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To balance capital requirements and manage credit risk, lenders slice and dice mortgages for securitization versus holding unsecured loans for investment in their portfolios. This article estimates factors that explain credit securitization decisions with Government Sponsor Enterprises (GSEs).

Keywords: securitization; GSE; portfolio; risk

JEL Classification: C25; G11; G21

I. Introduction

Government Sponsor Enterprises (GSEs) purchase mortgage loans from approved lenders, either for cash or in exchange for a mortgage-backed security that comprises those loans. The GSEs guarantee timely payment of interest and principal. The mortgage seller may then hold that security or sell it. A fundamental component of loan securitization decisions is the economic environment.

To balance capital requirements and manage credit risk, lenders slice and dice mortgages for securitization versus holding unsecured loans for investment in their portfolios. This article estimates factors that explain credit securitization decisions with GSEs. Using securitization data from 2005 to 2009, we show the impact that House Price (HP) trends have on decisions of banks to securitize new originations with GSEs. For the analysis, we also measure the preferences of banks to securitize certain loan products as well as the role of note rate spreads on credit securitization decisions.

II. Modelling Loan Allocations to GSE

Recent mortgage research has focused on the measurement of the effects of loan characteristics, loan

modification policies and macro variables on loan default (Deng *et al.*, 2000; Fabozzi, 2006; Foote *et al.*, 2009; Sarmiento, 2009). This article provides a departure from this type of analysis by focusing instead on the response of credit securitization decisions to the economic environment. Data for this type of analysis stem from servicers' reports on loan securitization status and coded in the Lender Process Services (LPS) data set.¹

In the estimation, we formulate an econometric model that evaluates the probability event that lenders keep a loan unsecured in their portfolios versus a GSE securitization. The probability model is defined in terms of securitization covariates, Z_{jt} , and is characterized as follows:

$$\text{prob}(Y_{jt} = 1) = F(G(Z_{jt})) \quad (1)$$

where $Y_{jt} = 1$ if the lender securitizes the loan with a GSE, and $Y_{jt} = 0$ if the lenders hold the loan unsecured in their portfolio.

Covariates Z_{jt} include origination variables (i.e. Fair Isaac Corporation (FICO) credit score, lending spreads) as well as the economic environment. For the spread between the lending rate and the cost of funds, we use the difference between the note rate and the

The article solely represents the author's own perspectives and opinions.

¹The investor code in the LPS data provides an indicator variable of whether loans are held unsecured in their portfolio and whether loans are securitized with GSEs. We use the investor status of the loan (GSE or portfolio) as of 6 months from the loan origination in the LPS data set. The 6-month window is sufficient as most of the loans that are sold to GSE occur within 6 months from the time of loan origination.

The LPS data provide more than 80 loan-level collateral attributes, including product type, geographic location, FICO score as well as other loan characteristics. This data set is increasingly used to examine recent mortgage defaults (e.g. Elul, 2009; Foote *et al.*, 2009)

Libor rate – denoted as SPREAD. In Equation 1, the credit risks associated with loan characteristics are captured by the FICO score, the Loan To Value (LTV) ratio and the product type (e.g. adjustable rate mortgages versus fixed rate mortgage). The economic environment is captured by 3-month changes in HP from loan origination. We also use as covariate the share of serious delinquent loans (90+ days DQ loans) – denoted as SDQ – in banks’ portfolios as of the time of decision to securitize new originations.

III. Trends

Figure 1 shows overtime patterns of loan securitization. The chart indicates that the share of unsecured loans in banks’ portfolios (from the pool of conventional loans) decreased from a range of 30–45% to 5–10%. In the chart, for loans originated in the same

period in California, we observe a share of loans held unsecured dropped below 5%.

To explain the patterns in Fig. 1, Fig. 2 shows the correlation of the share of unsecured loans in banks’ portfolios and the 3-month trend in Federal Housing Finance Agency (FHFA) HP observed at the time of the loan origination. For the state of California, Fig. 3 shows the correlation between securitization and 3-month HP changes in that state. Both Figs 2 and 3 indicate that a threshold of HP declines triggered the sharp increases in loan securitization with GSEs.

Interestingly, Figs 2 and 3 also indicate that banks kept in their portfolio a larger share of unsecured loans in the period in which the growth in HP started to decelerate. This indicates that during this period most lenders miscalculated the large HP declines that eventually started to occur in the mid-2007.

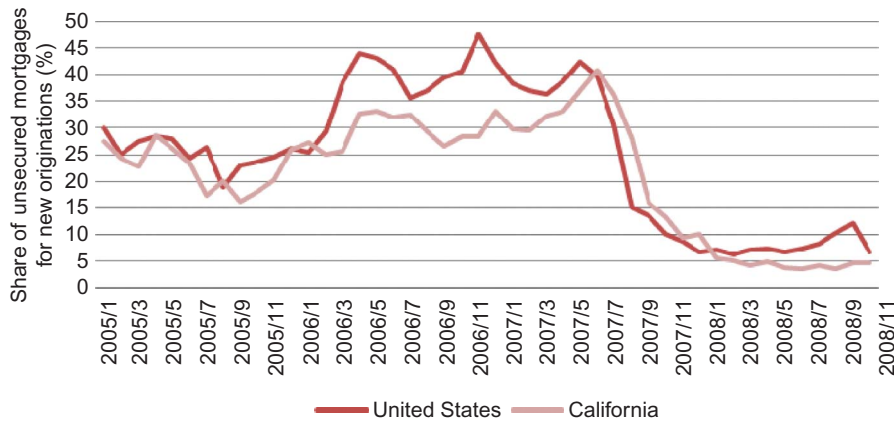


Fig. 1. Share of unsecured mortgages in banks’ portfolios by vintage

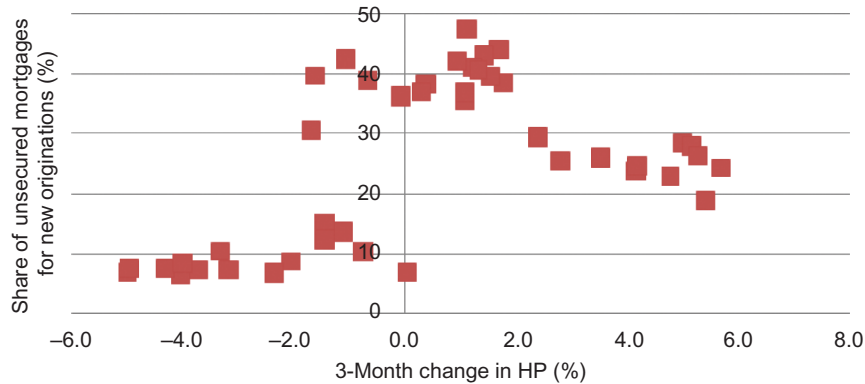


Fig. 2. Correspondence between 3-month change in HP and rate of securitization

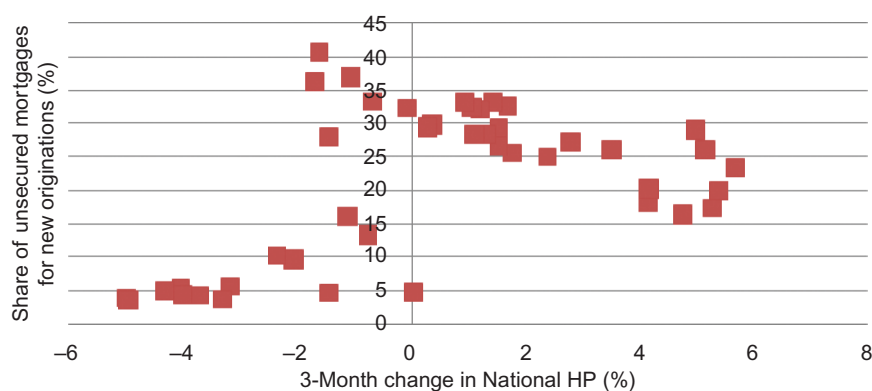


Fig. 3. Correspondence between 3-month change in HP and rate of securitization of California

IV. Results

The estimation of Equation 1 provides a better measure of the patterns illustrated in Figs 1–3. In the estimation of Equation 1, we use the standard logistic distribution. Application of maximum likelihood yields an algorithm that easily converges. Model estimation uses categorical variables for FICO, LTV, loan term, product type and 3-month HP growth. A continuous variable is only used for SPREAD and SDQ.

Table 1 shows coefficient estimates of Equation 1. From Table 1, lenders are less likely to securitize loans with higher spreads (larger difference between the note

rate and cost of funds). This result indicates that loans with larger note rates have lower probability of securitization. Furthermore, from Table 1, the relative odd ratios for each of the variables in the model can be inferred.

The odds ratios illustrate the impact of each of the covariates on the probability that banks securitize versus not securitize loans with GSE. For example, from the coefficient of Adjustable Rate Mortgage (ARM) in Table 1, the probability that an ARM loan is securitized is 80% lower than for a Fixed Rate Mortgage (FRM) product. Similarly, the probability that a 15–25 FRM product is securitized is 75% lower than for the standard 30 FRM products. There

Table 1. Factors that explain loan securitization decisions

Variable	Estimate	SD	p-Value
Intercept	3.11	0.017	<0.0001
ARM	-1.59	0.002	<0.0001
15–20-year term	-1.30	0.002	<0.0001
Low LTV (0, 70]	-0.02	0.003	<0.0001
Medium LTV (70, 80]	0.79	0.004	<0.0001
Medium–high LTV (80, 90]	0.67	0.004	<0.0001
High LTV (90, 100]	0	NA	NA
Low FICO <660	-0.09	0.003	<0.0001
Medium FICO (660, 700)	-0.04	0.004	<0.0001
Medium–high FICO (700, 740)	-0.19	0.003	<0.0001
High FICO (740, 780)	-0.20	0.003	<0.0001
Very high FICO >780	0	NA	NA
3-Month HP change >0	0	NA	NA
0 > 3-month HP change >-2%	0.31	0.004	<0.0001
3-Month HP change <-2%	0.97	0.005	<0.0001
SDQ loan	0.08	0.003	<0.0001
SPREAD	-1.54	0.001	<0.0001

Note: ARM, Adjustable Rate Mortgage; LTV, Loan To Value; HP, House Prices; SDQ, Serious Delinquent.

are two likely reasons for these results. First, keeping ARMs versus FRM partly facilitates lenders efforts to hedge against changes in long-term rates. Second, most standard Mortgage-Backed Securities (MBS) comprise 30 FRM products.

From Table 1, the probability of securitization is largest for loans with LTV that ranges from 70 to 90. Therefore, there is a larger concentration of securitized products embedded in medium- to medium-high LTV.

From Table 1, the share of stressed mortgages (SDQ) in the financial system positively correlates with larger probability of securitization with GSEs. The analysis, however, indicates that the regime of high securitization of mortgages with GSE was triggered by HP declines. Indeed, the odds ratios of the probability of securitization are three times larger in a period where HP decline by 2% in a 3-month period.

From the paper results, a normalization of unsecured lending by banks will only occur after a stabilization of housing prices and a related reduction of loan loss provisions in banks' portfolio. This will occur over time as the growth in the share of toxic assets is charged off from banks' balance sheets and loan severities reduce with the stabilization of housing prices.

V. Conclusion

Using data from 2005 to 2009 originations, this article estimated factors that drive banks to securitize mortgage loans. Of particular importance is the impact of HP changes on banks' decisions to securitize loans with GSEs. Estimation results indicate that HP triggered a regime of large securitization of mortgages with GSE.

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