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Original Research Article

Can Securitization Enhance Financial Stability? (Case of the I.R. of Iran)

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As a mechanism to enhance financial system stability and a process that allows banks to change their role from traditional lenders to originators and distributors of loans, securitization reduces the dependence on customer deposits. Also, it expands lending capacity, manages banks credit risk, and transforms illiquid assets into saleable securities. In this research, GMM method in three formats is used for the 16 selected Iranian banks. Results show that real sector growth positively and significantly increase financial stability in the Iranian economy. This is because of the economic scale augmentation and its impact on creating new financial resources. Meanwhile, the non-performing loans ratio significantly diminishes banking stability as well as it lowers banks' capacity to generate revenues from intermediary activities. Moreover, return is affected by the inflationary conditions which heightens revenue making and equity factors in banks' balance sheets. In order to generate higher revenues and gain upper profits, banking resources are occasionally withdrawn to enter other financial markets. Loans to deposits ratio, representing the credit risk in banking systems, denotes that higher risk in credit areas exacerbates financial stability due to the higher probability of risk appetite in generating loans to the general public. Also, security size highlights that although it is expected that securitization augments the financial stability in the banking system, other indicators would also be influential on financial stability. In other words, the higher the security size, the bigger its impact on banking stability. Furthermore, Lending capacity augments as a result of risk management and transforming illiquid assets into saleable securities.

Keywords: Securitization, Financial Stability, Banking System**.**
JEL Classification*:* G21, G28, G32, R30

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1 Introduction

Dissimilar to price stability, financial stability seems tough to interpret or measure. Interdependence between different elements' interaction in a financial system with the real economy would make it further complicated. Degree of financial stability can be monitored as well as the causes of financial stress in line with effective communication in order to enable policy makers. (Gadanecz and Jayaram (2008)).

The definitions are more abstract and include the macro-economic dimension of financial stability and interactions between the financial and real sectors. From this perspective, financial stability can be defined as "a condition in which the financial system – comprising financial intermediaries, markets and market infrastructure – is capable of withstanding shocks and the unraveling of financial imbalances, thereby mitigating the likelihood of disruptions in the financial intermediation process which are severe enough to significantly impair the allocation of savings to profitable investment opportunities" (ECB (2007)).

Securitization is located in the external financial system since most of the financing occurs, which could not happen from the households or firms (internal financial system) but arises from outside the household and firm context. (Figure 1)

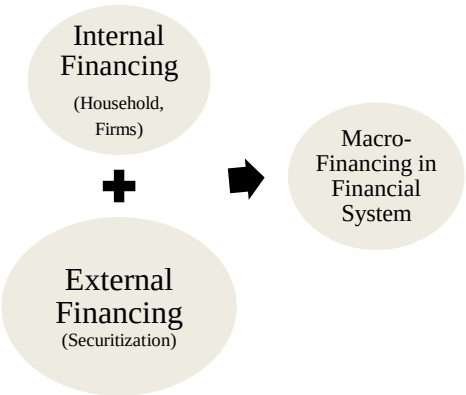

Figure 1. Securitization in Financial System

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Securitization is a process where cash-generating financial assets (such as mortgages, corporate loans, auto loans, or credit card receivables) – are packaged and sold to third parties as securities that have different risk profiles from the original underlying assets. In addition, cash flows of these underlying assets are directed to support the payments on the created securities (Deku et al. (2019)). It is a process by which securities are generated by a special purpose entity (SPE) and issued to investors. This gives right to payments supported by the cash flows from a pool of financial assets held by the SPE (BIS (2011)).

As a financial technique, securitization allows the issuer to modify a set of non-liquid rights that are subsequently traded in the market. Securitization also acts as a mechanism for transferring risk. The transactions are typically divided into different tranches with differing risk-return characteristics and a hierarchical structure; low, medium, and high risk correspond to senior, mezzanine and equity tranches. Several good reasons justify the importance of studying the effects of securitization. First, from the regulators' point of view, relevant and soundly based regulations should help restore market confidence in securitization. Second, this kind of study enables investors and future shareholders to better evaluate their positioning and reduce asymmetries of information. In addition, from the point of view of the originating entities, the knowledge regarding how their securitizations affect their risk-taking strategy is also highly important. Finally, because of the way in which financial activity takes place, there must be a structured, efficient market that offers the right levels of liquidity (Iglesias-Casal, A. (2020)).

Meanwhile, dividing the financial assets into tradable and non-tradable ones turns the definition of securitization back to normal as it emphasizes altering the non-tradable division into securities in order to raise having access to funds based on specific order which can be issued to the investors. It can also be transacted on capital markets. The orders by the payment division and the mechanisms regarding credit enhancement in line with giving various credit risks would be customized based on the risk appetite of the investor. Consumers of financial credits and lending with respect to mortgage made the terms securitization a key tool for substituting other sources, leading to a rise in the global growth relevant to the products that would be securitized in the developed market economies. Financial crisis during 2007-2008 highlights an appropriate example of the United States where a value percentage of trillions of loans and credits was subsidized by private securitization. Primary lenders supplied a private securitization, including a considerable percentage of lending related to commercial and non-commercial loaning and credit

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financing. Major concerns appeared from liquidity limitations in the secondary market as well as the primary insurance e.g. about 3.6 trillion loans and consumer credit would be financed by securities issued. During the crisis, when declines occurred, nations including the United States, Canada, Japan, and the European countries would be affected by the substantial failures.

Furthermore, pro-cyclicality in the financial systems could not be leveraged unless by the swings in economic activity as well as the role of failure in the relationship between savers and investors. It could also be the cause of financial developments, which strengthened the momentum of the underlying economic cycles where developments in the financial sector have played a major role in shaping macroeconomic outcomes in a wide range of countries in recent decades. The necessity to adjust the stability of the financial system and strengthen the permanency in the macroeconomic framework led to concerns to alter risk-related actions, accounting benchmarks, and regulations.

One major issue about securitization is the effect of collateral value on the power to raise money from different sources, mainly from various markets such as the debt market or stock market under a bigger term called the capital market. The value of guarantee makes it possible to obtain funding from the banking system, debt market, and the stock market, i.e., the power to finance is directly relevant to the collateral value. Provide that the value of collateral increases due to inflation, higher value makes it possible to acquire more funds to accelerate economic and financial cycles though it would be one aspect of creating the prevalent financial instability.

In this paper, we examine the impact of securitization upon financial stability in the Iranian banking system. Section one includes an introduction about financial stability and securitization and facts and figures in line with the literature review and empirical research respectively in sections two, three, and four, respectively. Samples, models, and variables are presented in section five, plus model specifications in line with the tests and empirical results which are highlighted in sections six and seven, and concluding remarks are finally presented in section eight.

2 Facts and Figures

Securitization in the Iranian banking system has mainly occurred through the banking system and facilitating financial resources by banks deposits. However, establishing institutions, instruments and creating new financial markets following the rules and regulations in 2005 paved the way to issue securities. Achieving the goals, stock market authorities found a way to make

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varieties in financial instruments by developing capital markets and finding solutions to orient liquidity to the market. According to figure 2, asset securitization in the selected Iranian banking system grew approximately from 3 percent in 2011 to 86 percent in 2020 denoted a considerable securitization capacity in the capital market.

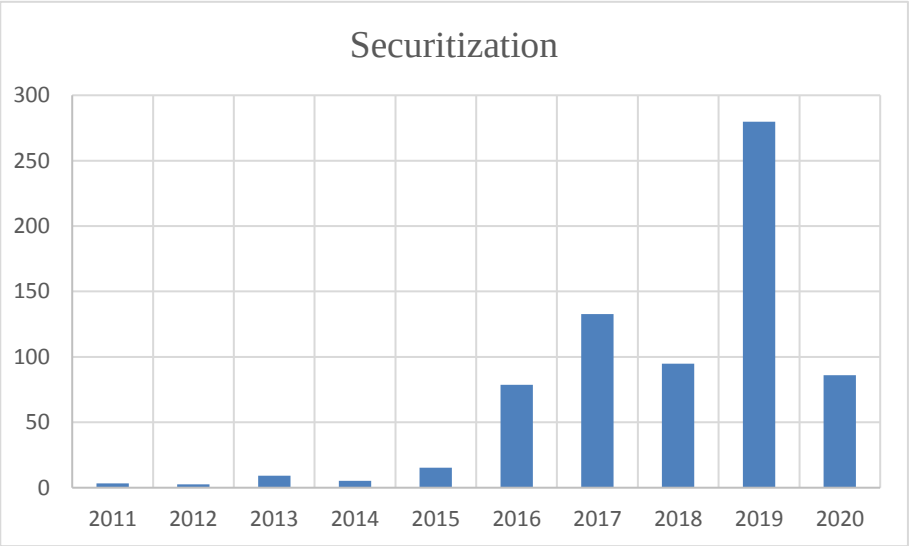

Figure 2. Asset Securitization Growth in Iran

The ratio of Mortgage-Backed Securities on the value total securities issued in 5 years (figure 3) denotes the fact that financing infrastructures were established at the beginning of the past decade to augment types of securities, especially Mortgage-Backed Securities. This is because it differentiates financial instruments in the Iranian capital market, reporting 4 percent in 2006 to reach 12 percent in 2010.

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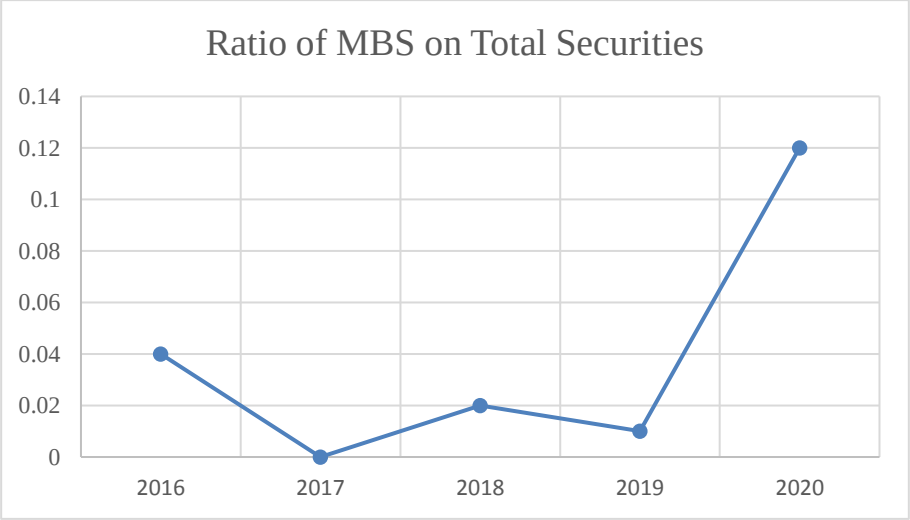

Figure 3. Ratio of MBS on Total Securities

The trend also highlights that securitization diminished the reliance on financing mechanisms on deposits. It heightened lending capacity in line with managing banks' off-loaded credit risk and transforming illiquid assets into saleable securities. It means that financial resources released through securitization led to the higher qualification of the financial system, which locates in the external financial system because most of the financing arises from outside households and firms contexts.

3 Literature Review

Demand for purchasing real states after World War II pressured banks and other financial institutes for mortgage loans, so banks attempted to follow various ways to obtain funds in order to respond to the increasing demand (Martellini et al. (2003)). Deposits were targeted to finance loans; therefore, funding sources were limited to the funds received from economic agents as deposits. Demands for modern financial instruments convinced banks to enter the capital market to utilize securities for financing issues mainly backed by different assets, specifically mortgage back securities.

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3.1 Involvement in Securitization

Crisis 2007-2008 could be aggravated as A result of the conflicts of interests among the beneficiaries in the debt market, which could have opposing and inadvertent impacts. Since the crisis, involvement in securitization at its innate situation has encompassed diversified interests from the issuers to the investors as well as enticements they include; however, outlook to the post-market conditions prior to the crisis could be effective, which might describe the prevailing violations in the target market that would expect to be securitized. In addition, the progress made in the markets before the crisis could be misleading since market participants would not be able to guess what might be occurring after the crisis to adjust their decisions and inducement.

Moreover, variation relevant to the transfer and cost as well as creating revenue has been comprised based on key enticements in line with the assistance from regulatory issues and accounting modules. In this regard, investments could be varied with an approach of response according to the risk-weighted returns along with the securitization subject to the risk appetite level of the investors as well as holding the prudential benchmarks to turn debts back to normal investment purchases (BIS (2011)).

Three areas would extensively be highlighted in the literature on securitization and its impact on the performance of the financial institutions, including the facts about incentives, the role of product complexity and rating arbitrage, and finally, credit ratings (Figure 4).

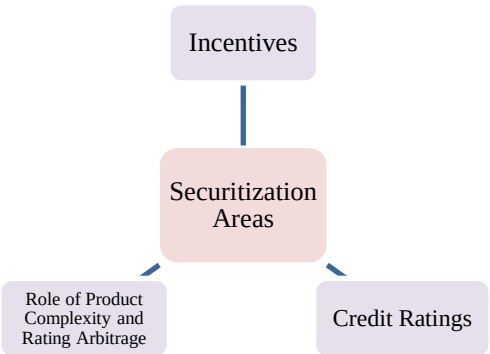

Figure 4. Securitization Areas in the Literature

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3.2 Securitization Context and Potentials

Facts that have led originators to securitize assets and the potential for conflicts of interest between the intervening parts in a securitization chain would mainly contribute to the motivations. In order to test the existence of incentives to pursue regulatory capital arbitrage, the literature has usually considered two working hypotheses.

First, security organizers who aim to exploit capital arbitrage opportunities should retain large portions of the riskiest assets. Second, the presence of this motive should imply a negative relationship between capital ratios and securitization volumes since those institutions facing binding or nearly binding capital requirements would have stronger incentives to securitize. A good example could be the study on Securitized mortgage loans which were analyzed in the United States from 1995 to 1997 to find that these mortgages have experienced lower ex-post defaults than those retained by the originating institutions in their portfolios (Ambrose et al. (2005)). Similar conclusion using more recent US mortgage origination data (2004 to 2008), as did Benmelech et al. (2009) in the market for collateralized loan obligations (CLOs). These findings could be equally consistent with the idea that banks securitize assets for arbitrage or, alternatively, with the presence of reputational concerns, as both would predict that securitized loans should have lower default rates than loans retained by originators (Agarwal et al. (2010)). Exploiting a more data set covering the period 2000-2007 of "private-label" securitization transactions (i.e., excluding government-sponsored enterprise transactions) and finding the opposite evidence to that reported by Ambrose et al. (2005) and Agarwal et al. (2010), Krainer and Laderman (2009) which means original lenders tend to retain the least risky loans which, in principle, would be at odds with the regulatory capital arbitrage motive.

3.3 Securitization, Credit Rating and Complexities

clues from the research conducted by the International Monetary Fund (2009) highlights the fact that before the collapse of the securitization market in 2007 and 2008, asset-backed securities (ABS) and covered bonds offered between 20 and 60 percent of the funding for new residential mortgage loans originated in the United States, Western Europe, and Australia. Moreover, the securitization mandate relevant to re-establishing sustainable securitization markets has been high on the agenda of the Group of Twenty (G20), the Financial Stability Board (FSB), and other international organizations and national governments since the onset of the crisis. In other words, The FSB's November 2010 report to the G20 leaders, e.g., noted, in particular, that re-

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establishing securitization on a sound basis remains a priority in order to support the provision of credit to the real economy and improve banks' access to funding in many jurisdictions. Furthermore, the report streamlines that surveys have been implemented upon prospects for securitization that securitization markets will recover in the medium term as well as recovery was already evident. However, investor demand remained lackluster, and activities were confined to a limited number of active investors (BIS (2011)).

4 Empirical Research

Minton et al. (2004) analyze US 1993 to 2002 private-label transactions to test whether securitization was then driven by efficient financial contracting (i.e., aimed at reducing the overall firm's financing costs) or regulatory arbitrage. Their findings provide stronger support to the former hypothesis; that is, the main reason for banks to securitize over that period was the reduction in financial distress costs rather than the exploitation of regulatory arbitrage opportunities (BIS (2011)). Interestingly, the authors compare various types of financial institutions facing different financing costs and risk levels to find those unregulated financial companies and investment banks are more likely to securitize when compared to commercial banks and savings institutions. Since the former are not subject to the same capital requirements whereas the latter face lower costs of financial distress (due to implicit or explicit public guarantees, like deposits guarantee schemes), they conclude that regulatory capital arbitrage was not the main driver of securitization in the sample. Bannier and Hänsel (2008) use a research strategy in line with that of Minton et al. (2004) but analyzed CLOs issued by European banks from 1997 to 2004. They find that securitization seems especially appealing for banks with high levels of risk and low liquidity, which, according to their study, are the main explanatory factor for the decision of whether to securitize and by how much.

Martin-Oliver and Saurina (2007) employ data from Spanish financial institutions (commercial banks, saving banks, and credit cooperatives) covering the entire boom period that preceded the crisis. They show that, on average, the regulatory capital arbitrage motive was not a key motivation for the banks when deciding whether to securitize, but once they had decided to do so, those with low levels of capital tended to issue a larger amount of securitized assets in order to raise their capital ratios. Cardone-Riportella et al. (2010) and Agostino and Mazzuca (2009) find similar results that point towards the relatively low importance of the regulatory capital arbitrage motive for Spanish and Italian banks, respectively. Other possible reasons that could help rationalize the rapid growth of securitization from the supply side

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have been empirically analyzed to a lesser extent. Dechow and Shakespeare (2009) examine US transactions between 1987 and 2005 and conclude that accounting "window-dressing" is an important side-benefit of securitization – "gain on sale" treatment increases earnings and reduces leverage. On the other hand, Krahnen and Wilde (2006), Hänsel and Krahnen (2007), and Uhde and Michalak (2010) conclude that the European issuance of collateralized debt obligations (CDOs) tends to raise the systematic risk (equity beta) of originating banks in Europe. This evidence, coupled with evidence that it was common for European security issuers to retain some of the risk associated with their transactions, implies that credit risk transfer was not an important securitization driver (BIS (2011)).

About the role of product complexity and rating arbitrage, scales denotes that despite the rapid growth of securitization over the last expansionary phase of the world economy, there persist some uncertainties around the specific motives that led financial entities securitize on such a large scale. The literature in this field has tried to identify quantitatively the relative importance of a number of motives to securitize: credit risk transfer, loan portfolio diversification, an increase of liquidity or funding, reduction of financial costs, regulatory capital arbitrage, improvement of profitability or performance, fee income rising, etc. (Borio et al. (2001), BIS, (2011)).

Borio et al. (2001) examined the concerns about the financial system's pro-cyclicality and unnecessarily amplifying swings in the real economy and discussed possible options for policy responses. The intention would not be to formally model the complex interactions between the financial system, the macro-economy, and economic policy. Rather, they had the more modest goal of stimulating discussion on some of the key linkages between developments in the financial system and the business cycle. Moreover, the main focus was on the intrinsically difficult issues of how risk moves throughout a business cycle and how policymakers might respond to reduce the risk of financial instability and attendant macroeconomic costs that can arise from the financial system's pro-cyclicality.

Carlson and Mitchener (2005) studied branch banking, bank competition, and financial stability to argue that branching stabilizes banking systems by facilitating diversification of bank portfolios; however, previous empirical research on the Great Depression offers mixed support for this view. Analyses using state-level data find that states allowing branch banking had lower failure rates, while those examining individual banks find that branch banks were more likely to fail. Also, it is argued that an alternative hypothesis can reconcile these seemingly disparate findings. Data on national banks from the

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1920s and 1930s shows that branch banking increased competition and forced weak banks to exit the banking system. This consolidation strengthens the system without necessarily strengthening the branch banks themselves. The empirical results suggest that the effects that branching had on competition were quantitatively more important than geographical diversification for bank stability in the 1920s and 1930s.

Fiordelisi and Mare (2014) examined competition and its effect on the stability of cooperative banks, highlighting that cooperative banks are a driving force for socially committed business at a local level, accounting for around one-fifth of the European Union (EU) bank deposits and loans. Little is known about the relationship between bank stability and competition for these small credit institutions despite their importance. The dynamic relationship between competition and bank soundness (both in the short and long run) is assessed in the European cooperative banking between 1998 and 2009, which obtained three main results. First, the competition-stability view proposed by Boyd and De Nicolò (2005) was supported. Bank market power negatively Granger-cause banks' soundness, meaning a positive relationship between competition and stability. Second, evidence of the negative impact of the 2007-2009 financial crisis is provided on the individual risk exposure of cooperative banks, although it does not change the relationship between competition and stability. Third, it is shown that herding behavior positively affects bank soundness. The study's findings have had important policy implications for designing and implementing regulations that enhance the overall stability of the financial system.

Ballesteros and Dulay (2013) draw lessons from international practices to determine the feasibility of developing mortgage-backed securitization (MBS) to expand housing finance to the underserved market in the country. Despite the risks of securitization, as evidenced by the recent US subprime crisis, the huge beneficial effects of opening up the capital market to individual investors and borrowers that were previously out of reach are well-acknowledged in literature. Several countries developed MBS to facilitate and promote housing finance. According to the study, the international best practices show that efficient securitization can be established based on: (1) clear regulatory framework; (2) prudent underwriting and valuation process; (3) reliable credit rating companies to mitigate moral hazards and adverse selection risks; and (4) the need for originators to have adequate capital so that warranties and representations can be taken seriously. In particular, the US subprime crisis highlights a major lesson that needs to be avoided: the use of securitization as

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a tool for balance sheet arbitrage instead of funding and investments in the real economy.

Deku et al. (2019) systematically reviewed the empirical literature to investigate whether and how securitization influences bank behavior and its implication on financial stability, where results indicated that in the years preceding the 2007-2009 financial crisis, banks with higher credit and market risk were more likely to securitize assets. Banks became riskier and increased systemic risk as they took advantage of securitization in order to obtain capital relief. Robust evidence denoted that mortgage securitization led to a deterioration in bank lending standards via weaker screening, lower denial rates, and misreporting of credit quality. For corporate loans securitization, the literature's findings on lax bank lending were inconclusive. However, securitization resulted in poorer ex-post bank monitoring of corporate borrowers.

5 Samples, Model, and Variables

5.1 Sample

In this study, we examine the impact of securitization on banks stability through a limited number of studies that have focused on the effect of Loan security on banking stability in developed countries and developing ones. For this reason, a sample of the selected Iranian banks has been chosen for developing countries, and the effect of security issuance on banking stability is examined. The period 2006-2019 has been chosen to investigate the impact of Loan security on banking stability for 13 years. In our research, secondary data is used for corporate governance indicators and financial statements for other indicators. Our sample is focused on 16 selected private-owned banks.

5.2 Variables

5.2.1 Dependent Variable

One of the most obvious indicators of bank stability is Z_ Score, which denotes a proxy bank stability using the natural logarithm of Z-score (for instance, in Iannotta et al., (2007); Laeven and Levine, (2009); Beck et al., (2013). We compute the Z-score at the bank-level as:

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$$\text{Zscore}_{ti} = \frac{\text{capital adequacy}_{\text{ti}} + \mu_{\text{roati}}}{\sigma_{\text{roai}}} \quad (1)$$

Where Zscore is banking stability, μ_{roa} is mean of ROA, σ_{roa} and is the standard deviation of ROA.

5.2.2 Explanatory Variables

The key explanatory variable used in this study is the growth rate of securities from 2011 to 2020 based on the fact that a widespread opinion before the credit crisis of 2007/8 was that securitization enhances financial stability by dispersing credit risk. After the credit crisis, securitization was blamed for allowing the "hot potato" of bad loans to be passed to unsuspecting investors. Both views miss the endogeneity of credit supply. Securitization enables credit expansion through higher leverage of the financial system. Securitization by itself may not enhance financial stability if the imperative to expand assets drives down lending standards. The "hot potato" of bad loans sits in the financial system on the balance sheets of large banks rather than being sold on to final investors since the aim of financial intermediaries is to expand lending in order to utilize slack in balance sheet capacity (Shin (2008)).

5.2.3 Control Variables

Besides these two types of measures (dependent and independent variables), we follow the literature, which introduces a set of control variables in Table (1).

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Table 1
Definition of the variables

Variables	Indicators	Definition
Credit risk	Non- performing loan to loan loan loss reserve to total non-performing loan	
Liquidity risk	Liquid asset to total asset Loans to deposit	
Banking Industry	Bank size Cost to Income Interest Margin Equity to loan Return on asset Return on equity	Bank size is the logarithm of an asset. Interest margin is the loan interest rate – deposit interest rate.
Macroeconomics	Inflation GDP Growth Deposit interest	

6 Model Specification

Since in the research model (eq. 2), the dependent variable appears as a lag on the right side of the equation, we are faced with a dynamic panel data model. The general form of a dynamic pattern in panel data is as follows:

$$Y_{it} = \alpha Y_{it-1} + \beta X_{it} + \mu_i + \varepsilon_{it} \tag{2}$$

Which Y_{it} is the dependent variable, X_{it} are independent variables, μ_i is cross-section error factors and ε_{it} is cross-section error term *ith* factor at time t. When the dependent variable appears on the right side in a panel data model, OLS estimators are not compatible (Arellano and Bond, 1991). Then we must use 2SLS (Anderson and Hsiao, 1982) and Generalized Method of Moments (Arellano and Bond, 1991). The 2SLS estimation may yield large variances for the coefficients due to the difficulty in selecting tools, and the estimates are not statistically significant. Therefore, the two-step GMM method proposed by Arellano and Bond has been proposed to solve this problem.

$$Y_{it} - Y_{it-1} = \alpha(Y_{it-1} - Y_{it-2}) + \beta(X_{it} - X_{it-1}) + (\epsilon_{it} - \varepsilon_{it-1}) \tag{3}$$

That is, the first is differentiated to eliminate the effects of the cross-sections or μ_i respectively from the model and in the second step, the residuals in the first step are used to balance the variance-covariance matrix. In other words, this method creates variables called instrument variables to have consistent and unbiased estimates (Baltagi, 2005).

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GMM estimator compatibility depends on the validity of the assumption of serial correlation of error and tools. We use Arellano and Bond(1991), Arellano and Bover (1995), and Blundell and Bond (1998) tests. Arellano and Bond(1991) is a Sargan (J-Statistic) test that tests the validity of the tools. J-Statistic has χ^2 distribution. Arellano and Bover (1995) is a Serial Correlation Test that tests Second-Order Serial Correlation in First-Order Differential Error term.

In this test, the GMM estimator is consistent when there is no second-order serial correlation in the error terms from the first-order differential equation. Non-rejection of the null hypothesis of both tests provides evidence for the assumption of serial correlation and validity of the instruments. The GMM estimator is consistent if there is no second-order serial correlation in the error terms from the first-order differential equation.

We use three models to examine the effect of loan securities on stability.

Model(1)
$$Y_{it} - Y_{it-1} = \alpha(Y_{it-1} - Y_{it-2}) + \beta(X_{it} - X_{it-1}) + \delta(Trloan\ securities_{it} - Trloan\ securities_{it-1}) + (\epsilon_{it} - \varepsilon_{it-1}) \quad (4)$$

Model(2)
$$Y_{it} - Y_{it-1} = \alpha(Y_{it-1} - Y_{it-2}) + \beta(X_{it} - X_{it-1}) + \delta(Dss_{it} - Dss_{it-1}) + (\epsilon_{it} - \varepsilon_{it-1}) \quad (5)$$

Model(3)
$$Y_{it} - Y_{it-1} = \alpha(Y_{it-1} - Y_{it-2}) + \beta(X_{it} - X_{it-1}) + \delta(Dsc_{it} - Dsc_{it-1}) + (\epsilon_{it} - \varepsilon_{it-1}) \quad (6)$$

Where Dss and $Dsc$are respectively, dummy variable loan security*size and loan security*cycle. Size is1, if the size of the bank is more than the mean of the banking group. The cycle is 1, if the economy is booming. $Trloan\ securities$ is a dummy variable that if loan security is more than the critical threshold of loan security, $Trloan\ securities = 1$ and otherwise is $Trloan\ securities = 0$. We use Threshold regression to calculate the critical threshold of this variable.

7 Tests and Empirical Results

7.1 Unit root Test and Co-integration Test

To check whether our data is stationary, we use two types of Panel Unit Root tests: Common unit root test and Individual unit root test. As a common unit root process, we use Levin, Lin and Chu Panel Unit root test, and for

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individual unit root process we use three types of Panel unit root tests. The first is Lm, Pesaran, and Shin Panel unit root test, the second is Fisher type test, the ADF-Fisher Chi-square test, and the last is a Fisher type test, the PP-Fisher Chi-square Panel unit root test. At 5%, all variables except, Bank size, Loan to deposit, Inflation, GDP growth, Deposit interest, loan securities are stationary in Level and Individual Intercept. These variables are I(1).

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Table 2
Unit rate test

Variables	Levin, Lin, Chu	Im, Pesaran, Shin	Fisher-PP	Fisher- ADF
Loan Securities	-6.13119 (0.0000)	-5.78788 (0.0000)	146.517 (0.0000)	154.595 (0.0000)
Non-performing loan to loan	-8.43970 (0.0000)	-1.98308 (0.0237)	80.4101 (0.0405)	86.9245 (0.0131)
Loan loss reserve to total non-performing loan	-14.4555 (0.0000)	-4.63296 (0.0000)	97.1772 (0.0005)	134.179 (0.0000)
Loan to deposit	-2.71980 (0.0033)	.....	252.549 (0.0000)	385.083 (0.0000)
Liquid asset to total asset	-6.13594 (0.0000)	-5.76034 (0.0000)	77.3015 (0.0000)	82.3974 (0.0000)
Bank size	-7.11570 (0.0000)	-6.81424 (0.0000)	98.0571 (0.0000)	162.201 (0.0000)
Cost to Income	-3.17095 (0.0008)	-3.98745 (0.0000)	61.7401 (0.0000)	62.6079 (0.0000)
Interest Margin	-4.46632 (0.0000)	-4.15966 (0.0000)	55.6154 (0.0000)	54.6344 (0.0000)
Inflation	-2.16420 (0.0152)	.....	5.22871 (0.0732)	5.22871 (0.0732)
GDP growth	-2.97424 (0.0015)	.....	6.90373 (0.0317)	6.90373 (0.0317)
Deposit interest	-0.76864 (0.0000)	.....	6.66812 (0.0356)	7.11977 (0.0284)
Equity to loan	-34.6141 (0.0000)	-29.8938 (0.0000)	369.984 (0.0000)	612.548 (0.0000)

Note:
Null: Unit root
Levin, Lin & Chu Test: Assumes Common Unit root Process
Im, Pesran and Shin: Assumes individual unit root process
ADF-Fisher chi-square: Assumes individual unit root process
PP- Fisher Chi-square: Assumes individual unit root process
Probabilities for Fisher tests are computed using an asymptotic Chi- Square distribution. Automatic Lag Length selection based on SIC
Source: Research Findings

Because of non-stationary variables, we use three types of Panel Cointegration tests where the third is Panel Co-integration. At a 5% level of significance, the Pedroni residual co-integration test, Johnsen Fisher and Kao residual co-integration test reject the null hypothesis, which means variables

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have a long-run relationship. Details results are given in Table 3, Table 4, and Table 5.

From Table 3 -5, in every case of opportunity cost except in Panel V-Statistics, the null hypothesis is accepted at a 5% level of significance; otherwise, in all cases at 5% level of significance, we reject the null hypothesis of no co-integration. So the variables (dependence and independence) have a long-run relationship.

Table 3
Pedroni Residual co-integration test

Variables	Within-Dimension			
Dependent Variable	Z_score			
	V-Statistic	Rho-Statistic	PP-Statistic	ADF-Statistic
Bank size	2.505424 (0.0061)	-0.662972 (0.2537)	-5.894350 (0.0000)	-5.284111 (0.0000)
Loan to deposit	3.391860 (0.0006)	-2.42270 (0.0046)	-3.500869 (0.0002)	-2.594079 (0.0047)
Inflation	2.144699 (0.0025)	-2.700354 (0.0035)	-3.960839 (0.0000)	-6.359315 (0.0000)
GDP Growth	0.993513 (0.0098)	-38.254929 (0.0000)	-1.664090 (0.0480)	-1.917244 (0.0276)
Deposit interest	1.742457 (0.0711)	-2.321707 (0.0531)	-2.722347 (0.0032)	-1.824303 (0.0341)
Loan securities	-1.889245 (0.0532)	-2.011766 (0.0069)	-4.094617 (0.0000)	-5.718272 (0.0001)
Note: Null Hypothesis: No co-integration Trend Assumption: No deterministic intercept or trend Automatic lag length selection based on SIC				
	Between Dimension			
Bank size		1.168524 (0.8787)	-7.395618 (0.0000)	-7.155584 (0.0002)
Loan to deposit		-2.694564 (0.9965)	-3.520370 (0.0002)	-7.041133 (0.0000)
Inflation		-5.769644 (0.0000)	-7.723082 (0.0000)	-7.257211 (0.0000)
GDP Growth		-5.474123 (0.0000)	-3.714292 (0.0001)	-5.339575 (0.0000)
Deposit interest		-6.668110 (0.0000)	-4.558708 (0.0000)	-3.142787 (0.0008)
Loan securities		1.946255 (0.0462)	-5.683637 (0.0000)	-3.665032 (0.0001)
Note: Null Hypothesis: No co-integration Trend Assumption: No deterministic intercept or trend Automatic lag length selection based on SIC				

Source: Research Findings

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In Table 4, we use the Kao test. Kao's residual co-integration test also shows us for every case of opportunity cost at a 5% level of significance, we reject the null hypothesis of no co-integration, and for every case, P-Value 0.0000, which is highly significant, gives strong evidence that the variables have a long-run relationship. Number in Table 4 is T-Statistic, and the number in ( ) is Prob.

Table 4
Kao Co-integration test

Dependent variable: Zscore	**T-Statistic**	**Prob.**
Bank size	-1.302111	0.0964
Loan to deposit	-1.287495	0.0990
Inflation	-1.968668	0.0213
GDP growth	-4.504085	0.0001
Deposit interest	-3.002731	0.0000
Loan securities	-3.225270	0.0006

Source: Research Findings

In Table 5, we see for different opportunity costs in both Fisher trace test, and Fisher Max-Eigen test at most 1 variable has a long-run relationship.

Table 5
Johansen Fisher Panel Co-integration Test

Dependent variable	**Hypothesized No. of CE(s)**	**Fisher Stat* (from trace test)**	**Fisher Stat* (from Max-Eigen test)**
Bank size	None	163.7 (0.0000)	147 (0.0000)
	At Most 1	74.15 (0.0004)	74.15 (0.0004)
Loan to deposit	None	263.3 (0.0000)	229 (0.0000)
	At Most 1	111.9 (0.0000)	111.9 (0.0000)
Inflation	None	383.8 (0.0000)	314.5 (0.0000)
	At Most 1	210.2 (0.0000)	210.2 (0.0000)
GDP growth	None	336.7 (0.0000)	277.1 (0.0000)
	At Most 1	184.4 (0.0000)	184.4 (0.0000)
Deposit interest	None	288.8 (0.0000)	228.8 (0.0000)
	At Most 1	188.6 (0.0000)	188.6 (0.0000)
Loan securities	None	366.1 (0.0000)	354.8 (0.0000)
	At Most 1	129.4 (0.0000)	129.4 (0.0000)

*Probabilities are computed using asymptotic Chi-square distribution.
Source: Research Findings

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7.2 Empirical Results

These models can be estimated after confirming the existence of co-integration between variables without worrying about the problem of false regression. Before estimating the model using GMM, we used the F-Limmer test to choose between Panel data methods and the Pooled method. The null hypothesis is pooled model. According to the calculations of this study, the null hypothesis is rejected, and these models need to be estimated using panel data.

Table 6
F-Limmer test

	Cross-section F	**Cross-section Chi-square**
Model(1)	10.836847 (0.0000)	225.810121 (0.0000)
Model(2)	10.835111 (0.0000)	226.530996 (0.0000)
Model(3)	10.894077 (0.0000)	227.322187 (0.0000)

Source: Research Findings

Based on the results of threshold regression estimation, the critical threshold of loan securities is 23.70. So if loan securities > 23.70, then Trloan securities $= 1$

We investigate whether the state of corporate governance in the Iranian banking industry impacts three measures of bank risks management: credit risk management, liquidity risk management, and overall risk management. Table 7, indicates the results. The number in () is t-Test, and the number is significant.

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Table 7
Results

	Model(1)	**Model(2)**	**Model(3)**
Trloansecurities	-1.789982 (-3.801622) [0.0036]	…….	…….
Securities*size	…….	-0.283411 (-3.570253) [0.0091]	…….
Securities*cycle	…….	…….	0.004203 (3.048035) [0.0017]
Nonperforming loan to total loan	-0.040288 (-3.252820) [0.0086]	-0.027602 (-3.125418) [0.0003]	-0.034674 (-2.191922) [0.0480]
Loan loss provision to total loan	-0.028926 (-3.191609) [0.0482]	-0.047033 (2.246326) [0.0587]	-0.031685 (-2.194568) [0.0459]
Liquid asset to total loan	0.088627 (3.121096) [0.0034]	0.136617 (2.276387) [0.0231]	0.088797 (3.129842) [0.0597]
Loan to deposit	0.059830 (2.934735) [0.0059]	0.116735 (4.85455) [0.0000]	0.064288 (3.925379) [0.0558]
Inflation	-0.230225 (-3.439783) [0.02.5]	-0.153903 (-2.221096) [0.0252]	-0.203726 (-3.387436) [0.0088]
GDP	-0.157625 (-4.149933) [0.0010]	-2.580952 (-4.454209) [0.0000]	-0.112214 (-5.103679) [0.0175]
Interest margin	0.297274 (3.081127) [0.0354]	0.690005 (2.381542) [0.0032]	0.157332 (4.130435) [0.0003]
Zscore(-1)	0.926238 (4.341851) [0.0000]	0.820445 (3.015818) [0.0029]	0.912613 (4.284050) [0.0000]
R-square	0.982916	0.838723	0.88318
D-W	1.890225	2.339662	1.901506
J-statistic	7.371798	5.392068	7.210044
Prob(J-statistic)	0.000221	0.000597	0.001859

Source: Research Findings

Results indicate that the impact of securities growth on banking stability is negative and significant in the short term as well as the security size which highlights that although it is expected that securitization augments the

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financial stability in the banking system, other factors would also be influential or eradicates the anticipated effect of securitization on financial stability. Meanwhile, the non-performing loans ratio significantly diminishes banking stability since it lowers banks' capacity to generate revenues from intermediary activities and would stop banks from orienting financial resources to productive banking activities. A higher ratio of liquid assets gives banks opportunities to stabilize their returns and expenses and manage risks. Furthermore, inflationary conditions heighten and worsen return aspects and equity factors in banks' balance sheets. Banking resources exit banks to enter other financial markets for higher profits to generate higher revenues for the economic agents. Loans to deposits ratio represented as the appetite in banking systems denote that higher risk in credit areas exacerbates financial stability due to the higher probability of risk desire in generating loans to the general public.

8 Concluding Remarks

Securitization helps banking system and stock market in Iran to support one another where facilitated financial resources from loans repayment would be utilized again. Issuing securities is framed by rules and regulations in 2005 in line with creating new financial markets, institutions have been created in order to apply instruments. Iranian stock market authorities have considered this opportunity to make varieties in financial instruments through developing capital market and finding solutions to orient liquidity to the market. In this context, asset securitization started growing slowly in 2011 with its considerable capacity of 86 percent of total financing in 2020. Meanwhile, the Mortgage-Backed Securities ratio depicted financing infrastructure established to differentiate financial instruments in the Iranian capital market. Securitization diminished the dependence on financing mechanisms on deposits, strengthened the lending capacity, managed credit risk, and transformed illiquid assets.

Results of the study indicate that the impact of securitization is negative due to the structural elements in both the banking system and stock market because higher capacity of loans repayment is required to securitize. Real sector developments in the Iranian economy significantly increase financial stability due to the economic scale augmentation and its impact on creating new financial resources for the financial sectors. Security size highlights that although it is expected that securitization augments financial stability in the banking system, other indicators would also be influential. Meanwhile, the non-performing loans ratio significantly diminishes banking stability and

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lowers banks' capacity to generate revenues from intermediary activities. It would also stop banks from leading financial resources to productive banking activities. A higher liquid assets ratio gives banks opportunities to stabilize returns and expenses and manage risks. Moreover, return is affected by the inflationary conditions, which heighten revenue-making as well as equity factors in banks' balance sheets. Loans to deposits ratio representing the credit risk in banking systems, denotes that higher risk in credit areas exacerbates financial stability due to the higher probability of risk appetite in generating loans to the general public. Reliance on customer deposits by using securitization is diminished to expand lending capacity as well as managing banks' credit risk and transforming illiquid assets into saleable securities. The higher the security size, the bigger its impact on banking stability.

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