

# NONPARAMETRIC TESTING FOR INFORMATION ASYMMETRY IN BANKS' SECURITIZATION

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Rapid development of financial markets and advances in structured finance have enabled lenders to overcome the traditional lending scheme by removing mortgages they originate from their balance-sheets before the scheduled maturity through securitization. Securitization enables mortgage originators to sell mortgage-related cash flows to third-party investors in the form of liquid interest-bearing securities traded on financial markets (commonly known as Mortgage-Backed Securities, MBSs). The two main advantages of securitization are to improve liquidity and to reduce regulatory capital requirements. The process of securitization involves numerous entities such as the mortgage servicer.

Once the securitization process is achieved and the underlying MBSs are sold to investors, the mortgage servicer ensures the ongoing management and upkeep of interest payments. In general, the main task of a mortgage servicer is collecting principal and interest payments from borrowers and passing the proceeds on to the underlying MBS-investors in the secondary market. These cash flows are passive claims linked to the pool of mortgages packaged by the Special Purpose Vehicle (SPV) and held by MBS investors. Typically, the mortgage originator can act as the servicer of the deal by guaranteeing the connection of cash-flow streams between borrowers and MBS-investors. However, originators are also able to further reduce the borrower's default risk by selling the underlying Mortgage Servicing Rights (MSRs) to a third party, hereafter referred to the MSR-purchaser or new servicer. In such case, the new servicer replaces the originator in ensuring ongoing mortgage management; borrowers become directly linked to the new servicer, to which they make debt payments.

In case of borrower delinquency, the servicing cost of mortgages increases significantly as the servicer incurs additional costs related to managing these loans, which can significantly reduce the profitability of the servicing activity. For instance, the mortgage servicer is required to deploy additional resources to investigate and collect delinquent payments, to perform loss mitigation activities, or to manage a foreclosure process. Mortgage servicers could incur additional significant costs related to unreimbursed foreclosure costs and real-estate owned losses. For these reasons, servicing inferior-quality mortgages could hinder the performance of mortgage servicing.

The main objective of this study is to test for evidence of information asymmetry in the mortgage servicing market. We are the first to analyze the following main question: Does selling the mortgage servicing rights unveil any residual asymmetric information between servicers? In a typical principal-agent relationship, we hypothesize that the mortgage originator (the agent) possesses an informational advantage over the MSR-purchaser (the principal) in the market for mortgage servicing rights. This privileged information about both loan risk characteristics and

borrower credit quality is collected at the time of the original mortgage underwriting, and the originator could have inducements to adversely exploit this information asymmetry. It is now well documented that soft information is private and not verifiable by the principal. Mortgage originators can transmit quantitative information about loan risk and borrower quality but it is very difficult or costly for the MSR-purchaser to access to the soft information that may affect the loan default probability.

Although a large body of theoretical and empirical literature has examined asymmetric information through the securitization process, we are the first to investigate this second-stage asymmetric information problem. The above-mentioned studies focus on information asymmetry between lenders and investors at the first stage of securitization. The main research question for most studies that test for asymmetric information through the securitization process is investigating the originators' decision to securitize a given loan. For instance, most studies compare the *ex-ante* risk characteristics as well as the *ex-post* default likelihood of mortgages that the originator chooses to securitize *versus* those kept on its balance-sheet. In this study, we focus on mortgages that have already been securitized. We consequently dig deeper in the data as we scrutinize these securitized mortgages to test for second-stage information asymmetry. The previous estimations of asymmetric information in the securitization market may have underestimated the information problem in the securitization market by not taking into account this intermediary or second-stage information problem between mortgage servicers. If this is the case, the current regulation may not be optimal.

To empirically test for evidence of asymmetric information in the market for mortgage servicing rights, we analyze the originator's selling choice of MSRs using a large sample of U.S. mortgages that were issued and securitized through the non-agency channel during the period of January 2000 to December 2013. In the first step, we contrast the *ex-ante* risk profile of mortgages for which the originator chooses to sell the underlying servicing rights to a third party with those for which it chooses to hold and service. In the second step, we compare the *ex-post* default risk of these observably similar mortgages. Our econometric methodology is merely nonparametric in the sense that we do not make any restrictive assumptions about either the conditional distribution of the originator's MSR-selling decision or the functional form of the relationship between the decision to switch the mortgage servicer and the mortgage default risk. The main advantage of this methodology is that inferences about the distribution are made purely from the data, and the density estimation is thus more data-driven than it would be if the density function were constrained to fall in a given parametric family. Our methodology is inspired by the nonparametric test of asymmetric information proposed by Su and Spindler (2013). The test is mainly driven by kernel density estimation techniques. We further propose a new nonparametric two-stage instrumental variable testing procedure to account for potential endogeneity. For robustness, we employ the nonparametric testing procedure of Chiappori and Salanié (2000). We also present a battery of parametric analyses to corroborate our results after controlling for observable risk characteristics, econometric misspecification errors, and endogeneity issues using the instrumental variable estimation procedure developed by Dionne et al. (2009, 2015).

Our empirical results provide strong support for the presence of second-stage residual asymmetric information in the mortgage servicing market. After controlling for available hard information, we obtain a significant positive association between lenders' decision to switch the servicer of the deal and the probability of mortgage default. For instance, our results show that the

higher the likelihood of switching the mortgage servicer, the higher the probability that the borrower defaults.

This result has important consequences for the securitization market. Recent regulation has introduced a retention provision for banks that use securitization. Since December 2014, securitizers must keep an economic interest (retention) in the credit risk of the securitized assets (Morgan, 2018). Only the original creditor must keep the economic interest. It would be interesting to investigate how this new rule may affect the type of information asymmetry effect that we have measured. Intuitively it should increase the incentives to switch bad loans to the second-level service.

## References

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