Securitization and Monetary Transmission Mechanism: Evidence from Italy (1999-2009)

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Abstract: - This paper investigates credit supply endogeneity in the Italian environment from 1999 to 2009. The study aims to shed more light on the relationship between securitization and the Italian monetary transmission mechanism during the two most recent financial crashes: the dot-com bubble burst (1998-1999) and the sub-prime mortgage crisis (2008-2009). Recently many works are focused on how securitization affects the relationship between credit channel and monetary policy. Altunbas *et al.* (2009) conclude that banks' securitization increases loans supply insulating banking system from negative shocks of monetary policy. The empirical results show that securitization increases credit supply endogeneity reducing the effect of monetary policy on the Italian banking system.

Key-Words:-banking behavior, monetary transmission mechanism, securitization, credit supply endogeneity, economic cycle

1 Introduction

During the last ten years European and American banks significantly increased their securitization activity moving towards a more marked-based financial system. These effects modified the monitoring function of banking system [33, 48]. Securitization became very significant in Italy since the introduction of the Law 130/99. In the last ten years Italy became one of the main European countries that securitized more. Between the 2001 and 2005, the Italian market was one of the most active in EMEA (Europe, Middle East, Asia) for issuance volumes of securitized assets. The issuance volumes remain significant since 2001 and do not fall never below the threshold of 30 millions of euro. With respect to the asset classes in the year following the introduction of the Law 130/99 there were mainly securitized Non Performing Loans. In 2009 the issuance volumes of self-securitization have consistently been significant, especially for the group Intesa San Paolo (13 million of euro) and the Popular Bank of Emilia Romagna (1,9 million of euro). The reason which led the Italian banks to securitize are not still clear. From the point of view of the *originator* securitization can be seen both as a transfer and as a funding source. Securitization affects the traditional banking activity in obtaining liquidity [32]. In fact, if a project is illiquid, the underlying loan can be sold on the market by providing additional funding sources. In this way, securitization can make previous illiquid loans available and tradable to investors [5]. Loans securitization changes credit risk management. By using credit derivatives, the banking system can easily transfer credit risk from their balance sheets to other economic agents with a positive effect on loans supply. In this case banks could combine and diversify business portfolio's securities by assembling less liquid credits and modifying the way to lend. According to James and Stanton (1998), securitization increases in economic expansions and decreases in recessions with significant implications for credit channel. In fact, during upswing loans supply increases because banks are more willing to sustain risks and they increase securitization activity [18]. Contrarily, when economic conditions worsen, they increase banks' risk aversion. In this case, it reduces securitization and credit supply. This paper focuses on the effects of securitization on loans supply during downswings and upswings of the economic cycle. Banking peculiarities influence loans supply response to changes of monetary policy [5]. The impact of a restrictive policy on credit supply will be less for big, more liquid and more capitalized banks [53, 57, 64, 76, 77, 43]. The aim of this paper is to investigate the securitization activity, considering a panel of Italian banks during the period between 1999-2009, looking at the monetary

policy relationship in order to find empirical evidence of credit supply endogeneity [61]. It is also analyzed the effect of bank-specific variables (size, liquidity and capitalization) on loans supply and it is tested monetary policy effects adding the interbank interest rate [5]. For this analysis it is used Bankscope database of Borueau Van Dijck for bank-specific variables and Bondware database of Dealogic for securitized assets[1].The empirical estimation is performed using an approach similar to Angeloni, Kashyap and Mojon[2](2003). The dynamic growth equation is estimated taking the GMM estimator. The System GMM estimator is the benchmark and the robustness of main results is checked using different estimators (Difference-GMM, LSDV and OLS). The main contribution of this work is that securitization significantly affects credit channel, confirming the recent empirical studies, and highlights credit supply endogeneity in Italy [5]. In order to check the validity of this finding "securitization" variable and an interaction term between "securitization" variable and interbank interest rate are added to analyze two effects: **a)** Securitization increases bank liquidity[3] and reduces the banks' dependence from Central Bank [50, 75, 31, 63]; **b)** Banks use securitization to transfer part of credit risk to the markets reducing capital constraints [26, 41, 30] and loan loss provision [28]. This increases, *ceteris paribus*, loans supply. This paper is organized as follows: Section 2 briefly reviews the literature about securitization and analyzes the Italian securitization market. These institutional developments provide the basis for the subsequent econometric analysis. Section 3 describes the data, illustrates some methodological and econometric issues, implements the econometric model and discusses the implications of the results. Section 4 concludes and suggests direction for futures investigations.

[1] In this analysis only mortgages-backed securities (MBS) and assets-backed securities (ABS) are considered as securitized assets.

[2]Angeloni, Mojon and Kashyap (2003) use VAR model to analyze the monetary transmission mechanism in the Euro Area. The empirical results highlight an active role of Italian and German banks. In the analysis capital ratio and size indicator result not significant; on the contrary, liquidity indicator results positive and statistically significant.

[3]Banks use securitization to get funding sources that are not subject to deposit's insurance nor to required reserves' constraints.

2 Literature review

The passage from the "*originate and hold*" model (OTD) to the "*originate, repackage and sell*" model affected lending channel and securitization activity [58, 47, 5]. One part of the literature analyses the effects that securitization produces on banks' risks [34] and on loans supply [58, 47]. Other authors, however, consider the principal factors that lead a bank to securitize part of its portfolio. Despite the growth experienced by the securitization market, the specific characteristics of financial entities that lead them to a securitize are not clear, although previous studies identify three main motivations that reduces the importance of the bank lending channel of monetary policy [5] : **a)** *Liquidity as a new sources of financing*. The liquidity effect of securitization is particularly clear in cash transactions. The transfer of assets follows a true sale ("off-balance sheet") of the underlying portfolio to a special purpose vehicle (SPV). Through securitization the banking system obtains additional funding in satisfying credit demand [66]. In this way, it is possible to get great liquidity also if this alters the liquidity indicator. This mechanism has serious consequences on the credit channel. According to Romer and Romer (1990) if the banks increase without limits CDSs or other securities that are not subject to the reserves' constraints, monetary policy will not be effective. Recent empirical studies affirm that the need for liquidity is the principal determinant factor of securitization. **b)***Transfer of credit risk*. Securitization allows higher-risk financial institutions to originate and fund risky financial assets (mortgages, consumer loans, business loans) to minimize financial distress costs with a positive effect on loans supply. Actually, the use of more advanced techniques increased in the euro countries [5]. This happened for the standardization of assessment techniques that made easier the pooling and selling of loans mortgage. These institutions can use SPVs to remove loans from their balance sheet. Minton, Sanders and Strahan (2004) and Bannier and Hänsel (2008) affirm that securitization is used mainly as a risk-transfer and funding tool that allows a more efficient risk-sharing and liquidity transformation. A better credit risk management is reflected in a relaxation of constraint on banks' loans supply. **c)** *Arbitrage of regulatory capital*. Other studies, argue that banks securitize in order to reduce their capital requirements [66]. This fact exploits the possibilities for arbitraging the regulatory capital required under Basel I. The Basle II Agreement of 2008, corrects some of the weaknesses of Basel I. The possible reduction in the capital requirements is associated with the quality of

the underlying portfolio and with the amount of risk exposure, preventing possible arbitrage of capital. However, while the incentives to use regulatory capital arbitrage will shrink under the new framework of Basel II that uses risk-sensitive capital ratios, arbitraging may have contributed to the increase in securitization in the early years. Bannier and Hänsel (2008) argue that: banks with lower tier 1 capital securitize significantly less than banks with higher tier 1 capital. Another possible cause of the increased banking securitization is the search for improvement in the measures of entity's performance (ROE, ROA). During the crisis financial institutions and in particular investment banks were characterized by a growing debt ratio and a greater exposure to liquidity risk. The commercial banks that used securitization to reduce debts maximizing ROE[4] [65] were exposed to the same risk. According to Adrian and Shin (2008), during the crisis commercial banks maintained a constant use of leverage. Finally, the other factors that influence the decision of a financial entity to securitize are the banking peculiarities and economic conditions. In this case since securitization leads to significant fixed costs, it is expected that relatively large, less liquid and poorly capitalized banks securitize their loans and they are more insulated from negative shocks of monetary policy [13]. Regarding the economic condition, during upswing loans supply and securitization activity increase because banks are more willing to sustain risk [8]. Contrarily, when economic conditions worsen, it increases banks' risk aversion. In this case, they reduce credit supply and securitization. This paper will extend the literature existing on this topic on Italian environment, and it is intended to contribute to it, analyzing Italian banks in their decisions to securitize their assets and evaluating whether securitization activity affects the transmission mechanism of monetary policy via the bank lending channel.

2.1 The Italian securitization market[5]

Securitization was introduced in the Italian system in 1999 with Law n.130 modified with the addition of the articles 7-bis and 7-ter.[6]The Italian securitized issues, that increased rapidly between 1999-2011 reaching a peak in the year 2001 for the dot-com bubble and another peak in the year 2009 for the sub-prime crisis. After the year 2001 the Italian market was one of the most active in Europe after the United Kingdom. In the last years securitized issues were never lower than 30 million of Euro. The issuance volumes decrease of 12,5% after the year 2005. These dynamics were influenced by public securitized assets. In fact, separating these assets from the average value for each operation, a strong growth results between 1999 and 2008. During the year 2007, the Italian market, after a great activity of securitization, dropped both in number and in volumes' issues. Markets' turbulences start in the second half of the year 2007 with a trend towards lower ABS (asset-backed-securities) of - 4,6% million of euro with respect to the year before. In 2008, the Italian market was characterized by the self-securitization[7] for the refinancing operations. The issuance volumes between 2009-2011 dropped with respect to the peak of the year 2008. In 2009 the issuance volumes of self-securitization have consistently been significant, especially for the group Intesa San Paolo (13 million of euro) and the Popular Bank of Emilia Romagna (1,9 million of euro). With the introduction of the Law n.130 in 1999, there was an increase of the issues' number with a peak of 59 transactions placed. Another peak, with over 50 securitized assets, was between 2008-2009 for the sub-prime mortgage crisis due in Italy to self-securitization. The Italian securitized activities, between 1999-2001, were mainly characterized by credits in suffering: not performing loans (NPLs). These credits had a strong growth reaching a peak in the year 2001 with 16 issues of NPLs on 59 total securitized loans. With respect to the asset classes in the year following the introduction of the Law n. 130 there were mainly securitized NPLs with value equal to 2959 in the year 2000 and equal to 7142 in the year 2001. In the same years the amount of public securities were equal to 1350 in the year 2000 and equal to 7510 in the year 2001. Until the year 2005 public loans represent an important part of the Italian securitization market. The securitized public assets decreased from the year 2006, both in volumes and in number for the criterions fixed by Eurostat. After the reduction of public securitized assets, Residential mortgage securities (RMBS) became the main securitized assets in Italy. This happened after the growth of the mortgage

[4]The return on equity (ROE) measures a corporation's profitability by revealing how much profit a company generates with the money shareholders invested. It is expressed as a percentage of net income on shareholders' equity.

[5] The data and tables of this section are available upon request.

[6] Law n.80, 14th May 2005.

[7] The securities issue by the SPV are not collocated on the market but they are signed by the same banks. In this case the risk remains on bank's balance sheet.

residential securities. Comparing the Italian market with the principal European countries (especially the UK, Spain and Germany) after the introduction of the Law N.130 (1999), the Italian market is in the second place, following the United Kingdom. In the period between 2003-2005, Italy results in the third place after Spain. In the year 2006 Italy goes down to the fifth place for the smaller volumes of public securitization assets. Nevertheless, in the year 2008, Italy reaches a record level of volumes' issues obtaining the first place among the European countries. Finally, considering the Italian market in comparison with the other European/EMEA countries, Italy shows two characteristics: a scarce number of CDO securitization and the absence of Whole business Securitization (WBS). In this analysis only mortgages-backed securities (MBS) and assets-backed securities (ABS) are considered as securitized assets. According to Altunbas *et al.*(2009) in this paper it is analyzed the funding element of securitization rather than its overall credit risk transfer effect.

3 Data and Methodology

3.1 Econometric model, Sample and Data

The empirical literature about the estimation of this dynamic model started on Kashyap and Stein (1995), Ehrmann *et al.* (2003) and Ashcraft (2006) model. This work also considers the research conducted by Angeloni *et al.* (2003) and Altunbas *et al*. (2009). Using data on commercial loans of American banks in the period between 1997-2005, Hirtle (2007) affirms that a great use of securitization activity is associated to an increase of credit supply. Cebenoyan *et al.* (2004) and Goderis *et al*. (2006) found that the banks adopting advanced techniques of credit risk management increase of 50% loans amount. Finally, Loutskina *et al.* (2006) affirm that there is a positive relationship between securitization and loans supply. To test the impact of securitization on loans supply it is estimated the following model[8]:

$$\Delta \ln(L)_{i,t} = \alpha_0 \Delta \ln(L)_{i,t-1} + \sum_{j=0}^{1} \delta_j \Delta \ln(GDPN)_{t-j} + \sum_{j=0}^{1} \beta_j \Delta im_{t-j} + \gamma\, SEC_{i,t-1} +$$

$$+ \eta\, SIZE_{i,t-1} + \psi CAP_{i,t-1} + \lambda LIQ_{i,t-1} + \mu LLP_{i,t-1} + \sum_{j=0}^{1} \phi_j \Delta im_{t-j} * SEC_{i,t-1} + \varepsilon_{it}$$

With i = 1,..., N (banks number) and t = 1,...,T (final year).

[8] The dynamic specification is affected by the Italian banks characteristics. For customers became expensive to change banks that have a monopoly power [45, 5].

The model in levels could introduce problems of fixed effects and of unit roots that can be wash out by applying first differences given in this model[9]. The dependent variable is the growth rate of loans supply $\Delta \ln(L)_{i,t}$.[10] The banks-specific variables[11]are added at time t-1 in order to solve the endogeneity problem. The nominal GDP growth rate is included as control variable in order to check possible "country-specific" loans demand's changes for the economic cycle. In general, it is used to insulate loans supply changes to credit demand's movements. This variable is bank-invariant, it captures the relevant temporal effects and it represents the economic context common to all banks. Following Estrella (2005) and Altunbas *et al.* (2009) it is added securitization variable. The model specification includes an interaction term between Euribor interest rate variation and securitization variable. Finally, banks loan loss provision it is added as control variable and proxy of the banking risk ex-post [5]. This paper uses yearly data for a panel of Italian banks over the period 1999-2009. The use of yearly data allows for a larger sample, even if data are flawed by business cycle dynamic. The sample employed in this empirical research comprises all the Italian commercial banks, savings banks and credit cooperatives included in the Bankscope database during the period 1999-2009.This period also coincides, with a substantial expansion of the securitization activity in Italy, encouraged by a change in the regulation with the Law 130/1999. For that reason the present study is focused on the period from 1999 to 2009. Macroeconomic data as Euribor interest rate (interbank interest rate) on three months and nominal GDP growth rate[12] are taken from Datastream database. The *banks specific* variables are drawn from Bankscope database of Borueau Van Dijck[13]. Securitization data are drawn from Bondware Database of Dealogic. The advantage to

[9]Variables in levels by applying Dickey Fuller Test result integrated of order one. They became stationary with only one differentiation. This approach follows Kashyap and Stein (1995) to avoid problem of spurious correlation.

[10]Loans comprise credit granted by the Italian banking system to households and enterprises (non-bank private sector) excluding the interbank positions and the government. This series is not adjusted for securitization. The nominal loans growth rate can be approximated as:$\Delta \ln(\mathrm{LOANS}_{it}) = \ln(\mathrm{LOANS}_{it}) - (\mathrm{LOANS}_{it-1})$.

[11]Size, liquidity, capital ratio, loan loss provision and securitized loans.

[12]The nominal GDP growth rate can be approximated as: $\Delta \ln(\mathrm{GDP}_{it}) = \ln(\mathrm{GDP}_{it}) - \ln(\mathrm{GDP}_{it-1})$.

[13]The three bank-specific variables are added to exclude bias problems derived from omitted variables [36].

use this database is that the name of the originator, data of issuance and deal proceeds are registered. They are covered all ABS and MBS securities. Definition of variables are reported in Appendix 1.

3.2 Methodology and Results

The empirical analysis concerns the estimation of the dynamic model uses both the GMM estimators. The choice between the two approaches of GMM estimator has not established a priori. They are compared to assess which of the two produces more robust results. It is looked at different estimates, in order to find confirm of the fact that the DIFF-GMM is likely to be biased downwards, because of the persistency of loans supply growth rate's series. For the SYST-GMM to be taken as a benchmark, there are three conditions that will be analyzed: **a)** the SYST-GMM estimates must lie between the upper and lower bound represented by OLS and LSDV; **b)** efficiency; **c)** validity of the instrument set. The basic model includes loans supply growth rate and nominal GDP growth rate variables expressed in logarithms as measures of elasticity[14]. The panel is unbalanced with some banks having more observations than others[15]. The bank-specific variables and securitized loans are treated as potentially endogenous variables. The lags order is performed using the difference Hansen J test [17] T-2 lags are used for all variables. The presence of higher autocorrelation than first order indicates that some lags of the dependent variable, which could be used as instruments, are endogenous and invalid instruments. The coefficient of the lagged loans supply growth rate results significant, confirming the validity of the dynamic specification. This coefficient is equal to 0.89. It is a value between the fixed effects estimates (0.77) and the OLS estimates (0.98). In fact, in a dynamic model the OLS estimates are upwards biased and the LSDV estimates are downwards biased.

[14] In particular, the growth rate of nominal GDP can be approximated by the difference of the natural logarithm of the initial level and final level of GDPN. The same approximation is made for loans supply growth rate.

[15] The first difference transformation has a weakness. It magnifies gaps in unbalanced panels. For this reason orthogonal deviations are used [10]. Instead of subtracting the previous observation from the contemporaneous ones, it subtracts the average of all future available observations of a variable. This minimizes data loss.

Table 1: Results of baseline model (1999-2009)

Dependent Variable: $\Delta \ln(L)_{i,t}$	**DIFF-GMM One step**	**DIFF-GMM Two step**	**SYST-GMM One step**	**SYST-GMM Two step**
$\Delta \ln(L)_{i,t-1}$	0.9784***	0.9783***	0.898***	0.89***
	(0)	(0)	(0)	(0)
$\Delta \ln(GDPN)_{t-1}$	0.48**	0.44*	0.57**	0.54***
	(0.047)	(0.056)	(0.04)	(0)
Δim_t	-0.03***	-0.026*	-0.001*	-0.03**
	(0.009)	(0.071)	(0.07)	(0.04)
$SEC_{i,t-1}$	0.22***	0.21***	0.061***	0.01***
	(0)	(0)	(0.05)	(0)
$SIZE_{i,t-1}$	0.33***	0.34***	0.015**	0.02***
	(0.001)	(0)	(0.034)	(0)
$CAP_{i,t-1}$	0.005**	0.014**	0.001***	0.01***
	(0.01)	(0.015)	(0)	(0.001)
$LIQ_{i,t-1}$	0.055***	0.06**	0.01**	0.12***
	(0.006)	(0.048)	(0.03)	(0.01)
$LLP_{i,t-1}$	-0.013**	-0.014*	-0.003*	-0.01***
	(0.042)	(0.08)	(0.09)	(0)
$\Delta im_t * SEC_{i,t-1}$	0.01*	0.02**	0.03**	0.65***
	(0.063)	(0.045)	(0.05)	(0)
Hansen J Test[a]	0.03	0.02	0.87	0.78
AR(1)	0.01	0.009	0.012	0.04
AR(2)	0.8	0.54	0.5	0.48
N. Observations	1140	1140	1805	1805

Notes: In parenthesis p-values robust to the heteroskedasticity are reported. (*), (**), (***) represents, respectively, the statistical significance at 10%, 5% and 1% level. No-significant variables are excluded from the table. The p-value of the *two step* estimate includes the Windmeijer correction (2005). The critical value at the confidence level of 95% of the Difference Hansen J test is equal to 43.19 while the statistical test is equal to 7.57. In this case the null hypothesis of restrictions over-identification to assess the validity of the instruments can not be rejected and the instruments matrix is robust. It is reported the p-value of the statistic test.

The results reported in Table 1 are consistent with theoretical arguments against the DIFF-GMM and

supporting SYST-GMM estimator[16]. In the first and second column the DIFF-GMM estimates (one and two step) are shown while in the third and fourth column the results of the SYST-GMM estimator (one and two step) are given. The Hansen J test is reported in place of the Sargan test because it is not robust to the heteroskedasticity and to the autocorrelation. If the null hypothesis is accepted, the instruments are valid and the model's specification is correct. In the Table 1 the value of Arellano and Bond statistical test (1991) are also shown to assess first and second order serial correlation. As expected, the null hypothesis of not autocorrelation of the first order is rejected but it can not reject the hypothesis of no autocorrelation of the second order that it is a necessary condition to have valid instruments. The third and fourth column of Table 1 reports the results using SYST-GMM. The results of the two stages SYST-GMM estimator seem to be more efficient than one step results. Considering the coefficients of the lagged loans supply growth rate, the Arellano and Bond estimates show that the degree of persistence of this variable is very high and because the series is similar to a random walk the DIFF-GMM is likely to be upwards biased because of weak instruments. Looking at the autoregressive parameter of the lagged loans supply growth rate, the Blundell and Bond estimates are between the upper bound of the OLS and the lower bound of LSDV. So, the DIFF-GMM estimates result upwards biased. As a consequence, since the instrument set is tested to be valid and also the difference Hansen test confirms the validity of the additional level moment conditions the SYST-GMM estimator is taken as a benchmark.[17]In fact, the value of Hansen J statistic test for over-identifying restrictions confirms that the instruments set can be considered valid and the difference Hansen J test, which compares the DIFF-GMM and the SYST-GMM results, confirms the validity of the SYST-GMM estimator. The explanatory variables signs are consistent with those expected. In fact, GDPN has a positive sign because, if the economic conditions improve, the bank system reduces risk aversion increasing loans supply [52, 5, 72] Euribor interest rate, instead, has a negative sign because an increase of the Euribor interest rate reflects a restrictive monetary policy. In this case, ceteris paribus, the banks reduce their credit supply [23]. The sign of loan loss provision is negative because a greater loans' loss reduces profits, capital and credit supply[18] [76, 73 5]. Contrarily, the signs of securitization, size, capitalization and liquidity is positive because banks with a great securitization activity [38, 5, 74] of big size[19] [53, 55], more capitalized[20] [64, 57, 77, 4] and more liquid[21] [76, 55, 11] ceteris paribus, increase credit supply [43]. Finally, the sign of the interaction term between the Euribor interest rate and securitization results positive and statistically significant. In fact, ceteris paribus, if monetary policy is restrictive, loans' supply increases because of the securitization [38, 5, 74]. Securitization activity results positively related to bank lending channel. Italian banks that securitize their asset have a higher growth rate of credit supply. This result is consistent with the view of securitization as a source of capital relief and additional funding that can be used by banks to grant additional loans [38, 5, 74]. In, fact the Italian banks result more insulated from monetary policy shocks and liquidity bank constraint for their greater capacity to securitize loans. This finding confirms an active rule of Italian banking system versus monetary policy.

4 Robustness checks

Given the previous findings, it could be confident about the efficiency and precision of the SYST-GMM estimator to check the robustness of the

[16] All the estimates consider the robust estimator of the covariance matrix of the parameter estimates be calculated. The resulting standard errors are consistent in the presence of any pattern of heteroskedasticity and autocorrelation within panels. In two step estimation, the standard covariance matrix is already robust in theory but it typically yields standard errors that are downwards biased but they are corrected using the finite sample correction for the two step covariance matrix developed by Windmeijer [70].

[17] The Difference Hansen J test confirms the instrument's validity.

[18] Altunbas *et al*. (2009) show that the European banks with a lower loan loss provision will grant more credit than banks with higher loan loss provision. This depends on their lower reaction to a restrictive monetary policy and on a greater ease in obtaining uninsured funding. The negative effect of an increased risk on loans' supply reduces in upswings and vice versa [18, 60, 1, 21]

[19] Small banks suffer more of asymmetry information problems than big banks. They have more difficulty in obtaining non-insured financing if there is a restrictive monetary policy. This causes a reduction of loans' supply with respect to big size banks [53, 55].

[20]The poorly capitalized banks have limited access to external financing and have to cut more their loans, in case of tight monetary policy, as compared to the most capitalized banks [64, 57, 77, 5]. According to "*minimum capital requests*", banks can increase loans supply only if they increase their capital. Less capitalized banks will incur in high costs in the short term.

[21] More liquid banks can drawn their liquid assets to protect their loan's portfolio from negative shocks of monetary policy with respect to less liquid banks [76, 55, 11].

results in four ways. These cases support the previous findings: **1)** Adding to the model the interaction term of securitization and GDPN for the possible presence of the endogeneity between securitization and economic cycle [75, 38, 5]. This interaction term results positive and statistically significant while the other coefficient remain unchanged. This means that loans supply depends on economic cycle. In this case banks increase securitization and loans supply in upswing but this effect decrease in downswing. **2)** Excluding mergers[22]. The reason is the possible presence of bias derived from mergers and acquisition. **3)** Adding a dummy variable set (θ_t) to test whether the used macro-variables (nominal GDP and the indicator of monetary policy) capture important temporal effects. They are used also to capture relevant shocks on lending from loan demand shift. In this case macro-variable capture all the relevant time effects. **4)** Analyzing only the commercial banks and excluding the cooperative banks that could be more influenced by the transmission monetary mechanism[23][43]. According to many empirical studies the large banks securitize more than small banks [51, 13, 59]. The results confirm the robustness of estimates and they are shown in Table 2.

Table 2:Analyses of SYST-GMM's robustness (1999-2009)

Dependent Variable: $\Delta \ln(L)_{i,t}$	**(I)** **SECURTIZATION AND BUSINESS CYCLE**		**(II)** **TIME DUMMIES**	
	One step	**Two step**	**One step**	**Two step**
$\Delta \ln(L)_{i,t-1}$	0.89***	0.89***	0.89***	0.89***
	(0)	(0)	(0)	(0)
$\Delta \ln(GDPN)_{t-1}$	0.58**	0.45**	-	-
	(0.04)	(0.013)		
Δim_t	-0.01**	-0.03***	-	-
	(0.042)	(0)		
$SEC_{i,t-1}$	0.06*	0.01**	0.05***	0.05***
	(0.063)	(0.045)	(0)	(0)
$SIZE_{i,t-1}$	0.01***	0.02***	0.01***	0.02***
	(0)	(0)	(0)	(0)
$CAP_{i,t-1}$	0.002**	0.012***	0.01**	0.01***
	(0.002)	(0)	(0.05)	(0)
$LIQ_{i,t-1}$	0.01**	0.11***	0.01**	0.12***
	(0.029)	(0.003)	(0.04)	(0.004)
$LLP_{i,t-1}$	-0.02*	-0.012***	-0.03*	0.01***
	(0.05)	(0.009)	(0.06)	(0.001)
$\Delta im_t * SEC_{i,t-1}$	0.033*	0.55**	0.039**	0.68**
	(0.054)	(0.05)	(0.01)	(0.006)
$\Delta GDPN_t * SEC_{i,t-1}$	0.8*	0.28**	-	-
	(0.09)	(0.015)		
Hansen J Test[a]	0.57	0.86	0.85	0.89
AR(1)	0	0.0065	0.04	0.001
AR(2)	0.13	0.47	0.16	0.44
N. Observations	1805	1805	1805	1805

Notes: In parenthesis p-values robust to the heteroskedasticity are reported. (*), (**), (***) represents, respectively, the statistical significance at 10%, 5% and 1% level. No-significant variables are excluded from the table. The *p-value* of the two step estimate includes the Windmeijer correction (2005). The critical value at the confidence level of 95% of the Difference Hansen J test is equal to 43.19 while the statistical test is equal to 7.57. It is reported the p-value of the statistic test.

4 Conclusion

Securitization is a financial operation by means of which a financial entity transforms a non-negotiable asset, into a fixed-income instrument that is homogeneous, standardized and, consequently, can be traded on organized securities markets. Since the year 2000, securitization in Europe have multiplied in volume exponentially, growing from 78.2 billion euro to 711.1 billion euro in 2008. After the Law N°130/1999 Italy results the second largest securitization market in Europe, in terms of volumes issued. The use of the securitization as a mechanism in the search for liquidity and, therefore, as a source of additional financing, has been seen to increase from the beginning of the current financial crisis in August 2007. Thus, it can be seen that increasingly there are more entities that underwrite their own

[22] To obtain more information I have consulted the Explanatory Notes of each banks from Bankscope database of Bureau Van Dijck. The results of "excluding mergers" and of "commercial banks" are available upon request.

[23] The results of "commercial banks" are available upon request.

securitization programs in order to use them as a guarantee for obtaining resources in the auctions of the European Bank Central (ECB). The object of the present work is to learn more about what is the effect of securitization on monetary transmission mechanism in Italy and thus to meet a need for empirical findings to contribute to the existing literature. This paper underlines the great relevance that securitization has on economic performance of banks in Italy in the period 1999-2009.The empirical evidence confirms some earlier studies which suggest that the use of the securitization as a mechanism in the search for liquidity and, therefore, as a source of additional financing, have contributed to a change in the way banks grant credit to borrowers and react to a restrictive monetary policy [22, 11, 5]. This is due mainly to the technological progress and credit derivative market that supported securitization in Italy. In this paper, it is used a dynamic panel model to test the effect of securitization on loans supply growth rate. The estimation of a dynamic growth regression with panel data has the advantage of overcoming two problems: the omitted variable bias and the endogeneity of the right-hand side variables. The paper argues that SYST-GMM could be taken as benchmark, after having verified some conditions that should assure its superiority against the DIFF-GMM and the LSDV estimator. Nevertheless, GMM technique is developed for micro data and has asymptotic properties, so that the results should be taken with caution because of the finite sample and, thus, their robustness is checked using different estimators. The analysis highlights that securitization has a positive and significant impact on loans supply growth rate and in particular the interaction term between securitization and Euribor interest rate is positive and statistical significant with important implications for the monetary transmission mechanism. In sum, this paper underlines the great relevance that securitization has in Italy and investigates the effect that securitization has on loans supply growth rate, finding support for the reduction of liquidity bank constraint because of securitization. Loans supply level is increased by securitization, while the impact of monetary policy is reduced by this activity because of the instability that securitization generates. As a consequence, what really matters for credit supply-monetary policy nexus is the liquidity constraint and the instability that securitization creates. This means that through securitization the banking system in Italy became active against the monetary policy obtaining additional financing sources. This is only part of the work that should be done in this research area. Further developments require a careful inclusion of: 1) a more detailed investigation of securitization effects in other countries as United States in which the impact of securitization was relevant during the last crisis; 3) the effect of risk aversion on the relationship between credit supply growth and securitization including a measure of this index; 4) considerations of moral hazard and incentives, along with a careful analysis of risks due to a rising securitization activity.

Appendix 1: Definition of variables

Bank's dimension is built as log of the total assets[24] [53, 55]:

$$SIZE_{i,t} = \text{Log A}_{\text{it}} - \frac{1}{\text{N}_{\text{t}}}\sum_{\text{i}} \text{LogA}_{\text{it}}$$

Bank's liquidity is built as the sum of liquid assets (securities, interbank loans and currency) on the total assets [76, 55, 11]:

$$LIQ_{i,t} = \frac{L_{it}}{A_{it}} - \frac{1}{T}\sum_t (\frac{1}{N}\sum_i \frac{L_{it}}{A_{it}})$$

Bank's capital ratio is built as total capital on the total activities[25] [64, 57, 77]:

$$CAP_{i,t} = \frac{C_{it}}{A_{it}} - \frac{1}{T}\sum_t (\frac{1}{N}\sum_i \frac{C_{it}}{A_{it}})$$

Securitization is built as securitized loans in the year t (SEC) on total assets at the end of the year t-1 (TA) [5]:

$$SEC_{i,t-1} = \frac{SEC_{i,t}}{TA_{i,t-1}}$$

Banks loan loss provision is built as loan loss provision (LLP) on total assets. It is added as proxy of the banking risk ex-post [5].

$$LLP_{i,t-1} = \frac{(LLP)_{i,t}}{TA_{i,t}}$$

[24] Banks can be divided into three **dimension classes** [54, 37]:
Small size: the total bank's assets is lower than 75th percentile of the total banks' assets distribution;
Average size: All banks that are nor small nor big;
Big size: the total bank's assets is greater than 95th percentile of the total banks' assets distribution.

[25] Banks can be divided into three capitalization's classes [57]:
Low capitalized: the capital ratio is greater than 5%;
Average capitalized: the capital ratio is lower than 10%;
Big capitalized: the capital ratio is greater than 10%.

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