600)	0.277*** (0.038900)	0.324*** (0.052500)	0.0907 (0.313)		0.338*** (0.040700)
Prepayment Penalty	0.216*** (0.0115)	0.190*** (0.0121)	0.116** (0.0356)	0.0981*** (0.0164)	0.135*** (0.0233)	0.265*** (0.0275)	0.187*** (0.0136)	0.134*** (0.017100)	0.105*** (0.017900)	0.104*** (0.023900)	-0.086 (0.0555)	0.204*** (0.056900)	0.0905*** (0.019000)	-0.243*** (0.010600)	-0.327*** (0.011200)	-0.309*** (0.014400)	-0.298*** (0.0842)	0.861 (1.073000)	-0.353*** (0.011400)
LTV at Orig. (<80%)	0.0222*** (0.00136)	0.0212*** (0.00122)	0.00163 (0.00105)	0.0228*** (0.00139)	0.0122*** (0.00089)	0.0171*** (0.00121)	0.0206*** (0.00125)	-0.0179*** (0.001150)	-0.0178*** (0.001040)	-0.0164*** (0.002000)	-0.0189*** (0.00116)	-0.00574** (0.001110)	-0.0173*** (0.001170)	-0.0186*** (0.001210)	-0.0184*** (0.001170)	-0.0227*** (0.000921)	-0.0161*** (0.00188)	-0.0222*** (0.002590)	-0.0175*** (0.001170)
LTV at Orig. (=80%)	0.0229*** (0.00134)	0.0218*** (0.00120)	0.00253* (0.000995)	0.0236*** (0.00138)	0.0127*** (0.00085)	0.0181*** (0.00115)	0.0212*** (0.00123)	-0.0145*** (0.001170)	-0.0143*** (0.001070)	-0.0125*** (0.002010)	-0.0166*** (0.00113)	-0.00399* (0.001790)	-0.0140*** (0.001130)	-0.0153*** (0.001170)	-0.0152*** (0.001130)	-0.0192*** (0.000879)	-0.0138*** (0.00177)	-0.0210*** (0.002470)	-0.0142*** (0.001130)
LTV at Orig. (>80%)	0.0171*** (0.00133)	0.0164*** (0.00118)	-0.00274** (0.000976)	0.0183*** (0.00139)	0.00505*** (0.000849)	0.0124*** (0.00125)	0.0160*** (0.00121)	-0.0184*** (0.001130)	-0.0182*** (0.001030)	-0.0169*** (0.002000)	-0.0231*** (0.00105)	-0.00640*** (0.001760)	-0.0173*** (0.001110)	-0.0173*** (0.001120)	-0.0171*** (0.001080)	-0.0212*** (0.000812)	-0.0171*** (0.00164)	-0.0241*** (0.002320)	-0.0162*** (0.001080)
Current LTV	1.404*** (0.119)	1.688*** (0.103)	3.117*** (0.0594)	1.543*** (0.119)	2.557*** (0.0428)	2.332*** (0.0532)	1.652*** (0.104)	1.934*** (0.152000)	1.911*** (0.145000)	1.774*** (0.220000)	2.366*** (0.135)	3.417*** (0.099800)	1.822*** (0.147000)	1.515*** (0.085400)	1.496*** (0.083400)	1.837*** (0.054600)	2.379*** (0.113)	4.172*** (0.177000)	1.427*** (0.080300)
Initial Interest Rate	0.651*** (0.00539)	0.662*** (0.00584)	0.417*** (0.0120)	0.688*** (0.00774)	0.563*** (0.010)	0.664*** (0.0133)	0.658*** (0.00638)	0.243*** (0.005770)	0.237*** (0.006000)	0.223*** (0.007820)	0.240*** (0.00985)	0.242*** (0.012600)	0.243*** (0.006730)	0.243*** (0.003340)	0.247*** (0.003530)	0.249*** (0.004880)	0.236*** (0.0121)	0.243*** (0.012600)	0.239*** (0.003710)
Margin	-0.178*** (0.00570)	-0.167*** (0.00569)	-0.197*** (0.0104)	-0.159*** (0.00684)	-0.135*** (0.017)	-0.171*** (0.0124)	-0.165*** (0.00613)	-0.00717 (0.004760)	-0.00128 (0.004970)	0.0105 (0.006390)	0.0945*** (0.0167)	-0.218*** (0.020900)	0.00703 (0.005150)	0.00773** (0.002570)	0.00509 (0.002660)	0.0121*** (0.003560)	0.0261 (0.0208)	0.0930*** (0.026500)	0.00315 (0.002700)
HPI appreciation (4-yr prior to orig.)	0.633*** (0.0194)	0.615*** (0.0181)	0.489*** (0.0243)	0.315*** (0.0434)	0.486*** (0.0184)	0.376*** (0.0240)	0.669*** (0.0195)	0.357*** (0.021000)	0.389*** (0.021300)	0.601*** (0.094900)	0.435*** (0.0363)	0.379*** (0.042400)	0.394*** (0.023300)	0.124*** (0.012100)	0.154*** (0.012500)	0.621*** (0.053600)	0.124*** (0.0348)	-0.09 (0.054000)	0.185*** (0.013000)
Refinancing	-0.0134 (0.00712)	0.00242 (0.00738)	0.0594*** (0.0155)	-0.000275 (0.00950)	0.107*** (0.0125)	0.150*** (0.0151)	-0.0477*** (0.00857)	-0.160*** (0.011200)	-0.163*** (0.011700)	-0.195*** (0.015000)	-0.0352 (0.0244)	0.0149 (0.025500)	-0.192*** (0.013100)	-0.190*** (0.007490)	-0.184*** (0.007790)	-0.199*** (0.010100)	-0.0255 (0.035)	-0.232*** (0.022800)	-0.174*** (0.008220)
Cashout Refi	-0.0281** (0.00980)	-0.0241* (0.0102)	0.151*** (0.0223)	-0.0250 (0.0131)	-0.0896*** (0.0164)	-0.147*** (0.0183)	0.0325** (0.0124)	0.00502 (0.016100)	0.0112 (0.016600)	0.0385 (0.021600)	-0.0939** (0.0353)	-0.0806* (0.036600)	0.0576** (0.018900)	0.00171 (0.015100)	0.0141 (0.015700)	-0.00181 (0.020100)	-0.298** (0.110)	1.223* (0.497000)	-0.0176 (0.016000)
County Unemp. Rate	0.0810*** (0.00392)	0.0703*** (0.00374)	0.0570*** (0.00397)	0.129*** (0.00587)	0.0567*** (0.00283)	0.0623*** (0.00393)	0.0673*** (0.00382)	-0.0108* (0.005030)	-0.0114* (0.004940)	-0.0272*** (0.007110)	-0.0161** (0.00562)	-0.0522*** (0.006090)	-0.0118* (0.005020)	0.0250*** (0.002330)	0.0241*** (0.002350)	0.0212*** (0.003870)	-0.0288*** (0.00574)	0.0267*** (0.006250)	0.0230*** (0.002330)

Notes: This table reports the coefficients from a Cox hazard model of sixty-day delinquency. Standard errors are robust, and clustered at the loan level. The baseline hazard function is not reported. The data includes all thirty-year owner-occupied mortgages, except for FHA and VA mortgages. "Prime" loans are those identified as such in the LPS dataset. "No early default" excludes loans that have missed at least one payment in the first three months following origination. "MSA Dummies" includes (unreported) fixed effects for the MSA in which the loan was originated, for loans in the top-25 MSAs. "Lender Dummies" includes (unreported) fixed effects for loans made by the top-25 lenders. Variable definitions and summary statistics can be found in Table 6. "Broker" includes those loans which are identified in the LPS dataset as being broker-originated. "Non-broker" are those not flagged as being broker-originated.

Table 7 (Panel B): Prime ARMs

	5/1 ARMs							3-yr ARMs						2/28 ARMs					
	Base Case	No Early Default	No IO or Option ARM	MSA Dummies	Lender Dummies	Broker	Non- Broker	Base Case	No Early Default	MSA Dummies	Lender Dummies	Broker	Non- Broker	Base Case	No Early Default	MSA Dummies	Lender Dummies	Broker	Non- Broker
PMI	0.341*** (0.0187)	0.281*** (0.0205)	0.580*** (0.0405)	0.206*** (0.0347)	0.585*** (0.0389)	0.287*** (0.0655)	0.270*** (0.0217)	0.493*** (0.021200)	0.484*** (0.022500)	0.489*** (0.029000)	0.827*** (0.0503)	0.135 (0.072000)	0.436*** (0.023300)	0.0253 (0.024900)	0.0347 (0.026100)	0.0708* (0.029100)	0.0592 (0.0757)	-37.46 0.000000	0.0329 (0.025100)
Transferred	0.446*** (0.00825)	0.465*** (0.00860)	0.819*** (0.0241)	0.461*** (0.0112)	0.443*** (0.0484)	0.467*** (0.00887)		0.267*** (0.015500)	0.291*** (0.016000)	0.287*** (0.021300)	0.382*** (0.0697)		0.286*** (0.016700)	0.293*** (0.025400)	0.426*** (0.027300)	0.493*** (0.036100)	0.656*** (0.122)		0.443*** (0.027000)
From Other Servicer	-0.128*** (0.00931)	-0.143*** (0.00974)		-0.109*** (0.0120)	0.00541 (0.132)	-0.193*** (0.0165)		0.0841*** (0.020200)	0.0866*** (0.021100)	0.145*** (0.026600)	-0.282 (0.224)	0.250*** (0.035500)	0.107*** (0.029300)	0.125*** (0.036200)	0.0910* (0.038200)	0.0692 (0.052100)	0.615* (0.244)	21.02*** (0.668000)	-0.0443 (0.051900)
Option-ARM	0.108*** (0.00768)	0.121*** (0.00790)		0.109*** (0.0101)	0.0417*** (0.0121)	0.0923*** (0.0162)	0.124*** (0.00880)	0.347*** (0.015800)	0.365*** (0.016200)	0.354*** (0.018000)	0.259*** (0.0243)	0.327*** (0.027900)	0.348*** (0.016900)	0.143*** (0.007340)	0.145*** (0.007560)	0.0886*** (0.009680)	0.0821** (0.0271)	0.212 (0.176000)	0.128*** (0.007550)
Orig. 2004	0.291*** (0.0259)	0.309*** (0.0270)	0.268*** (0.0397)	0.286*** (0.0338)	0.253*** (0.0522)	0.240*** (0.0504)	0.371*** (0.0321)	0.420*** (0.033300)	0.405*** (0.034400)	0.408*** (0.042900)	0.167* (0.0681)	0.422*** (0.059100)	0.384*** (0.043100)	0.668*** (0.048500)	0.289*** (0.053800)	0.411*** (0.078800)	0.000848 (0.771)	0.546*** (0.071800)	0.315** (0.101000)
Orig. 2005	0.851*** (0.0291)	0.842*** (0.0294)	0.945*** (0.0495)	0.791*** (0.0367)	0.614*** (0.0537)	0.774*** (0.0560)	0.865*** (0.0336)	0.872*** (0.038900)	0.867*** (0.040100)	0.857*** (0.051400)	0.442*** (0.0769)	0.742*** (0.068000)	0.841*** (0.049200)	0.697*** (0.052900)	0.533*** (0.054600)	0.629*** (0.078600)	0.533 (0.758)	20.15 .	0.807*** (0.090900)
Orig. 2006	1.309*** (0.0341)	1.308*** (0.0336)	1.160*** (0.0557)	1.315*** (0.0417)	0.966*** (0.0568)	1.181*** (0.0615)	1.342*** (0.0376)	1.775*** (0.046800)	1.783*** (0.048100)	1.911*** (0.064500)	1.254*** (0.0915)	1.549*** (0.079300)	1.761*** (0.055400)	0.811*** (0.043100)	0.671*** (0.044500)	0.825*** (0.064700)	-0.0193 (0.715)	20.75*** (0.679000)	0.993*** (0.085700)
Orig. 2007	2.149*** (0.0436)	2.116*** (0.0420)	1.743*** (0.0679)	2.036*** (0.0501)	2.116*** (0.0572)	2.194*** (0.0625)	2.022*** (0.0465)	2.120*** (0.049600)	2.070*** (0.051500)	2.308*** (0.073000)	1.857*** (0.0981)	2.180*** (0.082300)	1.919*** (0.058900)	0.745*** (0.047900)	0.547*** (0.050200)	0.710*** (0.073600)	0.455 (0.718)	21.08*** (0.672000)	0.822*** (0.090400)
Securitized 2003	0.210*** (0.0474)	0.188*** (0.0498)	0.565*** (0.0609)	0.128* (0.0640)	-0.0571 (0.0810)	-0.0253 (0.126)	0.238*** (0.0549)	0.180** (0.065100)	0.106 (0.069200)	0.15 (0.089400)	-0.075 (0.138)	0.355* (0.143000)	0.068 (0.079000)	-0.240*** (0.042500)	-0.244*** (0.044400)	-0.109 (0.068700)	-0.583 (0.686)	-0.243*** (0.048700)	0.0274 (0.155000)
Securitized 2004	0.337*** (0.0181)	0.344*** (0.0186)	0.450*** (0.0384)	0.352*** (0.0236)	0.203*** (0.0316)	0.414*** (0.0382)	0.292*** (0.0218)	0.633*** (0.023700)	0.669*** (0.024500)	0.691*** (0.030900)	0.375*** (0.052)	0.707*** (0.044700)	0.657*** (0.030500)	-0.407*** (0.036500)	-0.0986* (0.042400)	-0.0723 (0.057800)	-0.164 (0.352)	-0.353*** (0.060200)	0.169** (0.061800)
Securitized 2005	0.264*** (0.0135)	0.269*** (0.0140)	0.225*** (0.0419)	0.309*** (0.0187)	0.143*** (0.0283)	0.197*** (0.0365)	0.269*** (0.0152)	0.527*** (0.024800)	0.543*** (0.025600)	0.601*** (0.033900)	0.277*** (0.0586)	0.280*** (0.054000)	0.546*** (0.031400)	0.0439 (0.039000)	0.0898* (0.040200)	0.102 (0.053900)	-0.552 (0.301)	-43.03 0.000000	0.0981* (0.040300)
Securitized 2006	0.248*** (0.0140)	0.235*** (0.0142)	0.317*** (0.0448)	0.231*** (0.0175)	0.260*** (0.0284)	0.133*** (0.0359)	0.239*** (0.0152)	0.165*** (0.023200)	0.177*** (0.024500)	0.183*** (0.032900)	0.0285 (0.0664)	-0.0864 (0.074100)	0.161*** (0.027200)	0.0254 (0.020200)	0.016 (0.021000)	-0.00532 (0.028200)	0.0148 (0.161)	-0.436 (1.196000)	-0.0138 (0.021300)
Securitized 2007	0.0730*** (0.0185)	0.108*** (0.0199)	0.351*** (0.0724)	0.126*** (0.0246)	0.0341 (0.0321)	-0.168*** (0.0390)	0.224*** (0.0237)	0.303*** (0.047500)	0.383*** (0.050500)	0.350*** (0.061300)	0.1 (0.118)	0.0654 (0.121000)	0.447*** (0.056000)	0.199*** (0.046200)	0.285*** (0.048400)	0.355*** (0.065100)	-0.363 (0.254)	-42.69 0.000000	0.309*** (0.050800)
GSE 2003	0.363*** (0.0273)	0.349*** (0.0285)	0.374*** (0.0370)	0.294*** (0.0368)	0.0701 (0.051)	0.161* (0.0731)	0.392** (0.0323)	0.288*** (0.042500)	0.281*** (0.043900)	0.320*** (0.056200)	0.134 (0.0894)	0.249** (0.095400)	0.264*** (0.050700)						
GSE 2004	0.409*** (0.0169)	0.406*** (0.0174)	0.443*** (0.0279)	0.401*** (0.0226)	0.140*** (0.0306)	0.426*** (0.0325)	0.377*** (0.0208)	0.427*** (0.022500)	0.462*** (0.023200)	0.475*** (0.029800)	0.145** (0.0497)	0.430*** (0.042400)	0.455*** (0.028600)						
GSE 2005	0.147*** (0.0144)	0.141*** (0.0150)	-0.0827* (0.0392)	0.191*** (0.0203)	0.0187 (0.0285)	0.128*** (0.0351)	0.154** (0.0166)	0.211*** (0.026800)	0.211*** (0.027700)	0.242*** (0.037400)	0.121* (0.0575)	0.216*** (0.049100)	0.203*** (0.034600)						
GSE 2006	0.0883*** (0.0151)	0.0746*** (0.0153)	-0.0756 (0.0436)	0.0468* (0.0192)	0.0597* (0.0289)	-0.0178 (0.0361)	0.0959*** (0.0167)	-0.222*** (0.030900)	-0.202*** (0.032300)	-0.205*** (0.044200)	-0.170* (0.0683)	-0.177** (0.067900)	-0.210*** (0.037500)						
GSE 2007	0.00832 (0.0185)	0.0396* (0.0199)	-0.0911 (0.0705)	0.0422 (0.0251)	-0.105*** (0.0284)	-0.229*** (0.0330)	0.131*** (0.0254)	-0.386*** (0.054300)	-0.268*** (0.057500)	-0.378*** (0.079100)	-0.408*** (0.0945)	-0.562*** (0.091600)	-0.138 (0.075200)						
No Early Default	-	X	X	X	Y	X	X	-	X	X	Y	X	X	-	X	X	Y	X	X
Num. of obs.	19628285	19238238	8135845	11514164	7970234	3613032	15625206	4668454	4560519	2579919	1477223	1053784	3506735	5052194	4833211	2652468	160482	828741	4004470

Table 8 (Panel A): Fixed Rate Estimates

	Conforming						Jumbo						Subprime FRM					
	Base-Case	No Early Def.	MSA Dummies	Lender Dummies	Brokered	Non-Broker	Base-Case	No Early Def.	MSA Dummies	Lender Dummies	Brokered	Non-Broker	Base Case	No Early Def.	MSA Dummies	Lender Dummies	Brokered	Non-Broker
FICO at origination	-0.0123*** (0.000059)	-0.0122*** (0.000061)	-0.0119*** (0.000094)	-0.0121*** (0.000103)	-0.0105*** (0.000121)	-0.0126*** (0.000074)	-0.0108*** (0.0000999)	-0.0108*** (0.000105)	-0.0109*** (0.000130)	-0.0109*** (0.000166)	-0.00863*** (0.000204)	-0.0115*** (0.000123)	-0.00619*** (0.0000497)	-0.00583*** (0.0000543)	-0.00555*** (0.0000774)	-0.00572*** (0.000106)	-0.00523*** (0.000126)	-0.00594*** (0.0000606)
Loan Amt. (\$100,000)	0.0444*** (0.003600)	0.0587*** (0.003850)	0.0597*** (0.005990)	0.0889*** (0.00619)	0.103*** (0.008240)	0.0479*** (0.004360)	0.00679*** (0.001760)	0.00458* (0.001930)	0.000322 (0.002410)	0.0011 (0.00267)	-0.00417 (0.00361)	0.00796*** (0.00228)	0.117*** (0.00534)	0.110*** (0.00525)	0.0957*** (0.00629)	0.131*** (0.00592)	0.122*** (0.00715)	0.108*** (0.00582)
Jumbo loan				0.0101 (0.0158)									-0.207*** (0.0183)	-0.220*** (0.0185)	-0.177*** (0.0206)	-0.265*** (0.0261)	-0.241*** (0.0310)	-0.217*** (0.0206)
Low-doc loan	0.0330*** (0.007240)	0.0302*** (0.007710)	0.00834 (0.011400)	0.250*** (0.012)	0.0298 (0.016400)	0.0235** (0.008720)	-0.0130 (0.0139)	-0.0193 (0.0146)	-0.00997 (0.0174)	0.0780*** (0.0226)	0.138*** (0.0259)	-0.0994*** (0.0178)	0.0568*** (0.0101)	0.0578*** (0.0113)	0.0475** (0.0173)	0.0343 (0.0241)	0.160*** (0.0245)	0.0303* (0.0129)
Broker-originated	0.266*** (0.007320)	0.238*** (0.007840)	0.214*** (0.011600)	0.210*** (0.0264)			0.284*** (0.0113)	0.245*** (0.0119)	0.231*** (0.0144)	0.272*** (0.0168)			0.123*** (0.00681)	0.109*** (0.00743)	0.113*** (0.0108)	0.117*** (0.012)		
Correspondent	0.0602*** (0.006120)	0.0286** (0.006520)	0.0310** (0.009760)	0.176** (0.0599)		0.0341*** (0.006590)	-0.0537*** (0.0118)	-0.0740*** (0.009760)	-0.0398** (0.0150)	0.131* (0.0578)		-0.0837*** (0.0125)	0.114*** (0.00689)	0.121*** (0.00755)	0.0940*** (0.0115)	0.179*** (0.0522)		0.132*** (0.00763)
Prepayment Penalty	0.353*** (0.032900)	0.370*** (0.034700)	0.306*** (0.048200)	-0.00420*** (0.000859)	0.177* (0.069700)	0.427*** (0.039800)	0.240*** (0.0147)	0.257*** (0.0157)	0.224*** (0.0186)	0.0905*** (0.0269)	0.285*** (0.0306)	0.251*** (0.0184)	-0.126*** (0.0102)	-0.143*** (0.0105)	-0.0990*** (0.0143)	-0.134*** (0.0208)	-0.167*** (0.0250)	-0.143*** (0.0115)
LTV at Orig. (<80%)	-0.00729*** (0.000452)	-0.00308*** (0.000480)	-0.0167*** (0.000867)	-0.00308*** (0.000824)	-0.00153 (0.001140)	-0.00358*** (0.000529)	0.0247*** (0.00131)	0.0275*** (0.00126)	0.0286*** (0.00160)	0.0237*** (0.00150)	0.0288*** (0.00166)	0.0272*** (0.00139)	-0.00784*** (0.000427)	-0.00590*** (0.000468)	-0.00692*** (0.000714)	-0.00639*** (0.000889)	-0.00181 (0.00115)	-0.00682*** (0.000514)
LTV at Orig. (=80%)	-0.00656*** (0.000431)	-0.00245*** (0.000457)	-0.0159*** (0.000844)	-0.00478*** (0.00079)	-0.00118 (0.001090)	-0.00288*** (0.000503)	0.0258*** (0.00128)	0.0283*** (0.00123)	0.0295*** (0.00158)	0.0246*** (0.00144)	0.0297*** (0.00157)	0.0279*** (0.00135)	-0.00698*** (0.000403)	-0.00514*** (0.00044)	-0.00566*** (0.00068)	-0.00626*** (0.000838)	-0.000478 (0.00108)	-0.00621*** (0.000484)
LTV at Orig. (>80%)	-0.00722*** (0.000419)	-0.00296*** (0.000445)	-0.0166*** (0.000838)	3.070*** (0.0582)	-0.00456*** (0.001060)	-0.00293*** (0.000489)	0.0191*** (0.00130)	0.0219*** (0.00125)	0.0233*** (0.00159)	0.0202*** (0.00145)	0.0212*** (0.00168)	0.0220*** (0.00137)	-0.00892*** (0.000374)	-0.00718*** (0.000408)	-0.00831*** (0.000643)	-0.00797*** (0.000782)	-0.00390*** (0.000999)	-0.00795*** (0.000449)
Current LTV	3.218*** (0.029200)	3.105*** (0.029800)	4.730*** (0.073400)	0.548*** (0.0095)	3.239*** (0.068100)	3.080*** (0.033200)	1.165*** (0.101)	1.179*** (0.0927)	1.196*** (0.124)	1.090*** (0.0873)	1.246*** (0.0553)	1.178*** (0.0998)	2.484*** (0.0263)	2.428*** (0.0274)	2.639*** (0.0477)	2.230*** (0.0544)	2.389*** (0.0607)	2.447*** (0.0308)
Interest Rate	0.480*** (0.005680)	0.510*** (0.006200)	0.538*** (0.008650)	0.213*** (0.0228)	0.574*** (0.014500)	0.514*** (0.006240)	0.682*** (0.00845)	0.695*** (0.00879)	0.681*** (0.0107)	0.821*** (0.0160)	0.740*** (0.0186)	0.681*** (0.00988)	0.231*** (0.00247)	0.226*** (0.00274)	0.242*** (0.00393)	0.210*** (0.00484)	0.257*** (0.00576)	0.215*** (0.00310)
HPI Appreciation (4-years prior to orig.)	0.195*** (0.012500)	0.251*** (0.013300)	-0.368*** (0.042000)	0.118*** (0.0124)	0.0901** (0.030300)	0.288*** (0.014900)	0.362*** (0.0232)	0.386*** (0.0240)	-0.166** (0.0554)	0.365*** (0.0344)	0.189*** (0.0381)	0.447*** (0.0274)	0.0716*** (0.0107)	0.110*** (0.0114)	0.153*** (0.0418)	0.0848*** (0.0212)	0.104*** (0.0248)	0.113*** (0.0127)
Refinancing	0.0322*** (0.006880)	0.0801*** (0.007310)	0.101*** (0.011000)	-0.0385* (0.0165)	0.0917*** (0.016100)	0.0797*** (0.008200)	0.0818*** (0.0106)	0.151*** (0.0111)	0.147*** (0.0135)	0.265*** (0.0180)	0.0678** (0.0209)	0.176*** (0.0131)	-0.320*** (0.00777)	-0.303*** (0.00858)	-0.353*** (0.0129)	-0.207*** (0.0165)	-0.392*** (0.0265)	-0.284*** (0.00918)
Cashout Refi	0.120*** (0.008510)	0.116*** (0.008980)	0.113*** (0.013000)	0.0335*** (0.0022)	0.0471* (0.019000)	0.135*** (0.010200)	-0.127*** (0.0122)	-0.122*** (0.0128)	-0.117*** (0.0155)	-0.212*** (0.0213)	-0.160*** (0.0242)	-0.107*** (0.0151)	0.101*** (0.00747)	0.124*** (0.00820)	0.138*** (0.0121)	0.0622*** (0.0163)	0.140*** (0.0261)	0.130*** (0.00868)
County Unemp. Rate	0.0332*** (0.001280)	0.0319*** (0.001350)	0.0395*** (0.002980)		0.0325*** (0.003010)	0.0313*** (0.001510)	0.0921*** (0.00366)	0.0847*** (0.00352)	0.104*** (0.00479)	0.0711*** (0.00404)	0.0668*** (0.00452)	0.0890*** (0.00414)	0.00811*** (0.00125)	0.0116*** (0.00134)	0.0291*** (0.00302)	0.0182*** (0.00249)	0.0118*** (0.00298)	0.0113*** (0.00149)

Notes: This table reports the coefficients from a Cox hazard model of sixty-day delinquency. Standard errors are robust, and clustered at the loan level. The baseline hazard function is not reported. The data includes all thirty-year owner-occupied mortgages, except for FHA and VA mortgages. "Conforming" are those under the conforming loan limit for that year, and also exclude loans identified as being transferred from another servicer, and IO and OptionARM loans. Jumbo loans are those above the conforming loan limit for that year. Subprime are those identified by LPS as subprime. "No early default" excludes loans that have missed at least one payment in the first three months following origination. "MSA Dummies" includes (unreported) fixed effects for the MSA in which the loan was originated, for loans in the top-25 MSAs. "Lender Dummies" includes (unreported) fixed effects for loans made by the top-25 lenders. Variable definitions and summary statistics can be found in Table 6. "Broker" includes those loans which are identified in the LPS dataset as being broker-originated. "Non-broker" are those not flagged as broker-originated.

Table 8 (Panel B): Fixed Rate Estimates

	Conforming Lender						Jumbo Lender					Subprime FRM Lender						
	Base-Case	No Early Def.	MSA Dummies	Dummies	Brokered	Non-Broker	Base-Case	No Early Def.	MSA Dummies	Dummies	Brokered	Non-Broker	Base Case	No Early Def.	Top 25 MSA	Dummies	Brokered	Non-Broker
PMI	0.219*** (0.014300)	0.167*** (0.015600)	0.187*** (0.023600)	0.228*** (0.0227)	0.383*** (0.039300)	0.132*** (0.017300)	0.676*** (0.0359)	0.609*** (0.0385)	0.523*** (0.0456)	0.544*** (0.0568)	0.740*** (0.0938)	0.568*** (0.0428)	-0.0582** (0.0184)	-0.0473* (0.0203)	-0.0509 (0.0335)	0.155*** (0.0337)	-0.571** (0.214)	-0.0313 (0.0205)
Transferred From Other Servicer							0.284*** (0.0141)	0.214*** (0.0151)	0.267*** (0.0180)	0.382*** (0.0734)		0.188*** (0.0154)	0.179*** (0.00636)	0.134*** (0.00699)	0.120*** (0.0101)	0.096 (0.0513)		0.144*** (0.00704)
Option-ARM Loan							0.527*** (0.0213)	0.604*** (0.0222)	0.599*** (0.0262)	0.191*** (0.0386)	0.472*** (0.0374)	0.686*** (0.0274)	0.726*** (0.0380)	0.880*** (0.0408)	0.834*** (0.0606)	1.216*** (0.139)	1.003*** (0.0469)	0.676*** (0.0834)
Interest-Only Loan							0.884*** (0.0109)	0.908*** (0.0115)	0.879*** (0.0138)	0.618*** (0.0221)	0.804*** (0.0218)	0.938*** (0.0133)	0.414*** (0.00938)	0.430*** (0.0102)	0.445*** (0.0131)	0.397*** (0.0204)	0.559*** (0.0212)	0.387*** (0.0116)
Orig. 2004	0.217*** (0.055500)	0.268*** (0.061300)	0.335*** (0.080300)	0.353*** (0.104)	0.194 (0.159000)	0.274*** (0.066600)	0.330*** (0.0738)	0.552*** (0.0850)	0.566*** (0.101)	0.663*** (0.130)	0.515* (0.214)	0.560*** (0.0929)	0.274*** (0.0472)	0.234*** (0.0573)	0.284** (0.0870)	0.0764 (0.104)	0.0116 (0.176)	0.253*** (0.0606)
Orig. 2005	0.256*** (0.052700)	0.323*** (0.058100)	0.458*** (0.077100)	0.522*** (0.103)	0.0997 (0.136000)	0.474*** (0.066400)	1.132*** (0.0662)	1.102*** (0.0708)	1.114*** (0.0867)	1.342*** (0.120)	0.533** (0.198)	1.175*** (0.0766)	0.522*** (0.0323)	0.293*** (0.0370)	0.355*** (0.0523)	0.333** (0.121)	0.145* (0.0735)	0.169** (0.0518)
Orig. 2006	0.213*** (0.049300)	0.287*** (0.054600)	0.200** (0.075300)	0.394*** (0.0982)	0.303* (0.131000)	0.290*** (0.061000)	1.536*** (0.0621)	1.566*** (0.0664)	1.512*** (0.0850)	1.716*** (0.125)	1.634*** (0.146)	1.524*** (0.0755)	0.768*** (0.0305)	0.466*** (0.0359)	0.482*** (0.0533)	0.793*** (0.121)	0.313* (0.135)	0.477*** (0.0374)
Orig. 2007	0.248*** (0.049300)	0.424*** (0.054800)	0.438*** (0.074800)	0.710*** (0.0975)	0.510*** (0.132000)	0.391*** (0.060700)	2.357*** (0.0607)	2.557*** (0.0633)	2.419*** (0.0785)	2.849*** (0.109)	2.726*** (0.128)	2.500*** (0.0711)	1.162*** (0.0261)	1.075*** (0.0294)	1.118*** (0.0431)	0.986*** (0.0713)	0.805*** (0.0716)	1.125*** (0.0340)
Securitized 2003	-0.470*** (0.051700)	-0.395*** (0.057000)	-0.318*** (0.074500)	-0.202 (0.105)	-0.646*** (0.157000)	-0.293*** (0.059100)	-0.340*** (0.0485)	-0.408*** (0.0508)	-0.402*** (0.0598)	-0.278* (0.110)	-0.676*** (0.115)	-0.345*** (0.0569)	-0.0395 (0.0360)	-0.131*** (0.0390)	-0.236*** (0.0579)	0.224** (0.0736)	-2.132* (1.022)	-0.0995* (0.0391)
Securitized 2004	-0.292*** (0.041300)	-0.171*** (0.043900)	-0.149* (0.058900)	-0.183** (0.0599)	-0.155 (0.111000)	-0.0928 (0.047500)	-0.0461 (0.0613)	-0.189* (0.0737)	-0.215* (0.0876)	-0.239* (0.0984)	-0.221 (0.192)	-0.167* (0.0797)	0.0303 (0.0453)	0.100 (0.0554)	0.109 (0.0844)	0.032 (0.0882)	-0.00377 (0.168)	0.102 (0.0587)
Securitized 2005	-0.0994** (0.034100)	-0.0493 (0.036600)	-0.0998* (0.049400)	-0.123* (0.0541)	0.293*** (0.071000)	-0.222*** (0.045100)	-0.131** (0.0466)	-0.0296 (0.0507)	-0.0381 (0.0622)	-0.179* (0.0748)	0.499** (0.166)	-0.0992 (0.0533)	0.0323 (0.0287)	0.208*** (0.0333)	0.225*** (0.0463)	-0.0127 (0.108)	0.0689 (0.0473)	0.352*** (0.0492)
Securitized 2006	0.202*** (0.028300)	0.213*** (0.030700)	0.307*** (0.045300)	0.164*** (0.0435)	0.445*** (0.058500)	0.141*** (0.036500)	0.134** (0.0429)	0.221*** (0.0469)	0.267*** (0.0540)	0.119 (0.0803)	0.338*** (0.0889)	0.220*** (0.0526)	0.107*** (0.0258)	0.359*** (0.0313)	0.397*** (0.0461)	-0.141 (0.109)	0.260* (0.121)	0.371*** (0.0326)
Securitized 2007	0.631*** (0.033100)	0.616*** (0.036100)	0.555*** (0.049700)	0.443*** (0.0536)	0.655*** (0.063400)	0.611*** (0.044200)	-0.163*** (0.0198)	-0.166*** (0.0213)	-0.116*** (0.0259)	-0.190*** (0.0302)	-0.0413 (0.0379)	-0.199*** (0.0259)	-0.0907*** (0.0198)	-0.0249 (0.0228)	-0.0158 (0.0331)	-0.0715 (0.0408)	0.0495 (0.0392)	-0.0749** (0.0283)
GSE 2003	-0.400*** (0.043800)	-0.314*** (0.048700)	-0.291*** (0.064900)	-0.241* (0.0956)	-0.146 (0.124000)	-0.327*** (0.053300)							-0.554*** (0.0846)	-0.602*** (0.0918)	-0.451*** (0.114)	-0.566 (0.341)	-0.686* (0.324)	-0.629*** (0.0983)
GSE 2004	-0.430*** (0.036400)	-0.346*** (0.039400)	-0.380*** (0.051400)	-0.411*** (0.0515)	-0.0821 (0.103000)	-0.380*** (0.043000)							0.335*** (0.0478)	0.409*** (0.0578)	0.399*** (0.0885)	0.336*** (0.0957)	0.578*** (0.174)	0.391*** (0.0613)
GSE 2005	-0.326*** (0.031100)	-0.270*** (0.033400)	-0.348*** (0.044300)	-0.447*** (0.048)	0.122* (0.060700)	-0.446*** (0.042100)							0.169*** (0.0313)	0.328*** (0.0360)	0.269*** (0.0514)	0.117 (0.112)	0.465*** (0.0816)	0.454*** (0.0511)
GSE 2006	-0.212*** (0.024500)	-0.142*** (0.026600)	-0.0366 (0.039900)	-0.218*** (0.036)	-0.0466 (0.047500)	-0.170*** (0.032600)							0.134*** (0.0280)	0.365*** (0.0335)	0.357*** (0.0499)	-0.159 (0.112)	0.484*** (0.129)	0.347*** (0.0349)
GSE 2007	0.305*** (0.022400)	0.338*** (0.024700)	0.344*** (0.036100)	0.143*** (0.0305)	0.382*** (0.047000)	0.343*** (0.029100)							0.0755*** (0.0211)	0.144*** (0.0243)	0.154*** (0.0352)	-0.0132 (0.043)	0.251*** (0.0460)	0.0940** (0.0293)
No Early Default	-	X	X	Y	X	X	-	X	X	Y	X	X	-	X	X	X	X	X
Num. of obs.	27373645	26533679	12493762	9140289	3577766	22955913	7850509	7682202	5387952	3015868	1263913	6418289	4724547	4405820	2093203	1174207	721616	3684204

Table 9 (Panel A): Subprime ARM Estimates

	2/28 ARMs						3 yr ARMs						5/1 ARMs					
	Base Case	No Early Default	MSA Dummies	Lender Dummies	Broker	Non-Broker	Base Case	No Early Default	MSA Dummies	Lender Dummies	Broker	Non-Broker	Base Case	No Early Default	MSA Dummies	Lender Dummies	Broker	Non-Broker
FICO at origination	-0.00391*** (0.00005)	-0.00371*** (0.00005)	-0.00331*** (0.00007)	-0.00446*** (0.000117)	-0.00167*** (0.00010)	-0.00457*** (0.00006)	-0.00474*** (0.0000730)	-0.00453*** (0.0000770)	-0.00422*** (0.000105)	-0.00453*** (0.000147)	-0.00380*** (0.000134)	-0.00495*** (0.0000948)	-0.00581*** (0.000296)	-0.00548*** (0.000324)	-0.00567*** (0.000421)	-0.00626*** (0.00114)	-0.00279*** (0.000464)	-0.00813*** (0.000458)
Loan Amt. (\$100,000)	0.113*** (0.00273)	0.107*** (0.00294)	0.0884*** (0.00417)	0.0970*** (0.00615)	0.108*** (0.00564)	0.108*** (0.00346)	0.102*** (0.00479)	0.0995*** (0.00505)	0.0997*** (0.00709)	0.0825*** (0.00911)	0.119*** (0.00882)	0.0925*** (0.00613)	0.106*** (0.0128)	0.0981*** (0.0128)	0.0848*** (0.0156)	0.105** (0.0342)	0.160*** (0.0212)	0.0669*** (0.0162)
Jumbo Loan	-0.111*** (0.01080)	-0.104*** (0.01150)	-0.0583*** (0.01420)	-0.117*** (0.0254)	-0.0920*** (0.02190)	-0.111*** (0.01350)	-0.124*** (0.0175)	-0.122*** (0.0184)	-0.0910*** (0.0226)	-0.112*** (0.0319)	-0.177*** (0.0310)	-0.0922*** (0.0227)	-0.108 (0.0578)	-0.104 (0.0596)	-0.0686 (0.0696)	-0.147 (0.165)	-0.301** (0.0946)	-0.0228 (0.0792)
Low-doc loan	0.176*** (0.00710)	0.139*** (0.00770)	0.111*** (0.01000)	0.348*** (0.0451)	0.164*** (0.01280)	0.0708*** (0.01020)	0.170*** (0.0185)	0.142*** (0.0198)	0.101*** (0.0253)	0.137 (0.105)	0.214*** (0.0357)	0.0975*** (0.0244)	0.375*** (0.0371)	0.374*** (0.0405)	0.316*** (0.0519)	0.136 (0.240)	0.304*** (0.0515)	0.259** (0.0804)
Broker-originated	0.395*** (0.00779)	0.340*** (0.00838)	0.337*** (0.01190)	0.178*** (0.0176)			0.134*** (0.00914)	0.116*** (0.00965)	0.107*** (0.0137)	0.0984*** (0.015)			0.375*** (0.105)	0.210 (0.116)	0.282 (0.154)	-0.0581 (0.208)		
Correspondent	0.263*** (0.00767)	0.261*** (0.00830)	0.220*** (0.01200)	0.211*** (0.0519)		0.269*** (0.00855)	0.0457*** (0.0103)	0.0560*** (0.0108)	-0.000188 (0.056)	0.00734 (0.056)		0.0655*** (0.0109)	0.454*** (0.110)	0.323** (0.121)	0.395* (0.161)	-0.589 (0.822)		0.377* (0.151)
Prepayment Penalty	0.0134* (0.00574)	0.00547 (0.00624)	-0.00702 (0.00908)	-0.00244 (0.0158)	-0.0689*** (0.00690)	0.0166* (0.00690)	0.0340*** (0.00779)	0.0244** (0.00830)	0.0907*** (0.0136)	0.0124 (0.0155)	-0.000312 (0.0158)	0.0359*** (0.00978)	0.0386 (0.0537)	-0.0227 (0.0570)	0.0620 (0.0755)	-0.101 (0.158)	-0.185 (0.227)	-0.0351 (0.0607)
LTV at Orig. (<80%)	-0.0108*** (0.00044)	-0.00994*** (0.00048)	-0.0110*** (0.00069)	-0.00598*** (0.00104)	-0.0156*** (0.00101)	-0.00719*** (0.00055)	-0.0180*** (0.000679)	-0.0175*** (0.000723)	-0.0215*** (0.00107)	-0.0184*** (0.00132)	-0.0171*** (0.00140)	-0.0172*** (0.000852)	-0.000566 (0.00290)	-0.000961 (0.00307)	0.000203 (0.00436)	0.00655 (0.0102)	0.00282 (0.00452)	-0.000135 (0.00437)
LTV at Orig. (=80%)	-0.00939*** (0.00042)	-0.00863*** (0.00046)	-0.00948*** (0.00066)	-0.00524*** (0.000992)	-0.0136*** (0.00096)	-0.00615*** (0.00052)	-0.0169*** (0.000687)	-0.0166*** (0.00103)	-0.0201*** (0.00125)	-0.0178*** (0.00133)	-0.0156*** (0.000808)	-0.0166*** (0.000808)	0.000500 (0.00273)	0.0000597 (0.00289)	0.00195 (0.00415)	0.00735 (0.00968)	0.00362 (0.00427)	0.00149 (0.00410)
LTV at Orig. (>80%)	-0.0125*** (0.00039)	-0.0118*** (0.00042)	-0.0130*** (0.00061)	-0.00892*** (0.000903)	-0.0161*** (0.00088)	-0.00944*** (0.00048)	-0.0198*** (0.000595)	-0.0194*** (0.000631)	-0.0237*** (0.000967)	-0.0210*** (0.00115)	-0.0198*** (0.00121)	-0.0189*** (0.000744)	-0.00335 (0.00253)	-0.00357 (0.00267)	-0.00175 (0.00389)	0.00417 (0.00879)	0.000587 (0.00397)	-0.00323 (0.00375)
Current LTV	2.563*** (0.02550)	2.525*** (0.02620)	2.761*** (0.04220)	2.527*** (0.0561)	2.718*** (0.05290)	2.452*** (0.03020)	2.930*** (0.0412)	2.910*** (0.0424)	3.452*** (0.0751)	3.025*** (0.079)	3.030*** (0.0717)	2.861*** (0.0517)	2.738*** (0.148)	2.659*** (0.149)	2.596*** (0.261)	2.307*** (0.475)	2.306*** (0.212)	2.763*** (0.212)
Initial interest rate	0.202*** (0.00231)	0.199*** (0.00256)	0.221*** (0.00373)	0.138*** (0.00554)	0.217*** (0.00505)	0.188*** (0.00301)	0.229*** (0.00358)	0.227*** (0.00385)	0.253*** (0.00564)	0.189*** (0.0069)	0.255*** (0.00756)	0.216*** (0.00449)	0.256*** (0.0145)	0.263*** (0.0162)	0.265*** (0.0220)	0.183** (0.0565)	0.264*** (0.0218)	0.290*** (0.0264)
Margin	0.0176*** (0.00288)	0.0165*** (0.00315)	0.0201*** (0.00458)	0.0689*** (0.00684)	0.107*** (0.01580)	0.0163*** (0.00334)	0.0427*** (0.00500)	0.0500*** (0.00720)	0.0557*** (0.0167)	0.0981*** (0.0167)	0.0913* (0.0442)	0.0570*** (0.00527)	-0.0338 (0.0181)	-0.0496* (0.0195)	-0.0669** (0.0253)	-0.138 (0.124)	0.124* (0.0588)	-0.0651** (0.0219)
HPI appreciation (4-years prior to orig.)	0.141*** (0.00773)	0.188*** (0.00830)	0.223*** (0.04180)	0.176*** (0.0193)	0.0900*** (0.01580)	0.217*** (0.00985)	0.0911*** (0.0136)	0.127*** (0.0143)	0.0324 (0.0654)	0.188*** (0.0275)	0.0875*** (0.0250)	0.139*** (0.0175)	-0.0122 (0.0537)	0.0115 (0.0574)	0.193 (0.220)	0.177 (0.210)	-0.117 (0.0791)	0.136 (0.0861)
Refinancing	-0.199*** (0.00664)	-0.160*** (0.00717)	-0.200*** (0.01060)	-0.122*** (0.0135)	-0.209*** (0.02400)	-0.166*** (0.00761)	-0.177*** (0.0138)	-0.167*** (0.0146)	-0.174*** (0.0208)	-0.0731* (0.0296)	-0.172*** (0.0389)	-0.161*** (0.0159)	-0.192*** (0.0528)	-0.150*** (0.0549)	-0.200** (0.0724)	-0.129 (0.189)	-0.295*** (0.0839)	-0.0547 (0.0740)
Cashout Refi	0.0267*** (0.00735)	0.0113 (0.00790)	0.0203 (0.01140)	-0.00657 (0.0189)	0.0414 (0.02450)	0.0196* (0.00863)	-0.0200 (0.0138)	-0.0107 (0.0145)	-0.0215 (0.0206)	-0.0879** (0.0301)	-0.0426 (0.0394)	-0.00723 (0.0157)	-0.0503 (0.0535)	-0.0510 (0.0557)	-0.00404 (0.0739)	-0.0371 (0.177)	0.0575 (0.0823)	-0.126 (0.0782)
County Unemp. Rate	-0.0199*** (0.00121)	-0.0221*** (0.00130)	-0.0735*** (0.00276)	-0.0150*** (0.00279)	-0.0340*** (0.00251)	-0.0187*** (0.00153)	-0.0206*** (0.00211)	-0.0180*** (0.00221)	-0.0388*** (0.00426)	-0.0126** (0.00417)	-0.00632 (0.00407)	-0.0228*** (0.00263)	0.0159 (0.00949)	0.0265** (0.00999)	0.0174 (0.0206)	0.0336 (0.0353)	0.0287* (0.0136)	0.0209 (0.0150)

Notes: This table reports the coefficients from a Cox hazard model of sixty-day delinquency. Standard errors are robust, and clustered at the loan level. The baseline hazard function is not reported. The data includes thirty-year owner-occupied mortgages identified as subprime in the LPS dataset, except for FHA, VA, and GSE mortgages. "No early default" excludes loans that have missed at least one payment in the first three months following origination. "MSA Dummies" includes (unreported) fixed effects for the MSA in which the loan was originated (for loans in the top-25 MSAs). "Lender Dummies" includes (unreported) fixed effects for loans made by the top-25 lenders. Variable definitions and summary statistics can be found in Table 6. "Broker" includes those loans which are identified in the LPS dataset as being broker-originated. Non-broker are those not flagged as being broker-originated.

Table 9 (Panel B): Subprime ARM Estimates

	2/28 ARMs						3 yr ARMs						5/1 ARMs					
	Base Case	No Early Default	Lender MSA Dummies		Broker	Non-Broker	Base Case	No Early Default	Lender MSA Dummies		Broker	Non-Broker	Base Case	No Early Default	Lender MSA Dummies		Broker	Non-Broker
PMI	-0.0879*** (0.01040)	-0.0615*** (0.01140)	-0.0722*** (0.01860)	0.0519** (0.0174)	3.906*** (0.02550)	-0.0558*** (0.01170)	-0.213*** (0.0377)	-0.203*** (0.0401)	-0.268*** (0.0624)	0.112 (0.0639)	1.084 (0.727)	-0.214*** (0.0405)	0.229 (0.161)	0.228 (0.174)	0.324 (0.217)	0.329 (0.477)		0.287 (0.193)
Transferred	0.339*** (0.00729)	0.394*** (0.00787)	0.367*** (0.01120)	0.302*** (0.0425)		0.398*** (0.00824)	0.123*** (0.0106)	0.154*** (0.0112)	0.118*** (0.0159)	0.0536 (0.0805)		0.174*** (0.0115)	0.220* (0.0902)	0.293** (0.0980)	0.323* (0.132)	1.131* (0.477)		0.443*** (0.115)
From Other Servicer	-0.0908*** (0.00805)	-0.0119 (0.00855)	-0.00856 (0.01170)	-0.0975 (0.0573)	0.0187 (0.01410)	-0.0525*** (0.01370)	-0.0333 (0.0191)	0.0243 (0.0204)	0.0258 (0.0269)	-0.175 (0.181)	-0.0414 (0.0314)	-0.0880 (0.0459)	-0.243** (0.0747)	-0.0748 (0.0810)	-0.0329 (0.107)	1.521*** (0.442)	-0.103 (0.151)	-0.0867 (0.116)
Option-ARM	0.0579*** (0.00592)	0.0744*** (0.00628)	0.0457*** (0.00830)	0.0917*** (0.0142)	0.152*** (0.01290)	0.0550*** (0.00724)	0.00473 (0.00861)	0.0181* (0.00898)	-0.0118 (0.0122)	0.0299 (0.0169)	0.0181 (0.0152)	0.0234* (0.0112)	-0.0977* (0.0393)	-0.0648 (0.0412)	-0.0130 (0.0519)	-0.143 (0.123)	0.0757 (0.0614)	-0.0977 (0.0547)
Orig. 2004	0.327*** (0.02850)	0.262*** (0.03130)	0.260*** (0.05300)	0.675* (0.281)	-0.381*** (0.09070)	0.233*** (0.03320)	0.810*** (0.109)	0.818*** (0.117)	0.804*** (0.172)	0.753 (0.406)	-0.568* (0.270)	0.919*** (0.134)	0.256 (0.418)	0.398 (0.442)	0.0941 (0.500)	2.169** (0.728)		1.654 (1.301)
Orig. 2005	0.601*** (0.02670)	0.405*** (0.02940)	0.386*** (0.04930)	0.839** (0.283)	-0.322*** (0.08460)	0.448*** (0.03590)	1.058*** (0.0659)	0.831*** (0.0733)	0.831*** (0.109)	1.563*** (0.380)	-0.378* (0.192)	1.054*** (0.108)	-0.273 (0.166)	-0.329 (0.181)	-0.361 (0.234)	2.868 (2.026)	-0.570 (0.511)	-0.440 (0.405)
Orig. 2006	1.076*** (0.03180)	0.579*** (0.03510)	0.606*** (0.05510)	1.051*** (0.292)		0.607*** (0.03710)	0.998*** (0.0599)	0.890*** (0.0654)	0.841*** (0.105)	1.400*** (0.409)		0.999*** (0.0768)	0.597*** (0.156)		4.015*** (0.802)	-0.0227 (0.522)		
Orig. 2007	0.964*** (0.03740)	0.722*** (0.04180)	0.805*** (0.06340)	1.315*** (0.285)	-0.164 (0.09570)	0.859*** (0.05100)	1.013*** (0.0710)	0.896*** (0.0789)	0.928*** (0.119)	1.397*** (0.362)	-0.306 (0.213)	0.958*** (0.0880)		0.0964 (0.173)	0.123 (0.220)	4.638*** (0.930)	-0.0708 (0.519)	0.146 (0.288)
Securitized-2003	0.320*** (0.04310)	0.250*** (0.04800)	0.166 (0.08500)	0.304*** (0.0747)		0.249*** (0.04810)	0.390*** (0.106)	0.453*** (0.114)	0.489** (0.181)	0.342 (0.189)	-41.26 (0)	0.466*** (0.114)	-2.378*** (0.179)	-2.253*** (0.189)	-2.505*** (0.241)			-1.812*** (0.252)
Securitized-2004	0.193*** (0.01780)	0.241*** (0.01940)	0.225*** (0.03010)	0.166*** (0.0322)	0.0408 (0.04170)	0.257*** (0.02280)	-0.134 (0.0990)	-0.0933 (0.106)	-0.0449 (0.149)	0.224 (0.213)	0.111 (0.198)	-0.194 (0.125)	-1.172** (0.405)	-1.141** (0.426)	-1.069* (0.476)		-1.073 (0.598)	-2.138 (1.289)
Securitized-2005	-0.106*** (0.01290)	0.0248 (0.01430)	0.0246 (0.01980)	0.0183 (0.0437)	0.0159 (0.01760)	-0.0232 (0.02550)	-0.238*** (0.0454)	-0.0631 (0.0504)	-0.0492 (0.0620)	-0.511*** (0.154)	0.00299 (0.0606)	-0.306** (0.0949)	-0.241* (0.122)	-0.0407 (0.135)	-0.193 (0.174)	0.129 (1.691)	0.0775 (0.155)	0.228 (0.374)
Securitized-2006	-0.494*** (0.02140)	-0.0531* (0.02360)	-0.0654* (0.03100)	-0.0284 (0.0815)	-0.184* (0.08310)	-0.0881*** (0.02640)	-0.0883* (0.0345)	-0.0216 (0.0362)	0.0240 (0.0519)	-0.229 (0.215)	-0.224 (0.185)	-0.153** (0.0545)	-0.711*** (0.111)	0.0297 (0.126)	-0.126 (0.164)		-0.0660 (0.165)	0.211 (0.193)
Securitized-2007	-0.307*** (0.03120)	-0.0391 (0.03490)	-0.0328 (0.04700)	-0.123* (0.0511)	0.0475 (0.05420)	-0.170*** (0.04640)	-0.0330 (0.0602)	0.107 (0.0657)	0.0832 (0.0862)	0.00345 (0.106)	-0.00773 (0.121)	0.111 (0.0805)	0.184 (0.125)	0.298* (0.137)	0.0869 (0.171)	-0.158 (0.191)	0.0639 (0.166)	0.589* (0.239)
GSE 2003													-2.575*** (0.188)	-2.492*** (0.197)	-2.638*** (0.258)	0.95 (0.862)		-2.058*** (0.260)
No Early Default	-	X	X	Y	X	X	-	X	X	Y	X	X	-	X	X	Y	X	X
Num. of obs.	3991720	3714210	1802438	974916	817176	2897034	2001107	1929412	1010992	560167	588075	1341337	187210	180547	112759	16720	49584	130963

Table 10 (Panel A): Low-doc vs. Full-Doc Loans

	FRM				Prime ARMs						Subprime ARMs					
	Prime		Subprime		5/1 Low-Doc	5/1 Full-Doc	3yr Low-Doc	3yr Full-Doc	2/28 Low-Doc	2/28 Full-Doc	5/1 Low-Doc	5/1 Full-Doc	3yr Low-Doc	3yr Full-Doc	2/28 Low-Doc	2/28 Full-Doc
	Low-Doc	Full-Doc	Low-Doc	Full-Doc												
FICO at origination	-0.0108*** (0.000127)	-0.0127*** (0.0000708)	-0.00504*** (0.000246)	-0.00591*** (0.0000559)	-0.00962*** (0.0000674)	-0.00953*** (0.0000698)	-0.00825*** (0.000106)	-0.00831*** (0.000110)	-0.00289*** (0.0000703)	-0.00292*** (0.0000727)	-0.00304*** (0.000656)	-0.00624*** (0.000386)	-0.00251*** (0.000385)	-0.00417*** (0.0000772)	-0.00171*** (0.000154)	-0.00411*** (0.0000560)
Loan Amt. (\$100,000)	0.0705*** (0.00672)	0.0499*** (0.00385)	0.0943*** (0.0130)	0.111*** (0.00557)	0.0224*** (0.00134)	0.0206*** (0.00144)	0.0261*** (0.00379)	0.0253*** (0.00372)	0.120*** (0.00366)	0.122*** (0.00380)	0.185*** (0.0295)	0.0824*** (0.0137)	0.160*** (0.0192)	0.116*** (0.00542)	0.146*** (0.00775)	0.0987*** (0.00317)
Jumbo loan	-0.404*** (0.0473)	-0.353*** (0.0229)	-0.153* (0.0730)	-0.223*** (0.0192)	0.0102 (0.00956)	-0.00634 (0.00989)	0.0400* (0.0192)	0.0362 (0.0194)	-0.0729*** (0.0139)	-0.0784*** (0.0143)	-0.261 (0.135)	-0.0955 (0.0663)	-0.164* (0.0755)	-0.154*** (0.0191)	-0.153*** (0.0291)	-0.0954*** (0.0125)
Broker-originated	0.211*** (0.0183)	0.244*** (0.00867)	0.136** (0.0497)	0.0976*** (0.00764)	0.143*** (0.00886)	0.135*** (0.00922)	0.198*** (0.0156)	0.210*** (0.0162)	0.206*** (0.0467)	0.274*** (0.0494)	15.62*** (0.107)	0.208 (0.121)	-0.234 (0.485)	0.123*** (0.00968)	0.215 (0.600)	0.334*** (0.00861)
Correspondent	0.00406 (0.0157)	0.0420*** (0.00756)	0.139*** (0.0282)	0.112*** (0.00793)	0.0120 (0.00833)	0.00538 (0.00861)	0.0465** (0.0154)	0.0485** (0.0160)	0.233*** (0.0449)	0.335*** (0.0470)	15.72 (0.129)	0.323* (0.489)	-0.245 (0.489)	0.0534*** (0.0109)	0.143 (0.600)	0.255*** (0.00850)
Prepayment Penalty	0.238** (0.0749)	0.421*** (0.0367)	0.0687 (0.0758)	-0.150*** (0.0106)	0.249*** (0.0125)	0.223*** (0.0132)	0.100*** (0.0199)	0.0791*** (0.0208)	-0.276*** (0.0137)	-0.337*** (0.0143)	-0.393* (0.167)	0.0134 (0.0620)	-0.0171 (0.0445)	0.0365*** (0.00850)	-0.0414* (0.0199)	0.0114 (0.00661)
LTV at Orig. (<80%)	-0.00590*** (0.00112)	-0.0175*** (0.00197)	-0.00844*** (0.00210)	-0.00583*** (0.000480)	0.0224*** (0.00138)	0.0212*** (0.00124)	-0.0186*** (0.001000)	-0.0184*** (0.000918)	-0.00545*** (0.000695)	-0.00447*** (0.000725)	0.00895 (0.00721)	-0.00386 (0.00339)	-0.0137*** (0.00314)	-0.0337*** (0.000546)	-0.0157*** (0.00143)	-0.00887*** (0.000515)
LTV at Orig. (=80%)	-0.00551*** (0.00106)	-0.0150*** (0.00192)	-0.00785*** (0.00197)	-0.00505*** (0.000451)	0.0231*** (0.00136)	0.0218*** (0.00121)	-0.0150*** (0.00102)	-0.0148*** (0.000942)	-0.00391*** (0.000661)	-0.00300*** (0.000689)	0.00718 (0.00685)	-0.00185 (0.00318)	-0.0123*** (0.00305)	-0.0312*** (0.000530)	-0.0132*** (0.00137)	-0.00776*** (0.000490)
LTV at Orig. (>80%)	-0.00494*** (0.00106)	-0.0182*** (0.00196)	-0.00809*** (0.00182)	-0.00720*** (0.000419)	0.0175*** (0.00134)	0.0167*** (0.00120)	-0.0181*** (0.00100)	-0.0180*** (0.000919)	-0.00808*** (0.000598)	-0.00721*** (0.000623)	0.00369 (0.00636)	-0.00572 (0.00294)	-0.0159*** (0.00287)	-0.0321*** (0.000502)	-0.0151*** (0.00126)	-0.0111*** (0.000448)
Current LTV	2.917*** (0.0709)	3.012*** (0.170)	2.521*** (0.113)	2.427*** (0.0282)	1.389*** (0.119)	1.669*** (0.103)	1.892*** (0.143)	1.874*** (0.137)	2.413*** (0.0358)	2.354*** (0.0364)	2.869*** (0.355)	2.661*** (0.164)	2.837*** (0.239)	2.465*** (0.0385)	2.607*** (0.0765)	2.526*** (0.0279)
Initial Interest Rate	0.623*** (0.0204)	0.533*** (0.00651)	0.216*** (0.0115)	0.225*** (0.00284)	0.638*** (0.00599)	0.649*** (0.00642)	0.226*** (0.00602)	0.222*** (0.00626)	0.242*** (0.00387)	0.243*** (0.00407)	0.302*** (0.0322)	0.240*** (0.0191)	0.317*** (0.0201)	0.238*** (0.00389)	0.248*** (0.00758)	0.189*** (0.00274)
Margin					-0.175*** (0.00624)	-0.166*** (0.00620)	-0.000101 (0.00530)	0.00654 (0.00552)	0.00577* (0.00285)	0.00512 (0.00293)	-0.0960* (0.0387)	-0.0386 (0.0244)	-0.0383 (0.0218)	0.0698*** (0.00522)	-0.0211 (0.0108)	0.0272*** (0.00335)
HPI Appreciation (4-yrs prior to orig.)	0.142*** (0.0303)	0.202*** (0.0326)	0.00594 (0.0453)	0.115*** (0.0118)	0.662*** (0.0202)	0.643*** (0.0190)	0.358*** (0.0221)	0.392*** (0.0224)	0.201*** (0.0113)	0.226*** (0.0117)	-0.250* (0.113)	0.114 (0.0675)	-0.0150 (0.0657)	0.0404** (0.0144)	0.0129 (0.0220)	0.221*** (0.00898)
Refinance	0.0825*** (0.0179)	0.0186* (0.00909)	-0.251*** (0.0413)	-0.303*** (0.00878)	-0.0424*** (0.00821)	-0.0272** (0.00848)	-0.165*** (0.0123)	-0.166*** (0.0128)	-0.144*** (0.00785)	-0.140*** (0.00816)	-0.226 (0.160)	-0.155** (0.0592)	-0.221** (0.0848)	-0.217*** (0.0148)	-0.153*** (0.0357)	-0.163*** (0.00738)
Cashout Refi	0.175*** (0.0195)	0.0613*** (0.0102)	0.0764 (0.0418)	0.125*** (0.00837)	-0.0418*** (0.0122)	-0.0416** (0.0127)	-0.0758*** (0.0188)	-0.0723*** (0.0194)	0.00903 (0.0191)	0.00903 (0.0197)	0.0714 (0.162)	-0.0698 (0.0600)	0.0434 (0.0832)	-0.0276 (0.0148)	-0.0102 (0.0362)	0.0151 (0.00822)
County Unemp. Rate	0.0298*** (0.00324)	0.0361*** (0.00408)	0.0124* (0.00543)	0.0114*** (0.00138)	0.0791*** (0.00393)	0.0684*** (0.00376)	-0.0140** (0.00490)	-0.0151** (0.00483)	-0.0344*** (0.00185)	-0.0357*** (0.00192)	-0.0240 (0.0215)	0.0414*** (0.0111)	-0.0554*** (0.0104)	-0.00342 (0.00218)	-0.0435*** (0.00358)	-0.0195*** (0.00140)
PMI	0.205*** (0.0413)	0.517*** (0.0352)	-0.278 (0.200)	-0.0346 (0.0205)	0.333*** (0.0197)	0.274*** (0.0215)	0.398*** (0.0223)	0.403*** (0.0236)	-0.0456 (0.0269)	-0.0221 (0.0279)	-0.121 (0.631)	0.241 (0.186)	-41.97 (0)	-0.191*** (0.0402)	5.315*** (0.0712)	-0.0501*** (0.0116)

Notes: This table reports the coefficients from a Cox hazard model of sixty-day delinquency. Standard errors are robust, and clustered at the loan level. The baseline hazard function is not reported. The data includes all thirty-year owner-occupied mortgages, except for FHA and VA mortgages. Each subsample is broken up into those identified as having low or no documentation in LPS, and those not-so-identified. Prime FRM loans refers to the Prime Conforming FRM subsample (see Table 7) "No early default" excludes loans that have missed at least one payment in the first three months following origination. Variable definitions and summary statistics can be found in Table 6. "Broker" includes those loans which are identified in the LPS dataset as being broker-originated. "Non-broker" are those not flagged as being broker-originated.

Table 10 (Panel B): Lowdoc vs. Full-Doc Loans

	FRM				Prime ARMs						Subprime ARMs					
	Prime		Subprime		5/1 Low-Doc	5/1 Full-Doc	3yr Low-Doc	3yr Full-Doc	2/28 Low-Doc	2/28 Full-Doc	5/1 Low-Doc	5/1 Full-Doc	3yr Low-Doc	3yr Full-Doc	2/28 Low-Doc	2/28 Full-Doc
	Low-Doc	Full-Doc	Low-Doc	Full-Doc												
Transferred			0.00815	0.132***	0.481***	0.501***	0.250***	0.278***	0.335***	0.464***	15.49***	0.339**	0.609	0.186***	0.0378	0.401***
From Other Servicer			(0.0551)	(0.00713)	(0.00894)	(0.00933)	(0.0170)	(0.0176)	(0.0312)	(0.0330)	(0.649)	(0.106)	(0.340)	(0.0114)	(0.494)	(0.00817)
Option-ARM			0.576***	0.918***	-0.275***	-0.318***	-0.0181	-0.0258	0.0459	0.00138	-0.504	-0.0436	0.765*	-0.0332	-0.194	-0.0546***
			(0.112)	(0.0435)	(0.0130)	(0.0139)	(0.0250)	(0.0260)	(0.0418)	(0.0437)	(0.639)	(0.0868)	(0.349)	(0.0240)	(0.341)	(0.00930)
Interest-Only			0.454***	0.429***	0.136***	0.151***	0.374***	0.387***	0.106***	0.107***	-0.173	-0.146***	0.00720	0.0566***	0.0200	0.0822***
			(0.0671)	(0.0103)	(0.00861)	(0.00886)	(0.0169)	(0.0172)	(0.00808)	(0.00830)	(0.0940)	(0.0431)	(0.0563)	(0.00899)	(0.0214)	(0.00659)
Orig. 2004	0.685***	0.270***	0.222	0.239***	0.283***	0.324***	0.440***	0.444***	-0.0335	-0.434***	1.831***	0.370		0.911***	-0.414***	0.273***
	(0.175)	(0.0641)	(0.326)	(0.0581)	(0.0315)	(0.0331)	(0.0437)	(0.0453)	(0.113)	(0.126)	(0.278)	(0.490)		(0.117)	(0.110)	(0.0320)
Orig. 2005	0.921***	0.296***	-0.0949	0.299***	0.873***	0.890***	0.861***	0.865***	-0.318**	-0.501***		-0.274	1.957	0.962***	-0.296**	0.446***
	(0.176)	(0.0609)	(0.127)	(0.0394)	(0.0338)	(0.0347)	(0.0482)	(0.0499)	(0.122)	(0.131)		(0.215)	(1.071)	(0.0814)	(0.0969)	(0.0310)
Orig. 2006	0.961***	0.365***	0.335	0.474***	1.312***	1.345***	1.741***	1.774***	-0.261*	-0.380**	0.637		1.982	1.014***	0.185	0.608***
	(0.170)	(0.0600)	(0.208)	(0.0365)	(0.0383)	(0.0385)	(0.0539)	(0.0556)	(0.107)	(0.117)	(0.347)		(1.122)	(0.0662)	(0.151)	(0.0357)
Orig. 2007	1.785***	0.532***	0.516***	1.101***	2.111***	2.107***	2.000***	1.956***	-0.329**	-0.513***	0.303	0.277	2.406*	0.919***		0.763***
	(0.145)	(0.0607)	(0.131)	(0.0301)	(0.0475)	(0.0466)	(0.0561)	(0.0585)	(0.109)	(0.119)	(0.413)	(0.196)	(1.084)	(0.0811)		(0.0436)
Securitized 2003	-0.158	-0.598***	-45.33	-0.113**	0.247***	0.230***	0.0104	-0.0487	-0.929***	-0.931***		-2.047***		0.426***		0.256***
	(0.193)	(0.0569)	(0)	(0.0392)	(0.0535)	(0.0567)	(0.0718)	(0.0762)	(0.108)	(0.118)		(0.212)		(0.124)		(0.0483)
Securitized 2004	-0.157	-0.349***	-0.117	0.110*	0.317***	0.318***	0.513***	0.544***	-0.455***	-0.124*	-2.603***	-1.026*	1.963	-0.119	0.0605	0.229***
	(0.126)	(0.0457)	(0.323)	(0.0563)	(0.0205)	(0.0210)	(0.0271)	(0.0278)	(0.0479)	(0.0577)	(0.379)	(0.469)	(1.072)	(0.106)	(0.0625)	(0.0206)
Securitized 2005	-0.203	-0.153***	0.309***	0.211***	0.245***	0.248***	0.461***	0.479***	0.0539	0.129*	0.0905	-0.0353	-0.0810	-0.0965	0.0644*	-0.0140
	(0.126)	(0.0364)	(0.0909)	(0.0359)	(0.0148)	(0.0153)	(0.0278)	(0.0286)	(0.0617)	(0.0632)	(0.267)	(0.164)	(0.0849)	(0.0617)	(0.0252)	(0.0173)
Securitized 2006	-0.0503	0.0638*	0.138	0.365***	0.266***	0.241***	0.117***	0.113***	0.0297	0.0118	-0.203	0.123	0.0757	-0.0572	-0.262*	-0.0797**
	(0.116)	(0.0320)	(0.186)	(0.0318)	(0.0150)	(0.0152)	(0.0247)	(0.0260)	(0.0210)	(0.0218)	(0.225)	(0.150)	(0.337)	(0.0374)	(0.122)	(0.0243)
Securitized 2007	-0.258***	0.435***	0.0540	-0.0318	0.106***	0.128***	0.261***	0.338***	0.173***	0.258***	0.328	0.256	-0.273	0.187**	0.161	-0.0845*
	(0.0745)	(0.0357)	(0.0953)	(0.0235)	(0.0214)	(0.0229)	(0.0595)	(0.0623)	(0.0523)	(0.0547)	(0.343)	(0.150)	(0.180)	(0.0701)	(0.100)	(0.0374)
GSE 2003	-0.195	-0.420***	-45.36	-0.578***	0.431***	0.439***	0.277***	0.288***				-2.326***				
	(0.132)	(0.0519)	(0)	(0.0919)	(0.0318)	(0.0334)	(0.0504)	(0.0523)				(0.220)				
GSE 2004	-0.301*	-0.482**	-0.219	0.451***	0.455***	0.449***	0.304***	0.338***								
	(0.121)	(0.0416)	(0.317)	(0.0593)	(0.0196)	(0.0201)	(0.0264)	(0.0272)								
GSE 2005	-0.434***	-0.346***	0.185	0.341***	0.200***	0.194***	0.212***	0.218***								
	(0.123)	(0.0334)	(0.100)	(0.0390)	(0.0161)	(0.0168)	(0.0306)	(0.0317)								
GSE 2006	-0.492***	-0.300***	-0.107	0.390***	0.163***	0.140***	-0.185***	-0.177***								
	(0.112)	(0.0295)	(0.193)	(0.0341)	(0.0165)	(0.0167)	(0.0333)	(0.0348)								
GSE 2007	-0.734**	0.182***	0.132	0.153***	0.0196	0.0513*	-0.450***	-0.324***								
	(0.0626)	(0.0286)	(0.0974)	(0.0252)	(0.0236)	(0.0252)	(0.0712)	(0.0745)								
No Early Default	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Num. of obs.	3438481	24818589	205190	4200630	15474525	15158796	3523481	3442853	1496633	1441804	17205	163342	54234	1875208	354369	3348626

Table 11: Two-year Delinquency Rates and Securitization Coefficients

	Two-Year Delinquency Rate (2006 Vintage)	Coefficient on Private Securitization (2006 Vintage)
Prime		
Conforming FRM	7.28%	0.213
Jumbo FRM	8.9%	0.221
5-Year ARM	14.6%	0.235
3-Year ARM	28.6%	0.177
2/28 ARM	29.9%	0.016
Subprime		
FRM	41.4%	0.359
5-Year ARM	41.2%	-0.030
3-Year ARM	38.8%	-0.022
2/28 ARMS	43.7%	-0.053

* In the first column, this table reports the 60-day delinquency rate at two years following the date of origination for loans in the 2006 vintage, broken down by loan type. The second column gives the securitization coefficients for the 2006 vintage, for the “no-early default” models, as reported in Tables 7-9.