

The Effect of MSME Loan Securitization on Bank Stability: Collective Roles of Mediators

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Abstract

This study aims at understanding the consequences of the collective roles of risks, funding cost, liquidity and regulatory capital as the mediators in the effects of the MSME loan securitization on bank stability. We use a novel dataset on the US and European MSME ABS originators over 2003 to 2022 given the US' and European Commission's roles in the programme. Our findings show that risk, funding costs, liquidity and regulatory capital collectively act as mediators. This research is the first study to look at the collective roles of mediators at play in the effect of MSME loan securitization on bank stability.

Keywords: Small business, Securitization, Bank stability

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1. Introduction

Healthy securitization markets might help to ensure a better flow of money into the real economy, alleviate tight financing conditions for Micro, Small and Medium-size Enterprises (MSMEs), while keeping the banks in sound shape (Albertazzi et al., 2021; Bakoush et al., 2018; 2019; Buchanan, 2015). The MSME Asset Backed Security (ABS) program is one of the most popular methods of MSME financing in the developed countries. Considering that MSMEs have limited funding options, the US and European governments step in with a scheme of policies on the MSME loan securitization facilities (Kraemer-Eis et al., 2020). Banks face issues of adverse

selection and moral hazard when they deal with opaque MSMEs (Stiglitz and Weiss, 1981; Moro et al., 2012). The MSME ABS program helps to compensate for the aforementioned issues with the government-backed institutions guaranteeing the downside of their investments. This scheme aims to effectively improve MSME's access to finance by accelerating the development of alternative investment markets without creating further distortions (Hirata and Shimizu, 2003). The scheme also aims at ensuring minimum moral hazard, while removing any obstacle towards funding MSMEs.

MSME ABSs have some characteristics that are specifically different from the other types of ABS. Most conventional securitization programs are secured by the first lien loans with collateral that tends to increase in value, such as a commercial mortgage loan portfolio. MSME loans are guaranteed by the blanket lien on the borrower's assets that tend to decrease in value. For example, it can be in the form of inventories or account receivables. Further, each MSME ABS pool consists of a variety of MSME loans in various industries, scales and locations.

In a macroprudential sense, the outright purchases are aimed at strengthening the interactions between financial markets, banking sectors and the real economy. Several national and supranational institutions, including the Small Business Administration (SBA) in the US as well as the European Commission in Europe, have adopted this approach. Through this facility, banks may retain some of the MSME loan securitization products in their balance sheet, rather than place most of it in the market.

Then through a repo transaction, the central bank might be able to purchase the ABS, which is also known as the Asset-Backed Purchase Program (ABSPP) in Europe or Term Asset-Backed Securities Loan Facility (TALF) in the US. In this mechanism, the European Central Bank (ECB) lends an amount of money to the European Investment Bank (EIB) to buy back the MSME loan securitization product. Meanwhile, under the TALF mechanism, the Federal Reserve provides loans to MSME ABS originators. Since MSME loans are considered riskier than any other type of loans (e.g. mortgage), this buyback mechanism hopefully will incentivize banks to provide more loans to MSMEs (Armstrong and Ebell, 2015).

Our proposed methodology is a continuation of the one introduced by Bakoush et al. (2018, 2019). We use a novel dataset on the US and European MSME ABS originators over 2003 to 2022 given the US' and European Commission's roles in the program. We collectively test whether the securitization activity of MSME loans impacts a set of mediators while they also turn up affecting the stability of banks. Our empirical approach is based on the Three-Stage Least Squares (3SLS) method which allows different effects to be collectively tested in combination with the proposed empirical model.

This research extends the literature on the revival of business loan securitization markets (Bertay et al., 2017). This work is also closely related to the paper by Albertazzi et al. (2021) which shows that the securitization activity of MSME loans does not lead to excessively lower credit standards. This paper is also related to Abdelsalam et al. (2020), Arif (2020) and Buchanan (2015) which show how banks and securitization markets share their risks with each other (Buchanan, 2015; Abdelsalam et al., 2020; Arif, 2020). Regulations in place require banks—as the originators of MSME loan securitization transactions—to disclose the amount of the first-loss piece that they will maintain in the upcoming periods. This regulation, known as the securitization with implicit recourse, limits the possibility of low-quality and high-risk securitization products being issued, thereby reducing the possibility of any moral hazard problem. While a better understanding on reviving healthy securitization markets is considerably important, there is very little evidence

available for this particular topic (Berger et al., 2019; Bertay et al., 2017). This study aims at understanding the collective roles of mediators in the effects of MSME loan securitization activities on bank stability.

This research is the first study to look at the effect of MSME loan securitization on bank stability, while also accommodating the collective roles of mediators: risk, funding costs, liquidity and regulatory capital. The empirical test results show that MSME loan securitization activities have a destabilizing effect for banks. The mediation model provides an adequate representation of the effect of MSME loan securitization on bank stability. The results also show that risk, funding costs, liquidity and regulatory capital act as mediators.

This paper is organized as follows. Part 2 describes the literature review and hypothesis development. Part 3 sets out the sample and econometric model used. Part 4 details the main results. The research is concluded in Part 5.

2. Literature review and hypothesis development

Given the limited sources of funding available to MSMEs, the US and European governments intercede with a course of action: MSME ABS program (Kraemer-Eis et al., 2020). It thereby lays the foundation for banks to better engage with MSMEs. The scheme is carefully designed to deliver better financing access for MSMEs while speeding up the growth of ABS markets (Caglio et al., 2021; Dilger, 2016; Hirata and Shimizu, 2003; Kraemer-Eis and Passaris, 2015; Walsh, 2015).

The SBA introduced the US MSME loan securitization program in 1985. This program has long preceded the European MSME loan securitization facility. However, with vigorous policy support from the European Council, the European MSME loan securitization market has become much more developed. The European MSME ABS outstanding amount reached around €120 billion by the end of 2022. This value is almost three times larger than their US counterpart of around €30 billion at that time. There are several conditions that need to be fulfilled so that banks can take advantage of this policy. For example, MSME loans must constitute at least 80% of the pool to be securitized (European Commission, 2007). Within a year after the transactions, the originator should already have redisbursed 80% of the funds generated from the proceeds to new MSME loans.

Beside the fact that it is possible for banks to convert illiquid assets into liquid funds, it is argued that securitization is likely to increase credit growth while also making banks to have riskier assets (Casu et al., 2013; Cebenoyan and Strahan, 2004). However, as a way to provide implicit recourse to securitizations, banks also need to show their *“skin in the game”* by retaining the first-loss piece (Blommestein et al., 2011). Therefore, the risks associated with the securitized assets have not been fully distributed to investors and remain in the hands of issuing banks.

The cash proceeds from securitization can be used in different ways. It is therefore possible to replace existing funding sources, such as deposits, which reduces interest costs resulting from those deposits and thereby leads to a lower funding cost (Loutskina, 2011). It also enables banks to lower their exposure to bad loans, so that they are able to operate with less capital and invest in new businesses (Affinito and Tagliaferri, 2010). Hence, banks are incentivized enough to generate better profitability (Bakoush et al., 2019).

Our framework depends on the Z-score which expresses the risk-adjusted profitability. The role of risks, funding costs, liquidity and regulatory capital as mediators is also developed and analyzed on the basis of this model. We add to prior studies by incorporating the mediators into the process and then examining their collective roles.

The most important factor affecting stability is bank risk. On the one hand, the transfer of credit risk to the market could reduce bank risks (Affinito and Tagliaferri, 2010; Albertazzi et al., 2021; Cantor and Rouyer, 2000; Cebenoyan and Strahan, 2004; Jiangli and Pritsker, 2008; Santomero and Trester, 1998). On the other hand, due to the increased risk taking and recourse, or any additional credit enhancement, this could cause a rise in bank risks (Albertazzi et al., 2021; Casu et al., 2013). Securitizations increase the banks' risk appetite, which results in creation of risky assets that puts a strain on bank stability (Arif, 2020; Keys et al., 2010).

Securitization also enables banks to diversify their funding sources. It reduces their external financing costs, such as debt or deposits, and the overall cost of funds as well (Loutskina, 2011). On the contrary, Casu et al. (2013) show that due to the perception of an increased credit risk, banks are obliged to provide higher credit risk enhancement and thereby increase their funding costs.

Banks also use securitization to improve their liquidity position and reduce exposure to liquidity risk (Affinito and Tagliaferri, 2010). Loutskina (2011) confirmed this view and stated that when banks have the possibility to securitize, they decrease their holdings on liquid assets. A substantial portion of the liquidity buffer available in MSME ABS may be impossible to use due to certain market conditions (Kraemer-Eis and Passaris, 2015). In order to prevent bank failures, banks can choose to hold liquid assets.

An arbitrage of regulatory capital ensures banks securitize relatively less riskier assets, compared to those held in their portfolios. The reputation hypothesis also suggests that banks securitize their high-quality loans, while keeping the riskier ones. Hence, securitization is the preferred way of reducing risks, enhancing liquidity and improving capital ratios (Affinito and Tagliaferri, 2010). Therefore, regulatory capital is also a key factor in determining bank stability (Demirgüç-Kunt and Huizinga, 1999). The collective effects of the securitization activities of MSME loans and the mediators on the stability of banks is an open inquiry for policymakers. The latest reformed guidelines are also intended to bring more transparent securitization products to the market (Buchanan, 2015).

In the previous discussion, it has been established that securitization has an impact on risk, funding cost, liquidity and regulatory capital, although there is no conclusive evidence of this effect on bank stability. Given that these mediators affect bank stability as well, the effects of securitization activities and intermediating variables should also be expected to happen at the same time. Therefore, the argument can be put forward that through a set of mediators, securitization transfers its effects to stability. This leads to our hypothesis: risk, funding cost, liquidity and regulatory capital collectively act as a set of mediators in the effect of MSME loan securitization on bank stability.

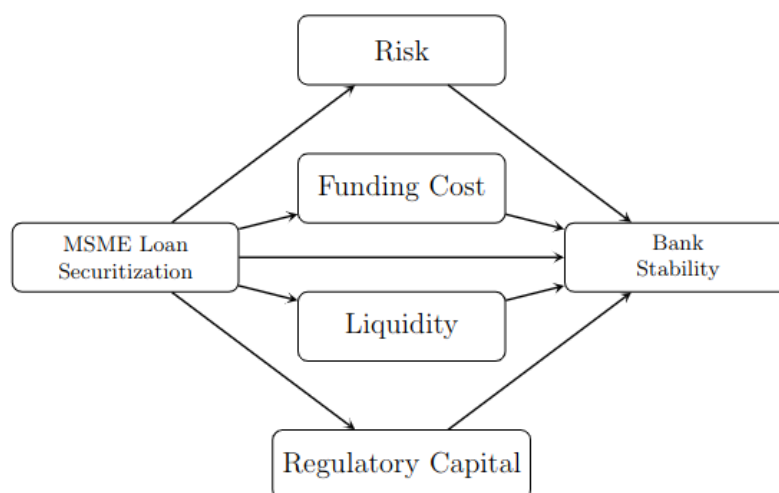


Figure 1 - Research Model

3. Methodology

We use a novel dataset on the US and European MSME ABS originators over 2003 to 2022 given the US' and European Commission's roles in the programme. Information on the income statements, balance sheets and transactions are retrieved from the S&P Capital IQ and the European DataWarehouse (ED) database. This active securitization transactions data set includes basic information of the originating country, deal name, ED-Code, asset class, ISIN and Bloomberg tranche ticker. Information regarding the originators is hand-collected by reading the prospectus filed. Next, we matched the ISIN of the security in the ED dataset to the S&P Capital IQ database. Later on, we collected detailed information (i.e. the issuer, offering date and outstanding amount) on each securitization transaction, which are available in S&P Capital IQ database. The sample excludes banks that do not provide adequate information. To avoid the chance of outliers influencing the results, the quarterly variables calculated from the dataset are winsorized at 1%. The largest and smallest 1% of the values of each variable are replaced by the nearest value. Our final sample consists of 1,157 observations of unbalanced panel data covering 27 banks over the quarterly period of Q1 2003 to Q4 2022 (N=27 banks and T=80 quarters). The detailed variable and statistical descriptions are provided in Appendices A and B, respectively.

We argue that MSME loan securitization activities affect bank stability and that this effect is transmitted through four mediators: risk, funding costs, liquidity and regulatory capital. Given that these mediators affect the stability as well, the impact of the securitization activities and the intermediating variables should also be expected to happen at the same time. Following Bakoush et al. (2018), we specify a structural model of the bank stability in which stability, risk, funding costs, liquidity and regulatory capital are jointly determined in equilibrium, while MSME loan securitization is exogenous. The model is specified as a system of equations as follows:

$$Y = B Y + \Gamma X + \zeta \quad (1)$$

where endogenous variable vectors, which consist of stability, risk, funding cost, liquidity and regulatory capital, are represented by Y . Meanwhile, exogenous variable vectors consist of MSME

loan securitization and represented by X . The relationships between endogenous and exogenous variables are represented by the matrix coefficient I . The standard error term vectors are represented by ζ .

We use the Three-Stage Least Square (3SLS) model to estimate Equation (1) as structural equation systems. As the explanatory variables are correlated with the endogenous variables, it is expected that the error terms are related to the endogenous variables. Moreover, the error terms between the equations are expected to be correlated, as certain dependent variables are also the explanatory variables of other equations in the system. These biases can be remedied by the 3SLS since this is a combination of the Two-Stage Least Squares (2SLS) and the Generalized Least Squares (GLS) approaches.

The 3SLS model is estimated in three phases. First, a regression of each endogenous variable on all exogenous variables in the system is used to determine the instrumented values for all endogenous variables. This phase, similar to the starting step of 2SLS, is crucial to be carried out in order to produce accurate parameter values. Next, the residuals previous step is used to calculate the matrix of variance for each structural equation. Consistent estimations of the covariance matrix and correct correlations between disturbance of equations are achieved at this phase. To conclude, the GLS estimation which replaces endogenous variables with estimates from the first phase and covariance matrices from the second phase are used to estimate the structural model.

To assess our model specification, we then use standard tests within the 3SLS model context. The F-statistic and p-value are reported for each specification to test the instrument joint relevance, assessing the problem of weak instruments. We report McElroy's R^2 of the system of equations as well. In addition, the Hansen-Sargan test for overidentifying restrictions is applied in order to evaluate the collective validity of these instruments and whether they are perceived as having exogenous characteristics. A type of test that is robust to heteroskedasticity and autocorrelation applied.

Our strategy of using a simultaneous equations modeling approach has a number of advantages. The main advantage is that it allows us to consider the potential problem of endogeneity given that the system of equations is estimated simultaneously. Another advantage of using this approach is that it allows us to explicitly consider the mediators through which MSME loan securitization affects bank stability, and identify the magnitude and direction of the impact.

4. Findings and discussions

Table 1 reports the results of estimating the structural model specified in Equation 1. Each column in the table shows the results of estimating a system of five equations for stability, risk, funding costs, liquidity and regulatory capital using MSME loan securitization as an exogenous variable. The estimate of McElroy's system R^2 is reported and the model explains 14.6% of the variation in dependent variables. To assess the effect of MSME loan securitization on bank stability, we focus on the coefficient on MSME ABS in the stability equation. The results from different specifications show that MSME loan securitization has a significant and negative impact on bank stability.

Table 1 - The Collective Roles of Mediators at Play in the Effect of MSME Loan Securitization on Bank Stability

	Coefficients	Standard Errors
The Stability of Banks: Z-score		
Constant	2.365***	0.134
The Risk-Weighted Assets Ratio	0.276***	0.284
The Interest Expense Ratio	40.651***	11.514
The Liquidity Ratio	-1.451***	0.337
The Tier 1 Leverage Ratio	11.236***	2.272
MSME ABS	-4.773***	0.445
Risk: The Risk-Weighted Assets Ratio		
Constant	0.483***	0.006
MSME ABS	0.193***	0.057
Funding Cost: The Interest Expense Ratio		
Constant	0.004***	0.001
MSME ABS	0.005***	0.001
Liquidity: The Liquidity Ratio		
Constant	0.226***	0.004
MSME ABS	-0.013***	0.036
Regulatory Capital: The Tier 1 Leverage Ratio		
Constant	0.051***	0.001
MSME ABS	0.112***	0.007
The Overall Fitness of Model		
Observations		1157
Banks		27
Instruments		6
McElroy R-Squared		0.146
Hansen-Sargan		0.476
Probability of F		0.000
Notes: ***, **, and * indicate statistical significance at the 1%, 5% and 10% levels respectively.		

The MSME ABS variable coefficients come out significant in all of the estimation results. However, the effects of MSME ABS activities on the mediators is much smaller, compared to its impact on the Z-score. For example, it shows that when the MSME ABS rises by 1%, then the risk-weighted assets ratio of the bank increases by 0.19%. Meanwhile, it indicates that when the MSME ABS rises by 1%, the Z-score of the bank decreases by 4.77%.

This finding applies for the other mediators as well. It indicates that when the MSME ABS rises by 1%, then the interest expense ratio of the bank increases by 0.005%. Moreover, an increase of 1% in the MSME ABS leads to an approximately 0.013% decrease in the liquidity ratio. It also shows that for a 1% rise of the MSME ABS, there is also a 0.112% increase of the Tier 1 leverage ratio.

The results indicate that the mediators collectively act to transfer their effects from the securitization activities of MSME loans to the stability of banks in equilibrium. It shows that when the risk-weighted assets ratio of the bank rises by 1%, then the Z-score of an MSME loan securitizer bank increases by 0.276%. Moreover, it also indicates that when the interest expense

ratio of the bank rises by 1%, then the Z-score of the bank increases by 40.651%. An increase of 1% in the liquidity ratio leads to an approximately 1.451% decrease in the Z-score. It also shows that for a 1% rise of the Tier 1 leverage ratio, there is also a 11.236% increase of the Z-score. There is no need of concern for the estimated models as demonstrated by the misspecification tests.

Overall, the results presented here expand on previous findings on the negative effect of securitization on bank stability. The examination of the collective acts of mediators provides an explanation on how MSME loan securitization affects bank stability. Identifying these mediators helps to design better securitization transactions. These findings provide some useful insights for banks. For example, banks can make good decisions regarding the amount of MSME loans to be securitized considering its effect on their stability. This decision will effectively help banks to use the MSME loan securitization facility in a more careful manner.

Although the literature has shown that securitization provides profitability benefits (Bakoush et al., 2019), previous evidence documented regulatory initiatives to support the MSME segment had influenced adverse selection and moral hazard in the MSME loan securitization market (Albertazzi et al., 2021). In line with that, the analysis in this study shows that bank stability decreases with the existence of a first-loss piece and the poor quality of the MSME loan portfolio remaining on the balance sheet. The scope of this research can only determine the implications of MSME loan securitization and bank stability in the US and Europe.

5. Conclusions

This research is the first study to look at the effect of MSME loan securitization on bank stability, while also accommodating the collective roles of mediators: risk, funding costs, liquidity and regulatory capital. The empirical test results show that MSME loan securitization activities have a destabilizing effect for banks. The mediation model provides an adequate representation of the effect of MSME loan securitization on bank stability. The results also show that risk, funding costs, liquidity and regulatory capital act as mediators. In sum, it can be concluded that through a set of mediators, MSME ABS activities transfers its effects to the stability of banks.

These findings may support current regulatory initiatives to address this weakness in the post-global financial crisis securitization market. One such initiative is the ECB's guidelines for securitization which are increasingly simple, transparent and standardized (Klein et al., 2021). This guide aims to reduce information asymmetry between markets and banks by improving the securitization structure and transparency of the underlying assets. The guide also aims to promote responsible securitization through measures that align the interests of issuing banks and investors. This guide requires banks to provide loan rate information for ABS when used as collateral.

Therefore, further study shall contribute to the ongoing debate on the other regions or crisis roles (e.g., the Covid-19 pandemic) in the impact of MSME loan securitization activities on bank stability. Thus, future research may also expand the analysis of this study to examine different types of securitization. In line with that, analysis of various asset classes can provide broader insights into how the “*skin in the game*” might impact bank stability.

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Appendix A. Summary of variables

	Definition	Source
The Stability of Banks		
Z-score	The natural logarithm of each bank sum of equity ratio and return on assets, divided by the standard deviation of its return on assets, over the past four quarters	S&P Capital IQ
Risk		
The Risk-Weighted Assets Ratio	The risk weighted assets to total assets ratio	S&P Capital IQ
Funding Cost		
The Interest Expense Ratio	The bank's interest expense in proportion to its total liabilities	S&P Capital IQ
Liquidity		
The Liquidity Ratio	The proportion of cash and securities to total assets	S&P Capital IQ
Regulatory Capital		
The Tier 1 Leverage Ratio	The bank's Tier 1 capital in proportion to its total unweighted assets	S&P Capital IQ
Securitization Activities		
MSME ABS	The outstanding balance of securitized MSME loans in proportion to total assets	ED, S&P Capital IQ

Appendix B. Descriptive statistics

	Observations	Mean	Standard Deviation	Maximum	Minimum
The Stability of Banks					
Z-score	1157	3.362	1.312	6.259	0.242
Risk					
The Risk-Weighted Assets Ratio	1157	0.500	0.183	1.214	0.170
Funding Cost					
The Interest Expense Ratio	1157	0.004	0.003	0.014	0.000
Liquidity					
The Liquidity Ratio	1157	0.225	0.113	0.506	0.018
Regulatory Capital					
The Tier 1 Leverage Ratio	1157	0.058	0.025	0.210	0.018
Securitization Activities					
MSME ABS	1157	0.064	0.092	0.494	0.000