Determinants and Effects of Capital Relief Trades*

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Securitization can serve different purposes. We focus on a sample of transactions which aim at releasing capital, so-called capital relief trades (CRTs). *Ex ante*, it turns out that, as expected, higher total capital ratios decrease the likelihood of a CRT, and larger banks are more likely to conduct CRTs. The non-performing loans ratio has a negative effect on this likelihood and the liquidity ratio basically none. The situation changes remarkably when examining determinants of the number of CRTs or their volumes. The total capital ratio has no significant effect anymore, but higher non-performing loans ratios come along with less CRTs and lower volumes, too, presumably because banks cannot afford to realize considerable hidden burdens of their loan portfolios. *Ex post*, we observe that neither the occurrence, nor the frequency or the size of a CRT change any of the following ratios: total capital ratio, non-performing loans ratio, liquid assets to total assets, loans to total assets. These results have important policy implications as they indicate that banks, by and large, use CRTs to eventually increase their lending, which is a key objective when trying to restore the market for securitizations.

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1 Introduction

Information asymmetry suggests that loans are non-marketable (Diamond, 1984). However, loan sales have been established over time, among others in the form of securitization, and have become a substantial market, not the least due to particular contractual features (Gorton and Pennacchi, 1995). Banks utilize securitization as an instrument to actively manage their (regulatory) capital, loan default risk, and liquidity. Improvements enable banks to increase their provision of loans to the real economy, i.e. individuals and firms (e.g., Merton, 1995; Loutskina and Strahan, 2009a). In this way, securitization provides an important contribution to the overall macroeconomic development.

The European Central Bank (ECB) started an extensive liquidity provision in 2011, including the eligibility of asset-backed securities (ABS) as collateral in repurchase agreements (repos) and buying ABS as part of the ABS Purchase Programme (ABSPP) (European Central Bank (ECB), 2015). Increasing regulatory capital requirements as part of the Basel III framework was another response to the financial crisis. These developments stimulated the segmentation of the European securitization market into liquidity generating transactions and those relieving banks' (regulatory) capital positions, the latter being called 'capital relief trades' (CRTs)[1]. In discussions of regulators and practitioners they are frequently also called 'balance sheet transactions'. Liquidity generating transactions are often retained by the issuing bank and characterized by data submitted to the European Datawarehouse, the central data repository for all ABS which are eligible for ECB liquidity provision.

With this paper, we are among the first to analyze CRTs and shed light on one of the few academically unexplored financial markets in Europe. We highlight the role of CRTs for the management of banks by showing incentives for and consequences of CRT issuances for banks' accounting figures and their business activities. CRTs comprise *traditional* "true-sale transactions", i. e. the actual elimination of loans from banks' balance sheets, as well

[1] In the literature on securitization, the abbreviation 'CRTs' is sometimes alternatively used for 'credit risk transfers' (e.g., Echeverry, 2022) In our paper, CRTs refer to 'capital relief trades', only.

as *synthetic* transactions, i. e. the purchase of instruments hedging against losses from credit defaults (European Parliament and the Council, 2017). The defining characteristic of CRTs is that these transactions are structured predominantly to provide a release of the issuing banks' (regulatory) capital. This is typically achieved by transferring as much credit risk to the investors as tolerable from a regulatory perspective and economically reasonable. Actively managing banks' capital and credit risk is especially important when regulatory capital requirements are increasing. They matter even more in severe economic stress situations, like the Euro crisis, the COVID-crisis, or the war in the Ukraine, when borrowers' ratings tend to deteriorate.

Not only the objectives of transaction types differ, their structures significantly differ as well. The vast majority of CRTs is backed by corporate loans, mostly of very large firms, and marketed bilaterally in OTC deals (European Banking Authority (EBA), 2019). By contrast, liquidity oriented transactions typically involve securities backed by residential mortgages, are sold publicly, and are rated by major credit rating agencies.[2] As Carbo-Valverde and Rodríguez-Fernández (2015) show that the valuable economic contribution of ABS in Europe on banks' loan supply mainly arises from banks' improved regulatory capital ratios and not from the liquidity generation, our analysis of CRTs examines a pivotal determinant for overall macroeconomic development.

In our empirical analysis, we examine, first, which bank characteristics determine a bank management's use of CRTs. Second, we investigate the consequences of a CRT issuance on a bank's total capital ratio (TCR), liquidity positions as well as the ratios of non-performing loans to total loans (NPL ratios) and gross loans to total assets. Our data set combines a novel repository of CRTs in Europe, provided by Structured Credit Investor, and bank accounting data of 225 large banks from 23 European countries between 2012 and 2021. Based on various regression models, we reveal that ex ante the probability of conducting a CRT as well as the number of CRTs and the volume securitized is higher

[2] In order to be eligible for a purchase under the ECB's ABS Purchase Program, an ABS needs to be rated by at least two of the four credit rating agencies ("External Credit Assessment Institutions") accepted within the Eurosystem Credit Assessment Framework (European Central Bank (ECB), 2015).

for larger banks. Banks with lower TCRs are more likely to conduct a CRT, whereas the number of CRTs issued and the total deal volume is not found to be driven by banks' TCRs. Interestingly, we find a lower quality of the loan portfolio as expressed by a higher share of NPL to be related to lower likelihood to conduct CRTs as well as lower CRT deal count and volume. This finding would be consistent with banks shying away from realizing loan losses when selling NPL in traditional true sale transactions. Ex post, we do not find that a bank's TCR and other relevant ratios change significantly as consequence of CRTs which would be in line with banks issuing CRTs to eventually increase their lending.

With our analysis, we contribute to at least two strands of the existing literature. First, we add to the literature on determinants of securitization issuances (Bannier and Hänsel, 2008; Affinito and Tagliaferri, 2010; Cardone-Riportella et al., 2010; Casu et al., 2013; Farruggio and Uhde, 2015). Regarding banks' loan portfolio risk and equity position, up to now it has been an open question whether the actual credit risk affects banks' securitization activities. By applying data with a sample period after the Global Financial Crisis, we provide evidence that large banks issue CRTs more likely and with a higher deal number and volume. Weakly capitalized banks are more likely to issue CRTs, whereas a high NPL ratio is found to decrease CRT deal count and volume. In contrast to most of the former literature on securitization, which did not distinguish different purposes for securitization, our results show that banks' liquidity does not affect managers' decisions to initiate a CRT. Second, our study contributes to the literature on the implications of securitizations on banks' accounting and risk figures (Michalak and Uhde, 2012; Nadauld and Weisbach, 2012; Carbo-Valverde and Rodríguez-Fernández, 2015; Kaya and Masetti, 2019) by showing that CRTs have no measurable influence on the TCRs and other relevant ratios of the issuing banks.

The remainder of this paper is organized as follows: Section 2 summarizes related literature. Section 3 introduces our data sources, and Section 4 the methodology of our analysis. We present our results in Section 5 before concluding with a summary and an outlook in Section 6.

2 Literature Review and Hypotheses Development

By selling ABS tranches on the capital market or purchasing guarantees covering potential losses from loan defaults, banks can achieve at least three objectives: The management and enhancement of their liquidity, their (regulatory) equity ratio, as well as a reduction of their credit risk position (e.g., Affinito and Tagliaferri, 2010; Loutskina, 2011). In this way, securitizations provide an important contribution to bank funding and credit risk diversification, as well as to enhanced bank lending and optimal risk allocation in the economy (e.g., Pennacchi, 1988; Loutskina, 2011). CRTs predominantly affect the equity and credit risk positions of banks, thus, we will focus on this part of the literature.[3] As the determinants and consequences of true-sale and synthetic securitization do not differ substantially in the former literature, we will not separate those in our literature review (Haensel and Krahnen, 2007; Farruggio and Uhde, 2015). In the last two decades, the institutional framework in the ABS market as well as the regulatory requirements for banks significantly differ over time and locations. Consequently, we present only studies which contain data sets that have a minimum level of comparability to the current situation in the European market. Especially, there is only little literature on determinants and consequences of ABS transactions focusing on the European ABS market after the Euro zone debt crises and the related ECB interventions.

Focusing on the motives for issuing ABS, securitizations enable banks to actively exclude credit risk from their balance sheet (or buy the respective insurance in case of synthetic transactions). The actual use of securitizations by the bank management as a tool to manage credit risk is supported in empirical studies as the default risk of the loan portfolio significantly increases banks' activity in the securitization market (e.g., Bannier and Hänsel, 2008; Affinito and Tagliaferri, 2010). In contrast, there are a number of studies, which do not find a significant effect of banks' credit risk position on the probability of a

[3] By selling the generated ABS tranches on the capital market, banks also generate liquidity for refinancing. In this context, liquidity generation is a major determinant of ABS issuances (e.g., Bannier and Hänsel, 2008; Altunbas et al., 2009; Affinito and Tagliaferri, 2010; Cardone-Riportella et al., 2010; Casu et al., 2011; Loutskina, 2011). This is especially prevalent for banks with liquidity constraints or more difficult capital market access (Almazan et al., 2015)

securitization issuance (e.g., Martín-Oliver and Saurina, 2007; Cardone-Riportella et al., 2010; Farruggio and Uhde, 2015). Banks having a high loan portfolio quality and, thus, a low credit default risk on their balance sheet can realize positive reputation in the market when securitizing high-quality portfolios (Ambrose et al., 2005). Closely related to banks' credit default risk as an important determinant of issuing an ABS transaction, banks' equity position is of importance for the issuance decision. For the period prior to the Global Financial Crisis, especially undercapitalized banks are found to be stronger incentivized to issue a securitization transaction in order to relief their equity position (e.g., Affinito and Tagliaferri, 2010; Casu et al., 2013).

Additionally, banks' performance, their efficiency, as well as their size are shown to be factors incentivizing bank management to issue ABS. Haensel and Krahnen (2007) and Cardone-Riportella et al. (2010) find that better performing and more efficient banks securitize their assets more often. As larger banks have more expertise in risk management as well as a higher degree of capital market access, size is positively affecting banks' probability of being an active supplier in the ABS market (e.g., Haensel and Krahnen, 2007; Cardone-Riportella et al., 2010; Farruggio and Uhde, 2015).

After the securitization transaction has been conducted, various impacts on banks' equity and NPL ratios as well as on the business activities are identified in former studies. On the individual banks' level, there is mixed evidence on bank risk after securitizing a part of the loan portfolio. On the one hand, there is evidence that banks take even greater risks after the issuance than before, which offsets the risk-reducing effect of divestment (e.g., Franke and Krahnen, 2007; Haensel and Krahnen, 2007; Michalak and Uhde, 2010; Casu et al., 2011; Michalak and Uhde, 2012; González et al., 2016; Bakoush et al., 2020). On the other hand, the elimination of loan default risk from bank balance sheet (or the assurance against it in case of synthetic securitizations) relieves banks equity and risk positions and leads to more financial stability (e.g., Jiangli and Pritsker, 2008; Keffala et al., 2020). Focusing on the time dimension of subsequent banks' risk profile, the default

risk of large European banks decreases in the year after the securitization issue, whereas it increases again in the following year (Battaglia et al., 2021).

Focusing on their business activities, banks show higher profitability of the loan portfolios and a seizing of profitable new business opportunities (Bartov, 1993; Beatty et al., 1995; Karaoglu, 2005; Bakoush et al., 2020). Furthermore, credit securitization by making available additional liquidity can enable banks to provide more loan financing for individuals and corporates, which is offered at better conditions, i.e. lower interest rates (e.g., Loutskina and Strahan, 2009b; Loutskina, 2011; Nadauld and Weisbach, 2012; Kaya and Masetti, 2019). A key finding for our study is that in the European banking sector the positive effect of securitization on the loan supply is derived through the channel of regulatory capital relief, whereas in the U.S. it arises through the liquidity effect of the conversion of typically illiquid loans to liquid assets (Loutskina, 2011; Carbo-Valverde and Rodríguez-Fernández, 2015; Kaya and Masetti, 2019). Empirical evidence of this result is provided by comparing the impact of securitizations with that of covered bonds, which provide liquidity but do not lead to regulatory capital relief. Importantly, the expansion of lending only depends on the total volume of securitized loans, not on their type (Loutskina, 2011; Kaya and Masetti, 2019).

The insights from the existing literature mentioned above lead us to the following hypotheses that are to be analyzed in the following sections:

- H1: Banks with a lower ex ante TCR securitize more CRTs.
- H2: Banks with a higher ex ante NPL ratio securitize more CRTs.
- H3: Banks which securitize more CRTs have an increased TCR ex post.

3 Data

To assess the research questions empirically, data is retrieved from two main sources. The first source is Fitch Connect. A list of European banks with individual total average assets per bank over USD 50 billion as of December 31, 2021 is accessed. For the banks in the list, a variety of static and dynamic variables is downloaded from Fitch Connect as well. This includes basic information such as Fitch ID or name as well as annual data from 2012 to 2021 on balance sheet and income statement items and regulatory figures. Accounting measures that are not expressed in USD are converted with each year end's exchange rate. The Total Capital Ratio (TCR) and the Ratio of Non-Performing Loans to Total Loans (NPL) are central for our analysis. Additionally, the Ratio of Deposits to Total Assets (DTA), Ratio of Liquid Assets to Total Assets (LATA), the Logarithm of Total Assets (LN_TA), the Ratio of Gross Loans to Total Assets (LTA), the Ratio of Non-Interest Operating Income to Total Assets (NII) and the Return on Equity (ROE) are of interest for our regressions. For precise definitions of the variables, please refer to Appendix A.1. Some of the entities included in the Fitch Connect list are erroneously declared as commercial or investment banks even though they do not operate as banks. Examples are central banks, stock exchanges or associations of banks. These entities are manually eliminated from the list. Additionally, all banks from Russia and Turkey are eliminated because their economies and banking systems differ largely from all other countries in various structural and regulatory aspects and could bias the results. A list of the names of all banks finally included in the sample is provided in Appendix A.2 and a list of the number of banks per country in Appendix A.3. A manual, rough overview of the numeric variables indicates that some infrequent and extreme outliers (e.g. TCR values much higher than 100 %) might distort regression results. The variables from Fitch Connect used as explanatory variables in the following analyses are therefore consistently winsorized for each variable to the top and bottom 1 %.

The second data set is provided by Structured Credit Investor (SCI) comprising tranche-level information on CRTs since 2005.[4] It includes information on approximately 400 CRTs conducted by around 100 originating banks. We generate a dummy variable *CRT* indicating for each bank-year combination, whether the respective bank did at least one CRT in the respective year (*CRT = 1*) or not (*CRT = 0*). Furthermore, we extract from the SCI data set the number of CRT transactions conducted by each bank in a given year (*CRT_COUNT*) and the natural logarithm of the total CRT deal volume for each bank-year combination (*LN_CRT_VOL*). For consistency reasons, *LN_CRT_VOL* is winsorized to the top and bottom 1 %.

The data used in our analysis is additionally augmented my macro variables. We access country-level data on the annual growth rate of the harmonized consumer price index (CPI) and the annual growth rate of the real gross domestic product (GDP) via EUROSTAT.[5] Furthermore, interest rate data on the one-year EURIBOR (IR) is provided by Refinitiv.

To combine the information from the Fitch Connect and SCI data set, they are matched based on bank names. For each of the banks included in the SCI data set, the Fitch ID is retrieved by searching for the bank name in the Fitch Connect database. Here, we try to correct missing matches that exist e.g. due to slightly different spellings as well as in rare cases of name changes, mergers and acquisitions. The data is deliberately not consolidated on the group level, because in principle every subsidiary has to fulfill regulatory requirements, e.g. with respect to minimum capital, on an individual basis (European Parliament and the Council, 2013, Art. 6) and thus motivations for and consequences of securitization transactions have to be analyzed accordingly on this level.[6] The macro variables are finally matched according to the country of the banks' respective headquarter.

[4] The classification of a certain transaction as a CRT is not fully transparent to researchers. However, as SCI sells access to this data, it should be its commercial interest to supply a correct an unbiased classification, and we have not come across any peculiar attribution.

[5] We use the GDP and CPI data on the UK for Jersey and on Switzerland for Liechtenstein, because in both cases no seperate numbers are available.

[6] So-called "waivers", where e.g. capital requirements have to be fulfilled only on a group level, are in principle possible under very strict conditions (European Parliament and the Council, 2013, Art. 7 - 10). However, because of these strict requirements, in practice "waivers" are a rare exception.

In total, we obtain a panel data set containing accounting, regulatory and securitization information for 225 banks from 23 countries between 2012 and 2021 on an annual basis with up to 2,250 bank-year observations for each variable.

Table 1: Summary statistics

	N	Mean	SD	5 %	50 %	95 %
CRT	2,250	0.06	0.24	0.00	0.00	1.00
CRT_COUNT	2,250	0.12	0.63	0.00	0.00	1.00
LN_CRT_VOL	2,228	0.30	1.28	0.00	0.00	4.39
TCR	1,788	20.69	11.29	12.10	18.40	35.00
NPL	1,790	4.51	6.78	0.10	2.51	14.96
DTA	2,054	57.21	24.41	5.13	62.32	89.36
LATA	2,094	22.95	17.64	2.32	18.68	62.11
LN_TA	2,108	11.86	1.21	10.46	11.60	14.10
LTA	2,076	55.31	23.48	8.90	59.59	89.25
NII	2,099	0.84	0.96	-0.05	0.67	2.34
ROE	2,074	6.30	9.48	-6.88	6.73	19.65
CPI	2,180	1.17	1.08	-0.55	1.10	3.00
GDP	2,180	1.31	3.20	-3.90	1.60	5.65
IR	2,250	-0.02	0.36	-0.50	-0.10	0.56

Table 1 provides summary statistics for the data set which is partly winsorized as described above. It contains the number of observations (N), the arithmetic mean (Mean) , the standard deviation (SD) and the 5 %, 50 % and 95 % percentiles of the respective variables. The dummy variable *CRT* has a mean of 0.06 which means that in 6 % of the bank-year observations, a certain bank has conducted at least one CRT in a given year. The mean value of the variable *CRT_COUNT* can be interpreted in a way that on average, per bank-year observation 0.12 CRT deals are conducted. Re-transforming the mean of *CRT_VOL* to arithmetic numbers refers to a deal volume of USD 1.35 million. The average total capital ratio lies at roughly 21 %. The mean values as well as the percentiles of *NPL*, *DTA*, *LATA*, *LTA*, *NII*, *ROE*, *CPI*, *GDP* and *IR* are within expected and plausible ranges. The mean of *LN_TA* is 11,86. Re-transformed, this values refers to total assets of USD 141 billion.

4 Methodology

To investigate the research questions and to test the corresponding hypotheses, different econometric models are employed.

To address the first question, a regression model is set up with a dependent variable *CRT_VAR* referring to different dimensions of conducting CRTs. *CRT_VAR* is replaced either by *CRT*, *CRT_COUNT* or *LN_CRT_VOL*, depending on the model specification. This means that we analyze the determinants of the binary decision whether a CRT transaction is conducted at all, of the number of CRT transactions conducted and of the CRT deal volume. In our ex ante analyses, we are particularly interested in the variables *TCR* and *NPL* as potential *Determinants* of CRTs. We add how heavily a bank relies on deposits (*DTA*), bank size (*LN_TA*), the relative importance of the credit business for a bank's business model (*LTA*), in our full model liquidity (*LATA*), the non-interest income reliance (*NII*) and profitability (*ROE*) as bank-level as well as (*CPI*), (*GPD*), and (*IR*) as macro *Controls*. Because some time is needed to prepare a CRT and in order to partly encounter potential endogeneity issues, all explanatory variables are lagged by one year. This results in the regression equation

$$CRT\_VAR_{i,t} = \alpha + \sum_{j=1}^{m} \beta_j \cdot Determinant_{i,j,t-1} + \sum_{k=1}^{n} \gamma_k \cdot Control_{i,k,t-1} + \epsilon_{i,t} \qquad (4.1)$$

where α is a constant and ϵ the error term. i is the bank index, j the determinats' index, k the controls' index and t the time index. We also control for year- and country-fixed effects. In the specification where *CRT* is used a dependent variable, a probit model is estimated, whereas in the other specifications OLS regressions are applied. The pairwise correlations between the explanatory variables are generally rather moderate (see Appendix A.4). Only the pairwise correlation between *LTA* and *LATA* is comparably high but still low enough to assume that multicollinearity is most likely not a concerning problem in the model.

To address the second question, i.e. how various capital adequacy and risk measures are affected by the CRT activity of a bank τ years ago, the variable *CRT_VAR* is used as an

explanatory variable in an OLS regression model. Again, CRT_VAR is replaced by either CRT, CRT_COUNT or LN_CRT_VOL. Because we are primarily interested in the change rather than the absolute values of the ratios analyzed in our ex post analysis, the changes in TCR, NPL, $LATA$, and LTA in percentage points are used as dependent variables ($\Delta\, Measure$). This results in the regression equation

$$\Delta\, Measure_{j,i,t} = \alpha + \beta \cdot CRT\_VAR_{i,t-\tau} + \sum_{k=1}^{n} \gamma_k \cdot Control_{k,i,t} + \epsilon_{i,t} \qquad (4.2)$$

where it is again controlled for LN_TA. j is the measure index. Additionally, it is controlled for year- and bank[7] fixed effects.

5 Empirical Results

Tables 2 - 4 provide the regression results of equation (4.1) in different specifications with respect to dependent and independent variables.

First, CRT is used as dependent variable (Table 2). Each of the models (M.A1) and (M.A2) uses one of the potential determinants of primary interest and various controls. Models (M.A3) and (M.A4) use both determinants and different controls as variables. Model (M.A4) additionally controls for $LATA$. Banks' capitalization expressed by TCR is negatively and significantly at a 90 % significance level related to CRT in all three models where it is included. This supports H1 with respect to the CRT decision. NPL is negatively and significantly at a 95 % significance level related to CRT in all three relevant models. This means that a lower quality of the loan portfolio, expressed by higher NPL, is decreasing the likelihood that a bank engages in CRTs, which is not what one would expect from the prevailing view in existing literature. H2 is not supported, because there

[7] In the ex ante analysis, we are especially interested in analyzing, which banks from the whole sample securitize CRTs and how the decision is determined. To do so, it is controlled for country fixed effects to take into account unobserved influences on the CRT activity that might stem e.g. from different national regulatory peculiarities. Potential bank-related determinants are already largely modeled as variables. However, in the ex post analysis, we want to investigate the consequences of CRTs for a securitizing bank. Here, bank fixed effects are deliberately employed because due to less bank-related explanatory variables, it has to be controlled for potential unobserved influences.

Table 2: Ex ante analysis - CRT decision determinants

	Dependent variable: CRT			
	(M.A1)	(M.A2)	(M.A3)	(M.A4)
TCR_{t-1}	−0.040 *		−0.042 *	−0.042 *
	(0.071)		(0.071)	(0.076)
NPL_{t-1}		−0.038 **	−0.039 **	−0.038 **
		(0.026)	(0.023)	(0.029)
DTA_{t-1}	−0.002	−0.002	−0.003	−0.003
	(0.747)	(0.618)	(0.550)	(0.539)
$LATA_{t-1}$				−0.006
				(0.421)
LN_TA_{t-1}	0.849 ***	0.876 ***	0.846 ***	0.844 ***
	(0.000)	(0.000)	(0.000)	(0.000)
LTA_{t-1}	0.005	0.009 *	0.007	0.004
	(0.285)	(0.080)	(0.175)	(0.515)
NII_{t-1}	0.011	0.049	0.021	0.019
	(0.924)	(0.660)	(0.859)	(0.867)
ROE_{t-1}	−0.011 *	−0.019 ***	−0.017 **	−0.017 **
	(0.066)	(0.008)	(0.016)	(0.018)
CPI_{t-1}	−0.036	−0.023	−0.009	−0.009
	(0.794)	(0.868)	(0.948)	(0.950)
GDP_{t-1}	−0.003	0.008	0.004	0.004
	(0.940)	(0.846)	(0.922)	(0.930)
IR_{t-1}	−1.364 ***	−1.199 ***	−1.373 ***	−1.380 ***
	(0.004)	(0.009)	(0.005)	(0.005)
Constant	−11.380 ***	−12.343 ***	−11.111 ***	−10.817 ***
	(0.000)	(0.000)	(0.000)	(0.000)
Year FE	Y	Y	Y	Y
Country FE	Y	Y	Y	Y
Obs.	1,355	1,348	1,224	1,224
Pseudo R^2	0.295	0.294	0.281	0.282

p-values in parentheses

* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

is evidence for an opposite effect that is analyzed in more detail later on. In accordance with prior literature, in all models *CRT* is found to be significantly and positively related to bank size as expressed by *LN_TA*. All four models are characterized by a substantial explanatory power as expressed by Pseudo R^2 values of at least 28 %.[8]

Second, *CRT_COUNT* (Table 3) and, third, *LN_CRT_VOL* (Table 4) are analyzed as dependent variables in an otherwise equivalent set of model specifications. The relation between *TCR* and *CRT_COUNT* is insignificant in all three relevant model specifications. The same result is found with respect to the relation between *TCR* and *LN_CRT_VOL*. Thus, whereas a bank's capitalization is found to be a determinant of the overall decision to conduct CRTs, it is not found to drive the number or total volume of the CRT deals conducted. This means that H1 is only supported on an overall CRT decision level, whereas no evidence is found with respect to the number of deals and deal volume. Interestingly, the relation between *NPL* and both *CRT_COUNT* and *LN_CRT_VOL* is found to be negative and significant in all relevant specifications at a 99 % significance level. This result is again in contrast to existing literature where especially prior to the Global Financial Crisis mostly a positive relation is found and leads to H2 being rejected. One potential explanation for this result might be that banks presumably shy away from realizing the loan losses involved when selling NPL in traditional true sales. Additionally, compared to the time prior to the Global Financial Crisis, substantially more extensive and stricter regulations on ABS transactions are in place now (e.g. with respect to risk retention, European Parliament and the Council, 2013, Art. 6). In that sense, our result might also be interpreted in a way that these attempts to reduce negative externalities are indeed effective. *LN_TA* is again positively and significantly related to both *CRT_COUNT* and *LN_CRT_VOL* in all model specifications.

[8] Because in the present regression model, a probit specification is used, the coefficients cannot be interpreted in the usual way as magnitudes of the effect.

Table 3: Ex ante analysis - CRT deal count determinants

	Dependent variable: CRT_COUNT			
	(M.B1)	(M.B2)	(M.B3)	(M.B4)
TCR_{t-1}	−0.000		−0.001	−0.001
	(0.911)		(0.400)	(0.368)
NPL_{t-1}		−0.016***	−0.017***	−0.017***
		(0.002)	(0.002)	(0.002)
DTA_{t-1}	0.002	0.001	0.001	0.001
	(0.254)	(0.459)	(0.456)	(0.314)
$LATA_{t-1}$				−0.004
				(0.198)
LN_TA_{t-1}	0.164***	0.183***	0.202***	0.197***
	(0.001)	(0.001)	(0.001)	(0.001)
LTA_{t-1}	−0.002 *	−0.001	−0.001	−0.003
	(0.092)	(0.402)	(0.417)	(0.133)
NII_{t-1}	−0.004	0.004	−0.002	−0.008
	(0.843)	(0.856)	(0.921)	(0.747)
ROE_{t-1}	0.000	−0.002	−0.002	−0.002
	(0.976)	(0.264)	(0.301)	(0.297)
CPI_{t-1}	−0.001	0.001	0.001	0.002
	(0.981)	(0.955)	(0.970)	(0.932)
GDP_{t-1}	−0.011	−0.007	−0.008	−0.008
	(0.273)	(0.485)	(0.453)	(0.470)
IR_{t-1}	−0.135 *	−0.148 *	−0.157 *	−0.161 *
	(0.084)	(0.059)	(0.058)	(0.052)
Constant	−1.873***	−2.025***	−2.220***	−1.985***
	(0.004)	(0.003)	(0.003)	(0.010)
Year FE	Y	Y	Y	Y
Country FE	Y	Y	Y	Y
Obs.	1,549	1,534	1,399	1,399
R^2	0.130	0.135	0.144	0.142

p-values in parentheses

* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Table 4: Ex ante analysis - CRT deal volume determinants

	Dependent variable: LN_CRT_VOL			
	(M.C1)	(M.C2)	(M.C3)	(M.C4)
TCR_{t-1}	−0.001		−0.004	−0.004
	(0.538)		(0.294)	(0.272)
NPL_{t-1}		−0.039***	−0.043***	−0.042***
		(0.008)	(0.008)	(0.008)
DTA_{t-1}	0.003	0.002	0.003	0.003
	(0.233)	(0.461)	(0.425)	(0.284)
$LATA_{t-1}$				−0.009
				(0.198)
LN_TA_{t-1}	0.344***	0.393***	0.428***	0.416***
	(0.000)	(0.000)	(0.000)	(0.000)
LTA_{t-1}	−0.004	−0.002	−0.002	−0.007
	(0.141)	(0.548)	(0.572)	(0.164)
NII_{t-1}	−0.029	−0.017	−0.032	−0.045
	(0.651)	(0.795)	(0.651)	(0.543)
ROE_{t-1}	−0.000	−0.005	−0.005	−0.005
	(0.984)	(0.337)	(0.349)	(0.348)
CPI_{t-1}	−0.022	−0.017	−0.019	−0.016
	(0.746)	(0.799)	(0.797)	(0.828)
GDP_{t-1}	0.009	0.019	0.019	0.019
	(0.762)	(0.509)	(0.549)	(0.536)
IR_{t-1}	−0.408 *	−0.424 *	−0.460 *	−0.470 *
	(0.087)	(0.070)	(0.066)	(0.062)
Constant	−3.817***	−4.244***	−4.586***	−4.020***
	(0.000)	(0.000)	(0.000)	(0.001)
Year FE	Y	Y	Y	Y
Country FE	Y	Y	Y	Y
Obs.	1,530	1,515	1,380	1,380
R^2	0.134	0.139	0.146	0.145

p-values in parentheses

* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Table 5: Ex post analysis - CRT decision as determinant

	$\Delta\, TCR$		$\Delta\, NPL$		$\Delta\, LATA$		$\Delta\, LTA$	
	(M.D1)	(M.D2)	(M.D3)	(M.D4)	(M.D5)	(M.D6)	(M.D7)	(M.D8)
CRT_{t-1}	0.190		0.366		−0.499		0.294	
	(0.595)		(0.270)		(0.447)		(0.595)	
CRT_{t-2}		0.115		0.255		0.960		−0.785
		(0.728)		(0.399)		(0.223)		(0.167)
DTA_t	−0.066*	−0.075*	−0.041**	−0.045**	0.049**	0.046	0.147***	0.168***
	(0.094)	(0.091)	(0.022)	(0.040)	(0.050)	(0.157)	(0.002)	(0.004)
LN_TA_t	−0.912	−1.469	0.545	0.446	−0.720	−1.607	−0.211	−0.256
	(0.391)	(0.224)	(0.281)	(0.363)	(0.466)	(0.131)	(0.887)	(0.886)
NII_t	−0.169	−0.391	−0.351	−0.229	−0.299	−0.713	−1.660	−1.525
	(0.725)	(0.458)	(0.685)	(0.831)	(0.485)	(0.177)	(0.235)	(0.327)
ROE_t	0.009	0.020	0.016	−0.007	−0.011	0.027	0.091 **	0.080 *
	(0.804)	(0.666)	(0.759)	(0.883)	(0.658)	(0.411)	(0.019)	(0.085)
CPI_t	−0.106	0.152	0.281**	0.392**	0.029	−0.016	0.241	0.186
	(0.740)	(0.439)	(0.032)	(0.015)	(0.891)	(0.945)	(0.299)	(0.447)
GDP_t	−0.016	−0.036	−0.205**	−0.155**	0.193	0.194	0.044	0.024
	(0.782)	(0.549)	(0.011)	(0.048)	(0.162)	(0.205)	(0.619)	(0.795)
IR_t	0.737	−0.268	0.884**	1.156 *	0.025	−2.340**	2.932***	1.195
	(0.161)	(0.766)	(0.013)	(0.054)	(0.975)	(0.033)	(0.000)	(0.348)
Year FE	Y	Y	Y	Y	Y	Y	Y	Y
Bank FE	Y	Y	Y	Y	Y	Y	Y	Y
Obs.	1,517	1,360	1,499	1,341	1,767	1,579	1,760	1,573
R^2	0.074	0.117	0.209	0.236	0.152	0.175	0.264	0.279

p-values in parentheses

* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Table 5 provides the regression results of equation (4.2) capturing the ex post relation between CRT and ΔTCR ((M.D1) and (M.D2)), ΔNPL ((M.D3) and (M.D4)), $\Delta LATA$ ((M.D5) and (M.D6)), and ΔLTA ((M.D7) and (M.D8)). CRT is used as explanatory variable and lagged by one period in model specifications (M.D1), (M.D3) and (M.D5) and by two periods in (M.D2), (M.D4) and (M.D6). None of the coefficients capturing the ex post relation between CRT and the four different dependent variables is significant. No significant effects are also found when CRT is replaced by CRT_COUNT or LN_CRT_VOL. The corresponding regression results are reported in Appendix A.5. In summary, the results of our ex post analysis suggest that originating a CRT does not significantly alter central capital and risk measures on the bank level. H3 has to be rejected. However, our findings are in line with banks applying CRTs to eventually increase their lending, because such a behavior would simultaneously explain the constancy of all four of the previous values. Replacing sold loans by new ones of about the same quality would obviously leave the total capital ratio, NPL ratio and loans to total assets unaffected. With respect to TCR, banks could also use CRTs to keep target capital ratios rather than increasing TCR.

6 Conclusions

Macroeconomic performance hinges on a number of factors, including real investments of firms as well as individuals' expenditures. Bank loans are often needed to finance these outlays and therefore sufficiently capitalized and liquid banks are a must-have. For some time now, securitization has been an important instrument for transforming otherwise illiquid loans into liquid securities and to allocate risks. Banks can use this tool to adjust their risk exposure, to secure liquidity, or to improve their regulatory capital ratios. Either way they widen their scope for further lending and thereby contribute to growth and economic wealth. In the run-up to the financial crisis, securitization was discredited due to the abuse of the instrument. Information asymmetries were exploited and incentives misaligned, leading to a breakdown of the respective markets. In the aftermath of the crisis, up to now, these markets have not recovered as desired given their commercial relevance. Against this background it is important to understand more deeply determinants and effects of different variants of this instrument.

This empirical study focuses on transactions that must be called under-researched from an academic perspective. Capital relief trades (CRTs) aim at releasing capital. Thus, it is to be expected that banks with a lower total capital ratio will be more likely to conduct a CRT, and this is what we indeed find. However, a lower total capital ratio does neither imply more nor larger CRTs. Liquidity ratios do not have any significant effect concerning CRTs. The significance of this result is twofold. First, it documents that the transactions considered in our study are supposedly correctly classified as CRTs and not contaminated by transactions directed at other objectives. Second, when analyzing securitization it is of utmost importance to distinguish different varieties instead of bunching them all together.

It seems plausible that banks with higher NPL ratios will use CRTs more intensively to reduce their credit risk and to improve their capital ratios. But the opposite seems to be true. The NPL ratio is negatively and significantly related to the likelihood of a CRT as well as to the number and volumes of CRTs. Banks presumably shy away from realizing

the loan losses involved when selling NPL in traditional true sales. This observation entails an important political message. If it is intended to stabilize a banking system by removing NPL from this sector, this will not work via CRTs as long as these are voluntary.

The results on the determinants above are derived from an ex ante perspective, i.e. before a (potential) CRT. For an assessment of the effects, we turn to an ex post view, looking at changes in four variables after a (potential) CRT: total capital ratio, NPL ratio, liquid assets over total assets, and loans over total assets. In line with the predominant motive of a CRT and the ex ante results, one should expect that banks with one or more CRTs exhibit an increase in their total capital ratio. Alas, this is not what we find: neither the occurrence, nor the frequency or the size of a CRT change any of these ratios. These results suggest that banks, by and large, use CRTs to eventually increase their lending, because such a behavior would simultaneously explain the constancy of all four of the previous values. Replacing sold loans by new ones of about the same quality would obviously leave the total capital ratio, NPL ratio and loans to total assets unaffected. From a political perspective, this observation is good news, as expanding banks' loan origination, without incurring additional risk, is a key reason for trying to restore the markets for securitizations.

Finally, a word on bank size is in order. The relatively high fixed costs of securitization and the necessity to hold sufficiently large portfolios imply that bank size is a driver of securitization. Correspondingly, we are able to show that larger banks conduct significantly more and larger CRTs. It looks as if supervisors should pay more attention to the CRTs of larger banks.

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A Appendix

A.1 Variables Description

Table A1: Variable description

Variable	Description	Unit
CRT	Dummy variable indicating whether the respective bank conducted a CRT as originator in the respective year (1) or not (0).	0/1
CRT_COUNT	Number of CRT deals the respective bank conducted as originator in the respective year.	units
LN_CRT_VOL	(Natural) logarithm of the total CRT deal volume the respective bank conducted as originator in the respective year.	ln(mio. USD)
TCR	Total capital ratio calculated as the sum of Tier 1 and Tier 2 capital divided by total risk weighted assets (RWA).	%
NPL	Share of non-performing loans in total loans.	%
DTA	Total deposits divided by total assets.	%
LATA	Liquid assets divided by total assets.	%
LN_TA	(Natural) logarithm of the total assets.	ln(mio. USD)
LTA	Total gross loans divided by total assets.	%
NII	Total non-interest operating income divided by total assets.	%
ROE	Return on equity, i.e. net income divided by average common equity.	%
CPI	Annual growth rate of the harmonized consumer price index in the country of a bank's headquarter.	%
GDP	Annual growth rate of real gross domestic product in the country of a bank's headquarter.	%
IR	Interest rate measured by 1-year EURIBOR.	%

A.2 List of Banks in the Sample

Table A2: List of banks in the sample

No.	Bank
1	Aareal Bank AG
2	ABANCA Corporacion Bancaria, S.A.
3	ABH Financial Limited
4	ABN AMRO Bank N.V.
5	Accord Mortgages Limited
6	AIB Group Public Limited Company
7	Allied Irish Banks, plc
8	Alpha Bank S.A.
9	Alpha Services and Holdings S.A.
10	Argenta Bank- en Verzekeringsgroep NV
11	Argenta Spaarbank N.V.
12	Banca Mediolanum S.p.A.
13	Banca Monte dei Paschi di Siena S.p.A.
14	Banca Nazionale del Lavoro S.P.A.
15	Banca Popolare di Sondrio - Societa per Azioni
16	Banco Bilbao Vizcaya Argentaria, S.A.
17	Banco BPM S.p.A.
18	Banco Comercial Portugues, S.A.
19	Banco de Sabadell, S.A.
20	Banco Santander Totta S.A.
21	Banco Santander, S.A.
22	BancoPosta RFC
23	Bank Julius Baer & Co. AG
24	Bank of Ireland
25	Bank of Ireland Group plc
26	Bank of Scotland Plc
27	Bankia S.A.
28	Bankinter, S.A.
29	Banque Cantonale Vaudoise
30	Banque et Caisse d'Epargne de l'Etat
31	Banque Federative du Credit Mutuel S.A.
32	Barclays Bank Ireland Plc
33	Barclays Bank plc
34	Barclays Bank UK PLC

35 Barclays plc
36 Basler Kantonalbank
37 Bausparkasse Schwaebisch Hall AG
38 BAWAG Group AG
39 BAWAG P.S.K.
40 Bayerische Landesbank
41 Belfius Bank SA/NV
42 Berliner Sparkasse
43 BFA, Tenedora de Acciones, S.A.U.
44 BGL BNP Paribas
45 BNG Bank N.V.
46 BNP Paribas Fortis SA/NV
47 BNP Paribas Personal Finance
48 BNP Paribas S.A.
49 BNP Paribas Securities Services
50 BPCE S.A.
51 BPER Banca S.p.A.
52 Bpifrance
53 BRED Banque Populaire
54 CA Consumer Finance
55 Caceis Bank
56 CACEIS SA
57 Caisse d'Epargne et de Prevoyance de Rhone Alpes
58 Caisse d'Epargne et de Prevoyance Ile-de-France
59 Caisse Federale de Credit Mutuel
60 Caisse Francaise de Financement Local
61 Caisse Regionale de Credit Agricole Mutuel de Paris et d'Ile de France
62 Caixa Geral de Depositos, S.A.
63 CaixaBank, S.A.
64 Ceska Sporitelna, a.s.
65 Ceskoslovenska Obchodni Banka a.s. (CSOB)
66 Citibank Holdings Ireland Limited
67 Citigroup Global Markets Europe AG
68 Clydesdale Bank PLC
69 Commerzbank AG
70 Compagnie de Financement Foncier
71 Cooperatieve Rabobank U.A.
72 Coventry Building Society

73	Credit Agricole
74	Credit Agricole Corporate and Investment Bank
75	Credit Agricole Italia S.p.A.
76	Credit Agricole S.A.
77	Credit du Nord S.A.
78	Credit Foncier de France S.A.
79	Credit Industriel et Commercial
80	Credit Mutuel
81	Credit Mutuel Alliance Federale
82	Credit Mutuel Arkea
83	Credit Suisse (Schweiz) AG
84	Credit Suisse AG
85	Credit Suisse Group AG
86	Credit Suisse International
87	Credito Emiliano Holding SpA
88	Credito Emiliano S.p.A.
89	Danske Bank A/S
90	de Volksbank N.V.
91	DekaBank Deutsche Girozentrale
92	Deutsche Apotheker- und Aerztebank eG
93	Deutsche Bank AG
94	Deutsche Kreditbank AG
95	Deutsche Pfandbriefbank AG
96	Dexia Credit Local S.A.
97	Dexia S.A.
98	DNB ASA
99	DNB Bank ASA
100	DZ BANK AG Deutsche Zentral-Genossenschaftsbank
101	DZ HYP AG
102	Erste Group Bank AG
103	Erwerbsgesellschaft der S-Finanzgruppe mbH & Co KG
104	Eurobank Ergasias Services and Holdings S.A.
105	Eurobank S.A.
106	Fideuram - Intesa Sanpaolo Private Banking
107	FMS Wertmanagement AoeR
108	Groupe BPCE
109	Hamburger Sparkasse AG (Haspa)
110	HASPA Finanzholding

111 HBOS plc
112 HSBC Bank plc
113 HSBC Continental Europe S.A.
114 HSBC Holdings plc
115 HSBC UK Bank plc
116 Ibercaja Banco, S.A.
117 Iccrea Banca S.P.A.
118 ING Bank N.V.
119 ING Belgium NV/SA
120 ING Groep N.V.
121 ING Holding Deutschland GmbH
122 ING-DiBa AG
123 Intesa Sanpaolo S.p.A.
124 Investec Group
125 J.P. Morgan Capital Holdings Limited
126 J.P. Morgan SE
127 Julius Baer Group Ltd
128 Jyske Bank A/S
129 KBC Bank NV
130 KBC Group NV
131 KfW
132 Komercni Banka, a.s.
133 Kommunalbanken AS
134 Kutxabank, S.A.
135 La Banque Postale S.A.
136 Landesbank Baden-Wuerttemberg
137 Landesbank Hessen-Thueringen Girozentrale
138 Landeskreditbank Baden-Wuerttemberg - Foerderbank
139 Landwirtschaftliche Rentenbank
140 Le Credit Lyonnais
141 LGT Group Foundation
142 Liberbank S.A.
143 Lloyds Bank Corporate Markets plc
144 Lloyds Bank plc
145 Lloyds Banking Group plc
146 Luzerner Kantonalbank AG
147 Lyonnaise de Banque
148 Mediobanca - Banca di Credito Finanziario SPA

149 Migrosbank AG
150 Muenchener Hypothekenbank eG
151 Municipality Finance PLC
152 National Bank of Greece S.A.
153 National Westminster Bank Plc
154 Nationwide Building Society
155 Natixis S.A.
156 NatWest Group plc
157 NatWest Markets Plc
158 Nederlandse Waterschapsbank N.V.
159 Nomura International plc
160 Norddeutsche Landesbank Girozentrale
161 Nordea Bank Abp
162 Nordea Hypotek AB (publ)
163 Nordea Kredit Realkreditaktieselskab
164 Novo Banco, S.A.
165 NRW.BANK
166 Nykredit A/S
167 Nykredit Realkredit A/S
168 OP Corporate Bank Plc
169 OP Financial Group
170 OTP Bank Plc.
171 Pfandbriefbank schweizerischer Hypothekarinstitute
172 Pfandbriefzentrale der schweizerischen Kantonalbanken AG
173 Pictet Group
174 Piraeus Bank S.A.
175 Piraeus Financial Holdings S.A.
176 Postfinance AG
177 Powszechna Kasa Oszczednosci Bank Polski S.A.
178 PPF Group N.V.
179 Raiffeisen Bank International AG
180 Raiffeisen Group
181 Raiffeisen Schweiz Genossenschaft
182 Raiffeisenlandesbank Oberoesterreich Aktiengesellschaft
183 RBC Europe Limited
184 RCI Banque S.A.
185 Realkredit Danmark A/S
186 Royal Bank of Scotland International (Holdings) Ltd.

187 Royal Bank of Scotland International Limited
188 Santander Bank Polska S.A.
189 Santander Consumer Bank AG
190 Santander Consumer Finance, S.A.
191 Santander Totta, SGPS, S.A.
192 Santander UK Group Holdings plc
193 Santander UK plc
194 SBAB Bank AB (publ)
195 Skandinaviska Enskilda Banken AB (publ)
196 Societe Generale International Limited
197 Societe Generale S.A.
198 Stadshypotek AB (publ)
199 Standard Chartered Bank
200 Standard Chartered PLC
201 State Street Bank International GmbH
202 State Street Europe Holdings Germany S.a.r.l. & Co. KG
203 Storebrand Group
204 Svenska Handelsbanken AB
205 Swedbank AB
206 Swedbank Mortgage AB
207 Swiss Post Ltd
208 The Mortgage Works (UK) plc
209 The Royal Bank of Scotland Public Limited Company
210 Totalkredit A/S
211 TSB Bank plc
212 TSB Banking Group PLC
213 UBS AG
214 UBS Europe SE
215 UBS Group AG
216 UBS Switzerland AG
217 Unicaja Banco, S.A.
218 UniCredit Bank AG
219 UniCredit Bank Austria AG
220 UniCredit S.p.A.
221 Unione di Banche Italiane S.p.A.
222 Volkswagen Bank GmbH
223 Volkswagen Leasing GmbH
224 Yorkshire Building Society

225 Zuercher Kantonalbank

A.3 Banks by Country

Table A3: Number of banks in the sample per country

Country	Number of banks in the sample
GERMANY	35
FRANCE	34
UNITED KINGDOM	33
SWITZERLAND	20
ITALY	16
SPAIN	13
NETHERLANDS	8
BELGIUM	8
GREECE	7
DENMARK	7
SWEDEN	7
AUSTRIA	6
IRELAND	6
PORTUGAL	5
FINLAND	4
NORWAY	4
CZECH REPUBLIC	3
POLAND	2
LUXEMBOURG	2
JERSEY	2
LIECHTENSTEIN	1
CYPRUS	1
HUNGARY	1

A.4 Correlation of Key Variables

Table A4: Correlation matrix of key variables

	TCR	NPL	DTA	LATA	LN_TA	LTA	NII	ROE	CPI	GDP	IR
TCR	1.000										
NPL	-0.228	1.000									
DTA	-0.204	0.132	1.000								
LATA	0.021	-0.245	-0.194	1.000							
LN_TA	-0.024	-0.084	-0.291	0.235	1.000						
LTA	0.064	0.167	0.245	-0.779	-0.326	1.000					
NII	-0.230	0.032	0.244	0.221	-0.097	-0.336	1.000				
ROE	0.111	-0.340	0.041	0.008	-0.088	0.030	0.225	1.000			
CPI	0.015	-0.114	-0.083	-0.031	0.115	-0.024	-0.102	0.020	1.000		
GDP	0.069	-0.086	0.016	0.002	-0.038	0.039	-0.024	0.134	0.059	1.000	
IR	-0.133	0.152	-0.116	-0.071	-0.002	0.042	-0.021	-0.056	0.201	0.154	1.000

A.5 Regression Results

Table A5: Ex post analysis - CRT deal count as determinant

	$\Delta\, TCR$		$\Delta\, NPL$		$\Delta\, LATA$		$\Delta\, LTA$	
	(M.E1)	(M.E2)	(M.E3)	(M.E4)	(M.E5)	(M.E6)	(M.E7)	(M.E8)
CRT_COUNT_{t-1}	0.076		0.070		0.006		0.023	
	(0.444)		(0.410)		(0.976)		(0.924)	
CRT_COUNT_{t-2}		0.041		0.072		0.132		−0.034
		(0.731)		(0.403)		(0.544)		(0.852)
DTA_t	−0.066*	−0.075*	−0.041**	−0.045**	0.049*	0.046	0.148***	0.168***
	(0.094)	(0.091)	(0.023)	(0.040)	(0.052)	(0.149)	(0.002)	(0.004)
LN_TA_t	−0.908	−1.468	0.546	0.449	−0.708	−1.607	−0.216	−0.253
	(0.394)	(0.224)	(0.281)	(0.360)	(0.474)	(0.132)	(0.885)	(0.887)
NII_t	−0.169	−0.393	−0.349	−0.232	−0.300	−0.713	−1.659	−1.527
	(0.723)	(0.457)	(0.687)	(0.830)	(0.484)	(0.176)	(0.236)	(0.325)
ROE_t	0.009	0.020	0.016	−0.007	−0.011	0.028	0.091 **	0.080 *
	(0.801)	(0.666)	(0.759)	(0.884)	(0.663)	(0.406)	(0.019)	(0.088)
CPI_t	−0.105	0.152	0.282**	0.394**	0.026	−0.007	0.243	0.177
	(0.741)	(0.436)	(0.031)	(0.015)	(0.901)	(0.976)	(0.295)	(0.473)
GDP_t	−0.015	−0.036	−0.205**	−0.156**	0.194	0.190	0.043	0.027
	(0.792)	(0.545)	(0.011)	(0.047)	(0.159)	(0.213)	(0.623)	(0.770)
IR_t	0.741	−0.270	0.872**	1.147 *	0.061	−2.389**	2.916***	1.247
	(0.160)	(0.765)	(0.014)	(0.056)	(0.940)	(0.030)	(0.000)	(0.330)
Year FE	Y	Y	Y	Y	Y	Y	Y	Y
Bank FE	Y	Y	Y	Y	Y	Y	Y	Y
Obs.	1,517	1,360	1,499	1,341	1,767	1,579	1,760	1,573
R^2	0.074	0.117	0.208	0.236	0.151	0.174	0.264	0.279

p-values in parentheses

* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Table A6: Ex post analysis - CRT deal volume as determinant

	$\Delta\, TCR$		$\Delta\, NPL$		$\Delta\, LATA$		$\Delta\, LTA$	
	(M.F1)	(M.F2)	(M.F3)	(M.F4)	(M.F5)	(M.F6)	(M.F7)	(M.F8)
LN_CRT_VOL$_{t-1}$	0.023		0.078		−0.060		0.034	
	(0.756)		(0.224)		(0.676)		(0.757)	
LN_CRT_VOL$_{t-2}$		0.070		0.081		0.188		−0.114
		(0.272)		(0.186)		(0.204)		(0.341)
DTA$_t$	−0.066*	−0.077*	−0.042**	−0.046**	0.049**	0.044	0.147***	0.168***
	(0.097)	(0.084)	(0.022)	(0.038)	(0.050)	(0.171)	(0.002)	(0.004)
LN_TA$_t$	−0.922	−1.483	0.548	0.452	−0.767	−1.632	−0.183	−0.252
	(0.388)	(0.220)	(0.282)	(0.363)	(0.436)	(0.124)	(0.902)	(0.888)
NII$_t$	−0.178	−0.426	−0.370	−0.251	−0.297	−0.729	−1.667	−1.528
	(0.711)	(0.422)	(0.671)	(0.817)	(0.489)	(0.174)	(0.233)	(0.326)
ROE$_t$	0.009	0.021	0.017	−0.007	−0.011	0.028	0.091 **	0.080 *
	(0.806)	(0.665)	(0.748)	(0.891)	(0.655)	(0.405)	(0.018)	(0.088)
CPI$_t$	−0.105	0.153	0.280**	0.388**	0.040	0.006	0.240	0.185
	(0.744)	(0.436)	(0.033)	(0.017)	(0.852)	(0.980)	(0.304)	(0.456)
GDP$_t$	−0.015	−0.032	−0.204**	−0.155 *	0.203	0.208	0.040	0.026
	(0.793)	(0.606)	(0.012)	(0.054)	(0.140)	(0.176)	(0.653)	(0.780)
IR$_t$	0.732	−0.192	0.920**	1.199**	0.042	−2.231**	2.932***	1.222
	(0.169)	(0.833)	(0.010)	(0.050)	(0.959)	(0.044)	(0.000)	(0.342)
Year FE	Y	Y	Y	Y	Y	Y	Y	Y
Bank FE	Y	Y	Y	Y	Y	Y	Y	Y
Obs.	1,501	1,345	1,483	1,326	1,751	1,564	1,744	1,558
R^2	0.074	0.117	0.210	0.237	0.153	0.176	0.264	0.278

p-values in parentheses

* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$