

Securitization and banks' capital structures

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Abstract

This paper aims to establish new and important facts regarding how securitization has transformed the capital structure of banks. We argue that the possibility of securitizing assets is a corporate finance innovation that has become available to banks and that changes the composition of their assets and liabilities. We focus on the Spanish data for 1988 to 2006 because banks have effectively had access to securitization since 1998, constituting an ideal framework to explore the pre- and post- securitizing periods. We provide descriptive evidence that securitization has become a central source of funds that significantly reduces bank reliance on deposits and enables a larger increase in loans. Consistent with the predictions of a stylized theoretical model, securitization has been used (more) by the banks with more growth opportunities and higher financial costs of alternative sources of funding. Finally, we demonstrate that securitization tends to be at the top of the pecking order of the financing choices, especially for banks that had restrictions to access to capital markets.

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1. Introduction

Asset securitization is arguably one of the most important financial innovations of the last thirty years. Securitized assets have increased exponentially over the last years due to the contribution of the banks because their lending activity generates illiquid assets that are eligible for securitization. By transforming hard-to-trade financial assets into marketable securities, securitization has been a corporate finance innovation that has expanded the financing possibilities of banks. Indeed, securitization has become a key financing source that has enabled the banks to decouple the evolution of bank activity from that of the traditional sources of financing, which could have brought about a significant impact on the composition of bank balance sheets. The focus of this paper is to analyze how securitization has transformed the capital structure of banks, both on the asset side and on the liability side.

While there is an extensive literature that explores securitization from different approaches, little is known about how securitization has impacted the balance sheet of the banks and, in particular, how it has affected their capital structure. There are papers that analyze the impact of securitization on the credit standards and credit expansion²; which explore the role of securitization in the decoupling of the evolution of credits from deposit growth (Loutskina and Strahan,2009; and Loutskina,2011) and, more recently, papers that posit corporate-taxation advantages to justify the generalized expansion of securitization (Penacchi et al.,2014). However, there are no papers that address the change of the relative importance of securitization in bank capital structure. Whether securitization has evolved at

² Purnanandam (2011) finds that the originate-to-distribute model brought about a lack of screening incentives coupled with leverage-induced risk taking behavior. In the same line, Keys et al. (2010) demonstrate that banks with higher participation in the originate-to-distribute market prior to the crisis presented higher default rates in the later periods; Demyanyk and Van Hemert (2011) provide evidence that the quality of loans deteriorated during the six years prior to the crisis and that securitizers were, to some extent, aware of it, though the problems were masked by the high growth in house prices; Mian and Sufi (2009) report an expansion in the credit subprime mortgages that was decoupled from income growth and correlated with the increase in the securitization of subprime mortgages. Jiménez et al (2010) analyze the impact of securitization on credit quality in the extensive margin as well as on the real economy. Thus, this paper has a very different objective than the current one in which we focus on the impact of securitization on bank capital structure. Accordingly, the methodology used in both papers is very different (dif in dif techniques in the former one, pecking order regressions in the current one) as well as the databases used (loan level data in the former, bank-level data in the current one). Nonetheless, there is also evidence that securitization does not always bring about adverse selection, as Benmelech et al. (2012) demonstrate for the securitization of corporate loans.

the same pace of existing funding sources or whether it has substituted the pre-existing financing alternatives has remained so far an open question, in spite of the non-trivial implications it may have on bank balance sheets.

It is also a remarkable fact that the use of securitization has not been homogeneous across banks, which could have different implications (if any) in terms of the capital structures. The empirical evidence indicates that certain banks have chosen not to securitize, even when they have access to the tool of securitization at the same terms as their peers. Even among banks that choose to securitize, we find a high dispersion in the amount securitized, which could have different implications on their capital structures. Finally, we can find banks that have been able to securitize, even when they did not have access to the capital markets because of the adverse selection problems (i.e., small banks, non-listed banks), enabling them to re-adjust their capital structures towards the optimal ratios that were out of reach before securitization.

This paper addresses the previous issues exploiting the insight that loan securitization is a shock that has expanded the financing possibilities of banks: (i) The paper establishes new and important facts about how securitization has become a central source of funds for banks and has substantially altered their capital structure; (ii) it posits a theoretical model to identify the factors that drive a bank to use this new source of funds and tests the theoretical predictions with an empirical application; and (iii) it argues that securitization offers the possibility of issuing assets under reduced adverse selection to banks that cannot usually access capital markets..

We apply our strategy to the Spanish case during the period 1988-2006 for several reasons. First, it provides an ideal framework for the purpose of studying securitization as a shock on the bank financing decisions because the Spanish banks could not effectively securitize until a change in regulation³ in 1998 introduced this possibility. The securitization period

³ While previous regulations (e.g., Law 2/81, RD 682/82 and Law 19/1992) allowed banks to securitize mortgages, only after the RD 926/1998 did credit institutions start considering securitization as a practicable financing alternative. While in other countries such as the United States securitization developed progressively beginning in the early eighties; in Spain the process can be better described as a regime shift:

begins in 1999, when the euro is adopted as the common currency and facilitates firm access (including the Spanish banks) to the European capital markets.⁴ The sample ends in 2006, right before the financial crisis has all but removed loan securitization as a funding possibility for banks.⁵ Second, securitization has been extensively used by the Spanish banks, which during this period have not only securitized a substantial part of their assets (e.g., more than 25% of the granted mortgages) but also have relied on securitization as a central source of finance.⁶ Third, the Spanish banking system comprises the entities of different characteristics subject to different degrees of adverse selection that have chosen to securitize their loan portfolios in different forms and amounts. This heterogeneity provides an optimal framework to study the extent to which securitization might overcome adverse selection in capital markets.

We organize this study into three well-identified parts. In the first part, the paper presents a descriptive analysis in which it compares the capital structure of the Spanish banks before 1999 and at the end of 2006 and describes how the banks have changed the way in which they fund their operations and the role that loan securitization has played as a source of funds.⁷ Next, the paper documents how securitization contributes to decouple the deposit and credit activities by financial intermediaries. In particular, it examines the role played by deposits in the financing of the Spanish credit expansion of 1988-1997 (pre-securitization) and the expansion of credit in Spain in 1998-2006 when securitization is feasible. It also explores whether securitization significantly impacts on the capital structure of banks that do securitize during the period 1998-2006, compared with those that do not.

Only after several legal changes that occurred in 1998 could banks effectively consider securitizing their assets.

⁴ See Bris, Koskinen and Nilsson (2009) who provide evidence consistent with a generalized reduction on the firm cost of capital after the adoption of the euro in 1999.

⁵ Since mid-2007, the Spanish banks have carried out securitization activities exclusively to obtain liquidity from the European Central Bank in a context where regular investors, for the most part foreigners, have refused to participate with new funds in the market.

⁶ During the period 1999-2006 that is under study, the Spanish banks became the second largest issuers in Europe (after the British banks) of ABS and the second largest (after the German banks) in covered bonds.

⁷ From 2005 on, the International Financial Reporting Standards (IFRS), the accounting standards applied in Spain and set by the International Accounting Standards Board (IASB), forced banks to keep in their balance sheets their securitized loans unless a *substantial* part of the risk and profits of the securitization have been transferred. In practice, banks have held more than 90% of their securitized loans on their balance sheets. In our analysis, we keep track of all the securitized loans, and to homogenize the data to facilitate comparisons, we add back any securitized loan pool that was off-balance-sheet during our sample period

The second part of this study examines the determinants of the securitization decision. Motivated by our premise that securitization is a corporate finance innovation, we posit a theoretical model whereby banks have the possibility to use a new source of funding.⁸ The model predicts that securitization will be used more intensively by those banks that have higher growth opportunities, a higher cost of capital of alternative sources of funds and a lower cost of securitization. In the empirical exercise, we look for empirical proxies of these variables and test whether banks that securitize (more) are those predicted by the model.

In the third part of our study, we examine more directly the issue of whether the use of securitization is consistent with a response to the presence of adverse selection in other forms of financing. Because the bank balance sheets are opaque (Morgan, 2002), traditional securities such as equity or debt can be sensitive to the bank's condition and, therefore, subject to large adverse selection discounts. Likewise, the sale of individual bank loans can be subject to large discounts because banks have private information on the borrower's condition.⁹ As for the securities backed by a pool of assets (without tranching), they also present problems of adverse selection because the information is destroyed in the process (DeMarzo, 2005; DeMarzo and Duffie, 1999). We argue that securitization may reduce the adverse selection faced by banks because it consists of a pooling and tranching process that, according to DeMarzo (2005), can reduce the informational problems present in other forms of loan sales. To test our hypotheses, we examine whether securitization has a prominent position as a financing source or whether other sources of funds (i.e., debt or equity issuances) are chosen first. Specifically, we estimate an adaptation for the securitization of the conventional pecking order equation¹⁰ as in Shyam-Sunder and Myers (1999) and Frank and Goyal (2003) and explore whether those banks with higher adverse

⁸ The model assumes that regulation does not allow the accounting of securitization off-balance sheet (i.e., as in Spain) and, thus, it does not consider the relative tax-advantages as in Penacchi et al. (2014)

⁹ See the seminal paper by Pennacchi (1988) on the process of securitizing loans and its risks. Nevertheless, as documented in Drucker and Puri (2009), there has been a substantial growth in the U.S. secondary loan market (i.e., of 25% during the period 1991-2006 to reach \$236.6 billion in 2006). Empirically, adverse selection can be reduced by the presence of implicit agreements (Gorton and Pennacchi (1995)) and/or by restrictive covenants (Drucker and Puri (2009)).

¹⁰ Frank and Goyal (2008) provide a survey of the literature of the pecking order, embedded in the review of the theories of debt.

selection problems are those that raise funds with an ordered preference (Bharath et al., 2009).

There are a number of findings that emerge from our analysis: (1) Loan securitization has been a central source of funds for banks and has substantially altered the structure of their liabilities. This change has been particularly noteworthy for small- and medium-size banks (that chose to securitize) for which the average ratio of securitized funds to total liabilities reached 20.5% in 2006 (16.2% for the large banks); (2) the use of securitization is related to a lower reliance on deposits to finance the banks' credit operations; (3) securitization has been used more frequently by firms with more growth opportunities (i.e., with larger credit growth projections), by entities for which the cost of the financial alternatives is higher and by those institutions with higher liquidity constraints; (4) there is little (if any) evidence that banks used securitization as a risk management tool (i.e., to shed-off credit risk) or as a means to improve its capital adequacy ratio¹¹ (i.e., to do regulatory capital arbitrage); (5) while large banks also tend to securitize funds more often, these banks are also more prone to use other financing sources. In relative terms, securitization represents a more important external financing source for smaller and medium-size institutions; and (6) securitization tends to be at the top of the pecking order of the financing choices for small- and medium-size firms and non-listed banks, for which the informational asymmetries are likely to be more acute.

The rest of the paper is organized as follows. In section 2, we describe the chief institutional details relative to the Spanish case (both in terms of the issuers and instruments) and describe the data used in this study. In section 3, we provide the descriptive evidence for how securitization has affected the capital structure of banks and how it contributed to the decoupling of the connection between deposits and credit. In section 4, we present the theoretical framework and econometric analysis of the determinants of the securitization, and in section 5, we explore securitization in the

¹¹ Acharya, Schnabl and Suarez (2013) study conduits as a case of "regulatory arbitrage", and they notice that the banks based in Spain and Portugal, which did not allow such capital arbitrage, did not set up conduits.

hierarchy of financing for banks. Section 6 presents a set of robustness tests, and we present our conclusions in section 7.

2. Data and Sample Characteristics

We examine the issuances of securitized loans by Spanish banks during the period 1999-2006, which is the period when securitization is actively performed by the Spanish intermediaries. Before 1999, the regulations limited the effective use of loan securitization by the banks, and after 2006, securitization was ineffective due to the lack of market liquidity for the securitized instruments.

We use the term “bank” to refer to all depository institutions that include (i) commercial banks, (ii) savings banks (i.e., “*cajas*”) and (iii) credit cooperatives. These institutions constitute the universe of the Spanish depository institutions, namely the financial intermediaries that simultaneously take demand deposits and lend funds to firms and households. As financial intermediaries, these entities face the same regulatory environment in terms of the capital requirements, market entry and exit conditions. They differ, however, in their governance and organizational purpose: Commercial banks are profit-maximizing entities owned by their shareholders, and savings banks are not-for-profit organizations controlled by the local and regional governments¹², and credit cooperatives are entities owned by a fraction of their depositors whose main objective is to provide credit to their owners. For the purpose of this study, the most important difference among the entities is their capacity to raise funds beyond their deposit base. While commercial banks are able to raise external funds (e.g., to issue additional equity and/or access other typical financing sources such as public bonds), the savings banks and credit cooperatives are severely limited in their ability to raise external funds other than deposits.

Our sample consists of the population of Spanish banks, which features 212 banks in 1999 and, due to the consolidation in the banking sector, includes 179 entities by 2006¹³ (Table

¹² Depositors and philanthropic institutions may also exert some control in certain savings banks.

¹³ We exclude the foreign branches, which have a negligible presence in retail banking in Spain. See Table 1 for more details on the yearly evolution of banks in our sample.

1). When banks merge, we consider them as separate entities before the merger and as unique institutions after the merger is consummated. In 1999 (2006), the sample includes 72 (51) commercial banks, 48 (45) savings banks and 92 (83) credit cooperatives.

Banks securitize loans by issuing either asset-backed securities (ABS) or securitizing covered bonds, the so-called *cédulas hipotecarias*. The issuance of the ABS consists of the sale of a portfolio of loans from the originating bank to a special purpose vehicle (SPV), which simultaneously issues the ABS to investors in exchange of funds that are transferred to the banks. Typically, the originating bank also services the loan portfolio (i.e., receives the monthly payments, addresses arrears, etc.). Banks can alleviate the regulatory capital requirements by issuing an ABS because they may transfer credit risk out of the balance sheet. Such a risk transfer, however, requires that the banks do not provide the SPV with credit enhancements, which typically consists of providing investors with a compensation in the event of losses in the securitized portfolio. Before 2005, the banks used to remove from their balance sheets all the loans included in the ABS. After 2005, however, a new accounting rule imposed on the banks stricter requirements to remove loans and, as a result, to use the ABS as a means to alleviate their regulatory capital requirements.¹⁴

Alternatively, securitization may be performed with the issuance of securities backed by covered bonds. From 2001, groups of small banks securitize their loans by first issuing covered bonds and then transferring those covered bonds to a joint SPV, which in turn issue the bonds to investors. A covered bond is a bond secured not only by the full credit of the originating institution but also by an eligible mortgage portfolio that acts as its specific collateral.¹⁵ Two requirements limit the issuance of covered bonds: (i) The eligible mortgage portfolio can only include mortgages with a loan to value (LTV) less than 80%; and (ii) the amount securitized must be less than 80% of the value of the eligible mortgage portfolio (i.e., overcollateralization requirement). It is worth noting that the issuance of covered bonds has no immediate effects on the regulatory capital. This is because the

¹⁴ See the Appendix A for more details on the change of requirements considered in the new regulation (i.e., Circular CBE 4/2004).

¹⁵ This is similar to a secured bond issued by a non-financial corporation whereby the bond is guaranteed by specific collateral and also by the credit of the corporation itself.

eligible mortgages that back the covered bond remain in the originating bank's balance sheet, which implies that the bank is subject to the same amount of regulatory capital. Small banks benefited from this multiple-bank securitization procedure, which, by improving the diversification of the underlying pool of assets, helped to attract more investors. In our analysis, the regular issuances of covered bonds are assimilated to multiple-bank securitization because they have similar economic and regulatory implications for the originating banks¹⁶. The main difference is the type of issuer: While small, regional banks used securitization of covered bonds to build a common loan portfolio (indeed, a common covered bond portfolio) that backed the securities issued, the banks with access to the capital markets issued covered bonds directly. Both mechanisms transformed illiquid assets stocked in the balance sheet into tradable securities.

We collect the data from the following sources. First, we gather the bank financial and accounting information. This information comes from the confidential statements provided by the banks to fulfill their regulatory duties with the Bank of Spain, the entity that regulates and supervises banks in Spain. These statements include the bank balance sheets, income statements and statements of regulatory capital collected at the end of each calendar year from 1999 to 2006. Second, we collect the data on securitization issuances from two sources: (i) For the ABS, we collect the information from the brochures provided to investors as requested by the Spanish financial market regulator CNMV; (ii) for the securitization of covered bonds, we have access to an incomplete set of brochures, which we complement by considering the balance sheet information from the confidential statements described above.

Table 1 describes the number of securitizations at every year attending to the type of banks. Of the 212 banks that begin the sample, 103 of them securitize at least once during the sample period. Table 1 indicates that the number securitization increases substantially for all types of institutions (e.g., from 1999 to 2006, the amount of securitized loans increases sixteen-fold). The main issuers of securitizations in absolute volumes are the savings banks and commercial banks. Nonetheless, the securitization activity for credit cooperatives has

¹⁶ By 2006, multiple-bank securitization represented 41% of the total amount of covered bonds issued.

been important: Their market share is 10.66%, which is substantial relative to its weight in terms of total assets, which is only 4.18%.

3. Securitization and financing choices

In this section, we describe the Spanish banks' financial condition during the period 1988-2006. We compare the banks' conditions in two sub-periods: a) the *pre-securitization* years (from 1988 to 1997) and b) the *post-securitization* years (from 1998 until 2006). Because securitization is viable on a large scale only after 1998, this comparison gives us a first approximation of the effects of securitization on bank behavior. In the post-securitization years, we also compare the banks that use securitization as a means of financing with the other banks that chose not to securitize their loans.

3.1 Securitization and balance sheets

While during the *pre-* and *post-securitization* periods (i.e., from 1988 to 2006) the banks exhibit substantial growth, i.e., an average yearly asset growth rate of 11.2%, securitization is associated with a substantial increase in the growth rate, which goes from 8.9% per annum in the *pre-securitization* years to 14.0% in the *post-securitization* period. In addition, the emergence of securitization can be related to the other changes in bank operations.

To describe these relationships, we group the bank balance sheet accounts as follows. On the asset side, we consider three sets of items: (1) *LOANS*, which measures the credit granted by the bank to the non-financial sector (i.e., households and firms) regardless of its maturity;¹⁷ (2) *GOVBONDS*, which accounts for the amount of government debt held by the bank; and (3) *INTERBANK*, which corresponds to the bank's net financial position in the interbank market (i.e., the lent minus borrowed funds).¹⁸ On the liability side, we consider four groups: (1) *OWNFUNDS*, which measures a bank's equity position (i.e., the capital, reserves and insolvency funds); (2) *DEBT*, which corresponds to the amount of debt

¹⁷ To make a proper comparison, we include in this concept the underlying loans in asset securitizations that are removed from the bank balance sheets (see Appendix A).

¹⁸ In this item, we consider the difference between credits to and deposits from other financial intermediaries (including international banks).

financing issued by the bank in the wholesale markets (excluding the interbank market); (3) *DEPOSITS*, which includes the traditional demand deposits held by the banks¹⁹ and (4) *SEC*, which consists of the sum of securitized instruments issued by a bank. In addition to these items, we calculate a residual account, i.e., *REST*, which is computed by subtracting from the sum of items not considered in the asset side the sum of the other items not considered in the liability side.²⁰

The previous aggregation of bank accounts is displayed in Table 2, from which a number of stylized facts emerge. On the asset side, the emergence of securitization is associated with an increase in *LOANS* (i.e., the ratio of loans over assets), which goes from 68% in 1997 to 84.58% in 2006. (Notice that, by contrast, relative to assets, loans remain fairly stable in the pre-securitization years.) The growing importance of *LOANS* in the balance sheet was at the expense of government debt (*GOVBONDS*), which is reduced from 17.00% in 1997 to 4.11% in 2006.

On the liability side, securitization is associated with the abrupt changes to the bank capital structures. In the pre-securitization period, the *SEC* is negligible and the *DEBT* and the *OWNFUNDS* represent on average 5.06% and 10.77% of the bank liabilities, respectively. During these years, the *DEPOSITS* are the dominant form of bank financing, i.e., 84.17% of bank liabilities. From 1998, there is a drastic reduction of the *DEPOSITS* (59.11% of the bank liabilities in 2006), an increased reliance on the *SEC* (19.84%) and, to some extent, on the wholesale debt financing (i.e., the *DEBT* represents 12.34% of liabilities). This reliance on market debt financing is a major shift in the bank capital structures and one of the aspects over which we concentrate our analysis in Section 4. Finally, in the post-securitization period, the contribution of the *OWNFUNDS* is slightly reduced to 8.71% in 2006, confirming a process of leverage increases that has been documented in previous studies.

¹⁹ See the Appendix A for a full description of the process that we follow to obtain the amount of bank deposits starting from the accounting information reported by banks.

²⁰ More specifically, among other things, the *REST* includes in the asset side the other holdings of financial assets (e.g, the private fixed-income debt, cash, and derivatives) and parties related to the bank trading book and corrections for writing-off assets. On the liability side, it includes derivatives, other commercial obligations with suppliers, short positions in securities for overdraft in repo operations and financial guarantees.

Further insight can be obtained by comparing the differential behavior of the banks that resort to securitization to fund their operations and those banks that stay away from it. As indicated in Figure 1, the expansion of credit (i.e., loan growth) during the post-securitization years is particularly intense for the banks that choose to securitize (Figure 1A). These banks increase their loans relative to assets by 17.39 percentage points during the securitizing years (from 67.38% in 1997 to 84.77% in 2006). In contrast, the banks that do not securitize (Figure 1B) do not significantly increase their loans (while their loans over assets go from 75.10% in 1997 to 79.19% in 2006; statistically, this amount is insignificantly different from zero). In addition, the depletion of the stock of liquid assets (i.e., the government debt) is larger for the securitizing banks (from 17.34% in 1997 to 4.07%, significant at 1%) than for those banks that do not resort to securitization (from 13.53% to 5.20%, significant at 5%).

On the liability side, there are also significant differences between the securitizing and non-securitizing banks. Most notably, there is a large reduction in the deposits as a proportion of assets, which is particularly intense for the securitizing banks (from 84.10% in 1997 to 58.60% in 2006). This difference occurs because on average the securitizing banks grow their deposits at a lower rate than the non-securitizing banks (i.e., 10.6% vs. 13.6%) and also because the funds obtained from securitizing substitute for deposits as a source of funds.²¹

3.2 Securitization and the reliance on deposits for credit expansion

Previous findings suggest that securitization contributes to the decoupling of the deposit and credit activities by the financial intermediaries. To further examine this issue, we analyze the relation between credit and deposits in two periods of intense economic expansion in the Spanish economy: (i) the period 1988-1991 when securitization is unfeasible and (ii) the 2003-2006 period when securitization is fully operative. Comparing these two periods allows us to properly evaluate the effect of securitization in the credit

²¹ Non-securitizing banks rely on debt issuances that reached 15.56% of their assets to fund their loan expansions. Securitizing banks also issued debt (12.23%) but used securitization more intensely (20.54%).

market; it is precisely when the economy expansion is in effect that an excessive reliance on deposits can reduce the availability of credit and preclude an efficient intermediation process.²²

As Figure 2 indicates, while credit growth during the 1988-1991 pre-securitization period follows closely the rate of growth of deposits, the credit growth more than doubles the deposit growth in the 2003-2006 post-securitization period. This higher credit growth during the post-securitization period is likely a response to a higher supply of bank credit enhanced by securitization rather than to a higher demand derived from a higher economic growth because the average GDP growth rate in the post-securitization period was lower (3.46%) than in the pre-securitization period (4.06%).

To examine the link between the deposit and credit growth across individual banks, in Table 3 we regress the credit growth on the deposit and GDP growth. We consider both the OLS and fixed effect specifications and both indicate that the coefficient of deposit growth falls by 40% between the 1988-1991 and 2003-2006 periods (from 0.48 to 0.29 in OLS and from 0.35 to 0.19 in Fixed Effects). This result demonstrates that the relationship between deposit and credit growth is less intense after banks can securitize, which is consistent with the hypothesis that securitization contributes to the separate credit from the depository functions in banks.

In the second panel of Table 3, we examine the relation between credit and deposit growth for the banks that do and do not securitize their loan portfolios. In this case, the evidence is less well defined. While in the OLS specification the securitizing banks exhibit a lower coefficient in the regression (i.e., 0.30 vs. 0.47), including the bank fixed effects in the regressions, we fail to find that the relationship is stronger for non-securitizing banks (i.e., the coefficients are 0.27 vs. 0.23). One possibility is that this difference is because the choice of whether to securitize is related to the same factors that make credit and deposits grow, which makes a comparison of the coefficients difficult to interpret. To account for

²² This is in contrast with the pre-securitization period in our sample (years 1988-1997), in which the Spanish economy exhibited a modest growth and the expansion of credit was limited.

this and other related possibilities in the next section, we examine more carefully the factors that affect the decisions of banks to securitize their loans.

4. The determinants of the securitization decision

In this section, we analyze the determinants of the banks' decision to securitize. We first present a theoretical model of the financing decisions of banks and explore how these decisions are affected by the introduction of an additional source of funding, i.e., securitization. Next, we present our empirical exercise that is designed to test whether banks that securitize (more) are those predicted by the model.

4.1. Theoretical Model

Consider the following model of a firm with decreasing returns to scale financed with D (i.e., debt), E (i.e., equity) and a stock of liquid assets held by the firm L :

$$\begin{aligned} \underset{I,D,E}{Max} \quad & kI - \frac{I^2}{2} - \frac{k_d}{2} D^2 - \frac{k_e}{2} E^2 \\ \text{s.t.} \quad & I = D + E + L \end{aligned} \tag{1}$$

where I is the total amount of investment, k is a measure of investment productivity and k_d and k_e are the cost of capital for the different types of sources of finance. We assume that the use of L does not entangle any additional cost of capital for the firm because the funds come from the sale of liquid assets already in the firm's balance sheet. What is unusual here is that the cost of capital for a given source increases with the use of that source, perhaps capturing the insight that there is an optimal capital structure ratio.²³

Substituting the budget constraint in the maximizing function and taking the first order conditions on D and E we obtain:

$$\begin{aligned} k - D - E - L - k_d D &= 0 \\ k - D - E - L - k_e E &= 0 \end{aligned} \tag{2}$$

which immediately implies:

²³ We use this functional form to simplify the algebra. The choice of a more general form of the maximizing function such as $kI - \frac{I^2}{2} - f(D) - g(E)$, where f and g are increasing and convex functions, does not affect the implications that we derive in this Section.

$$k_d D = k_e E \Rightarrow D = \frac{k_e}{k_d} E \quad (3)$$

Substituting (3) in (2), one gets

$$E = \frac{k-L}{1+k_e+\frac{k_e}{k_d}} = \frac{k_d(k-L)}{k_d+k_e k_d+k_e} \quad D = \frac{k-L}{1+k_d+\frac{k_d}{k_e}} = \frac{k_e(k-L)}{k_d+k_e k_d+k_e}$$

Finally, adding up, one gets

$$I = \frac{(k_d+k_e)(k-L)}{k_d+k_e k_d+k_e} + L = \frac{(k_d+k_e)k + L k_e k_d}{k_d+k_e k_d+k_e}$$

The comparative statistics using these expressions produce some obvious results, such as investment increases with the productivity, $\frac{\partial I}{\partial k} > 0$, and decreases with the cost of capital

of the financing sources, $\frac{\partial I}{\partial k_d} < 0$, $\frac{\partial I}{\partial k_e} < 0$, and that the use of a given financing source

depends negatively on its cost of capital, $\frac{\partial D}{\partial k_d} < 0$, $\frac{\partial E}{\partial k_e} < 0$. More interestingly, the model

also predicts a substitution effect among the financing sources as a response to the changes in their relative costs of capital $\frac{\partial E}{\partial k_d} > 0$, $\frac{\partial D}{\partial k_e} > 0$ and that a higher stock of the firm's liquid assets, L , reduces the need to rise E or D .

What is the interesting exercise for our purposes? We aim at exploring how banks in the previous equilibrium will react with the inclusion of securitization as a new alternative to fund projects. Let us consider the effect of introducing an additional source of financing (e.g., securitization) such that model (1) becomes

$$\begin{aligned} \text{Max}_{I,D,E} \quad & kI - \frac{I^2}{2} - \frac{k_d}{2} D^2 - \frac{k_e}{2} E^2 - \frac{k_s}{2} S^2 \\ \text{s.t.} \quad & I = D + E + S + L \end{aligned} \quad (4)$$

What we would examine is the effect of such new forms of financing and the types of firms that would use such forms of financing more intensively. Following the same steps as before, one obtains the following expression for S :

$$S = \frac{(k-L) k_d k_e}{k_d k_e + k_d k_e k_s + k_s k_e + k_s k_d} = \frac{k-L}{1+k_s + \frac{k_s}{k_e} + \frac{k_s}{k_d}} \quad (5)$$

From this example, we immediately conclude that the new sources of finance, i.e., S , will be used more intensively by those firms that have:

- a) Higher k_d and k_e (higher cost of using alternative sources of finance, $\frac{\partial S}{\partial k_e} > 0, \frac{\partial S}{\partial k_d} > 0$)
- b) Lower k_s (lower cost of securitization; $\frac{\partial S}{\partial k_s} > 0$)
- c) Lower L (lower stock of liquid assets, $\frac{\partial S}{\partial L} < 0$)
- d) Higher k (higher growth opportunities; $\frac{\partial S}{\partial k} > 0$)

This simple model identifies the banks that are more likely to use securitization once it becomes a new alternative source of funding and also the banks that will securitize more. In the next section, we present an empirical analysis that relates the decision to securitize and the amount securitized with the empirical proxies of k , k_s , k_d , k_e and L , and we test whether the predictions of the theoretical model hold in the empirical data.

4.2. Empirical exercise

In this Section, we test whether the predictions from the theoretical model hold with the empirical data. First, we define the proxy variables to test the predictions, and then we present the empirical model.

4.2.1. Variables

According to the predictions of the theoretical model, we distinguish five groups of explanatory variables: (1) the proxies related to financial costs, (2) the proxies related to liquidity, (3) the proxies that capture the growth opportunities of a bank, (4) the variables related to the access of the bank to markets and (5) the control variables.

4.2.1.1 Proxies related to financial costs

The theoretical model predicts that the corporate finance benefits of securitization are likely to be larger for banks that are constrained in their investment policy by their inability to resort to other sources of finance such as demand deposits, interbank loans and debt and equity issuances. To measure the financially constrained banks, we consider variables that capture the relative cost of their financial sources. Our logic is that the banks with higher financial costs of funding alternatives are more likely to benefit from the new financing

possibility offered by securitization. In particular, for each bank-year, we consider the following corporate finance proxies:

(i) *Dep/Loans, Interbank/Loans, Debt/Loans, Equity/Loans*: The ratio of the volume of each financing source with respect to the loans provides a measure of the degree of constraint of a bank's credit operations. We consider the five possible sources of financing of banks, Deposits, Net Financing from the Interbank²⁴, Debt and Equity. Banks that have better access in one of the funding sources (i.e., low costs, better availability of funds, branch network in the case of deposits) will finance a higher proportion of their loan operations with this financing source. For these banks, we expect lower incentives to securitize because they already have a cheap financing source that dominates the alternatives, and the introduction of an additional source could have a smaller impact on the financing decisions.

(ii) *Concentration*: This variable is an alternative to measuring the importance of the interbank, debt and equity as the financing sources of banks. It is constructed as the ratio of the sum of squares of financing sources divided by the square of the sum of all the sources, that is, $\frac{Interbank^2 + Debt^2 + Equity^2}{(Interbank + Debt + Equity)^2}$. It is bounded between 1 when the bank has only one source of financing (as well as deposits) and 1/3 if the bank deploys the same amount of the three sources of funds. We expect that banks with a higher *Concentration* have less incentives to securitize because they have a financing alternative that dominates the others. We do not include deposits in the definition and consider them in the separate variable *Dep/Loans* to isolate the effect of this traditional source of bank financing and to focus on the alternatives that can be raised in the financial markets.

4.2.1.2 Proxies related to liquidity

From the theoretical model, the banks that have higher liquidity constraints are those more likely to securitize. We include two variables to capture the stock of liquidity of the bank:

(i) *Liquidity / Loans*: Taking the capital structure defined in Section 2, we construct a measure of liquidity equal to the sum of the government debt and the net volume of

²⁴ We refer to the net financing position in the interbank, that is, $\text{Max}\{\text{Loans from Interbank} - \text{Deposits in the Interbank}, 0\}$.

deposits held in the interbank²⁵ market. We expect a negative relation between the banks' incentive to securitize and the ratio of this liquidity buffer with respect to the volume of loans that are to be financed.

(ii) *Past profitability / Loans*: This variable is a proxy of the availability of internally generated funds as an alternative to funds loans. It is computed as the profits of the previous year net of the distributed dividends with respect to the volume of loans to be financed. We expect that the banks with higher retained earnings will have lower incentives to securitize.

4.2.1.3 Proxies related to growth opportunities

(i) *Projected Loan Growth*: This variable is a proxy of growth opportunities and, ideally, it should be equal to the expected credit growth of a bank for the next period. As this expectation is not observable, we estimate a series of expectations of loan growth, $\frac{L_t - L_{t-1}}{A_{t-1}}$,

where L_t is the balance of loans at end of year t , and A_{t-1} is the total assets of each bank the year before. We use the absolute difference on the loan balances with respect to the total assets to avoid large growth rates derived from small initial loan balances and to be consistent with the rest of variables defined below. We estimate an autoregressive model of loan growth at t as a function of the loan growth at $t-1$ and $t-2$ with a rolling window of 10 years, to avoid differences in the standard errors due to the growing number of years. Then, for each year after t , we have two rolling parameters and use them for every year t to obtain a best prediction (based on the observed loan growth for $t-1$ and $t-2$) of the estimated loan growth at t . The variable loans, L_t , include loans to the public sector and loans to the non-financial firms and households (resident and non-residents).

Additionally, we generate other proxy variables of the growth opportunities related to the number of new regional markets in which banks enter to operate and the sum of the GDP of the regional markets in which banks operate. These variables will be introduced in the robustness analysis to test the validity of the results obtained with the variable *GrowthOpp*.

²⁵ $\text{Max}\{\text{Deposits in the Interbank} - \text{Loans from the Interbank}, 0\}$

4.2.1.4 Variables related to the access to markets

The theory predicts that banks that have access to the financial markets are more likely to use securitization as a new source of funds, once it becomes available. In addition to this prediction, we explore whether securitization could grant the access to financial markets for the banks that are affected by adverse selection because of their small size, not being listed in the stock market or because of their legal nature. The argument is based on the differential feature of securitization that enables different banks to transfer loans into a common portfolio and issue tranching bonds backed by this portfolio and on the possibility that this process could reduce information asymmetries. Thus, the proxies for the access to market that will be used in the empirical analysis are:

InAssets: Larger banks are more likely to have access to financial markets to fund all their operations and, thus, they will be more likely to securitize.

Savings and *Coop*: Dummy variables that take the value of 1 if the bank is a savings banks or a credit cooperative and zero otherwise. Both types of banks have had restricted access to financial markets to raise debt or equity because of informational problems. We expect a positive coefficient if our hypothesis that securitization enables firms to reduce the costs of adverse selection holds in the data.

4.2.1.5 Control variables

The variables included in this group aim to capture whether the decision of banks to securitize has been driven by other potential determinants, such as the possibility to manage the credit risk of their portfolios or to perform regulatory capital arbitrage across different lending possibilities. We consider three proxies:

(i) *NPL*: The ratio of non-performing loans over total loans in the bank portfolio can indicate the low credit standards of the bank and higher risk in their portfolios. Henceforth, we expect that banks with a higher proportion of non-performing loans have riskier loans and hence stronger incentives to transfer those risks to investors via securitization.²⁶

²⁶ However, if riskier loans are those loans that require more bank monitoring, an opposite force may reduce incentives to securitize.

(ii) *RegCap*: The dummy variable that takes the value of 1 if the (Basel) regulatory capital ratio is below the 25th percentile of the distribution and zero otherwise.²⁷ The regulatory capital ratio is computed as the ratio between the regulatory capital (the capital eligible for the capital requirements of the Basel Committee) to the assets of the bank weighted according to their risk (the so-called Risk Weighted Assets or *RWA*). Banks closer to the regulatory limit, set at 8% in the Basel requirements, can find it useful to use the ABS as an instrument to help them ensure regulatory compliance.

(ii) *Mortg/Loans*: The weight of the mortgage loans in the balance sheet controls for the possibility that the banks with a higher proportion of mortgages are more likely to securitize (because mortgages are the most common underlying asset in securitizations)

4.3 Empirical model

We perform three sets of tests: (i) We estimate a Probit model to investigate the determinants of the banks' decision to securitize (i.e., the "extensive margin") using two approaches, the year-to-year decisions (panel data) and the decision to securitize at least once during a given period explained with the initial conditions of the bank when the securitization becomes available. The reason for the second approach is to consider that the decision to securitize is related to the capital structure decisions that might take several years to be implemented. If this were the case, the panel data with year-to-year observations could not be the optimal setup to test the predictions of the model. As an alternative, we compare the situation of the banks once securitization became available with the decision of having securitized several years later. (ii) In the second exercise, we estimate a Tobit model to consider the determinants of the amount securitized by the banks (i.e., the "intensive margin"), also with the two approaches used in the Probit model. (iii) In the last test, we estimate the duration models for the decision to securitize and explore which variables determine the speed at which a bank decides to securitize for the first time.

²⁷ As discussed below, we consider the alternative definitions of this variable including the other cut-off values.

4.3.1. Results on the decision to securitize

Table 4 presents the marginal effects of the Probit regressions estimated with robust standard errors clustered at the bank level. Column (1) and (2) provide the results of the Probit model that relates the decision of having securitized at least once during the period 1999-2007 and the proxy variables of the determinants of securitization valued at 1999 when securitization became available. Estimation (1) includes all the financing alternatives relative to the volume of loans and Estimation (2) replaces them by the variable *Concentration*. Consistent with the predictions from the theoretical model, the coefficient of *Dep/Loan* is negative and statistically significant in (1), suggesting that the banks having easier access to deposits in 1999 (i.e., the branch network, monopoly in the collection, etc.) are less likely to have securitized at the end of the sample period. The rest of the financial cost proxies are not statistically significant, nor is *Concentration* in (2) though it has the expected negative sign.

Moving to *Liquidity proxies*, we observe that those banks with a higher stock of liquid assets with respect to loans in 1999 are less likely to securitize because they can deploy them to finance new activity instead of raising new external funds. However, we do not find evidence that internally generated funds from past profits reduce the incentives to securitize. From the block of proxies of *Access to Markets*, we observe a positive and significant coefficient for *lnAssets*, suggesting that the large, well-known banks can also gain access to securitization. In addition, we find evidence that the savings banks and credit cooperatives are more likely to securitize than commercial banks, *ceteris paribus*. This result supports our hypothesis that securitization could reduce adverse selection if groups of banks can jointly issue bonds backed by a common loan portfolio. As for the *Control Variables*, we do not find any evidence supporting that securitization is driven by risk transfer or capital arbitrage in the Spanish bank data.

Columns (3) and (4) refer to the estimation of the Probit models that relate the decision of having securitized at least once during the period 1999-2002 and the situation of the banks in 1999. The results are not very different compared to the estimations in (1) and (2), suggesting that the banks that securitized during the period 1999-2006 already made the decision to securitize during the first time period. Column (5) and (6) performed with the

panel data provide similar results to the previous estimations, though the magnitude of the coefficients is smaller. The variable *Interbank/Loans* becomes statistically significant, though *Dep/Loans* loses its significance and none of the financial cost proxies is significant in (6). As stated, these weaker results could be due to the time dimension of the decision to securitize, which is not made in a yearly basis but within a medium/ long-term strategy related to the capital structure.

4.3.2. Results on the amount securitized

Table 5 displays the results of a Tobit model. Following the same structure as in the Probit analysis, columns (1) and (2) correspond to the estimation in which the dependent variable is the amount of funds securitized by a bank during the period 1999-2006 normalized by the size of its assets in 2006, and as explanatory variables, we include the same regressors that we used in the Probit dated in 1999; columns (3) and (4) present the results of the same estimation using the amount securitized during 1999-2002 as the dependent variable normalized by the banks' assets in 2002, and columns (5) and (6) correspond to the estimations with the panel data using as the dependent variable the amount securitized at year t normalized by assets at t and explained with regressors valued at $t-1$.

The analysis of the Tobit regressions indicates that the amount securitized responds to the same determinants as the decision to securitize, though with certain variations in the coefficients supporting the evidence. The financial costs of the funding sources are determinants of the amount securitized, and the evidence in estimations (1) and (3) comes from the negative and significant coefficient of the *Interbank/Loans* and *Equity/Loans*; *Concentration* has the expected negative sign in (2) and (4) though it is not statistically significant. In the panel data estimation, *Dep/Loans* is negative and significant, and so is *Interbank/Loans* in estimation (5). Overall, these findings suggest that the banks with the higher base of a financing source relative to their loans securitize more. Liquidity proxies, Growth proxies and Access to Markets keep their signs and their significance in the three cases: a) The banks with a lower liquidity base relative to their loans securitize more (negative coefficient for *Liquidity/Loans*); b) The *Projected Loan Growth* is positive and significant at the 5% level (10% in (4)); and c) Savings and *lnAssets* keep their positive and significant coefficients at 5%, though *Coop* is only significant at 5% in (2) and (4). The

control variables have no statistically significant effects as in the case of the decision to securitize.

4.3.3. Results from duration analysis

Table 6 presents the estimation of the duration models that explains the number of years until a bank securitizes as a function of the group of proxies used in the Probit and Tobit models. We assume that the amount of time until a bank securitizes is governed by the proportional hazard models in which the hazard rate, $h(t, X)$, can be written as the multiplication of a function that indicates the time pattern of securitization and a function of covariates that capture the observed heterogeneity across banks, i.e., $h(t, X) = h_0(t) \cdot e^{X_i\beta}$. Estimations (1) and (2) use the exponential model that assumes a constant conditional probability of securitization over time, $h(t, X) = e^{X_i\beta}$ and (3) and (4) are based on the Weibull model that assumes a monotonic dependence of the hazard rates with respect to time, $h(t, X) = pt^{p-1}e^{X_i\beta}$, in such a way that the probability to securitize increases over time if $p > 1$ and decreases over time if $p < 1$ (note that if $p = 1$ we are back to the exponential model). The results are presented in the form of exponential coefficients, that is, e^β because they can be directly interpreted as increases in the baseline hazard rate.²⁸

When we allow for the time dependency of the hazard rate, we observe that the probability to securitize increases over time in the Weibull estimations ($p > 1$), which is consistent with the increasing number of securitizations observed in Table 1. The sign and magnitude of the rest of the coefficients are not significantly affected by the assumption of the hazard rate time dependence. Thus, unless specified, the next comments refer to both types of estimations.

We observe that the higher the deposit base, the longer it takes for the bank to securitize, consistent with the results in the Probit and Tobit models. When we include the *Concentration* variable, the coefficient in (2) and (4) is similar, though only in the Weibull estimation is it statistically significant. This result is again in line with the assumption that a

²⁸ For instance, if $e^{\beta_k} = 1.2$, an increase in 1 unit in X_k increases the baseline hazard rate by 1.2, indicating that the expected time to securitize will decrease. On the contrary, if $e^{\beta_k} < 1$, an increase in 1 unit in X_k lengthens the amount of time until the bank securitizes.

larger base of a given financing source is an indicator of a lower relative financial cost for the bank and a lower probability to use a new financing source when it is introduced. The higher the *Concentration* is, the higher the importance of one of the sources included in the variable and, thus, the longer the period of time until securitization.

The rest of the significant coefficients are the *Projected Loan Growth*, *Savings*, *Coop* and *lnAssets*. All of these coefficients are higher than 1, indicating that an increase of these variables is translated into a reduction of the amount of time until securitization, consistent with the positive relation with the decision to securitize found in Table 4 and Table 5.

To check the prediction power of the estimates of the duration model, we present in Figure 3 the distribution of the predicted number of years until a bank securitizes using the estimates of (3), separating securitizing and non-securitizing banks. We observe that the model predicts a smaller number of years for securitizing banks, and the distribution is concentrated in the values below 5 years (63% of the cases; 93% lower than 10 years). For non-securitizing banks, the distribution is more disperse and predicts securitization beyond 10 years for 78% of the cases, which is out of our sample scope.

In summation, the empirical exercises based on the different models and estimation techniques provide evidence supporting the hypothesis derived from the theoretical model posited in Section 4.1. More concretely, the banks more likely to resort to securitization are those with higher relative costs of the financial alternatives, higher growth opportunities and a lower proportion of liquid assets. We also find evidence that the savings banks and credit cooperatives are more likely to use (before) securitization than commercial banks, and we argue that the reason lies in the fact that securitization grants the access of these banks to the financial markets that are otherwise closed to them. In the next Section, we link the access to financial markets through securitization with the reduction of costs related to asymmetric information.

5. Securitization and Pecking order

This section explores whether securitization offers the possibility of issuing assets under reduced adverse selection. Our purpose is to explore whether the potential smaller informational cost is translated into a dominance of securitization in the choice of the funding of banks. We argue that only those banks that suffer higher informational costs to

access capital markets will benefit from the reduction of information asymmetries that securitization guarantees. If this were the case, we expect to observe a higher resource to securitization for the small banks and non-listed banks that are usually excluded from the capital markets.

Our exercise is based on the conventional equation of the pecking order (Shyam-Sunder and Myers, 1999; Frank and Goyal, 2003) applied to the securitization of the bank firm. The basic test examines whether a firm's financial deficit (FD) explains the increments of debt (ΔD) by considering the specification $\Delta D_{it} = \alpha + \beta FD_{it} + e_{it}$ and testing whether the pecking order coefficient is equal to one, $\beta=1$, that is, whether the financial needs of the firm are covered issuing only new debt (versus issuing new equity). The previous literature usually rejects the null hypothesis (Shyam-Sunder and Myers, 1999; Frank and Goyal, 2003; Fama and French, 2005) and finds values of beta smaller than 1, which is consistent with the empirical evidence that firms combine the issuances of debt and capital to finance their FD .

We adapt this basic test for the case of the banks and securitization and regress the amount of the (new) securitized loans on the bank's financial deficit (FD). In the case of bank i at year t , we define its financial deficit as:

$$FD_{it} = \Delta LOANS_{it} - \Delta DEPOSITS_{it} + \Delta INTERBANK_{it} + \Delta GOVBONDS_{it} + \Delta RESERVES_{it} + \Delta REST_{it} \quad [1]$$

where $RESERVES$ includes the banks' reserves (including current profits) and the rest of variables are as defined in Section 3. We then consider the following specification:

$$SEC_{it} = \alpha + \beta FD_{it} + e_{it} \quad [2]$$

and test whether $\beta=1$. For the banks, we expect the test to be rejected and $\beta < 1$ because they also rely on debt and capital to finance their FD , as well as securitization. Nonetheless, we intend to explore whether certain banks securitize more than others to cope with the asymmetric information costs at the time of issuance. Bharath, Pasquariello and Wu (2009) argue that the firms more affected by the pecking order at the time of issuing securities are those in which the adverse selection problem is more severe. To test their hypothesis, they include in the pecking order equation the interaction of FD with a measure of the asymmetric information and find a higher β for those firms more affected by the informational problem. We embrace this approach, and we include in [2] the interaction of

the variable FD with the three variables $Small$, $Savings$, $Coop$, which are dummies identifying the small banks, savings banks and credit cooperatives, respectively. We define the small banks as those whose total assets fall below the 30th percentile of the sample distribution of the banks' assets. Then, the equation to be estimated becomes:

$$SEC_{it} = \alpha + \beta FD_{it} + \gamma FD_{it} \cdot Small_{it} + \delta_1 FD_{it} \cdot Savings_{it} + \delta_2 FD_{it} \cdot Coop_{it} + e_{it} \quad [3]$$

We expect $\gamma > 0$, $\delta_1 > 0$, $\delta_2 > 0$, that is, the coefficient of the FD is higher for the small banks and for the non-listed banks because these banks finance a higher proportion of their financial deficit through the issuance of securitization.

Table 7 presents the estimates of the pecking order equation using a sample that consists of banks that present a positive financial deficit. We report the robust standard errors that are corrected for clustering at the bank level.

The first column of Table 7 exhibits the results of the basic specification [2], and we find that $\beta < 1$, that is, the strict version of the pecking order is rejected. This result was expected because securitization does not have to become the only financing source of the banks as they continue to issue debt and equity. Nonetheless, it might have become the preferred alternative for the banks with higher informational costs, and we should observe a higher β for these banks. The results provide some evidence towards this hypothesis: Column (2) presents the result when we include the interaction of the FD with the $Savings$ and $Coop$, and we obtain a positive and significant coefficient at 5% for the credit cooperatives; and if we include the interaction $FD \cdot Small$, column (3), the coefficient is also positive and statistically significant. To disentangle the effect of the size and legal nature, estimation (4) includes all of the previous variables plus the interactions of $FD \cdot Small$ with the dummies of $Savings$ and $Coop$. The results indicate that the statistically significant coefficients are $FD \cdot Coop$ and $FD \cdot Savings \cdot Small$, which suggests that the stronger preference for securitization is found in the medium-large credit cooperatives (small cooperatives captured by $FD \cdot Savings \cdot Small$, non-significative) and in the small savings banks. Indeed, the credit cooperatives and small savings banks faced asymmetric informational problems and could not access capital markets issuing debt or equity. Indeed, securitization became the tool for them to reduce the cost of adverse selection and raise funds in the international markets.

6. Robustness test

To check the validity of our results, we have performed several robustness tests. First, in the estimation of the decision to securitize, we have considered the alternative proxies to those included in the paper. To capture the bank growth perspectives, we have included the growth of the sum of the GDP of all the regions where a bank operates and a dummy variable that identifies the banks opening branches in a new regional market. Both variables will capture the banks entering into a new market, and we expect that these banks will have higher growth opportunities to expand their activity in the new region. The growth of the sum of GDPs is statistically significant at 5% when it is the only variable capturing the growth opportunities, and its significance is reduced to 10% if we include the dummy identifying the banks in the new markets. This latter variable is not significant when standing alone as a proxy of growth. When we include these two proxies and our estimate of the prediction of loan growth, the latter variable is significant at 5%, and the sum of GDP loses its significance. Thus, we interpret that the three variables are capturing the same effect, but the proxy of the predicted credit growth contains all the relevant information of the other two. Second, we have considered two additional dummy variables as the proxies of the access to financial markets, which identify the banks listed in the stock market and the banks that had issued debt instruments in the wholesale markets. The results demonstrate a positive and significant coefficient of these variables, in line with the theoretical predictions. Nonetheless, we have not included them in the analysis because they perfectly predict the outcome of several banks, which were automatically removed from the estimation.

In the pecking order exercise, we have used the alternative thresholds to define a bank as small. Thus, we have defined a bank as small if its size is smaller than the 5th, 10th, 20th, 40th and 50th percentiles of the distribution of the banks' assets, as well as the 30th percentile used in Table 7. The results of the estimation of (4) demonstrate that the coefficient of *FD* and *FD-Coop* is not sensitive to the definition of *Small*, but *FD-Savings-Small* is not significant if the threshold is smaller than the 10th percentile or higher than the 40th percentile.

7. Conclusions

This paper demonstrates that securitization has become a central source of funds for banks and has substantially altered the capital structures of the banks. Using the data of the Spanish banks during the period 1988-2006, we find that this change is particularly noteworthy for the small- and medium-size banks that chose to securitize, for which the weight of the securitized funds reached 20.5% in 2006, compared to 16.2% for the large banks. We also provide descriptive evidence that securitization is related to a lower reliance on the traditional deposits and a higher importance placed on the loans on the bank balance sheets. Comparing the two periods of economic growth, pre-securitization and post-securitization, we find a stronger correlation between credit growth and deposit growth in the pre-securitization period.

This paper also explores the determinants that lead a bank to securitize, once it has the power to do so. The empirical evidence obtained from the estimation of the Logit, Tobit and Hazard models is consistent with the theoretical predictions provided in the paper: The opportunity to securitize has been used (more) by the banks with higher growth opportunities and a higher cost of alternative financing sources.

Finally, we find that securitization tends to be at the top of the pecking order of the financing choices for the small savings banks and the medium-large credit cooperatives. These (non-listed) banks are more affected by the adverse selection, and they are more prone to issue securitization to reduce the costs of information asymmetries. This finding is observed because securitization enables the issuance of bonds backed by a pool of loans transferred from the different banks, thereby achieving better credit qualifications than if the banks issued on their own.

References

Acharya, V.V., Schnabl, P. and Suarez, G. “Securitization without risk transfer” *Journal of Financial Economics*, 2013, forthcoming.

Benmelech, E., Dlugosz, J. and Ivashina, V. “Securitization without adverse selection: The case of CLOs”. *Journal of Financial Economics*, 106, 2012, 91-113.

Bharath, S.T., Pasquariello, P. and Wu, G. “Does asymmetric information drive capital structure decisions?”, *Review of Financial Studies*, 22, 2009, 3211-3243.

Bris, A., Koskinen, Y. and Nilsson, M. “The Euro and corporate valuations”. *Review of Financial Studies*, 22, 2009, 3171-3209

DeMarzo, P. “The pooling and tranching of securities: A model of informed intermediation” *Review of Financial Studies*, 18, 2005, 1-35

DeMarzo, P and Duffie, D. “A liquidity-based model of security design”. *Econometrica*, 67, 1999, 65-99

Demyanyk, Y., Van Hemert, O. “Understanding the subprime mortgage crisis”. *Review of Financial Studies*, 24, 2011, 1848-1880.

Drucker, S. and Puri, M. “On Loan Sales, Loan Contracting, and Lending Relationships”. *Review of Financial Studies*, 22, 2009, 2835-2872.

Fama, E., and French, K. “Financing Decisions: Who Issues Stock?”, *Journal of Financial Economics*, 76, 2005, 549-82.

Frank, M.Z. and Goyal, V.K. “Trade-off and pecking order theories of debt” in B.E.Eckbo, Ed., *Handbook of Corporate Finance: Empirical Corporate Finance, Vol. 2, Handbook of Finance Series, Amsterdam, Elsevier/North-Holland*, 2008.

Frank, M.Z. and Goyal, V.K. “Testing the pecking order theory of capital structure”, *Journal of Financial Economics*, 67, 2003, 217-248.

Gorton, G. B. and Pennacchi, G. G. “Banks and loan sales. Marketing nonmarketable assets”, *Journal of Monetary Economics*, 35, 1995, 389-411.

Jiménez, G., Mian, A.R., Peydró, J.L., Saurina, J. “Local versus aggregate lending channels: The effects of securitization on corporate credit supply in Spain”. *NBER Working Paper* 16595, 2010.

Keys, B., Mukherjee, T., Seru, A., Vig, V. “Did securitization lead to lax screening? Evidence from subprime loans”. *Quarterly Journal of Economics*, 125, 2010, 14-53.

Loutskina, E. “The role of securitization in bank liquidity and funding management”. *Journal of Financial Economics*, 100, 2011, 663-684

Loutskina, E. and Strahan, P.E. “Securitization and the declining impact of bank finance on loan supply: evidence from mortgage originations”. *Journal of Finance*, 64, 2009, 861-889.

Mian, A. and Sufi, A. “The consequences of mortgage credit expansion: evidence from the U.S. mortgage default crisis”. *Quarterly Journal of Economics*, 124, 2009, 1449-1496.

Morgan, D.P. “Rating banks: Risk and uncertainty in an opaque industry”. *American Economic Review*, 92, 2002, 874-888.

Pennacchi, G., Park, K and Han, J. “Corporate taxes and securitization”, *Journal of Finance*, 2014, *forthcoming*.

Pennacchi, G. G. “Loan sales and the cost of bank capital”, *Journal of Finance*, Vol. 43, 2, 1988, 375-396.

Purnanandam, A. “Originate-to-distribute Model and the Subprime Mortgage Crisis”. *Review of Financial Studies*, 24, 2011, 1881-1915

Shyam-Sunder, L., and Myers, R. “Testing static tradeoff against pecking order models of capital structure”. *Journal of Financial Economics*, 51, 1999, 219-244.

Table 1. Number of banks, Securitizing banks and Volume of Securitization

	Total Number of Banks			N.Banks that Securitize at <i>t</i>			Balance of Securitization (mill€)		
	Comm. Banks	Savings Banks	Credit Coop.	Comm. Banks	Savings Banks	Credit Coop.	Comm. Banks	Savings Banks	Credit Coop.
1999	72	48	92	7	17	3	10,434	11,182	190
2000	68	46	90	9	13	3	16,067	11,101	343
2001	66	45	88	10	33	11	17,088	21,378	572
2002	61	45	84	10	30	10	30,632	33,150	1,378
2003	57	45	83	11	39	16	48,550	57,486	3,368
2004	54	45	83	20	41	17	80,763	77,472	6,901
2005	52	45	83	20	44	22	115,345	122,122	11,133
2006	51	45	83	22	43	24	161,526	179,870	16,242

Table 2: Balance sheet of the Spanish Banking system

A. Volumes (Billions of Euros)

Billions €	ASSETS				LIABILITIES			
	LOANS	INTERBANK	GOV BONDS	REST	DEPOSITS	DEBT	OWN FUNDS	SEC
1988	156.63	10.70	50.16	23.99	203.25	12.23	26.00	0.00
1989	178.77	16.07	59.61	22.87	237.76	11.00	28.55	0.00
1990	203.07	-3.11	68.15	45.90	268.91	10.98	34.13	0.00
1991	233.32	2.98	55.91	55.79	293.34	13.36	41.30	0.00
1992	255.01	-2.12	58.47	64.78	316.42	7.76	46.67	5.30
1993	267.49	11.01	64.67	74.87	348.43	9.41	52.80	7.40
1994	282.93	-1.29	85.69	77.31	373.00	11.12	53.19	7.32
1995	303.58	15.82	97.81	75.53	418.09	11.66	54.88	8.10
1996	332.33	9.20	104.91	76.42	441.93	15.17	57.62	8.14
1997	380.19	1.39	94.92	81.93	470.34	19.81	60.06	8.22
1998	435.30	-31.10	93.81	89.30	494.98	21.56	61.71	9.05
1999	493.03	-35.33	94.35	111.53	538.68	46.64	65.80	12.46
2000	605.71	-17.72	91.83	108.86	653.11	29.98	74.68	32.15
2001	648.01	-4.12	99.53	122.49	707.67	36.62	82.55	39.07
2002	720.14	-5.68	102.30	119.61	743.40	38.12	89.65	65.20
2003	824.55	-29.94	111.29	137.30	776.18	60.40	97.16	109.45
2004	972.32	-12.07	93.28	154.45	812.56	108.23	121.94	165.23
2005	1226.88	-34.57	92.73	199.43	930.60	167.01	138.11	248.75
2006	1526.40	17.85	74.10	186.26	1066.66	222.72	157.17	358.08

B. Percentages of Total Assets

Perc. of Assets	ASSETS				LIABILITIES			
	LOANS	INTERBANK	GOV BONDS	REST	DEPOSITS	DEBT	OWN FUNDS	SEC
1988	64.87	4.43	20.77	9.93	84.17	5.06	10.77	0.00
1989	64.47	5.79	21.49	8.25	85.74	3.97	10.30	0.00
1990	64.67	-0.99	21.70	14.62	85.63	3.50	10.87	0.00
1991	67.05	0.86	16.07	16.03	84.29	3.84	11.87	0.00
1992	67.80	-0.56	15.55	17.22	84.12	2.06	12.41	1.41
1993	63.99	2.63	15.47	17.91	83.35	2.25	12.63	1.77
1994	63.63	-0.29	19.27	17.39	83.89	2.50	11.96	1.65
1995	61.61	3.21	19.85	15.33	84.85	2.37	11.14	1.64
1996	63.56	1.76	20.07	14.62	84.52	2.90	11.02	1.56
1997	68.08	0.25	17.00	14.67	84.23	3.55	10.76	1.47
1998	74.12	-5.30	15.97	15.20	84.28	3.67	10.51	1.54
1999	74.30	-5.32	14.22	16.81	81.18	7.03	9.92	1.88
2000	76.80	-2.25	11.64	13.80	82.68	3.80	9.45	4.07
2001	74.84	-0.48	11.49	14.15	81.73	4.23	9.53	4.51
2002	76.91	-0.61	10.92	12.77	79.39	4.07	9.57	6.96
2003	79.04	-2.87	10.67	13.16	74.40	5.79	9.31	10.49
2004	80.49	-1.00	7.72	12.79	67.27	8.96	10.09	13.68
2005	82.65	-2.33	6.25	13.43	62.69	11.25	9.30	16.76
2006	84.58	0.99	4.11	10.32	59.11	12.34	8.71	19.84

Table 3. Estimations of the relation of credit growth and deposit growth

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	Total Banks		Total Banks		Securitizing Banks		Non-Securitizing Banks	
	1988-1991		2003-2006		2003-2006		2003-2006	
Deposit Growth	0.48 ***	0.35 ***	0.29 ***	0.19 ***	0.30 ***	0.27 ***	0.47 ***	0.23 ***
	(0.08)	(0.04)	(0.08)	(0.04)	(0.07)	(0.04)	(0.10)	(0.08)
GDP Growth	-3.60 ***	-0.73	4.71 ***	4.59 ***	6.21 ***	6.18 ***	6.04 *	6.56 **
	(1.07)	(0.78)	(1.25)	(1.04)	(1.70)	(1.50)	(3.57)	(3.33)
Intercept	0.23 ***	0.16 ***	-0.01	0.00	-0.04	-0.04	-0.12	-0.12
	(0.04)	(0.33)	(0.03)	(0.001)	(0.06)	(0.06)	(0.125)	(0.12)
Fixed Effects	No	Yes	No	Yes	No	Yes	No	Yes
No. of Observ	578	578	743	743	433	433	307	307

Note. *Credit Growth* is the dependent variable in all the estimations. Symbols: $p < 0.01 = ***$, $p < 0.05 = **$, $p < 0.1 = *$.

Standard errors are in parentheses

Table 4. Probit estimation of the decision to securitize

	(1)	(2)	(3)	(4)	(5)	(6)
	1(Securitized 99-06)		1(Securitized 99-02)		Panel Estimation	
<i>Financial Cost Proxies</i>						
Dep/Loans	-0.226 ** (0.114)	-0.009 (0.053)	-0.247 ** (0.121)	-0.014 (0.055)	-0.059 (0.037)	-0.030 (0.023)
Interbank/ Loans	-0.491 (0.420)		-0.472 (0.429)		-0.358 *** (0.121)	
Debt / Loans	0.421 (1.359)		0.391 (1.448)		-0.074 (0.127)	
Equity / Loans	4.265 (2.863)		2.346 (1.862)		-0.448 (0.567)	
Concentration		-0.843 (0.702)		-0.825 (0.607)		-0.221 (0.143)
<i>Liquidity Proxies</i>						
Past Profitability / Loans	-4.770 (9.354)	1.925 (6.418)	-3.903 (9.758)	3.374 (6.488)	-1.635 (1.721)	-2.261 (1.726)
Liquidity / Loans	-1.309 * (0.731)	-1.398 *** (0.477)	-1.347 * (0.744)	-1.532 *** (0.534)	-0.561 *** (0.180)	-0.609 *** (0.153)
<i>Growth Proxies</i>						
Projected Loan Growth	23.485 *** (5.539)	18.393 *** (5.730)	25.961 *** (5.512)	21.356 *** (5.665)	2.967 ** (1.206)	2.748 ** (1.190)
<i>Access to Markets</i>						
Savings	0.576 *** (0.129)	0.489 *** (0.120)	0.629 *** (0.131)	0.545 *** (0.126)	0.392 *** (0.073)	0.449 *** (0.075)
Coop	0.695 *** (0.161)	0.661 *** (0.158)	0.738 *** (0.158)	0.706 *** (0.164)	0.200 *** (0.071)	0.299 *** (0.074)
In Assets	0.288 *** (0.048)	0.201 *** (0.035)	0.307 *** (0.051)	0.216 *** (0.038)	0.122 *** (0.014)	0.123 *** (0.017)
<i>Bank Control Variables</i>						
Npl	0.293 (0.293)	0.292 (0.261)	0.355 (0.314)	0.319 (0.285)	9.210 (5.616)	9.649 * (5.778)
RegCap	0.001 (0.010)	-0.141 (0.261)	0.006 (0.282)	-0.124 (0.270)	0.009 (0.038)	0.017 (0.039)
Mortg/Loans	-0.572 (0.417)	-0.428 (0.393)	-0.645 (0.439)	-0.478 (0.416)	-0.131 (0.128)	-0.143 (0.137)
No. of Observations	195	195	202	202	1369	1369

Note. (1), (2)= The dependent variable is a dummy that takes the value of 1 if the bank has securitized at least once between 1999 and 2006 and zero otherwise. The explanatory variables refer to the value in 1999. (3), (4)=The dependent variable takes the value of 1 if the bank has securitized at least once between 1999 and 2002 and zero otherwise. The explanatory variables refer to the value in 1999. (5), (6)=The dependent variable takes the value of 1 if the bank has securitized in year t and zero otherwise; the estimation includes the time-dummy variables. The explanatory variables refer to the value in $t-1$. The robust standard errors corrected for clustering at the firm and bank level are in parentheses. Symbols: $p < 0.01 = ***$, $p < 0.05 = **$, $p < 0.1 = *$. Standard errors are in parentheses.

Table 5. Tobit estimation of the amount securitized

	(1)	(2)	(3)	(4)	(5)	(6)
	1(Securitized 99-06)		1(Securitized 99-02)		Panel Estimation	
<i>Financial Cost Proxies</i>						
Dep/Loans	-0.056 (0.069)	-0.014 (0.016)	-0.024 (0.025)	-0.010 (0.013)	-0.016 ** (0.008)	-0.011 ** (0.005)
Interbank/ Loans	-0.437 *** (0.142)		-0.166 ** (0.084)		-0.052 * (0.028)	
Debt / Loans	-0.171 (0.475)		-0.062 (0.367)		-0.023 (0.036)	
Equity / Loans	-0.844 ** (0.414)		-0.589 * (0.317)		0.078 (0.136)	
Concentration		-0.060 (0.099)		-0.113 (0.077)		-0.009 (0.022)
<i>Liquidity Proxies</i>						
Past Profitability / Loans	0.979 (3.627)	-0.649 (2.496)	1.541 (2.801)	0.097 (1.936)	-0.192 (0.332)	-0.016 (0.365)
Liquidity / Loans	-0.209 (0.258)	-0.323 ** (0.143)	-0.112 (0.149)	-0.164 (0.103)	-0.141 ** (0.055)	-0.138 *** (0.042)
<i>Growth Proxies</i>						
Projected Loan Growth	10.091 ** (4.294)	8.964 ** (4.437)	7.187 ** (3.506)	6.620 * (3.540)	1.015 *** (0.372)	0.978 *** (0.370)
<i>Access to Markets</i>						
Savings	0.062 ** (0.030)	0.110 *** (0.031)	0.057 ** (0.025)	0.066 ** (0.026)	0.038 *** (0.009)	0.045 *** (0.010)
Coop	0.032 (0.035)	0.106 *** (0.035)	0.022 (0.027)	0.057 ** (0.023)	0.012 (0.014)	0.023 (0.014)
In Assets	0.029 *** (0.009)	0.039 *** (0.009)	0.025 *** (0.007)	0.027 *** (0.007)	0.017 *** (0.002)	0.016 *** (0.002)
<i>Bank Control Variables</i>						
Npl	0.158 (0.137)	0.164 (0.142)	0.158 (0.115)	0.152 (0.113)	3.176 (1.930)	3.172 (1.952)
RegCap	-0.079 (0.084)	-0.091 (0.082)	-0.020 (0.062)	-0.017 (0.062)	0.006 (0.007)	0.004 (0.008)
Mortg/Loans	0.050 (0.079)	0.065 (0.089)	-0.004 (0.074)	0.001 (0.071)	-0.015 (0.029)	-0.018 (0.031)
No. of Observations	195	195	202	202	1369	1369

Note. (1), (2)= The dependent variable is the ratio of the amount securitized during the period 1999-2006 with respect to assets in 2006 if the bank has securitized and zero otherwise. All of the estimations are robust to heteroskedasticity, and the standard errors are clustered at the bank level. The explanatory variables refer to the value in 1999. (3), (4)= The dependent variable is the ratio of the amount securitized during the period 1999-2002 with respect to assets in 2002 if the bank has securitized and zero otherwise. The explanatory variables refer to the value in 1999. (5), (6)=The dependent variable is the amount securitized in year t with respect to assets in t and zero otherwise; the estimation includes the time-dummy variables. The explanatory variables refer to the value in $t-1$. The robust standard errors corrected for clustering at the firm and bank level are in parentheses. Symbols: $p < 0.01 = ***$, $p < 0.05 = **$, $p < 0.1 = *$. Standard errors are in parentheses.

Table 6. Duration Model: Number of years from 1998 to securitization

	(1)	(2)	(3)	(4)
	Exponential		Weibull	
<i>Financial Cost Proxies</i>				
Dep/Loans	0.994 *	0.996	0.994 *	0.996
	(-1.68)	(-1.46)	(-1.75)	(-1.44)
Interbank/ Loans	0.983		0.980	
	(-1.41)		(-1.62)	
Debt / Loans	1.005		1.000	
	(0.23)		(-0.01)	
Equity / Loans	0.985		0.965	
	(-0.38)		(-0.84)	
Concentration		0.989		0.984 *
		(-1.19)		(-1.81)
<i>Liquidity Proxies</i>				
Past Profitability / Loans	0.995	1.006	0.999	0.985
	(-0.05)	(0.07)	(-0.01)	(-0.15)
Liquidity / Loans	1.009	1.007	1.011	1.009801
	(0.90)	(0.75)	(1.16)	(1.03)
<i>Growth Proxies</i>				
Projected Loan Growth	1.785 ***	1.710 ***	1.928 ***	1.833 ***
	(4.09)	(3.84)	(4.35)	(4.09)
<i>Access to Markets</i>				
Savings	2.865 ***	3.123 ***	3.987 ***	4.635 ***
	(2.90)	(3.18)	(3.48)	(3.90)
Coop	3.073 ***	4.011 ***	3.834 ***	5.356 ***
	(3.07)	(4.07)	(3.56)	(4.75)
In Assets	1.596 ***	1.574 ***	1.819 ***	1.778 ***
	(5.62)	(5.54)	(6.69)	(6.50)
<i>Bank Control Variables</i>				
Npl	0.998	0.998	0.997	0.997
	(-0.50)	(-0.50)	(-0.68)	(-0.78)
RegCap	1.643	1.855	1.298	1.787
	(1.10)	(1.48)	(0.55)	(1.33)
Mortg/Loans	1.008	1.009	1.009	1.010
	(0.85)	(0.98)	(0.94)	(1.00)
p			1.903 ***	1.912 ***
No. of Observations	211	211	211	211

Note. (1), (2) = The exponential model, hazard rate is constant over time (3), (4)= Weibull model, hazard rate is monotonic if $p \neq 1$. Symbols: $p < 0.01 = ***$, $p < 0.05 = **$, $p < 0.1 = *$. The results are presented in the form of exponential coefficients, that is, e^β because they can be directly interpreted as the increases in the baseline hazard rate. t -ratios in parentheses.

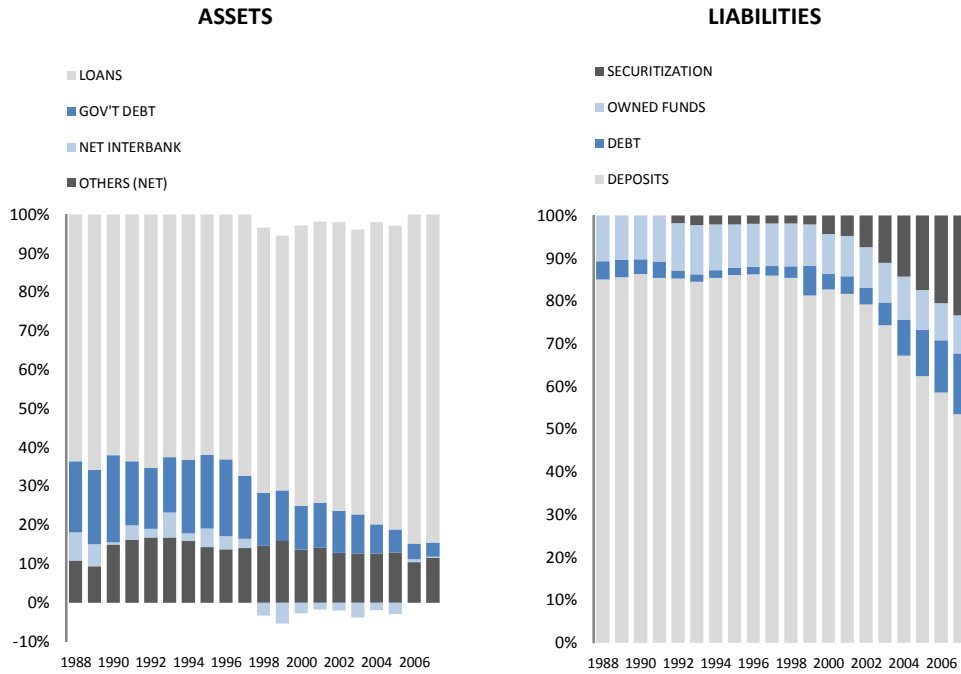
Table 7. Estimation of the Pecking order Equation

Dependent variable: SEC_t				
	(1)	(2)	(3)	(4)
FD	0.560 *** (0.063)	0.561 *** (0.104)	0.560 *** (0.063)	0.562 *** (0.104)
FD·Savings		-0.004 (0.124)		-0.004 (0.129)
FD·Coop		0.214 ** (0.100)		0.214 ** (0.099)
FD·Small			0.203 * (0.110)	-0.609 (0.543)
FD·Savings·Small				0.855 * (0.483)
FD·Coop·Small				-8.849 (12.641)
R^2	85.04	85.17	85.04	85.18
No. of Observ	813	813	813	813

Note. SEC is the volume of securitized assets issued by a bank at t , and FD is the financial deficit of the bank defined in [1]; $Small$ is a dummy variable that identifies banks with assets below the 30th percentile of the asset distribution of banks of the same legal nature; $Savings$ and $Coop$ are dummy variables that identify the savings banks and credit cooperatives, respectively. OLS are estimations with the standard errors clustered at the bank level. Symbols: $p < 0.01 = ***$, $p < 0.05 = **$, $p < 0.1 = *$. Standard errors in parentheses.

Figure 1. Evolution of Banks' Capital Structure

1A. Banks that do securitize



1B. Banks that do not securitize

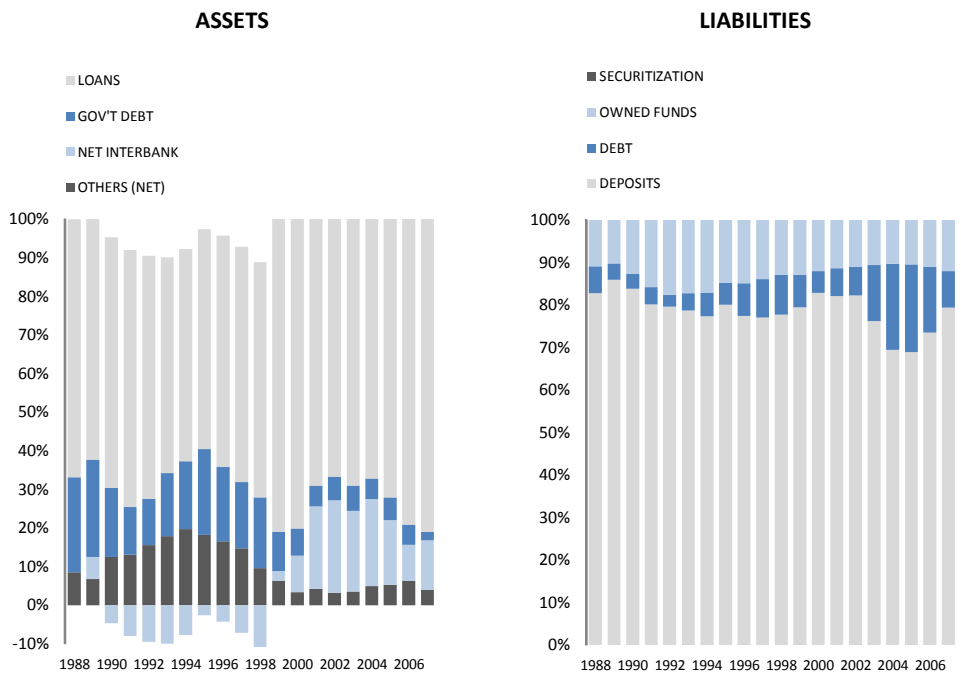
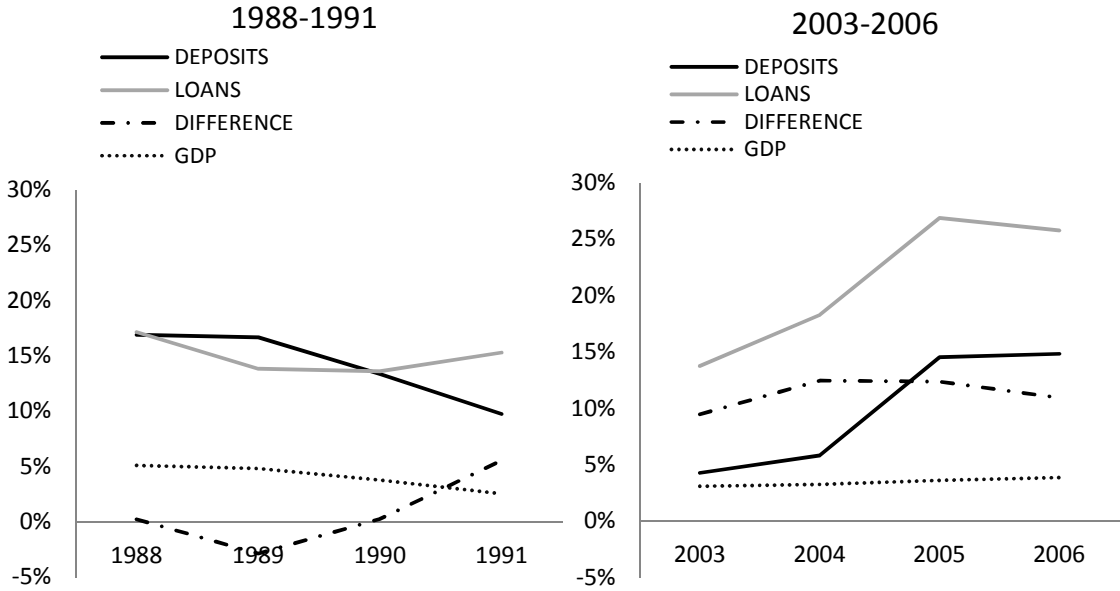
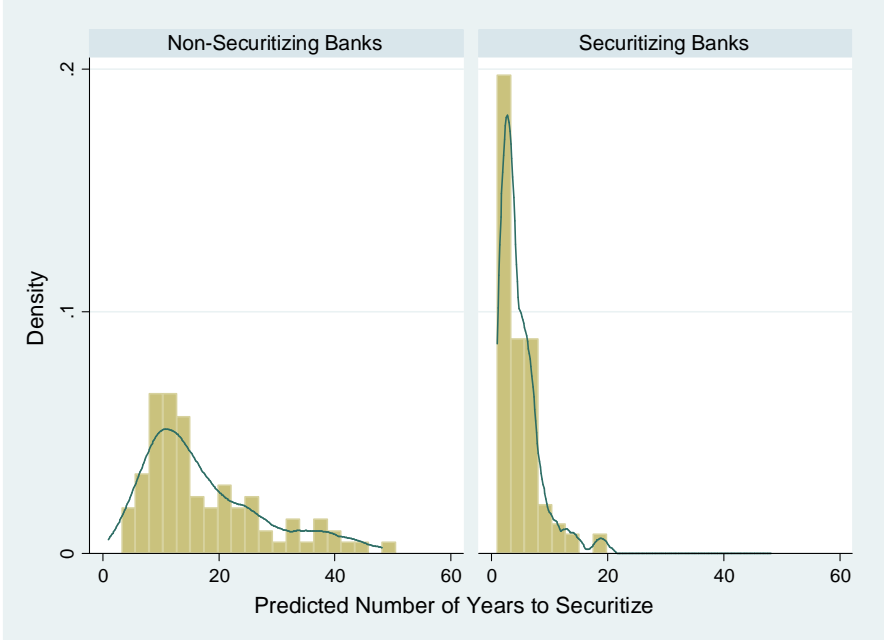


Figure 2. Evolution of growth rates of loans and deposits.

Total Spanish Banks



**Figure 3. Density of the prediction of the number of years until securitization
Total Spanish Banks**



Appendix A. Homogenization of the concepts of LOANS and DEPOSITS

This paper gathers the different items of the asset side and the liability side of the balance sheets in the following aggregate concepts:

Assets = Loans + Net Interbank + Government Debt + Others (net)

Liabilities = Own Funds + Securitization + Deposits + Debt

Most of the items (net interbank, government debt, own funds, debt, securitization) are obtained straightforwardly from the information in the balance sheet data. However, for the loans and deposits, we have made certain adjustments.

For Loans, the adjustments made are to address a regulatory change introduced at the end of 2004 (CBE 4/2004). Prior to 2004, CBE 4/1991 established that when a bank securitized a loan, this loan was written off the balance sheet. With the new regulation, the banks could only write off the securitized loan provided that the securitization implied an effective transfer of the risk of the loan. In addition to this, the new regulation had a retrospective effect, and it obliged the banks to include again in the balance sheets those loans securitized in the past that did not comply with the new criteria of risk transfer. As a consequence, there was a break in the information of the outstanding loans in 2005 because approximately 90% of the securitized loans made in the past returned to the balance sheet. To homogenize these series, we adopt the criterion of the CBE 4/2004. We compute the percentage of the off-balance sheet loans that returns to the balance sheet in 2005 and extend this percentage to the previous years of the sample (1999-2004). Therefore, the variable *LOAN* will be equal to the accounting item of credit from 2005 onwards and to this item plus the computed proportion of the securitized assets of that year.

For Deposits, the accounting regulation establishes that the liability counterparty of an operation of securitization is accounted for in the *Deposit* item of the balance sheet. However, we want to consider a more pure definition of deposits (i.e., the funds collected from the consumers in the retail business of the banks) and separate them from securitization. To accomplish this, we define our variable *DEPOSITS* as the difference between the item *Deposits* of the balance sheet and the outstanding amount of securitized assets *SEC*.