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**Working Paper**

## Banks' bail-in and the new banking regulation: An EU event study

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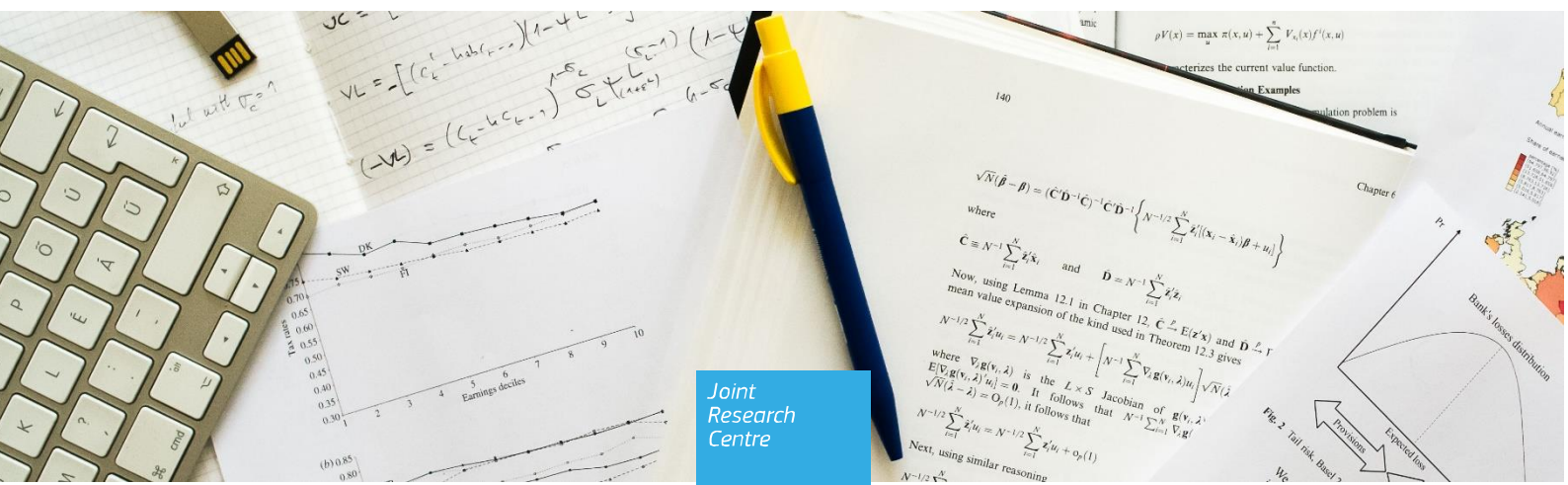
# JRC TECHNICAL REPORT

## Banks' bail-in and the new banking regulation: an EU event study

Bellia Mario  
Maccaferri Sara

2020

*JRC Working Papers in Economics and Finance, 2020/07*



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## **Abstract**

The purpose of the study is to estimate the short term reaction of equity and CDS prices of a sample of European banks to various events and announcements, such as bail-ins, recapitalisations, and the proposal and final agreement of the EU reform package of prudential and resolution rules in banking (“banking package”).

This study replicates and expand Schäfer et al. (2017) to include more recent EU events, such as the resolution of Banco Popular and the further tightening of EU prudential and resolution rules in 2019.

Overall, our analysis shows the most recent events did not seem to trigger abnormal reactions in bank funding markets after bank prudential and resolution reforms were implemented in the EU in 2016. An exception is the 2018 Council agreement on its general approach to the proposed banking package. While the 2016 and 2019 reforms of EU prudential and resolution rules seem to have increased perceived probabilities of bail-in, the latter seem not to be affected significantly by more recent individual cases.

## **Acknowledgements**

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This work benefits from a similar ongoing project where the EC JRC collaborate with Sebastian Schich from the OECD, undertaken as part of work of the OECD Committee on Financial Markets on implicit bank debt guarantees. The latter applies an event-study analysis to selected regulatory and resolution reform regime changes and actions.

## 1 Introduction

In 2017 the Financial Stability Board (FSB) established a network of experts (Evaluation Working Group, EWG) to examine the set of regulatory reforms addressing the too-big-to-fail (TBTf) expectations. In particular, the goal of the EWG has been to assess to what extent TBTf reforms are reducing the systemic and moral hazard risks associated with (Global) Systemically Important Banks ((G-)SIBs) and to analyse the broader effects (positive or negative) of these reforms on the financial system.

The working group has divided its work into four subgroups: (1) implicit funding subsidies; (2) bank behavior and structure; (3) resolution and resolvability; and (4) broader effects of TBTf reforms.

The EWG is made of experts coming from worldwide countries and international organizations. The European Commission (EC) is part of this working group and DG FISMA asked the JRC to support the activities of the subgroup on resolution and resolvability by undertaking event studies to measure the credibility of the set of financial regulatory reforms. In particular, DG FISMA requested the JRC to replicate the methodology presented in the 2017 paper *Expecting Bail-in? Evidence from European Banks* by A. Schäfer, I. Schnabel and B. Weder di Mauro (referred to Schäfer et al. (2017) hereinafter) and to extend the analysis considering market reactions to more recent events.

The purpose of the study is to estimate the short term reaction of stock and Credit Default Swap (CDS) prices of European banks to various events and announcements, such as bail-ins, recapitalizations, and the proposal and final agreement of the EU reform package of prudential and resolution rules in banking (“banking package”). The paper replicates the work of Schäfer et al (2017), focusing on bail-in events, but also considers and assesses the impact of a broader and more recent set of events and announcements (e.g. resolution of Spanish bank Banco Popular).

## 2 Methodology

The empirical analysis applied in this report closely follows the one applied in Schäfer et al (2016a), Schäfer et al (2016b) and Schäfer et al (2017), and consists of estimating a system of equations with a technique called Seemingly Unrelated Regression (SUR), introduced by Zellner (1962). The advantage of this technique is to assume that the error terms are correlated across equations or, in other terms, the errors associated with the dependent variables are correlated. Following Zellner (1962), the general SUR model consists of  $m=1 \dots M$  linear regression equations for  $j=1 \dots N$  banks. The  $m$ th equation for the bank  $i$  can be written as:

$$y_j = X_j \beta_j + u_j$$

Where  $y_j$  is a  $T \times 1$  vector of observations for the  $j$ th dependent variable,  $X_j$  a  $T \times K$  matrix of observations for the independent (explanatory) variables,  $\beta_j$  is a  $K \times 1$  vector of regression coefficient and  $u_j$  a  $T \times 1$  vector or error term, with zero mean. The full SUR model can be written as:

$$\begin{bmatrix} y_1 \\ y_2 \\ \cdot \\ \cdot \\ \cdot \\ y_M \end{bmatrix} = \begin{bmatrix} X_1 & 0 & \dots & 0 \\ 0 & X_2 & \dots & 0 \\ \vdots & \vdots & \ddots & \vdots \\ 0 & \dots & \dots & X_M \end{bmatrix} \begin{bmatrix} \beta_1 \\ \beta_2 \\ \cdot \\ \cdot \\ \beta_M \end{bmatrix} + \begin{bmatrix} u_1 \\ u_2 \\ \cdot \\ \cdot \\ u_M \end{bmatrix}$$

The model can be estimated via FGLS or Maximum Likelihood. The same coefficients can be obtained estimating a system of simultaneous equations, or a multivariate regression. In some cases, the covariance matrix of error terms appears to be singular using the SUR method, thus the analysis is run using a multivariate regression framework. Once the model is estimated, it is possible to impose restrictions on the coefficient, or run comparisons across groups of banks. However, it worth mentioning that since the explanatory variables are the same across the  $N$  banks in the sample, the estimated coefficients of the SUR are identical compared to OLS. One

clear advantage of using SUR or the multivariate regression framework is that it allows to directly test linear combinations of coefficients, even if it is possible to obtain the same tests using alternative methodologies.<sup>1</sup>

This econometric technique is applied for both CDS and Equity prices, but the dependent and explanatory variables are different. For the CDS, the dependent variable is the first difference in the daily mid quoted spread. The estimated model includes the average of the first difference for each bank, and a set of dummies that identifies the events. More formally, one single equation for the CDS model reads as follows:

$$\Delta CDS_{i,t} = \alpha_i + \beta_1 D_t + \beta_2 D_{t-1} + \beta_3 D_{t+1} + \beta_4 D_{pe} + \epsilon_{i,t}$$

Where  $\Delta CDS_{i,t}$  represents the first difference of the mid-quoted CDS for bank  $i$  at time  $t$ ,  $\alpha_i$  the constant term which account for the average banks' first difference,  $D_t$  is a dummy variable equals to one for the event date,  $D_{t-1}$  and  $D_{t+1}$  two dummy variables equal to one on the previous trading day and on the following trading day, respectively. The variable  $D_{pe}$  is one additional dummy variable that takes the value one if there are other events included in the estimation window. In this model the estimation window is set to 80 trading days for each event

The Equity model is estimated using the percentage returns instead of the first difference, and including the Stoxx Global 1800 Index, denominated in euro, as a proxy for the market. The dummy variables are the same as in the previous equation. One single equation of the model is:

$$Ret_{i,t} = \alpha_i + \beta_1 Mkt_t + \beta_2 D_t + \beta_3 D_{t-1} + \beta_4 D_{t+1} + \beta_5 D_{pe} + \epsilon_{i,t}$$

Each event is estimated separately for all banks in the sample. The overall reaction is estimated by calculating the average beta coefficient across banks for all the events. Significance is assessed by a t-test where the null hypothesis is that the average beta coefficient across regressions is equal to zero. The same test is carried out on the cumulative return, calculated summing the beta coefficient for the event day plus the coefficient of the following day.

The analysis is run on the full sample and considering different subgroups of banks (G-SIBs vs non-G-SIBs, and GIIPS - Greece, Ireland, Italy, Portugal and Spain - vs non-GIIPs) as in Schäfer et al (2017). The significance of the differences between groups is assessed using a t-test where the two samples are unequal (different number of components of the groups) and with different variances.

## 2.1 Selected events

The present report aims at assessing how stock and debt markets responded to selected bail-in/resolution events and to regulatory announcements and decisions. The set of selected events follows the selection done in the paper by Schäfer et al (2017) and expands it to more recent events. Schäfer et al (2017) analysed five bail-in cases occurred in Europe, namely in Denmark (2011), Spain (2012), Netherlands (2013), Cyprus (2013) and Portugal (2014). The paper also considered the implementation of the Single Resolution Mechanism (SRM) occurred in 2013-2014 and the analysis focused on the key events, from the EU ministers' agreement on the Bank Recovery and Resolution Directive (BRRD) to the legislative steps to adopt the legal text. The present paper extend this set of events focusing also on the following.

- The “precautionary recapitalization” of Banca Monte dei Paschi di Siena (MPS) as of 29th December 2016. A precautionary recapitalization is a measure foreseen in exceptional circumstances by the BRRD to tackle serious threats to the financial stability of a Member State. The intervention is a temporary and extraordinary State aid, compliant with State aid rules. In the case of MPS, the precautionary recapitalization amounted to 8.8 billion EUR. On 23rd June 2017, the EC announced the approval of the precautionary recapitalisation.

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<sup>1</sup> Seaks (1990) provides an alternative way to calculate the covariance matrix needed to test cross-equation linear combination of coefficients. However, since the number of banks in our sample is relatively small, we don't have computational issues that justify the simplifications assumed by the author. We thank George Pennacchi for pointing out this.

- The resolution of Banco Popular by the Single Resolution Board (SRB) , occurred on the 6th - 7th June 2017.
- The adoption of the banking package proposed by the EC in 2016 and adopted in 2019. The package aims at reducing risks in the banking sector and strengthening the resilience and resolvability of EU banks.
- The SRB decision not to take resolution actions for Banca Popolare di Vicenza and Veneto Banca On 23rd June 2017, the SRB concluded that for these two banks, resolution actions were not warranted in the public interest and the winding up of the banks took place under national insolvency proceedings.
- The Commission conclusion on German Norddeutsche Landesbank – Girozentrale NordLB recapitalization as of 5th December 2019. The EC found Germany's measures to improve the capital position of state-owned NordLB to be free of any State aid. These measures involved a direct investment of 2.8 billion EUR and additional investments to ensure the functioning of the bank.

Table 1 presents all the events selected for this purpose. The first column reports the country/geographical area where the events took place, the second column the date of the events and the third column describes the event.

**Table 1:** Overview of selected events

Country	Date	Description
Denmark	06/02/11	Bail-in of senior debt of Amagerbanken in Denmark
Spain	10/07/12	Spanish bank rescue plan implies junior creditor bail-in
	19/07/12	German government backs Spanish bank rescue plan
	23/08/12	Spanish authorities express intent to implement national bank resolution law
Netherlands	01/02/13	Nationalisation of SNS Reaal in the Netherlands
Cyprus	11/02/13	Euro area finance ministers meeting consider bail-in of senior debt as an option in dealing with distressed banks in Cyprus
	18/03/13	Cyprian proposal to introduce levy on Cyprian bank depositors including insured ones
	25/03/13	Bail-in of senior debt of Cyprian banks
EU	28/06/13	EU Finance Ministers agree on rules of BRRD
	09/07/13	Presentation of the SRM proposal by European Commission
	18/12/13	EU Council accepts general approach towards SRM
	20/03/14	Provisional agreement on the SRM between Council and European Parliament
	15/04/14	EU Parliament backs EC proposal on completing the SRM
Portugal	04/08/14	Creditor bail-in in case of Banco Espírito Santo, Portugal
EU	23/11/16	EC proposes banking reform package
Italy	29/12/16	MPS precautionary recapitalization
Spain	06/06/17	Resolution of Banco Popular
Italy	23/06/17	SRB decision not to take resolution actions for Banca Popolare di Vicenza and Veneto Banca
Italy	04/07/17	EC announced the approval of the precautionary recapitalisation of MPS



Country	Date	Description
EU	25/05/18	The Council of the European Union reaches a general approach on the banking package
	19/06/18	The EP votes the amended text on the banking package
	16/04/19	Final political agreement on the banking package
	07/06/19	Publication of legislative text on the banking package
	27/06/19	Applications of TLAC requirements
Germany	05/12/19	EC approves NordLB State aid

## 2.2 The dataset

The paper by Schäfer et al (2017) makes use of daily equity returns and CDS spreads for both junior and senior tranches. Quotes are from Datastream and cover banks from the European Union plus banks located in UK, NO, CH and LI. Their final sample, after inactive or not continuously traded banks were deleted, is made of 64 banks for senior CDS spreads, 40 for junior CDS spreads and 85 banks for stock returns. CDS spreads are the mid-prices of end-of-day quotes for the 5-year tranches. Stock returns are based on their closing auctions and are listed in their domestic stock exchanges. The baseline analyses, replicated in this report, use senior CDS spreads and stock returns, while they used junior CDS for a separate analysis on the differences between junior and senior CDS spreads. The market model that enters the formulas to estimate the stocks' returns is proxied by the Stoxx Global 1800.

In order to replicate the exercise, the JRC attempted to reconstruct the same database used in the paper. Banks' stock data are downloaded from Bloomberg and they are total returns including dividends; senior and junior CDS spreads are downloaded from Thomson Reuters Eikon and Thomson Reuters Datastream. Quotes are in Euro, with Modified Modified (MM) restructuring clause, 5 years maturity and midspread close. For what concern the CDS protocol, all events prior to 2014 are estimated using the 2003 Protocol, for consistency with the original paper. However, a major change occurs in October 2014, when the new MM protocol has been implemented. The new protocol provides full insurance on subordinated debt also, reflecting the full protection of the derivative also in case of bail-in.<sup>2</sup> For that reason, all events after October 2014 are evaluated using the MM14 protocol.

For some banks CDS quotes are not available in Thomson Reuters and thus quotes from Intercontinental Exchange (ICE) of CMA Datavision are used (considered contracts are in EUR, 5 years maturity and with MM restructuring clause). Following the approach of the paper, the market model is proxied by the Stoxx Global 1800, downloaded from Bloomberg.

Data available to the present analysis spans the period 2010-2019, though following the approach by Schäfer et al (2017), only quotes starting 80 days before each analyzed event are considered. The datasets attempt to include the same banks that are used in the paper by Schäfer et al (2017). Unfortunately, it is not possible to fully reconstruct such dataset, since senior CDS spreads data are available for 59 banks (out of 64), stock data are available for 84 banks (out of 85) and junior CDS spreads are available for 39 (out of 40). Table 2, Table 3 and Table 4 show the summary statistics of the two final datasets for, respectively, senior CDS spreads and stock returns. In Table 2, banks in italics have CDS quotes from ICE. The dataset on CDS spreads is not complete as 4 banks do not always have available quotes in the considered event windows.

To better understand to what extent the datasets used in the paper and by the JRC differ, Annex 1 reports the same statistics shown in the tables discussed above for reduced datasets, covering only the events analysed in the paper by Schäfer et al (2017). The last four columns show the

<sup>2</sup> The 2014 Protocol is a set of new standards for CDS transactions. They reflect, among the other things, the introduction of the bail-in mechanism as foreseen by the EU Regulation. More details on the Protocol can be found at <https://www.isda.org/a/ydiDE/isda-2014-credit-definitions-faq-v12-clean.pdf>

differences of the averages, standard deviations, minimum and maximum with respect to those of the paper. Table 43 and Table 45 express difference in basis points and Table 44 in percentage points.<sup>3</sup> These figures point to the fact that, while stock datasets are generally aligned and for the majority of the banks these statistics coincide, the CDS datasets seem to diverge in some instances (for example, the minimum and maximum values of National Bank of Greece differ by almost 800bp and 180bp, respectively). Also the differences between junior and senior are aligned in the two papers for the majority of banks, though for some banks the extreme values considerably diverge. We decided not to apply any trimming or winsorization procedure, and to keep the data as they have been downloaded from the data provider, since in general the results are consistent with the original paper.

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<sup>3</sup> Zero difference is labelled as “-”

**Table 2:** Senior CDS spreads – Summary Statistics

BANK	COUNTRY	OBS	MEAN	STD	MIN	MAX	GSIB	GIIPS	BANK	COUNTRY	OBS	MEAN	STD	MIN	MAX	GSIB	GIIPS
BAWAG PSK Bank fuer Arbeit und Wirtschaft und Oesterreichische	Austria	1040	-0.056	5.545	-53.72	53.76			Intesa Sanpaolo SpA	Italy	1040	0.035	7.46	-36.83	24.42		X
Erste Group Bank AG	Austria	1040	-0.081	2.611	-20.976	19.48			Mediobanca Banca di Credito Finanziario SpA	Italy	1040	-0.002	6.134	-41.27	20.29		X
Raiffeisen Bank International AG	Austria	922	-0.135	2.484	-19.59	19.15			UniCredit SpA	Italy	1040	0.022	7.617	-40.22	22.5		X
DEXIA	Belgium	1040	-0.09	8.418	-59.675	86.04			Unione di Banche Italiane SpA	Italy	1040	-0.1	5.68	-67.89	14.61		X
KBC Bank NV	Belgium	1040	-0.073	3.514	-24.83	54.63			Cooperatieve Rabobank UA	Netherlands	1040	-0.069	2.033	-12.04	7.16		
Danske Bank A/S	Denmark	1040	-0.09	3.033	-37.71	29.83			ING Bank NV	Netherlands	1040	-0.09	3.033	-19.26	9.74	X	
BANQUE FEDERATIVE DE CREDIT MUTUEL	France	1040	0.025	2.561	-7.6	57			SNS BANK	Netherlands	1040	-0.412	9.702	-182.725	19.275		
BNP Paribas SA	France	1040	-0.081	3.838	-20.79	26.09	X		DNB Bank ASA	Norway	1040	-0.012	1.896	-10.5	6.5		
Credit Agricole SA	France	1040	-0.088	4.919	-28.96	34.49	X		Banco Comercial Portugues SA	Portugal	1040	-0.529	14.361	-125.88	43.323		X
Credit Lyonnais SA	France	1040	-0.081	5.386	-31.41	39.84			Banco Espirito Santo SA em Liquidacao	Portugal	1040	0.062	16.548	-311.77	38.32		X
Natixis SA	France	1040	-0.07	2.82	-19.2	24.235	X		Banco Bilbao Vizcaya Argentaria SA	Spain	1040	-0.11	6.412	-36.89	22	X	X
Societe Generale SA	France	1040	-0.112	4.722	-31.84	30.76	X		Banco de Sabadell SA	Spain	1040	0.079	7.513	-73.105	24.86		X
Bayerische Landesbank	Germany	1040	0.043	2.9	-22.48	32.63			Banco Popular Espanol SA	Spain	1040	0.34	8.342	-56.237	32.12		X
Commerzbank AG	Germany	1040	-0.039	5.172	-41.2	63.21			Banco Santander SA	Spain	1040	-0.093	6.224	-32.94	22.05	X	X
Deutsche Bank AG	Germany	1040	-0.027	4.402	-33.14	27.79	X		Bankinter SA	Spain	1040	0.152	7.551	-54.24	29.024		X
HSB NORDBANK	Germany	1040	0.038	3.967	-25.9	86.595			Fundacion Bancaria Caixa d Estalvis i Pensions de Barcelona	Spain	1040	0.337	7.816	-31	20.5		X
IKB Deutsche Industriebank AG	Germany	1040	-0.123	3.48	-21.88	21.01			Fundacion Caja Mediterraneo	Spain	957	-0.381	11.278	-126.408	36.33		X
Landesbank Baden Wuerttemberg	Germany	1040	-0.012	3.036	-19.69	34.68			NORDEA	Sweden	1040	-0.067	2.63	-19.795	7.925	X	
Landesbank Hessen Thueringen Girozentrale	Germany	1040	-0.045	3.551	-33.4	35.65			Skandinaviska Enskilda Banken AB	Sweden	1040	-0.075	1.58	-9.88	5.44		
Norddeutsche Landesbank Girozentrale	Germany	318	-0.06	2.513	-19.83	16.44			Svenska Handelsbanken AB	Sweden	1040	-0.054	1.209	-6.66	4.03		
Portigon AG	Germany	1040	0.118	4.279	-39.39	59.81			Swedbank AB	Sweden	1040	-0.085	1.89	-14.32	5.852		

BANK	COUNTRY	OBS	MEAN	STD	MIN	MAX	GSIB	GIIPS	BANK	COUNTRY	OBS	MEAN	STD	MIN	MAX	GSIB	GIIPS
UniCredit Bank AG	Germany	1040	-0.11	3.06	-21.5	26.09	X		Credit Suisse Group AG	Switzerland	1040	-0.103	2.687	-12.59	8.813	X	
Alpha Bank SA	Greece	1040	-0.949	29.819	-283.45	484.226		X	UBS AG	Switzerland	1040	-0.119	2.497	-11.96	7.89	X	
NATIONAL BANK OF GREECE	Greece	1040	-1.453	55.779	-1112.33	552.525		X	Royal Bank of Scotland Group PLC	United Kingdom	1040	-0.079	5.367	-35.79	16.43	X	
Bank of Ireland	Ireland	1040	-0.033	15.364	-100.89	172.48		X	Barclays Bank PLC	United Kingdom	1040	-0.069	3.498	-27.09	11.63	X	
Banca Italease SpA	Italy	1040	-0.018	6.438	-67.532	76.48		X	HSBC Bank PLC	United Kingdom	1040	-0.076	2.512	-12.12	7.9	X	
Banca Monte dei Paschi di Siena SpA	Italy	1040	0.556	20.236	-165.92	377.04		X	Lloyds Bank PLC	United Kingdom	1040	-0.129	4.185	-33.55	14.5		
Banca Nazionale del Lavoro SpA	Italy	1040	-0.022	6.747	-104.03	92.48		X	Santander UK PLC	United Kingdom	1040	-0.112	3.323	-29.21	10.19	X	
Banco Bpm SpA	Italy	309	0.16	5.636	-18.43	64.23		X	Standard Chartered Bank	United Kingdom	1040	-0.064	3.145	-20.57	11.04		
BANCO POPOLARE	Italy	1040	0.107	9.621	-47.225	49.785		X									

Source: Thomson Reuters Eikon and ICE

**Table 3:** Stock Returns - Summary statistics

BANK	COUNTRY	OBS	MEAN	STD	MIN	MAX	GSIB	GIIPS	BANK	COUNTRY	OBS	MEAN	STD	MIN	MAX	GSIB	GIIPS
Erste Group Bank AG	Austria	1044	0	0.021	-0.164	0.074			Unione di Banche Italiane SpA	Italy	1044	0	0.026	-0.092	0.104		X
Raiffeisen Bank International AG	Austria	1044	0	0.022	-0.123	0.098			Liechtensteinische Landesbank AG	Liechtenstein	1044	0.001	0.016	-0.073	0.07		
Dexia SA	Belgium	1044	0.002	0.103	-0.333	0.5			VP Bank AG	Liechtenstein	1044	0.001	0.014	-0.052	0.068		
KBC Groep NV	Belgium	1044	0.001	0.022	-0.093	0.107			ING Groep NV	Netherlands	1044	0.001	0.019	-0.074	0.093	X	
Central Cooper. Bank AD	Bulgaria	1044	0.001	0.027	-0.241	0.269			Van Lanschot Kempen NV	Netherlands	1044	0	0.017	-0.09	0.125		
First Investment Bank AD	Bulgaria	1044	0.001	0.025	-0.111	0.157			Dnb ASA	Norway	1044	0.001	0.015	-0.107	0.073		
Zagrebacka Banka dd	Croatia	1044	0	0.016	-0.103	0.077			Sparebank 1 SR Bank ASA	Norway	1044	0.001	0.014	-0.053	0.074		
Komerční Banka as	Czech Republic	1044	0	0.014	-0.083	0.074			Alior Bank SA	Poland	1044	0	0.015	-0.079	0.097		
Danske Bank A/S	Denmark	1044	0	0.015	-0.096	0.067			Bank Handlowy w Warszawie SA	Poland	1044	0	0.019	-0.095	0.067		
Jyske Bank A/S	Denmark	1044	0.001	0.014	-0.046	0.105			Bank Polska Kasa Opieki SA	Poland	1044	0	0.015	-0.071	0.068		
Ringkjøbing Landbobank AS	Denmark	1044	0.001	0.009	-0.034	0.055			ING Bank Śląski SA	Poland	1044	0	0.016	-0.096	0.072		
Sydbank A/S	Denmark	1044	0	0.014	-0.095	0.064			mBank SA	Poland	1044	0	0.018	-0.056	0.117		
Aktia Bank Abp	Finland	1044	0	0.012	-0.082	0.071			Powszechna Kasa Oszczędności Bank Polski SA	Poland	1044	0	0.015	-0.054	0.105		
Pohjola Pankki Ord Shs	Finland	1044	0.001	0.014	-0.059	0.181			Banco BPI Ord Shs	Portugal	1044	0.001	0.021	-0.124	0.227		X
BNP Paribas SA	France	1044	0	0.018	-0.067	0.097	X		Banco Comercial Portugues SA	Portugal	1044	0.001	0.028	-0.129	0.269		X
CIC Ord Shs	France	1044	0.001	0.025	-0.074	0.763			Banco Espírito Santo Class N Ord Shs	Portugal	1044	-0.002	0.033	-0.421	0.197		X
Credit Agricole SA	France	1044	0.001	0.021	-0.08	0.109	X		Banca Transilvania SA	Romania	1044	0.001	0.017	-0.199	0.111		
Natixis SA	France	1044	0.001	0.022	-0.159	0.225	X		Patria Bank SA (BUCURESTI)	Romania	1044	0	0.02	-0.147	0.149		
Societe Generale SA	France	1044	0	0.021	-0.072	0.103	X		Banco Bilbao Vizcaya Argentaria SA	Spain	1044	0	0.019	-0.078	0.107	X	X
Aareal Bank AG	Germany	1044	0.001	0.02	-0.091	0.093			Banco de Sabadell SA	Spain	1044	0	0.021	-0.091	0.139		X
Commerzbank AG	Germany	1044	-0.001	0.024	-0.097	0.119			Banco Popular Español Ord Shs	Spain	1044	-0.002	0.026	-0.182	0.147		X
Deutsche Bank AG	Germany	1044	-0.001	0.02	-0.085	0.092	X		Banco Santander SA	Spain	1044	0	0.018	-0.073	0.107	X	X
IKB Deutsche Industriebank Ord Shs	Germany	1044	0.003	0.068	-0.156	1.808			Bankinter SA	Spain	1044	0.001	0.022	-0.072	0.139		X

BANK	COUNTRY	OBS	MEAN	STD	MIN	MAX	GSIB	GIIPS	BANK	COUNTRY	OBS	MEAN	STD	MIN	MAX	GSIB	GIIPS
Quirin Privatbank AG	Germany	1044	0	0.02	-0.125	0.127			Caixabank SA	Spain	1044	0.001	0.02	-0.1	0.169		X
Umweltbank AG	Germany	1044	0.002	0.068	-0.072	2.161			Nordea Bank Abp	Sweden	1044	0	0.014	-0.11	0.056	X	
Alpha Bank SA	Greece	1044	0.001	0.045	-0.192	0.297		X	S kandinaviska Enskilda Banken AB	Sweden	1044	0.001	0.014	-0.076	0.082		
Eurobank Ergasias SA	Greece	1044	-0.001	0.063	-0.3	0.297		X	Svenska Handelsbanken AB	Sweden	1044	0	0.012	-0.098	0.043		
National Bank of Greece SA	Greece	1044	-0.001	0.049	-0.497	0.273		X	Swedbank AB	Sweden	1044	0	0.015	-0.136	0.105		
Piraeus Bank SA	Greece	1044	0.001	0.054	-0.295	0.285		X	Banque Cantonale Vaudoise	Switzerland	1044	0	0.01	-0.07	0.074		
OTP Bank Nyrt	Hungary	1044	0	0.017	-0.061	0.067			Credit Suisse Group AG	Switzerland	1044	0	0.017	-0.105	0.059	X	
AIB Group plc	Ireland	1044	0.001	0.04	-0.302	0.318		X	Julius Baer Gruppe AG	Switzerland	1044	0	0.015	-0.074	0.083		
Bank of Ireland	Ireland	1044	0	0.032	-0.229	0.163		X	Luzerner Kantonalbank AG	Switzerland	1044	0	0.008	-0.031	0.042		
Banca Carige SpA Cassa di Risparmio di Genova	Italy	1044	-0.002	0.029	-0.188	0.308		X	St Galler Kantonalbank AG	Switzerland	1044	0	0.003	-0.032	0.022		
Banca Monte dei Paschi di Siena SpA	Italy	1044	-0.001	0.037	-0.201	0.283		X	UBS Group AG	Switzerland	1044	0	0.016	-0.077	0.087	X	
Banca Piccolo Credito Valtellinese SpA	Italy	1044	-0.001	0.027	-0.128	0.168		X	Valiant Holding AG	Switzerland	1044	-0.001	0.014	-0.104	0.06		
Banca Popolare di Sondrio SpA	Italy	1044	0	0.021	-0.072	0.095		X	Vontobel Holding AG	Switzerland	1044	0.001	0.014	-0.055	0.103		
Banco Bpm SpA	Italy	1044	0	0.026	-0.104	0.111		X	Zuger Kantonalbank	Switzerland	1044	0	0.008	-0.034	0.054		
Bper Banca SpA	Italy	1044	0	0.028	-0.124	0.134		X	Barclays PLC	United Kingdom	1044	0	0.019	-0.155	0.087	X	
Credito Emiliano SpA	Italy	1044	0	0.021	-0.103	0.084		X	HSBC Holdings PLC	United Kingdom	1044	0	0.011	-0.065	0.047	X	
Intesa Sanpaolo SpA	Italy	1044	0	0.022	-0.096	0.126		X	Lloyds Banking Group PLC	United Kingdom	1044	0.001	0.017	-0.061	0.083		
Mediobanca Banca di Credito Finanziario SpA	Italy	1044	0	0.022	-0.094	0.089		X	Royal Bank of Scotland Group PLC	United Kingdom	1044	0	0.021	-0.115	0.108	X	
UniCredit SpA	Italy	1044	0	0.025	-0.094	0.143	X	X	Standard Chartered PLC	United Kingdom	1044	0	0.016	-0.164	0.071	X	

Source: Bloomberg

**Table 4:** Differences of Junior and Senior CDS spreads – Summary statistics

BANK	COUNTRY	OBS	MEAN	STD	MIN	MAX	GSIB	GIIPS	BANK	COUNTRY	OBS	MEAN	STD	MIN	MAX	GSIB	GIIPS
Banca Monte dei Paschi di Siena	Italy	639	-0.052	15.842	-80.158	96.58		X	Deutsche Bank	Germany	639	-0.094	4.339	-23.79	18.76	X	
Banca Nazionale del Lavoro	Italy	639	-0.066	9.022	-63.83	77.05		X	Erste Group Bank	Austria	639	-0.117	3.872	-30.626	32.604		
Banco Bilbao Vizcaya Argentaria	Spain	639	-0.033	7.789	-50.57	47.96	X	X	Hsbc	United Kingdom	639	0.004	2.5	-13.85	15.14	X	
Banco Comercial Portugues	Portugal	639	0.328	25.553	-313.72	411.9		X	Ing Bank	Netherlands	639	0.022	3.061	-12.086	24.12	X	
Banco Espirito Santo	Portugal	639	0.467	25.876	-359.29	239.59		X	Intesa Sanpaolo	Italy	639	-0.1	8.192	-37.2	52.83		X
Banco Popolare	Italy	639	0.155	12.417	-63.048	110.26		X	Kbc	Belgium	639	-0.101	9.555	-54.63	155.42		
Banco Popolare di Milano	Italy	639	-0.166	14.754	-78.91	116.05		X	Lloyds	United Kingdom	639	-0.13	6.994	-63.92	38.45		
Banco Popular Espanol	Spain	639	0.39	23.175	-246.433	205.544		X	Nordea	Sweden	639	-0.044	1.624	-14.518	10.111	X	
Banco Sabadell	Spain	639	0.362	20.175	-263.157	178.62		X	Raiffeisen Zentralbank	Austria	639	-0.032	7.517	-78.92	82.89		
Banco Santander	Spain	639	0.007	7.669	-32.45	63.42	X	X	Skandinaviska Enskilda Banken	Sweden	639	-0.106	2.911	-23.54	22.473		
Bank Of Ireland	Ireland	639	-0.477	43.709	-400.68	277.45		X	Societe Generale	France	639	-0.117	5.449	-29.558	30.72	X	
Barclays	United Kingdom	639	-0.086	5.133	-41.95	29.76	X		Standard Chartered	United Kingdom	639	0.011	3.579	-14.281	40.46	X	
Bawag	Austria	639	0.096	11.838	-180.989	180.79			Svenska Handelsbanken	Sweden	639	-0.035	1.68	-12.97	11.28		
Bayerische Landesbank	Germany	639	-0.13	7.365	-62.172	54.27			Swedbank	Sweden	639	-0.085	1.972	-14	14.13		
Bnp Paribas	France	639	0.017	5.448	-53.38	30.69	X		The Co-Operative Bank	United Kingdom	639	-0.021	21.664	-235.344	438.676		
Commerzbank	Germany	639	-0.211	8.944	-60.49	51.35			Ubi Banca	Italy	639	-0.035	7.481	-101.45	48.52		X
Credit Agricole	France	639	-0.041	7.574	-48.89	53.69			Ubs	Switzerland	639	-0.024	2.989	-16.82	12.32	X	
Credit Lyonnais	France	639	-0.057	5.855	-30.5	33.8			Unicredit	Italy	639	-0.021	6.456	-28.441	37.03	X	X
Credit Suisse	Switzerland	639	-0.065	3.019	-18.59	17.06	X		Unicredit Bank (Hvb)	Germany	639	-0.063	5.132	-62.94	33.98		
Danske Bank	Denmark	639	-0.009	4.534	-41.65	31.52											

Source: Thomson Reuters Eikon and Datastream

The paper by Schäfer et al (2017) investigated more in depth two events, namely the bail-in event in Cyprus and the nationalization of the Dutch bank as of 2013 by means of cross-sectional regressions. For this purposes they used country-specific and bank-specific variables.

The JRC replicated these cross-sectional analyses using the same control variables; Table 5 and Table 6 show the summary statistics and the correlation matrix of the variables used for the Cyprian regression (results are presented in Table 27 and Table 28), while Table 7 and Table 8 show the same figures for the analysis of the Dutch event (regressions are presented in Table 29 and Table 30).

**Table 5:** Summary statistics for cross-sectional regressions – Bail-in Cyprus

	<b>CDS increase (A)</b>	<b>Debt/GDP 2012 (B)</b>	<b>Avg Common Equity (C)<sup>4</sup></b>	<b>Avg Assets (D)</b>	<b>Net income (E)</b>	<b>CDS level (F)</b>	<b>Avg Equity Ratio (G)</b>	<b>Net income ratio (H)</b>
<b>Source</b>		WEO	Orbis BankFocus	Orbis BankFocus	Orbis BankFocus		(C)/(D)	(E)/(D)
<b>N</b>	59	15	57	57	57	59	41	57
<b>Mean</b>	6.51	88.04	21,787	652,528	335	262.94	0.0493	-0.0012
<b>Std</b>	10.35	40.50	19,369	686,667	2,909	265.05	0.0302	0.0072
<b>Min</b>	-12.21	30.40	658	8,472	-9,294	68.01	0.0154	-0.0217
<b>Max</b>	59.67	177.95	75,757	2,668,190	9,655	1490.38	0.2090	0.0078

**Table 6:** Correlations – data for cross-sectional analysis - Bail-in Cyprus

	<b>CDS increase</b>	<b>Debt/GDP 2012</b>	<b>CDS level</b>	<b>Avg Equity Ratio</b>	<b>Ln(Assets)</b>	<b>Net income ratio</b>
<b>CDS increase</b>	1					
<b>Debt/GDP 2012</b>	0.2399	1				
<b>CDS level</b>	0.0709	0.6772	1			
<b>Avg Equity Ratio</b>	-0.0744	0.3376	0.2414	1		
<b>Ln(Assets)</b>	0.1252	-0.3658	-0.3852	-0.6017	1	
<b>Net income ratio</b>	-0.0969	-0.5717	-0.6718	-0.4182	0.4536	1

Comparing figures in Table 5 with the ones in the paper, one can immediately notice that, while CDS differences and levels, total assets, net income and net income ratio are quite aligned, statistics for the others variables differ. The standard deviation and the maximum of debt/GDP deviate by around 43% and 13% and the average, the standard deviation and the maximum of the common equity differ by 24%, 32% and 26%, respectively. The average equity ratio shows the largest deviations in the standard deviation, minimum and maximum (47%, 300% and 54%, respectively).

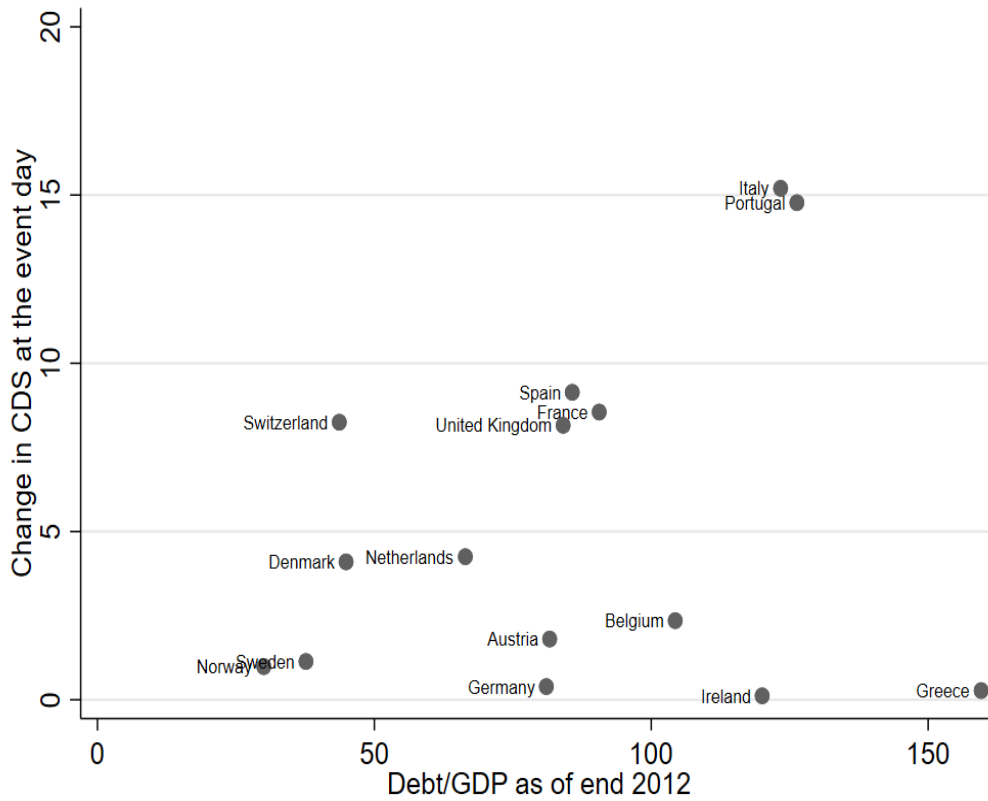
Correlations of Table 6 are comparable in most of the cases. The most relevant deviations are the correlations of the equity ratio with the CDS increases and the CDS levels at the end of the year: in these cases, both the magnitude and the signs of the correlations are different.

In order to better compare data collected by the JRC with those used in the paper by Schäfer et al (2017), Figure 1 plots the 2012 debt/GDP versus the CDS spreads increases during the event day. The ordering of the countries and the relative positions do not change overall, though the levels of some countries differ (e.g. Greece), pointing to the fact that the datasets used in the two works do not perfectly match.

<sup>4</sup> This variable is equal to the Tier 1 capital reported in Orbis BankFocus; if it is not available, it is proxied by the Common Equity. The label is chosen to ease comparison with the paper by Schäfer et al (2017).



**Figure 1:** Abnormal CDS increase vs debt/GDP – Scatterplot



**Table 7:** Summary statistics for cross-sectional regressions - Bail-in Netherlands

	<b>CDS increase</b> <b>(A)</b>	<b>Debt/GDP 2012</b> <b>(B)</b>	<b>Avg Common Equity</b> <b>(C)</b>	<b>Avg Assets</b> <b>(D)</b>	<b>Net income</b> <b>(E)</b>	<b>CDS level</b> <b>(F)</b>	<b>Avg Equity Ratio</b> <b>(G)</b>	<b>Net income ratio</b> <b>(H)</b>
<b>Source</b>		WEO	Orbis BankFocus	Orbis BankFocus	Orbis BankFocus		(C)/(D)	(E)/(D)
<b>N</b>	38	13	38	38	38	38	38	38
<b>Mean</b>	18.03626	83.832	26,670	783,351	767	216.7921	0.0430	0.0002
<b>Std</b>	22.23101	29.89334	19,737	740,801	2,958	137.3678	0.0154	0.0059
<b>Min</b>	-0.7089875	37.655	1,440	54,445	-8,485	71.44099	0.0125	-0.0156
<b>Max</b>	116.0406	126.299	75,757	2,668,190	9,655	505.7358	0.0740	0.0078

**Table 8:** Correlations – data for cross-sectional analysis - Bail-in Netherlands

	<b>CDS increase</b>	<b>Debt/GDP 2012</b>	<b>CDS level</b>	<b>Avg Equity Ratio</b>	<b>Ln(Assets)</b>	<b>Net income ratio</b>
<b>CDS increase</b>	1					
<b>Debt/GDP 2012</b>	0.4562	1				
<b>CDS level</b>	0.4861	0.6758	1			
<b>Avg Equity Ratio</b>	0.1672	0.385	0.4484	1		
<b>Ln(Assets)</b>	-0.0925	-0.3313	-0.5218	-0.6214	1	
<b>Net income ratio</b>	-0.4237	-0.4415	-0.6662	-0.3419	0.2346	1

### 3 Results

The tables below show the results of the event studies conducted by the JRC to replicate those presented in the paper by Schäfer et al (2017). Results in Section 3.1 refer to the baseline results presented in the paper, Section 3.2 presents the results of assessing the differences between junior and senior CDS spreads, Section 3.3 discusses the results of the two cross-sectional analyses and Section 3.4 applies the event study technique to more recent events that were not covered by the paper. It is worth highlighting that the regressions implemented for each selected event have been run by removing the banks belonging to the country where the event took place. Annex 2 reports the results of Section 3.1 without removing the banks.

Overall results for senior CDS and stock returns allow concluding that the JRC approach is in line with the one by Schäfer et al (2017): the majority of events classified as significant by the JRC were also identified as significant by the paper. Also the sign and magnitude of the coefficients, although not identical, are similar. When focusing on the differences between junior and senior CDS, results are slightly less aligned, albeit the most relevant events are still significant and with the same sign.

#### 3.1 Comparisons with the baseline results by Schäfer et al (2017)

Results presented in this section rely on first differences of senior CDS spreads and on equity daily returns. Table 9 and Table 10 show the events study results for the bail-in of the Danish bank Amagerbanken occurred in February 2011. In line with the paper by Schäfer et al (2017), the market does not seem to have any relevant reaction. Only when comparing G-SIB and non G-SIB banks, CDS spreads show different reactions in the two groups.

**Table 9:** Abnormal bank CDS spreads differences - Creditor Bail-in Denmark

Event	Date	Full sample	G-SIB	Non-G-SIB	G-SIB vs Non-G-SIB	GIIPS	Non GIIPS	GIIPS vs Non-GIIPS	
Amagerbanken: bail-in of senior debt	06/02/11	Average	-1.198	2.606	-2.799	<b>5.406**</b>	-6.066	1.445	-7.512
		T-test	-0.060	-0.420	-0.267	-3.894	-0.509	-0.201	-1.550
		p-value	0.806	0.517	0.605	0.049	0.475	0.654	0.213
		Cumulated average	-4.861	-0.651	-6.633	5.982	-12.151	-0.903	-11.248
		T-test	0.489	0.013	0.741	2.354	1.009	0.039	1.716
		p-value	0.484	0.909	0.389	0.125	0.315	0.844	0.190

**Table 10:** Abnormal bank stock returns - Creditor Bail-in Denmark

Event	Date	Full sample	G-SIB	Non-G-SIB	G-SIB vs Non-G-SIB	GIIPS	Non GIIPS	GIIPS vs Non-GIIPS	
Amagerbanken: bail-in of senior debt	06/02/11	Average	0.793%	1.111%	0.713%	0.398%	0.056%	1.147%	-1.091%
		T-test	-0.553	-0.586	-0.510	-0.303	-0.001	-2.330	-0.150
		p-value	0.459	0.447	0.477	0.584	0.976	0.131	0.700
		Cumulated average	0.879%	1.271%	0.781%	0.49%	-0.009%	1.307%	-1.316%
		T-test	0.331	0.372	0.297	0.222	0.000	1.343	0.105
		p-value	0.567	0.544	0.587	0.639	0.997	0.250	0.747

The analysis of the bail-in event in Spain that occurred in summer 2012 allows drawing similar conclusions to those of the paper (Table 11). The only difference with respect to the paper is that neither the CDS market nor the stock market reveal any significant reaction, while the paper signalled as significant the reaction for the difference between G-SIBs and non G-SIBs CDS

spreads when the Spanish authorities expressed the intention to implement a national bank resolution law.

**Table 11:** Abnormal bank CDS spreads differences- creditor bail-in Spain

Event	Date		Full sample	G-SIB	Non-G-SIB	G-SIB vs Non-G-SIB	GIIPS	Non GIIPS	GIIPS vs Non-GIIPS
Spanish bank rescue plan implies bail-in	10/07/12	Average	-1.028	-2.77	-0.332	-2.438	-1.229	-0.956	-0.273
		T-test	-0.020	-0.231	-0.002	-0.181	-0.004	-0.053	0.000
		p-value	0.888	0.631	0.968	0.670	0.949	0.819	0.987
		Cumulated average	-0.43	-2.007	0.201	-2.208	3.198	-1.74	4.938
		T-test	0.002	0.060	0.000	0.073	0.014	0.086	0.041
		p-value	0.967	0.807	0.987	0.786	0.906	0.769	0.839
German government backs rescue plan	19/07/12	Average	-1.886	-0.278	-2.53	2.251	-4.3	-1.015	-3.286
		T-test	-0.068	-0.002	-0.092	-0.150	-0.050	-0.064	-0.036
		p-value	0.794	0.961	0.762	0.699	0.823	0.800	0.849
		Cumulated average	2.694	3.951	2.191	1.761	2.355	2.816	-0.461
		T-test	0.069	0.241	0.034	0.045	0.007	0.245	0.000
		p-value	0.793	0.624	0.854	0.832	0.932	0.621	0.985
Spain pushes national bank resolution plan	02/08/12	Average	3.788	4.736	3.419	1.316	5.743	3.101	2.642
		T-test	-0.279	-0.673	-0.171	-0.049	-0.082	-0.682	-0.021
		p-value	0.598	0.412	0.680	0.826	0.774	0.409	0.884
		Cumulated average	3.713	12.726	0.208	12.518	-9.513	8.361	-17.874
		T-test	0.132	2.396	0.000	2.168	0.111	2.394	0.470
		p-value	0.716	0.122	0.986	0.141	0.739	0.122	0.493

**Table 12:** Abnormal bank stock returns - creditor bail-in Spain

Event	Date		Full sample	G-SIB	Non-G-SIB	G-SIB vs Non-G-SIB	GIIPS	Non GIIPS	GIIPS vs Non-GIIPS
Spanish bank rescue plan implies bail-in	10/07/12	Average	0.545%	0.899%	0.467%	0.432%	-0.922%	1.05%	-1.973%
		T-test	-0.178	-0.237	-0.151	-0.205	-0.125	-1.412	-0.517
		p-value	0.674	0.628	0.698	0.652	0.725	0.239	0.474
		Cumulated average	0.512%	1.699%	0.252%	1.447%	-1.025%	1.042%	-2.068%
		T-test	0.078	0.418	0.022	1.135	0.076	0.277	0.207
		p-value	0.781	0.520	0.883	0.290	0.783	0.600	0.651
German government backs rescue plan	19/07/12	Average	-0.02%	-0.154%	0.009%	-0.163%	0.248%	-0.112%	0.36%
		T-test	0.000	-0.007	0.000	-0.029	-0.009	-0.010	-0.018
		p-value	0.988	0.935	0.994	0.865	0.925	0.922	0.893
		Cumulated average	-1.562%	-2.602%	-1.335%	-1.267%	-2.87%	-1.111%	-1.759%
		T-test	0.728	0.966	0.618	0.870	0.602	0.331	0.535
		p-value	0.396	0.329	0.434	0.354	0.440	0.567	0.467

Event	Date		Full sample	G-SIB	Non-G-SIB	G-SIB vs Non-G-SIB	GIIPS	Non GIIPS	GIIPS vs Non-GIIPS
Spain pushes national bank resolution plan	02/08/12	Average	0.442%	0.672%	0.391%	0.281%	-0.049%	0.611%	-0.66%
		T-test	-0.105	-0.113	-0.098	-0.080	0.000	-0.241	-0.027
		p-value	0.747	0.738	0.756	0.778	0.985	0.625	0.869
		Cumulated average	-0.334%	-1.052%	-0.177%	-0.875%	-0.801%	-0.173%	-0.628%
		T-test	0.030	0.140	0.010	0.395	0.048	0.000	0.068
		p-value	0.862	0.709	0.920	0.532	0.826	0.987	0.795

The nationalization of the SNS Reaal, a Dutch bank, triggers significant reactions by the European banks. In line with the paper by Schäfer et al (2017), CDS spreads (Table 13) show a significant increase for the full sample by almost 12 basis points, when considering the cumulated effects. G-SIBs and non G-SIBs banks had a significant rise of CDS spreads of around 10 and 13 basis points, respectively. Banks located in GIIPS countries faced the largest cumulated increase in CDS spread, more than 22 basis points (in line with the almost 26 estimated by Schäfer et al (2017)). Also the difference between GIIPS and non GIIPS banks is significant. The only difference with respect to the paper by Schäfer et al (2017) is that also banks located in non GIIPS countries have a significant, though smaller than the others, rise of the CDS spreads. Also results for the stock returns (Table 14) are aligned, as the two studies identify the same set of significant events.

**Table 13:** Abnormal bank CDS spreads differences – creditor bail-in Netherlands

Event	Date		Full sample	G-SIB	Non-G-SIB	G-SIB vs Non-G-SIB	GIIPS	Non GIIPS	GIIPS vs Non-GIIPS
Nationalization of the SNS Reaal	01/02/13	Average	3.208	2.693	3.406	-0.713	5.565	1.822	3.743
		T-test	-0.934	-0.743	-0.920	-0.127	-0.801	-0.984	-0.602
		p-value	0.334	0.389	0.338	0.722	0.371	0.321	0.438
		Cumulated average	<b>11.774**</b>	<b>9.172**</b>	<b>12.775**</b>	-3.603	<b>22.865***</b>	<b>5.25**</b>	<b>17.615***</b>
		T-test	6.212	4.257	6.386	1.597	6.674	3.919	6.644
		p-value	0.013	0.039	0.012	0.206	0.010	0.048	0.010

**Table 14:** Abnormal bank stock returns – creditor bail-in Netherlands

Event	Date		Full sample	G-SIB	Non-G-SIB	G-SIB vs Non-G-SIB	GIIPS	Non GIIPS	GIIPS vs Non-GIIPS
Nationalization of the SNS Reaal	01/02/13	Average	0.334%	0.205%	0.363%	-0.158%	-0.295%	0.627%	-0.921%
		T-test	-0.151	-0.028	-0.184	-0.033	-0.031	-0.651	-0.174
		p-value	0.699	0.867	0.669	0.857	0.860	0.422	0.678
		Cumulated average	<b>-2.321%*</b>	<b>-3.647%**</b>	<b>-2.024%*</b>	-1.623%	<b>-3.951%*</b>	-1.564%	-2.387%
		T-test	3.572	4.415	2.817	1.701	2.784	1.163	2.484
		p-value	0.063	0.039	0.097	0.196	0.099	0.284	0.119

Markets reaction to the 2013 Cyprian bail-in shows significant abnormal returns (see Table 15 and Table 16). Although the first event does not record any significant reaction, the second and third events lead to increase of CDS spreads and drops of stock returns for all the different

groups of banks considered in the analysis. The paper by Schäfer et al (2017) comes to the same results. The only differences are the following.

- While the paper by Schäfer et al (2017) show that CDS spreads reaction of G-SIBs and non G-SIBs are significantly different for the third event, the present analysis cannot reach the same conclusion. The same holds true for reaction of GIIPS and non-GIIPS banks.
- The paper by Schäfer et al (2017) does not identify as significant the reactions of stock returns of the full sample, G-SIBs and non G-SIBs banks to the second event, while the present analysis does.

**Table 15:** Abnormal bank CDS spreads differences–creditor bail-in Cyprus

Event	Date		Full sample	G-SIB	Non-G-SIB	G-SIB vs Non-G-SIB	GIIPS	Non GIIPS	GIIPS vs Non-GIIPS
Eurozone Finance ministers: bail-in as option	11/02/13	Average	0.492	-0.041	0.7	-0.74	2.766	-0.737	3.503
		T-test	-0.040	0.000	-0.070	-0.169	-0.331	-0.239	-0.803
		p-value	0.842	0.987	0.791	0.681	0.565	0.625	0.370
		Cumulated average	-0.927	-3.51	0.081	-3.591	2.468	-2.763	5.231
		T-test	0.070	0.979	0.000	1.957	0.130	1.644	0.863
		p-value	0.792	0.322	0.983	0.162	0.718	0.200	0.353
Proposal in CY to tax bank deposits	18/03/13	Average	<b>6.349**</b>	<b>6.109**</b>	<b>6.442**</b>	-0.334	<b>11.251**</b>	<b>3.699**</b>	<b>7.552**</b>
		T-test	-6.113	-4.347	-6.231	-0.037	-5.785	-4.423	-4.202
		p-value	0.013	0.037	0.013	0.847	0.016	0.036	0.040
		Cumulated average	<b>11.834***</b>	<b>12.028***</b>	<b>11.758***</b>	0.27	<b>19.642***</b>	<b>7.614***</b>	<b>12.028**</b>
		T-test	10.474	8.312	10.236	0.012	8.695	9.214	5.327
		p-value	0.001	0.004	0.001	0.913	0.003	0.002	0.021
Bail-in of senior debt	25/03/13	Average	<b>7.063***</b>	<b>8.207***</b>	<b>6.617**</b>	1.59	<b>10.977**</b>	<b>4.948***</b>	6.029
		T-test	-7.498	-7.784	-6.516	-0.838	-5.504	-7.729	-2.685
		p-value	0.006	0.005	0.011	0.360	0.019	0.005	0.101
		Cumulated average	<b>18.163***</b>	<b>15.219***</b>	<b>19.311***</b>	<b>-4.092*</b>	<b>37.094***</b>	<b>7.929***</b>	<b>29.165***</b>
		T-test	24.437	13.192	27.353	2.737	30.981	9.927	30.935
		p-value	0.000	0.000	0.000	0.098	0.000	0.002	0.000

**Table 16:** Abnormal bank stock returns – creditor bail-in Cyprus

Event	Date		Full sample	G-SIB	Non-G-SIB	G-SIB vs Non-G-SIB	GIIPS	Non GIIPS	GIIPS vs Non-GIIPS
Eurozone Finance ministers: bail-in as option	11/02/13	Average	0.016%	0.128%	-0.011%	0.139%	-0.248%	0.134%	-0.381%
		T-test	0.000	-0.011	0.000	-0.024	-0.023	-0.005	-0.037
		p-value	0.986	0.917	0.990	0.877	0.881	0.942	0.849
		Cumulated average	0.891%	2.237%	0.575%	1.662%	1.349%	0.686%	0.663%
		T-test	0.515	1.631	0.222	1.716	0.333	0.827	0.158
		p-value	0.475	0.206	0.639	0.194	0.565	0.366	0.692

Event	Date		Full sample	G-SIB	Non-G-SIB	G-SIB vs Non-G-SIB	GIIPS	Non GIIPS	GIIPS vs Non-GIIPS
Proposal in CY to tax bank deposits	18/03/13	Average	<b>-1.648%*</b>	<b>-2.314%*</b>	<b>-1.491%*</b>	-0.822%	-1.798%	<b>-1.581%**</b>	-0.218%
		T-test	-3.084	-2.904	-2.850	-1.020	-1.161	-5.494	-0.385
		p-value	0.083	0.093	0.096	0.316	0.285	0.022	0.537
		Cumulated average	<b>-4.357%***</b>	<b>-5.359%***</b>	<b>-4.12%***</b>	-1.238%	<b>-7.1%***</b>	<b>-3.13%***</b>	<b>-3.97%***</b>
		T-test	10.664	7.710	10.765	1.145	8.953	10.597	7.155
		p-value	0.002	0.007	0.002	0.288	0.004	0.002	0.009
Bail-in of senior debt	25/03/13	Average	<b>-1.802%*</b>	<b>-3.23%**</b>	-1.466%	<b>-1.764%**</b>	-2.847%	-1.334%	-1.513%
		T-test	-3.455	-5.359	-2.590	-4.664	-2.657	-2.124	-2.404
		p-value	0.067	0.023	0.112	0.034	0.107	0.149	0.125
		Cumulated average	<b>-2.989%**</b>	<b>-4.041%**</b>	<b>-2.74%**</b>	-1.3%	<b>-5.79%**</b>	-1.732%	<b>-4.06%**</b>
		T-test	4.643	4.099	4.422	1.238	5.373	1.435	6.045
		p-value	0.034	0.047	0.039	0.269	0.023	0.235	0.016

The fourth event analysed in the paper by Schäfer et al (2017) is the implementation process of the Single Resolution Mechanism. No banks are removed from the sample for this analysis. In line with the paper, CDS spreads (Table 17) show significant reactions to the provisional agreement on the SRM occurred in March 2014. Stock returns (Table 18) also show significant drop during the last event, the formal agreement of the EU Parliament to back EC proposals on completing the SRM. The paper by Schäfer et al (2017) also detects as relevant the difference of the CDS spreads reaction between G-SIBs and non G-SIBs banks during the first event, the CDS spreads reaction of non GIIPS banks to the second event and the difference of the stock returns reaction between GIIPS and non GIIPS banks during the fourth event. In such cases, the present analysis does not find statistical evidence to reach the same conclusions.

**Table 17:** Abnormal bank CDS spreads – Single Resolution Mechanism

Event	Date		Full sample	G-SIB	Non-G-SIB	G-SIB vs Non-G-SIB	GIIPS	Non GIIPS	GIIPS vs Non-GIIPS
EU finance ministers agreed rules of BRRD	28/06/13	Average	2.298	4.448	1.459	2.989	2.84	2.005	0.835
		T-test	-0.335	-0.923	-0.142	-1.813	-0.188	-0.477	-0.034
		p-value	0.563	0.337	0.706	0.178	0.664	0.490	0.854
		Cumulated average	1.424	4.35	0.282	4.068	1.431	1.42	0.011
		T-test	0.063	0.435	0.003	1.656	0.024	0.125	0.000
		p-value	0.801	0.510	0.959	0.198	0.878	0.723	0.998
Presentation of the SRM proposal	09/07/13	Average	-3.642	-4.872	-3.161	-1.711	-4.3	-3.286	-1.015
		T-test	-0.754	-1.016	-0.597	-0.581	-0.389	-1.172	-0.046
		p-value	0.385	0.314	0.440	0.446	0.533	0.279	0.830
		Cumulated average	-2.484	-1.784	-2.758	0.973	-2.423	-2.518	0.095
		T-test	0.173	0.067	0.224	0.093	0.061	0.353	0.000
		p-value	0.677	0.795	0.636	0.761	0.805	0.552	0.986
EU Council generally accepts SRM, doubts by the ECB	18/12/13	Average	-0.531	-0.727	-0.455	-0.272	-0.284	-0.665	0.381
		T-test	-0.053	-0.076	-0.040	-0.051	-0.004	-0.221	-0.014
		p-value	0.819	0.783	0.842	0.822	0.947	0.640	0.905

Event	Date		Full sample	G-SIB	Non-G-SIB	G-SIB vs Non-G-SIB	GIIPS	Non GIIPS	GIIPS vs Non-GIIPS
		Cumulated average	-2.157	-3.62	-1.586	-2.034	-2.692	-1.868	-0.824
		T-test	0.429	0.934	0.241	1.418	0.197	0.847	0.035
		p-value	0.515	0.337	0.625	0.237	0.658	0.360	0.852
Provisional agreement on the SRM	20/03/14	Average	<b>3.428*</b>	<b>4.979**</b>	2.823	<b>2.156*</b>	3.224	<b>3.54***</b>	-0.315
		T-test	-3.790	-5.867	-2.610	-3.334	-1.142	-8.182	-0.021
		p-value	0.055	0.018	0.110	0.072	0.289	0.005	0.886
		Cumulated average	2.326	3.03	2.051	0.979	2.079	2.46	-0.381
		T-test	0.861	1.072	0.680	0.339	0.234	2.044	0.017
		p-value	0.356	0.304	0.412	0.562	0.630	0.157	0.896
EU Parliament backs EC proposal on the SRM	15/04/14	Average	0.73	1.158	0.563	0.595	1.382	0.378	1.004
		T-test	-0.129	-0.254	-0.077	-0.229	-0.142	-0.079	-0.131
		p-value	0.721	0.615	0.783	0.634	0.707	0.780	0.718
		Cumulated average	0.156	0.085	0.184	-0.099	1.42	-0.527	1.947
		T-test	0.003	0.001	0.004	0.003	0.074	0.046	0.214
		p-value	0.957	0.979	0.949	0.956	0.786	0.832	0.645

**Table 18:** Abnormal bank stock returns – Single Resolution Mechanism

Event	Date		Full sample	G-SIB	Non-G-SIB	G-SIB vs Non-G-SIB	GIIPS	Non GIIPS	GIIPS vs Non-GIIPS
EU finance ministers agreed rules of BRRD	28/06/13	Average	-0.737%	-1.484%	-0.562%	-0.922%	-0.734%	-0.739%	0.005%
		T-test	-0.612	-2.004	-0.330	-1.384	-0.127	-0.010	-0.162
		p-value	0.437	0.161	0.567	0.243	0.723	0.920	0.688
		Cumulated average	0.128%	-0.243%	0.215%	-0.458%	-0.128%	0.243%	-0.371%
		T-test	0.009	0.026	0.024	0.168	0.002	0.080	0.011
		p-value	0.925	0.871	0.878	0.683	0.965	0.778	0.918
Presentation of the SRM proposal	09/07/13	Average	-1.333%	-1.156%	-1.374%	0.218%	-2.721%	-0.71%	-2.012%
		T-test	-1.830	-0.974	-1.854	-0.063	-1.707	-0.313	-1.668
		p-value	0.180	0.327	0.178	0.802	0.196	0.578	0.201
		Cumulated average	-0.676%	-1.153%	-0.564%	-0.589%	-3.59%	0.63%	-4.22%
		T-test	0.239	0.491	0.158	0.234	1.506	0.119	1.950
		p-value	0.626	0.486	0.692	0.630	0.224	0.731	0.167
EU Council generally accepts SRM, doubts by the ECB	18/12/13	Average	0.054%	-0.237%	0.123%	-0.36%	-0.435%	0.274%	-0.709%
		T-test	-0.007	-0.088	-0.033	-0.396	-0.125	-0.801	-0.012
		p-value	0.935	0.768	0.857	0.531	0.725	0.374	0.915
		Cumulated average	0.312%	0.21%	0.336%	-0.126%	0.206%	0.359%	-0.153%
		T-test	0.103	0.033	0.115	0.023	0.013	0.003	0.013
		p-value	0.749	0.857	0.735	0.880	0.908	0.954	0.911

Event	Date		Full sample	G-SIB	Non-G-SIB	G-SIB vs Non-G-SIB	GIIPS	Non GIIPS	GIIPS vs Non-GIIPS
Provisional agreement on the SRM	20/03/14	Average	-0.777%	-0.638%	-0.81%	0.173%	-0.964%	-0.694%	-0.27%
		T-test	-1.228	-0.715	-1.275	-0.138	-0.767	-0.291	-0.668
		p-value	0.271	0.400	0.263	0.711	0.384	0.591	0.416
		Cumulated average	<b>-1.83%*</b>	-1.552%	<b>-1.89%*</b>	0.339%	-2.327%	-1.602%	-0.726%
		T-test	3.372	2.107	3.453	0.266	2.224	1.426	1.614
		p-value	0.070	0.151	0.067	0.608	0.140	0.236	0.208
EU Parliament backs EC proposal on the SRM	15/04/14	Average	<b>-1.46%*</b>	<b>-1.72%**</b>	<b>-1.39%*</b>	-0.323%	<b>-2.28%*</b>	<b>-1.08%*</b>	-1.202%
		T-test	-3.842	-4.953	-3.337	-0.482	-3.537	-3.222	-2.192
		p-value	0.054	0.029	0.072	0.490	0.064	0.077	0.143
		Cumulated average	-1.302%	<b>-1.929%*</b>	-1.154%	-0.775%	-0.892%	<b>-1.48%*</b>	0.593%
		T-test	1.477	3.007	1.099	1.335	0.259	3.084	0.007
		p-value	0.228	0.087	0.298	0.252	0.612	0.083	0.936

The last event analysed in the paper by Schäfer et al (2017) is the bail-in of the Portuguese bank Banco Espírito Santo that took place in August 2014. Both analyses identify as significant the CDS spreads reaction during the Friday before the weekend of negotiations (see Table 19, event labelled as “anticipatory”). Stock returns (Table 20) do not show any significant reaction (the paper Schäfer et al (2017) only finds the difference between GIPS and non GIIPS banks as significant).

**Table 19:** Abnormal bank CDS spreads – creditor bail-in Portugal

Event	Date		Full sample	G-SIB	Non-G-SIB	G-SIB vs Non-G-SIB	GIIPS	Non GIIPS	GIIPS vs Non-GIIPS
Creditor bail-in - Banco Espírito Santo	01/08/14	Anticipatory	<b>3.606**</b>	3.072	<b>3.825**</b>	-0.754	<b>7.612***</b>	1.657	<b>5.956***</b>
		T-test	4.136	2.086	4.704	0.310	7.443	1.384	10.568
		p-value	0.045	0.153	0.033	0.579	0.008	0.243	0.002
	04/08/14	Average	-1.233	-1.467	-1.137	-0.329	-2.425	-0.653	-1.772
		T-test	-0.484	-0.476	-0.416	-0.059	-0.755	-0.215	-0.936
		p-value	0.489	0.493	0.521	0.808	0.387	0.644	0.336
		Cumulated average	-3.048	-4.767	-2.343	-2.424	-4.767	-2.212	-2.556
		T-test	1.459	2.479	0.871	1.583	1.441	1.210	0.976
		p-value	0.231	0.119	0.354	0.212	0.234	0.275	0.326



**Table 20:** Abnormal bank stock returns– creditor bail-in Portugal

Event	Date		Full sample	G-SIB	Non-G-SIB	G-SIB vs Non-G-SIB	GIIPS	Non GIIPS	GIIPS vs Non-GIIPS
Creditor bail-in - Banco Espírito Santo	01/08/14	Anticipatory	0.635%	0.656%	0.629%	0.027%	1.075%	0.46%	0.615%
		T-test	0.920	0.852	0.826	0.002	0.577	0.463	0.497
		p-value	0.341	0.359	0.366	0.961	0.450	0.498	0.483
	04/08/14	Average	-0.086%	0.097%	-0.131%	0.228%	-0.236%	-0.027%	-0.209%
		T-test	-0.018	-0.020	-0.038	-0.185	-0.029	-0.130	-0.013
		p-value	0.894	0.889	0.847	0.668	0.865	0.719	0.909
	04/08/14	Cumulated average	-0.363%	0.144%	-0.488%	0.632%	-2.343%	0.422%	-2.765%
		T-test	0.156	0.021	0.257	0.702	1.419	0.661	2.235
		p-value	0.694	0.885	0.614	0.405	0.237	0.419	0.139

### 3.2 Comparisons with the analysis on the junior versus senior CDS spreads

Results presented in this Section are based on the daily differences between junior and senior CDS spreads. Results in Table 21 show statistics of the junior and senior differences of their CDS spreads during the Danish bail-in. In line with Schäfer et al (2017) and with results presented in Table 9 and Table 10, JRC estimates do not reveal almost any significant difference in the reactions of junior and senior CDS. The only difference is the difference between G-SIB and non G-SIB banks: JRC results allow concluding that on average, the difference is significant, while the paper by Schäfer et al (2017) does not find the same evidence.

**Table 21:** Abnormal bank CDS spreads differences - Junior vs Senior CDS spreads- creditor bail-in Denmark

Event	Date		Full sample	G-SIB	Non-G-SIB	G-SIB vs Non-G-SIB	GIIPS	Non GIIPS	GIIPS vs Non-GIIPS
Amagerbanken: bail-in of senior debt	2/6/11	Average	-1.202	1.167	-2.529	3.696	-3.233	-0.065	-3.168
		T-test	0.199	-0.293	0.322	-1.541	0.247	0.022	0.849
		p-value	0.842	0.769	0.748	0.132	0.805	0.982	0.410
		Cumulated average	-3.744	0.864	-6.324	<b>7.188**</b>	-7.692	-1.533	-6.159
		T-test	-0.436	0.153	-0.565	2.675	-0.412	-0.368	-1.403
		p-value	0.663	0.879	0.572	0.012	0.680	0.713	0.181

Estimated reactions to the 2012 Spanish bail-in events obtained by the JRC (Table 22) are similar to those estimated by Schäfer et al (2017). Both analyses find as significant differences for the non G-SIB banks and for the GIIPS countries for the first event and difference for the G-SIBs banks, G-SIBs versus non G-SIBs and for the GIIPS banks for the last event. JRC analyses also find significant reaction for the difference between G-SIBs and non G-SIBs during the second event, while they do not allow concluding that the difference between GIIPS and non GIIPS banks is statistically different from zero.

**Table 22:** Abnormal bank CDS spreads differences - Junior vs Senior CDS spreads - creditor bail-in Spain

Event	Date		Full sample	G-SIB	Non-G-SIB	G-SIB vs Non-G-SIB	GIIPS	Non GIIPS	GIIPS vs Non-GIIPS
Spanish bank rescue plan implies bail-in	10/07/12	Average	1.966	2.634	1.593	1.041	2.551	1.639	0.912
		T-test	-0.551	-0.623	-0.418	-0.283	-0.397	-0.535	-0.221
		p-value	0.582	0.534	0.676	0.780	0.691	0.592	0.827
		Cumulated average	7.021	3.381	<b>9.059*</b>	-5.678	<b>16.822*</b>	1.532	15.289
		T-test	1.382	0.562	1.669	-0.993	1.839	0.352	1.590
		p-value	0.167	0.574	0.095	0.330	0.066	0.725	0.136
German government backs rescue plan	19/07/12	Average	-1.238	-1.985	-0.819	-1.166	-1.503	-1.089	-0.414
		T-test	0.357	0.501	0.215	1.245	0.238	0.369	0.430
		p-value	0.721	0.616	0.830	0.226	0.812	0.712	0.671
		Cumulated average	1.342	-1.738	3.066	<b>-4.804**</b>	4.059	-0.18	4.239
		T-test	0.272	-0.308	0.566	-2.163	0.452	-0.043	1.148
		p-value	0.786	0.758	0.571	0.038	0.652	0.966	0.271
Spain pushes national bank resolution plan	02/08/12	Average	2.009	<b>9.00**</b>	-1.906	<b>10.91***</b>	0.814	2.678	-1.864
		T-test	-0.545	-2.298	0.441	-3.060	-0.115	-0.928	0.442
		p-value	0.586	0.022	0.659	0.007	0.908	0.354	0.664
		Cumulated average	7.358	<b>13.31**</b>	4.023	<b>9.29**</b>	6.747	<b>7.7*</b>	-0.953
		T-test	1.402	2.387	0.654	2.090	0.672	1.873	-0.149
		p-value	0.161	0.017	0.513	0.044	0.502	0.061	0.884

JRC analyses of the junior and senior differences of CDS spreads for the 2013 Dutch bail-in case (Table 23) lead to the same conclusions as those by Schäfer et al (2017). On average, junior CDS increase more than senior (the difference being around 8 basis points) and the difference reaches 15 basis points for banks located in GIIPS countries.

**Table 23:** Abnormal bank CDS spreads differences - Junior vs Senior CDS spreads – creditor bail-in Netherlands

Event	Date		Full sample	G-SIB	Non-G-SIB	G-SIB vs Non-G-SIB	GIIPS	Non GIIPS	GIIPS vs Non-GIIPS
Nationalization of the SNS Reaal	01/02/13	Average	<b>7.783***</b>	4.473	<b>9.637***</b>	-5.165	<b>15.208**</b> *	3.625	11.583
		T-test	-2.892	-1.640	-3.055	1.191	-3.017	-1.597	-1.596
		p-value	0.004	0.101	0.002	0.244	0.003	0.110	0.134
		Cumulated average	<b>17.601***</b>	<b>14.884***</b>	<b>19.12***</b>	-4.238	<b>31.36***</b>	<b>9.894***</b>	<b>21.47**</b>
		T-test	4.594	3.833	4.259	-0.730	4.372	3.062	2.578
		p-value	0.000	0.000	0.000	0.471	0.000	0.002	0.021

When considering the Cyprian case, both the paper by Schäfer et al (2017) and results of the present analysis conclude that junior and senior CDS react significantly different during the

second event (18th March 2013, see Table 24) and that junior CDS rise more than the senior. The only differences between the two studies are the following:

- Average junior and senior CDS difference for the entire sample for the second event Schäfer et al (2017) find this reaction as significant while this analysis cannot reach the same conclusion.
- Junior vs senior CDS difference of banks located in GIIPS countries for the second event This reaction is estimated as significant by Schäfer et al (2017) while the present analysis does not.

**Table 24:** Abnormal bank CDS spreads differences - Junior vs Senior CDS spreads - creditor bail-in Cyprus

Event	Date		Full sample	G-SIB	Non-G-SIB	G-SIB vs Non-G-SIB	GIIPS	Non GIIPS	GIIPS vs Non-GIIPS
Eurozone Finance ministers: bail-in as option	11/02/13	Average	0.185	-0.53	0.585	-1.115	0.709	-0.109	0.817
		T-test	-0.072	0.205	-0.188	1.365	-0.146	0.049	-0.871
		p-value	0.943	0.837	0.851	0.181	0.884	0.961	0.390
		Cumulated average	-0.675	-2.88	0.56	-3.44	0.199	-1.164	1.363
		T-test	-0.184	-0.784	0.127	-1.563	0.029	-0.372	0.557
		p-value	0.854	0.433	0.899	0.127	0.977	0.710	0.581
Proposal in CY to tax bank deposits	18/03/13	Average	4	<b>5.372*</b>	3.231	2.141	2.286	<b>4.96***</b>	-2.674
		T-test	-1.490	-1.943	-1.085	-1.233	-0.438	-2.671	1.303
		p-value	0.136	0.052	0.278	0.227	0.662	0.008	0.209
		Cumulated average	<b>8.597**</b>	<b>10.276**</b>	7.657*	2.619	9.317	<b>8.194**</b>	1.123
		T-test	2.248	2.611	1.805	1.164	1.252	3.099	0.422
		p-value	0.025	0.009	0.071	0.254	0.210	0.002	0.677
Bail-in of senior debt	25/03/13	Average	2.412	2.845	2.169	0.676	2.391	2.424	-0.033
		T-test	-0.926	-1.061	-0.753	-0.331	-0.466	-1.353	0.011
		p-value	0.355	0.289	0.452	0.742	0.642	0.176	0.991
		Cumulated average	0.211	-1.123	0.957	-2.08	-5.089	3.178	<b>-8.267*</b>
		T-test	0.057	-0.294	0.233	-0.564	-0.696	1.246	-1.884
		p-value	0.955	0.769	0.816	0.576	0.487	0.213	0.076

Estimated responses to the political discussion on the SRM differ. Both analyses find some significant reactions when the SRM was publicly presented (second event); moreover, JRC analyses find some significant reactions also to the other events (see Table 25).

**Table 25:** Abnormal bank CDS spreads - Junior vs Senior CDS spreads – Single Resolution Mechanism

Event	Date		Full sample	G-SIB	Non-G-SIB	G-SIB vs Non-G-SIB	GIIPS	Non GIIPS	GIIPS vs Non-GIIPS
EU finance ministers agreed rules of BRRD	28/06/13	Average	-1.007	-1.511	-0.725	-0.787	-3.27	0.26	-3.531
		T-test	0.308	0.440	0.196	0.452	0.770	-0.072	1.759
		p-value	0.758	0.660	0.845	0.655	0.441	0.942	0.101
		Cumulated average	-0.781	-2.463	0.161	-2.624	-1.089	-0.608	-0.481
		T-test	-0.168	-0.504	0.031	-1.285	-0.180	-0.119	-0.191
		p-value	0.867	0.614	0.976	0.211	0.857	0.906	0.851

Event	Date		Full sample	G-SIB	Non-G-SIB	G-SIB vs Non-G-SIB	GIIPS	Non GIIPS	GIIPS vs Non-GIIPS
Presentation of the SRM proposal	09/07/13	Average	-0.209	-1.825	0.695	-2.52	3.944	-2.535	<b>6.479**</b>
		T-test	0.065	0.539	-0.189	1.209	-0.949	0.703	-2.347
		p-value	0.948	0.590	0.850	0.235	0.343	0.482	0.031
		Cumulated average	0.871	-0.767	1.787	-2.554	5.512	-1.729	<b>7.241**</b>
		T-test	0.189	-0.159	0.341	-1.110	0.931	-0.337	2.210
		p-value	0.850	0.874	0.733	0.274	0.352	0.736	0.044
EU Council generally accepts SRM, doubts by the ECB	18/12/13	Average	0.064	-0.507	0.384	-0.891	1.105	-0.519	<b>1.624**</b>
		T-test	-0.048	0.374	-0.231	1.650	-0.445	0.500	-2.664
		p-value	0.962	0.710	0.818	0.109	0.657	0.619	0.016
		Cumulated average	-0.355	-0.424	-0.317	-0.107	0.317	-0.732	1.049
		T-test	-0.186	-0.219	-0.134	-0.159	0.090	-0.495	1.295
		p-value	0.853	0.827	0.894	0.875	0.929	0.622	0.209
Provisional agreement on the SRM	20/03/14	Average	0.924	1.473	0.617	<b>0.857**</b>	0.843	0.97	-0.127
		T-test	-1.122	-1.395	-0.659	-2.134	-0.750	-1.111	0.305
		p-value	0.266	0.167	0.512	0.041	0.455	0.270	0.762
		Cumulated average	1.15	1.675	0.856	0.819*	1.19	1.127	0.062
		T-test	0.980	1.114	0.643	1.889	0.744	0.907	0.127
		p-value	0.330	0.269	0.522	0.067	0.459	0.367	0.900
EU Parliament backs EC proposal on the SRM	15/04/14	Average	-1.063	0.262	-1.805	2.067	1.308	<b>-2.391**</b>	3.699
		T-test	1.088	-0.238	1.620	-0.767	-0.876	2.553	-1.263
		p-value	0.280	0.813	0.109	0.450	0.384	0.013	0.215
		Cumulated average	-0.83	0.142	-1.374	1.517	1.845	<b>-2.328*</b>	4.173
		T-test	-0.596	0.091	-0.866	0.587	0.867	-1.745	1.478
		p-value	0.553	0.928	0.389	0.563	0.389	0.085	0.148

Results for the 2014 Portuguese bail-in (see Table 26) are different to some extent. Both analyses identify as significant the average reactions of the entire sample, of non G-SIBs banks during the anticipatory event and the cumulated reaction of GIIPS banks, though JRC results are higher than those by Schäfer et al (2017). Different results are found in the following cases:

- Reactions of banks located in GIIPS countries and differences between GIIPS and non GIIPS banks during the anticipatory event: the paper by Schäfer et al (2017) find that junior CDS rise significantly more than senior CDS, while the present analysis does not find any statistical significance.
- Cumulated reactions of the entire sample of banks and of non-G-SIBs banks: while JRC results allow concluding that senior CDS rise more than junior (being the averages negative and statistically different from zero), the paper by Schäfer et al (2017) does not reach the same conclusion.

While Schäfer et al (2017) conclude that there are significant results for the anticipatory effect and that junior CDS rise more than the senior, the present analysis does not reach any clear conclusion, as no effect can be considered as significant (see Table 26).

**Table 26:** Abnormal bank CDS spreads - Junior vs Senior CDS spreads - creditor bail-in Portugal

Event	Date		Full sample	G-SIB	Non-G-SIB	G-SIB vs Non-G-SIB	GIIPS	Non GIIPS	GIIPS vs Non-GIIPS
Creditor bail-in - Banco Espírito Santo	01/08/14	Anticipatory	<b>5.156***</b>	1.339	<b>7.293***</b>	-5.954	17.806	-1.929	19.735
		T-test	3.027	1.110	3.265	-0.591	-0.014	-1.639	1.497
		p-value	0.003	0.271	0.002	0.560	0.989	0.105	0.143
	04/08/14	Average	-0.534	-1.076	-0.23	<b>-0.846*</b>	-0.657	-0.465	-0.193
		T-test	0.313	0.891	0.103	1.888	0.188	0.395	0.311
		p-value	0.755	0.376	0.918	0.067	0.852	0.694	0.760
	04/08/14	Cumulated average	<b>-8.53***</b>	-2.312	<b>-12.01***</b>	9.701	<b>-27.77***</b>	2.246	-30.022
		T-test	-3.519	-1.346	-3.779	0.641	-5.570	1.341	-1.143
		p-value	0.001	0.182	0.000	0.528	0.000	0.184	0.273

### 3.3 Cross-sectional analyses

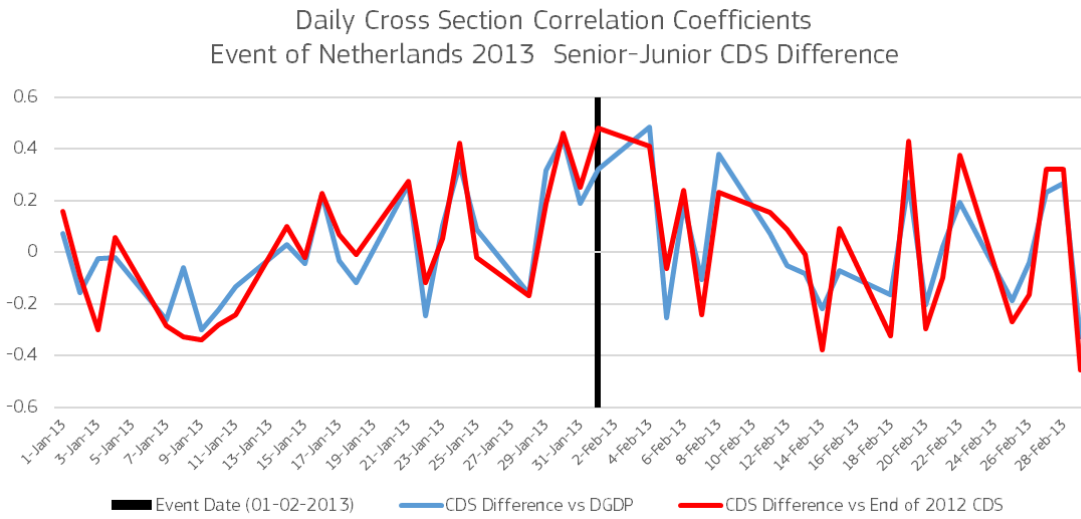
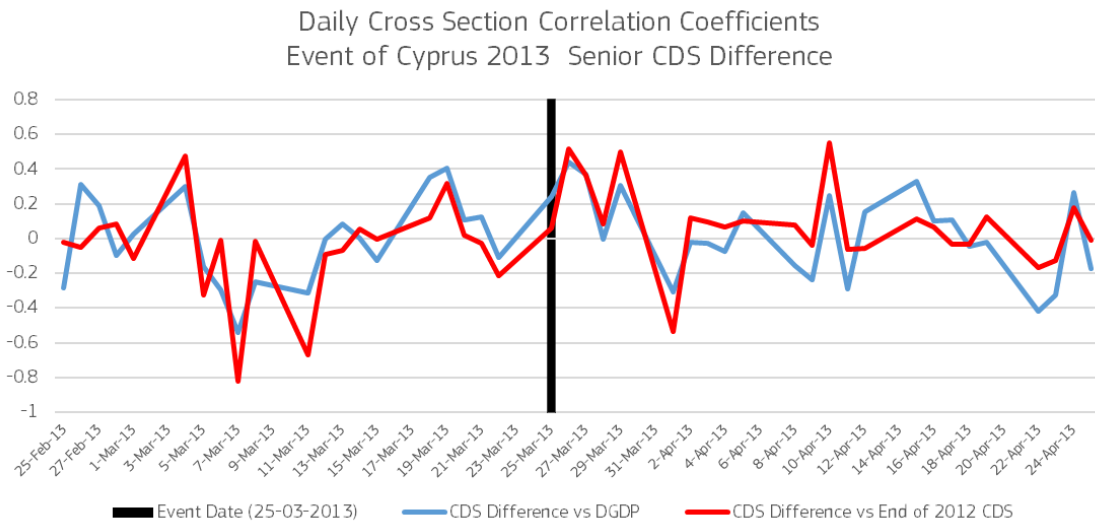
The paper by Schäfer et al (2017) posed special attention to reactions of senior CDS spreads of the EU banking system to the 2013 Cyprian bail-in event and to the difference between junior and senior CDS spreads during the 2013 nationalisation of SNS Reaal, the Dutch bank. The authors ran cross-sectional regressions to better investigate drivers of markets' reactions to these specific events. The JRC replicated these regressions and results are presented in Table 27 to Table 30.

Results of the cross-sectional regression analysis developed by the JRC are similar to those by Schäfer et al (2017), although not identical. When focusing on Table 27 (cross-sectional regression on senior CDS considering all the banks in the sample), many coefficients are significant in both analyses, but some differences arise. Debt over GDP is not significant when it is the only independent variable in the model and the G-SIB dummy is significant only in regression (5).

To fine-tune the analysis, Table 28 replicates results presented in Table 27 by excluding banks from countries that were under a European Stability Mechanism program, namely Greece, Spain, Portugal and Ireland. This new set of results is more aligned with those by Schäfer et al (2017): the debt/GDP is not significant only in one regression (regression 2) and G-SIB is not significant in regression 8 only.

The analysis on the junior vs senior CDS spreads leads to rather different results from those by Schäfer et al (2017), as can be seen in Table 29 and Table 30. When considering regressions run over the entire sample, debt/GDP and the interaction term debt/GDP#CDS level are almost never significant, while in Schäfer et al (2017) they are. On the other hand, the CDS level alone is significant for many regression models (while in Schäfer et al (2017) it is not). Also results obtained with the reduced sample (excluding, as for the analysis of Cyprus, banks from Portugal, Spain, Ireland and Greece). We investigate the reason of this divergence of results, looking at the correlation coefficient between the CDS differences and two of the variables that are relevant in the analysis, namely the Debt/GDP ratio for the year 2012 and the level of the CDS spread of the banks at the end of the 2012. Figure 2 plots the daily cross section correlations for both variables. The correlation is calculated daily for the two pairs of variables, and shows that the coefficient is quite volatile, ranging from -0.54 to 0.44 for the Senior CDS (with an average value of 0.007 in the two months) and from -0.33 to 0.48 for the Junior minus Senior CDS (with an average value of 0.023 in the two months). This variability clearly affects the stability of the results for the cross section regression, and challenge the interpretation of the authors of the role of fiscal capacity. In this regards, some robustness checks to confirm the results would be needed from the authors. For this reason, we report the results of the replication exercise, with the caveat that the results might be quite unstable.

**Figure 2:** Daily cross section correlation between the banks' CDS difference for the event date against Debt/GDP ratio by country and End of Year 2012 banks' CDS.



**Table 27:** Bail-in Cyprus - cross-sectional regression - all banks - senior CDS

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Debt/GDP de-meaned	0.08705 (0.05818)	<b>0.13245***</b> (0.03002)	<b>0.09991***</b> (0.02508)	<b>0.07817**</b> (0.03344)	<b>0.09514***</b> (0.02660)	<b>0.08868*</b> (0.04297)	<b>0.08775*</b> (0.04331)	<b>0.08763*</b> (0.04458)
CDS level de-meaned		-0.00729 (0.00591)	0.00470 (0.01031)	0.02088 (0.01407)	0.00965 (0.00995)	0.01617 (0.01225)	0.01446 (0.01216)	0.01459 (0.01313)
Debt/GDP # CDS level de-meaned			-0.00018 (0.00013)	<b>-0.00036*</b> (0.00018)	<b>-0.00023*</b> (0.00013)	<b>-0.00031*</b> (0.00016)	<b>-0.00030*</b> (0.00015)	<b>-0.00030*</b> (0.00015)
Ln(TA)				<b>2.60200**</b> (1.02980)				
G-SIB					<b>4.58901**</b> (1.85412)	3.80901 (2.44158)	3.81841 (2.49272)	3.77341 (2.19561)
Equity ratio						-53.27409 (39.33534)	-57.68832 (60.85846)	-57.52146 (62.87372)
Net income							-78.27767 (405.63927)	-76.03148 (427.35341)
Supersized								0.16862 (2.88323)
Constant	<b>6.22371***</b> (1.44754)	<b>6.08576***</b> (1.45160)	<b>7.08245***</b> (1.66548)	<b>-42.1719**</b> (19.27708)	<b>6.09297***</b> (1.86188)	<b>9.40109**</b> (4.07076)	<b>9.44903*</b> (4.45987)	<b>9.43711*</b> (4.60587)
Observations	59	59	59	57	59	57	57	57
R-squared	0.05780	0.07690	0.09472	0.17397	0.13022	0.15968	0.16100	0.16103
SE cluster country	Y	Y	Y	Y	Y	Y	Y	Y
Adjusted R-squared	0.0413	0.0439	0.0453	0.110	0.0658	0.0773	0.0603	0.0412
Number of clusters	15	15	15	15	15	15	15	15

**Table 28:** Bail-in Cyprus - cross-sectional regression - excluding banks from Program Countries - senior CDS

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Debt/GDP de-meaned	<b>0.14119**</b> (0.04744)	0.07839 (0.04916)	<b>0.24035***</b> (0.04185)	<b>0.22630***</b> (0.05680)	<b>0.22884***</b> (0.04040)	<b>0.24972***</b> (0.05345)	<b>0.24771***</b> (0.05959)	<b>0.25124***</b> (0.05961)
CDS level de-meaned		0.02270 (0.02691)	-0.00367 (0.01574)	0.01226 (0.02230)	0.00400 (0.01601)	0.00436 (0.01809)	-0.00231 (0.02401)	-0.00078 (0.02370)
Debt/GDP # CDS level de-meaned			<b>0.00141***</b> (0.00038)	<b>0.00124***</b> (0.00034)	<b>0.00136***</b> (0.00033)	<b>0.00140***</b> (0.00032)	<b>0.00142***</b> (0.00033)	<b>0.00143***</b> (0.00033)
Ln(TA)				<b>3.28689***</b> (0.79603)				
G-SIB					<b>5.28607***</b> (1.12605)	<b>4.54483**</b> (1.81927)	<b>4.36321*</b> (2.40261)	3.27797 (2.50396)
Equity ratio						-52.37461 (45.33085)	-63.17670 (74.82717)	-62.37247 (72.54143)
Net income							-253.59498 (372.93457)	-231.24208 (365.72029)
Supersized								<b>3.24990*</b> (1.66078)
Constant	<b>6.39184***</b> (1.56574)	<b>8.03850**</b> (2.95688)	3.40951 (1.94165)	<b>-59.32281***</b> (13.98724)	2.50135 (1.72962)	4.99871 (3.15037)	4.95063 (3.56094)	4.79111 (3.50285)
Observations	47	47	47	47	47	47	47	47
R-squared	0.13030	0.17116	0.29987	0.42009	0.35051	0.37260	0.38509	0.39605
SE cluster country	Y	Y	Y	Y	Y	Y	Y	Y
Adjusted R-squared	0.111	0.133	0.251	0.365	0.289	0.296	0.293	0.288
Number of clusters	11	11	11	11	11	11	11	11



**Table 29:** Bail-in Netherlands - cross-sectional regression - all banks – junior vs senior CDS

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Debt/GDP de-meaned	<b>0.36062**</b> (0.15602)	0.10151 (0.08848)	0.25197 (0.18015)	0.26869 (0.18067)	0.25386 (0.18420)	0.26464 (0.21586)	0.24789 (0.20562)	0.27320 (0.19558)
CDS level de-meaned		0.07713 (0.05791)	<b>0.04733**</b> (0.02063)	<b>0.06575***</b> (0.01743)	<b>0.05445**</b> (0.02022)	<b>0.05914***</b> (0.01873)	0.02761 (0.02255)	0.00588 (0.02080)
Debt/GDP # CDS level de-meaned			0.00144 (0.00169)	0.00167 (0.00158)	0.00149 (0.00168)	0.00141 (0.00166)	0.00117 (0.00158)	0.00133 (0.00161)
Ln(TA)				<b>5.52435***</b> (1.49449)				
G-SIB					<b>5.77621**</b> (2.57563)	3.19127 (4.88246)	2.22159 (4.79467)	4.92086 (5.19396)
Equity ratio						-199.15295 (227.50687)	-220.66257 (143.38196)	-221.40000 (124.90320)
Net income							-1,141.20260 (931.90049)	-1,514.56201 (918.21234)
Supersized								-12.57236 (9.62137)
Constant	<b>17.47219***</b> (3.52099)	<b>21.31477***</b> (6.23227)	<b>16.05304***</b> (2.10193)	<b>-92.62189***</b> (28.88921)	<b>14.12047***</b> (2.62376)	<b>24.04101*</b> (11.61494)	<b>24.80991***</b> (7.99861)	<b>24.83227***</b> (6.72716)
Observations	38	38	38	38	38	38	38	38
R-squared	0.21154	0.32946	0.36758	0.41837	0.38142	0.39420	0.43810	0.47496
SE cluster country	Y	Y	Y	Y	Y	Y	Y	Y
Adjusted R-squared	0.190	0.291	0.312	0.348	0.306	0.300	0.329	0.352
Number of clusters	13	13	13	13	13	13	13	13

**Table 30:** Bail-in Netherlands - cross-sectional regression - excluding banks from Program Countries – junior vs senior CDS

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Debt/GDP de-meaned	<b>0.46778***</b> (0.12488)	-0.05185 (0.13822)	0.51244 (0.29374)	<b>0.41218*</b> (0.19500)	0.43402 (0.27202)	<b>0.54053***</b> (0.15492)	<b>0.46259**</b> (0.17016)	<b>0.47598**</b> (0.17719)
CDS level de-meaned		<b>0.18076***</b> (0.04530)	0.05367 (0.07197)	<b>0.09402*</b> (0.04881)	0.07848 (0.06896)	0.07946 (0.04588)	0.01408 (0.03251)	0.00317 (0.03664)
Debt/GDP # CDS level de-meaned			<b>0.00329**</b> (0.00138)	<b>0.00286***</b> (0.00081)	<b>0.00291**</b> (0.00126)	<b>0.00306**</b> (0.00095)	<b>0.00262**</b> (0.00082)	<b>0.00270**</b> (0.00088)
Ln(TA)				<b>4.63995**</b> (1.44411)				
G-SIB					<b>5.07660*</b> (2.76762)	-3.37873 (6.82379)	-3.27726 (6.85763)	-2.32890 (7.47686)
Equity ratio						<b>-568.03308*</b> (254.67308)	<b>-313.73088*</b> (161.60403)	-292.71487 (171.77175)
Net income							- <b>2,170.23208*</b> (1,164.33668)	-2,309.36089 (1,280.51971)
Supersized								-3.15818 (5.13244)
Constant	<b>19.31992***</b> (3.55620)	<b>33.63928***</b> (3.77754)	<b>15.73718*</b> (8.38779)	<b>-71.94305**</b> (30.11786)	<b>16.68997*</b> (7.56443)	<b>43.85222**</b> (14.93031)	<b>31.15009***</b> (9.45860)	<b>29.57151**</b> (10.16973)
Observations	31	31	31	31	31	31	31	31
R-squared	0.30830	0.64228	0.68905	0.72080	0.69765	0.76360	0.81564	0.81743
SE cluster country	Y	Y	Y	Y	Y	Y	Y	Y
Adjusted R-squared	0.284	0.617	0.654	0.678	0.651	0.716	0.770	0.762
Number of clusters	10	10	10	10	10	10	10	10

### 3.4 Additional Events

As already mentioned, the present analysis aims not only at replicating the work by Schäfer et al (2017), but also at applying their methodology to analyse more recent events that occurred after the release of the working paper. Results presented in this section focus on additional selected events, namely the resolution of the Spanish Bank Banco Popular, the introduction of the new Banking Package by the European Commission, the Italian Banks that have been precautionary recapitalized by the government (Monte dei Paschi di Siena) or has been declared by the ECB “failing or likely to fail” (Popolare di Vicenza S.p.A. and Veneto Banca S.p.A.), and finally the recapitalization of the German NordLB on 2019. We discuss singularly the events related to a bank, and collectively the regulatory events. We stress that the analysis that follows are carried out using the CDS with protocol MM14, released after October 2014, that includes also bail-in as a credit event.

On June, the 6<sup>th</sup> 2017 the ECB agreed that the SRB started a resolution procedure for Banco Popular, given its liquidity situation, and on June, the 7<sup>th</sup>, the SRB transferred all shares of Banco Popular to Banco Santander. Overall, markets do not seem to have abnormal reactions (see Table 31, Table 32 and Table 33). Results show that the full sample of banks (without the Spanish banks) face no statistically significant reaction of CDS spreads to the SRB intervention. The stock market reveals significant reaction only for the differences between GIIPS and non-GIIPS, albeit individually the two groups are not statistically significant. One possible explanation might be that bank’s stock was traded below 1 Euro even before the final decision on resolution by ECB and SRB and thus the markets already knew that the bank was insolvent.<sup>5</sup> The analysis of the differences between junior and senior CDS spreads does not give additional insights with respect to the other two markets: there are no significant differences in the groups of banks for that event.

**Table 31:** Abnormal bank CDS spreads – Resolution of Banco Popular

Event	Date	Full sample	G-SIB	Non-G-SIB	G-SIB vs Non-G-SIB	GIIPS	Non GIIPS	GIIPS vs Non-GIIPS	
Resolution of Banco Popular	06/06/17	Average	0.807	1.438	0.534	0.904	0.938	0.772	0.166
		T-test	-0.687	-0.766	-0.550	-0.962	-0.470	-0.677	-0.224
		p-value	0.494	0.446	0.584	0.353	0.640	0.500	0.826
		Cumulated average	-0.15	-0.353	-0.062	-0.291	0.602	-0.349	0.951
		T-test	-0.090	-0.132	-0.045	-0.438	0.212	-0.215	1.095
		p-value	0.929	0.895	0.964	0.666	0.833	0.830	0.300

**Table 32:** Abnormal bank stock returns – Resolution of Banco Popular

Event	Date	Full sample	G-SIB	Non-G-SIB	G-SIB vs Non-G-SIB	GIIPS	Non GIIPS	GIIPS vs Non-GIIPS	
Resolution of Banco Popular	06/06/17	Average	-0.549%	-0.518%	-0.557%	0.039%	-0.794%	-0.471%	-0.323%
		T-test	0.738	0.432	0.825	-0.115	0.588	0.755	0.508
		p-value	0.463	0.667	0.412	0.909	0.558	0.453	0.618
		Cumulated average	-0.432%	0.07%	-0.558%	0.628%	-2.02%	0.077%	<b>-2.097%**</b>
		T-test	-0.409	0.041	-0.583	1.518	-1.056	0.087	-2.254
		p-value	0.683	0.967	0.562	0.134	0.295	0.931	0.038

<sup>5</sup> 1 Euro was the purchase price paid by Santander for the shares and capital instruments of Banco Popular. More details of the resolution procedure are available at the SRB website <https://srb.europa.eu/en/node/315>

**Table 33:** Abnormal bank CDS spreads – Junior vs Senior CDS spreads - Resolution of Banco Popular

Event	Date		Full sample	G-SIB	Non-G-SIB	G-SIB vs Non-G-SIB	GIIPS	Non GIIPS	GIIPS vs Non-GIIPS
Resolution of Banco Popular	06/06/17	Average	0.637	-0.413	1.049	-1.462	1.499	0.414	1.085
		T-test	-0.586	0.285	-0.812	1.450	-0.636	-0.360	-1.118
		p-value	0.559	0.776	0.419	0.156	0.526	0.719	0.274
		Cumulated average	0.86	0.474	1.012	-0.538	2.066	0.549	1.517
		T-test	0.557	0.230	0.550	-0.947	0.616	0.336	1.350
		p-value	0.579	0.819	0.584	0.350	0.539	0.738	0.212

In November 2016, the European Commission proposed the banking reform package. It is a broad initiative meant to further progress towards reducing the risk of the EU banking sector and completing the Banking Union. The entire process has been complex as it covered different reforms. Six main events were identified (they are listed in Table 1) and the analysis assessed how markets reacted to them. Results show that CDS spreads (Table 34) do not react when the EC proposed the reform package (November 2016) but strongly react with positive coefficients when the Council of the EU reached a general approach on the package (May 2018), an important milestone because it provided the Council Presidency with the mandate to start negotiations with the European Parliament. During this event, stock returns reported significant drops of around 1-5% (see Table 35). The differences between junior and senior CDS mimic the reaction of the CDS and the Equity for the second event (Banking Package of 25/05/18), but also significantly react for the first event of this list, namely the proposal of a reform package. This result appears to be driven by the over-reaction of NON-G-SIB and GIIPS banks, as reported in Table 36. The average difference is pretty high, especially for GIIPS banks (around 29 bps). All the remaining events are mostly non-significant, with some sporadic exception for the equity and the difference between Junior and Senior CDS.

**Table 34:** Abnormal bank CDS spreads – European Commission Banking Package

Event	Date		Full sample	G-SIB	Non-G-SIB	G-SIB vs Non-G-SIB	GIIPS	Non GIIPS	GIIPS vs Non-GIIPS
EC proposes banking reform package	23/11/16	Average	0.458	0.877	0.274	0.604	0.597	0.403	0.195
		T-test	-0.322	-0.428	-0.203	-1.699	-0.202	-0.389	-0.639
		p-value	0.749	0.670	0.840	0.109	0.841	0.699	0.530
		Cumulated average	0.111	0.498	-0.06	0.558	-0.125	0.205	-0.329
		T-test	0.054	0.170	-0.031	1.430	-0.030	0.139	-0.612
		p-value	0.957	0.865	0.975	0.164	0.976	0.890	0.549
		The Council of the European Union reaches a general approach on the banking package	25/05/18	Average	<b>3.39***</b>	<b>4.698***</b>	<b>2.774***</b>	1.924	<b>7.883***</b>
T-test	-3.559			-3.433	-3.447	-1.203	-5.558	-1.755	-3.584
p-value	0.001			0.001	0.001	0.240	0.000	0.083	0.003
Cumulated average	<b>3.273**</b>			<b>4.429**</b>	<b>2.73**</b>	1.699	<b>8.832***</b>	0.891	<b>7.94***</b>
T-test	2.415			2.274	2.383	1.012	4.375	0.751	4.558
p-value	0.018			0.026	0.020	0.319	0.000	0.455	0.000
The EP votes the amended text on the banking package	19/06/18			Average	0.643	1.107	0.424	0.683	1.165
		T-test	-0.399	-0.530	-0.294	-1.156	-0.342	-0.385	-0.959
		p-value	0.691	0.597	0.769	0.258	0.733	0.702	0.352

Event	Date		Full sample	G-SIB	Non-G-SIB	G-SIB vs Non-G-SIB	GIIPS	Non GIIPS	GIIPS vs Non-GIIPS
		Cumulated average	-0.302	-0.253	-0.325	0.072	-0.427	-0.249	-0.178
		T-test	-0.132	-0.085	-0.158	0.119	-0.088	-0.160	-0.240
		p-value	0.896	0.932	0.875	0.906	0.930	0.873	0.813
Final political agreement on the banking package	16/04/19	Average	0.211	0.519	0.067	<b>0.451**</b>	0.33	0.161	0.169
		T-test	-0.186	-0.252	-0.079	-2.230	-0.241	-0.141	-0.591
		p-value	0.853	0.802	0.937	0.032	0.810	0.888	0.561
		Cumulated average	0.17	0.412	0.056	0.355	0.151	0.178	-0.027
		T-test	0.105	0.141	0.046	0.917	0.077	0.110	-0.062
		p-value	0.916	0.888	0.963	0.369	0.939	0.913	0.951
Publication of legislative text on the banking package	07/06/19	Average	-0.903	-1.456	-0.651	-0.805	-1.234	-0.752	-0.481
		T-test	0.833	0.730	0.796	1.050	0.896	0.701	0.508
		p-value	0.407	0.468	0.429	0.306	0.373	0.485	0.618
		Cumulated average	-1.628	-2.219	-1.36	-0.859	-2.665	-1.157	-1.508
		T-test	-1.055	-0.781	-1.167	-0.941	-1.360	-0.757	-1.193
		p-value	0.295	0.437	0.247	0.355	0.178	0.451	0.251
Applications of TLAC requirements	27/06/19	Average	-0.48	-0.81	-0.326	-0.484	-1.029	-0.247	-0.782
		T-test	0.444	0.408	0.419	1.067	0.692	0.242	1.289
		p-value	0.658	0.684	0.677	0.298	0.491	0.809	0.219
		Cumulated average	-0.72	-1.309	-0.445	-0.864	-1.608	-0.344	-1.265
		T-test	-0.468	-0.463	-0.401	-0.894	-0.759	-0.237	-1.184
		p-value	0.641	0.645	0.689	0.383	0.450	0.814	0.255

**Table 35:** Abnormal bank stock returns – European Commission Banking Package

Event	Date		Full sample	G-SIB	Non-G-SIB	G-SIB vs Non-G-SIB	GIIPS	Non GIIPS	GIIPS vs Non-GIIPS
EC proposes banking reform package	23/11/16	Average	-0.841%	-0.916%	-0.822%	-0.094%	-0.996%	-0.771%	-0.225%
		T-test	0.938	0.784	0.932	0.369	0.730	0.880	0.546
		p-value	0.351	0.436	0.354	0.713	0.467	0.382	0.588
		Cumulated average	-1.238%	-1.335%	-1.214%	-0.122%	-1.817%	-0.979%	-0.839%
		T-test	-0.971	-0.804	-0.968	-0.304	-0.937	-0.785	-1.067
		p-value	0.335	0.424	0.336	0.762	0.352	0.435	0.295
The Council of the European Union reaches a general	25/05/18	Average	-1.146%	-1.091%	<b>-1.161%*</b>	0.07%	<b>-3.36%***</b>	-0.226%	<b>-3.13%***</b>
		T-test	1.644	1.257	1.715	-0.157	3.215	0.342	7.245
		p-value	0.105	0.213	0.091	0.876	0.002	0.733	0.000

Event	Date		Full sample	G-SIB	Non-G-SIB	G-SIB vs Non-G-SIB	GIIPS	Non GIIPS	GIIPS vs Non-GIIPS
approach on the banking package		Cumulated average	<b>-2.20%**</b>	<b>-2.17%*</b>	<b>-2.21%**</b>	0.034%	<b>-5.80%***</b>	-0.708%	<b>-5.09%***</b>
		T-test	-2.219	-1.762	-2.293	0.045	-3.898	-0.751	-7.286
		p-value	0.030	0.082	0.025	0.965	0.000	0.455	0.000
The EP votes the amended text on the banking package	19/06/18	Average	0.302%	0.602%	0.221%	0.381%	0.707%	0.134%	0.573%
		T-test	-0.414	-0.657	-0.310	-1.164	-0.548	-0.227	-1.371
		p-value	0.680	0.514	0.757	0.249	0.586	0.821	0.176
		Cumulated average	0.755%	1.164%	0.644%	0.52%	1.761%	0.338%	<b>1.423%**</b>
		T-test	0.727	0.893	0.636	1.249	0.959	0.400	2.628
		p-value	0.470	0.375	0.527	0.219	0.341	0.690	0.013
Final political agreement on the banking package	16/04/19	Average	0.172%	0.855%	-0.016%	<b>0.87%**</b>	0.201%	0.161%	0.041%
		T-test	-0.188	-0.669	0.019	-2.326	-0.130	-0.217	-0.080
		p-value	0.851	0.505	0.985	0.023	0.897	0.828	0.937
		Cumulated average	0.591%	1.629%	0.305%	1.323%**	0.952%	0.449%	0.503%
		T-test	0.454	0.895	0.252	2.331	0.431	0.426	0.621
		p-value	0.651	0.374	0.801	0.024	0.668	0.672	0.539
Publication of legislative text on the banking package	7/6/19	Average	-0.177%	-0.445%	-0.101%	-0.343%	-0.67%	0.01%	<b>-0.679%*</b>
		T-test	0.240	0.446	0.143	1.265	0.493	-0.017	1.918
		p-value	0.811	0.657	0.887	0.212	0.624	0.987	0.064
		Cumulated average	0.517%	0.241%	0.594%	-0.353%	1.71%	0.066%	<b>1.643%***</b>
		T-test	0.490	0.168	0.586	-0.829	0.878	0.081	3.583
		p-value	0.625	0.867	0.560	0.413	0.383	0.936	0.001
Applications of TLAC requirements	27/06/19	Average	0.548%	0.489%	0.565%	-0.077%	0.634%	0.516%	0.119%
		T-test	-0.820	-0.502	-0.890	0.306	-0.556	-0.923	-0.363
		p-value	0.415	0.617	0.377	0.761	0.580	0.359	0.720
		Cumulated average	0.775%	0.777%	0.775%	0.002%	1.212%	0.611%	0.601%
		T-test	0.813	0.560	0.855	0.006	0.744	0.766	1.581
		p-value	0.419	0.577	0.396	0.995	0.459	0.446	0.124

**Table 36:** Abnormal bank CDS spreads - Junior vs Senior CDS spreads - European Commission Banking Package

Event	Date		Full sample	G-SIB	Non-G-SIB	G-SIB vs Non-G-SIB	GIIPS	Non GIIPS	GIIPS vs Non-GIIPS
EC proposes banking reform package	23/11/16	Average	<b>8.422***</b>	-0.294	<b>11.96***</b>	-12.258	<b>28.992***</b>	0.065	28.927
		T-test	-3.345	0.209	-3.474	1.010	-3.958	-0.034	-0.968
		p-value	0.001	0.835	0.001	0.320	0.000	0.973	0.352

Event	Date		Full sample	G-SIB	Non-G-SIB	G-SIB vs Non-G-SIB	GIIPS	Non GIIPS	GIIPS vs Non-GIIPS
		Cumulated average	2.536	-0.817	3.898	-4.715	8.914	-0.055	8.969
		T-test	0.708	-0.407	0.795	-1.196	0.855	-0.020	0.943
		p-value	0.481	0.685	0.429	0.240	0.395	0.984	0.364
The Council of the European Union reaches a general approach on the banking package	25/05/18	Average	<b>2.156**</b>	<b>2.449**</b>	<b>2.029**</b>	0.42	<b>5.177**</b>	0.835	<b>4.342**</b>
		T-test	-2.423	-2.109	-2.070	-0.266	-2.171	-1.582	-2.175
		p-value	0.018	0.038	0.042	0.792	0.033	0.118	0.046
		Cumulated average	0.176	2.392	-0.794	3.185	-2.709	<b>1.437*</b>	-4.146
		T-test	0.139	1.447	-0.569	0.971	-0.798	1.913	-0.588
		p-value	0.890	0.152	0.571	0.337	0.427	0.059	0.566
The EP votes the amended text on the banking package	19/06/18	Average	-0.213	-1.1	0.176	-1.276	-0.526	-0.076	-0.451
		T-test	0.159	0.634	-0.128	1.576	0.144	0.115	0.300
		p-value	0.874	0.528	0.899	0.122	0.886	0.909	0.768
		Cumulated average	0.916	-1.692	2.057	-3.749	4.001	-0.434	4.435
		T-test	0.482	-0.685	1.052	-1.446	0.769	-0.465	0.781
		p-value	0.632	0.495	0.296	0.157	0.445	0.643	0.448
Final political agreement on the banking package	16/04/19	Average	-0.088	0.746	-0.438	<b>1.184**</b>	-1.001	0.295	-1.296
		T-test	0.022	-0.459	0.080	-2.074	0.077	-0.405	1.023
		p-value	0.982	0.647	0.936	0.045	0.939	0.686	0.326
		Cumulated average	-0.299	0.694	-0.716	<b>1.411**</b>	-1.243	0.096	-1.34
		T-test	-0.054	0.300	-0.093	2.176	-0.067	0.093	-1.029
		p-value	0.957	0.765	0.927	0.035	0.947	0.926	0.323
Publication of legislative text on the banking package	07/06/19	Average	-0.892	-2.118	-0.394	-1.724	-1.476	-0.629	-0.847
		T-test	0.375	1.042	0.123	1.674	0.205	0.579	0.797
		p-value	0.708	0.301	0.902	0.114	0.838	0.565	0.437
		Cumulated average	-1.109	-2.356	-0.603	-1.753	-1.546	-0.912	-0.634
		T-test	-0.328	-0.814	-0.132	-1.357	-0.151	-0.590	-0.423
		p-value	0.744	0.418	0.895	0.191	0.881	0.557	0.678
Applications of TLAC requirements	27/06/19	Average	-0.129	-1.582	0.48	-2.061	1.787	-0.933	2.72
		T-test	0.044	0.781	-0.120	1.013	-0.190	0.851	-1.004
		p-value	0.965	0.437	0.905	0.322	0.850	0.397	0.333
		Cumulated average	-0.727	-2.975	0.215	-3.19	1.066	-1.479	2.544
		T-test	-0.173	-1.032	0.038	-1.014	0.079	-0.948	0.715
		p-value	0.863	0.305	0.970	0.324	0.937	0.346	0.486

We now analyse three events related to Italian banks, with two different regulatory approaches. The first two events are related to Monte dei Paschi di Siena (MPS) bank. On July 2016, the European Banking Authority (EBA) published the results of the stress test at the European level. MPS failed the exercise, and needed a set of measures to meet the solvency criteria under the stress test scenario, which includes the sale of all bad loans and an increase of the coverage of the loans unlikely to pay. The estimated cost, around €8.8 billion, has been granted by the Italian Government under the “precautionary recapitalization” measures provided under the BRRD. The recapitalization has been approved by the EC on 4 July, 2017, date that we use as a second event for the study. Both events related to MPS display no significant reaction across markets in the sample of banks (Italian banks are excluded from the sample),<sup>6</sup> with very few exceptions. Thus, no abnormal consistent reaction of the banking sector has been triggered by the precautionary recapitalization of MPS:

Between the two MPS events, two banks located in the North of Italy, Banca Popolare di Vicenza S.p.A. and Veneto Banca S.p.A. have been declared by the ECB on 23 June 2017 “failing or likely to fail”. At this stage, the SRB stepped in and, after careful analysis, decides that the resolution action for these banks are not warranted in the public interest. Thus, the two banks went under national proceeding by the Italian authorities. The evidence for both Senior CDS and Equity show no significant reaction to the Event and one day after (see Table 37 and Table 38). However, for the Junior Vs Senior CDS difference (Table 39), there is a significant deviation for the day of the event, with an average negative sign, significant for the entire sample, for both GSIB and non-G-SIB, but not for the GIIPS banks. A negative difference implies that the Junior CDS went down more than the Senior, implying a reduction in the cost of buying a CDS on the Junior liabilities. One potential explanation of this effect might be due to the new 2014 MM restructuring clause, which covers also the bail-in event. In fact, with the previous regime, junior debt is likely to be the first to be called-in in case of a bail-in, and this will be reflected in an increase of the risk premium for the CDS. In this case, both senior and junior CDS have the same level of protection, and the market now recognizes a lower risk premium for the junior tranche.

**Table 37:** Abnormal bank CDS spreads – Italian Banks

Event	Date		Full sample	G-SIB	Non-G-SIB	G-SIB vs Non-G-SIB	GIIPS	Non GIIPS	GIIPS vs Non-GIIPS
MPS precautionary recapitalization	29/12/16	Average	-0.298	0.283	-0.588	0.871	0.805	-0.518	1.324
		T-test	0.249	-0.146	0.584	-0.979	-0.248	0.527	-1.633
		p-value	0.804	0.884	0.561	0.335	0.805	0.600	0.112
		Cumulated average	-1.068	-0.809	-1.198	0.389	-0.475	-1.187	0.712
		T-test	-0.629	-0.293	-0.836	0.424	-0.103	-0.848	0.473
		p-value	0.531	0.770	0.406	0.674	0.918	0.399	0.648
EC announced the approval of the precautionary recapitalization of MPS	04/07/17	Average	0.63	0.385	0.752	-0.367	-0.106	0.803	-0.909
		T-test	-0.407	-0.206	-0.436	0.709	0.021	-0.677	1.204
		p-value	0.685	0.837	0.664	0.484	0.984	0.501	0.252
		Cumulated average	0.625	0.618	0.628	-0.011	1.12	0.508	0.612
		T-test	0.283	0.232	0.256	-0.012	0.152	0.301	0.878
		p-value	0.778	0.817	0.799	0.991	0.879	0.764	0.394
SRB decision not to take resolution actions for Banca Popolare di	23/06/17	Average	-0.504	-1.286	-0.112	-1.174	-0.949	-0.399	-0.55
		T-test	0.334	0.700	0.069	1.188	0.199	0.346	0.429
		p-value	0.739	0.486	0.945	0.243	0.843	0.730	0.674

<sup>6</sup> The regressions implemented for each selected event have been run by removing the banks belonging to the country where the event took place. The main reason is to exclude potential biased data from the sample, as banks in that country might have abnormal reactions.



Event	Date		Full sample	G-SIB	Non-G-SIB	G-SIB vs Non-G-SIB	GIIPS	Non GIIPS	GIIPS vs Non-GIIPS
Vicenza and Veneto Banca		Cumulated average	-0.317	-3.364	1.206	-4.57	10.102	<b>-2.769*</b>	12.871
		T-test	-0.148	-1.286	0.520	-1.135	1.485	-1.688	1.005
		p-value	0.883	0.202	0.605	0.264	0.142	0.096	0.348

**Table 38:** Abnormal bank stock returns – Italian Banks

Event	Date		Full sample	G-SIB	Non-G-SIB	G-SIB vs Non-G-SIB	GIIPS	Non GIIPS	GIIPS vs Non-GIIPS
MPS precautionary recapitalization	29/12/16	Average	0.237%	-0.321%	0.389%	<b>-0.71%***</b>	0.586%	0.15%	0.436%
		T-test	-0.325	0.271	-0.595	3.267	-0.394	-0.243	-1.191
		p-value	0.746	0.787	0.554	0.003	0.695	0.809	0.252
		Cumulated average	0.968%	0.861%	0.998%	-0.137%	2.414%	0.607%	<b>1.807%***</b>
		T-test	0.926	0.508	1.063	-0.426	1.134	0.685	3.699
		p-value	0.357	0.613	0.291	0.673	0.261	0.496	0.002
EC announced the approval of the precautionary recapitalisation of MPS	04/07/17	Average	-0.079%	-0.136%	-0.062%	-0.073%	-0.276%	-0.027%	-0.249%
		T-test	0.115	0.126	0.100	0.261	0.221	0.042	0.637
		p-value	0.908	0.900	0.921	0.796	0.825	0.966	0.532
		Cumulated average	0.011%	-0.361%	0.116%	-0.477%	0.023%	0.008%	0.016%
		T-test	0.011	-0.235	0.130	-1.325	0.013	0.008	0.034
		p-value	0.991	0.815	0.897	0.193	0.990	0.993	0.973
SRB decision not to take resolution actions for Banca Popolare di Vicenza and Veneto Banca	23/06/17	Average	-0.249%	-0.403%	-0.117%	-0.354%	1.392%	-0.607%	2%
		T-test	0.363	0.377	0.172	0.739	-1.033	0.870	-1.685
		p-value	0.718	0.707	0.864	0.462	0.305	0.387	0.113
		Cumulated average	0.022%	0.275%	0.063%	-0.756%	1.693%	-0.57%	2.263%
		T-test	0.023	0.181	0.068	-1.328	0.925	-0.602	1.547
		p-value	0.982	0.857	0.946	0.189	0.358	0.549	0.143

**Table 39:** Abnormal bank CDS spreads – Junior vs Senior CDS spreads – Italian Banks

Event	Date		Full sample	G-SIB	Non-G-SIB	G-SIB vs Non-G-SIB	GIIPS	Non GIIPS	GIIPS vs Non-GIIPS
MPS precautionary recapitalization	29/12/16	Average	-1.244	-0.468	-1.589	1.12	0.095	<b>-1.537*</b>	1.631
		T-test	1.385	0.293	1.473	-0.517	-0.036	1.732	-0.883
		p-value	0.170	0.770	0.145	0.610	0.971	0.087	0.383
		Cumulated average	-0.78	-1.034	-0.666	-0.368	-0.557	-0.828	0.272
		T-test	-0.610	-0.454	-0.434	-0.621	-0.150	-0.656	0.328
		p-value	0.544	0.651	0.666	0.539	0.881	0.514	0.750

Event	Date		Full sample	G-SIB	Non-G-SIB	G-SIB vs Non-G-SIB	GIIPS	Non GIIPS	GIIPS vs Non-GIIPS
EC announced the approval of the precautionary recapitalisation of MPS	04/07/17	Average	1.242	0.626	1.527	-0.9	1.011	1.295	-0.283
		T-test	-0.918	-0.366	-0.920	0.584	-0.196	-1.138	0.156
		p-value	0.362	0.716	0.360	0.564	0.845	0.259	0.877
		Cumulated average	1.3	1.346	1.279	0.067	1.482	1.259	0.223
		T-test	0.674	0.552	0.541	0.048	0.202	0.777	0.106
		p-value	0.502	0.583	0.590	0.962	0.841	0.439	0.918
SRB decision not to take resolution actions for Banca Popolare di Vicenza and Veneto Banca	23/06/17	Average	<b>-5.642***</b>	<b>-7.25***</b>	<b>-4.899***</b>	-2.351	-7.331	<b>-5.26***</b>	-2.071
		T-test	4.363	4.625	2.912	0.613	1.617	4.396	0.326
		p-value	0.000	0.000	0.005	0.549	0.110	0.000	0.754
		Cumulated average	0.916	-1.692	2.057	-3.749	4.001	-0.434	4.435
		T-test	0.482	-0.685	1.052	-1.446	0.769	-0.465	0.781
		p-value	0.632	0.495	0.296	0.157	0.445	0.643	0.448

The last event in our sample covers a very recent German event, dated 5 December 2019. This event involves a state-owned bank, Norddeutsche Landesbank – Girozentrale (NordLB), that requires additional capital. The European Commission declared the direct investment by the Government free of any State aid, since it has been granted at market conditions (i.e., with remuneration in line with the market). As we can see from Table 40 to Table 42, the markets do not react abnormally to this event. Markets overall do not react abnormally to this event. The strength of the country might have played a role, since no significant spillover effects occur across the banks in the sample.

**Table 40:** Abnormal bank CDS spreads – Nord LB

Event	Date		Full sample	G-SIB	Non-G-SIB	G-SIB vs Non-G-SIB	GIIPS	Non GIIPS	GIIPS vs Non-GIIPS
EC approves NordLB State aid	05/12/19	Average	0.039	0.224	-0.09	0.314	0.263	-0.067	0.33
		T-test	-0.046	-0.177	0.127	-0.919	-0.215	0.086	-0.678
		p-value	0.963	0.860	0.900	0.369	0.831	0.932	0.513
		Cumulated average	0.179	0.194	0.168	0.027	0.709	-0.075	0.784
		T-test	0.146	0.108	0.166	0.076	0.407	-0.067	1.699
		p-value	0.884	0.914	0.868	0.940	0.685	0.947	0.119

**Table 41:** Abnormal bank stock returns – Nord LB

Event	Date		Full sample	G-SIB	Non-G-SIB	G-SIB vs Non-G-SIB	GIIPS	Non GIIPS	GIIPS vs Non-GIIPS
EC approves NordLB State aid	05/12/19	Average	-0.057%	-0.05%	-0.059%	0.01%	-1.073%	0.366%	<b>1.438%***</b>
		T-test	0.073	0.047	0.080	-0.031	0.901	-0.524	4.041
		p-value	0.942	0.963	0.936	0.976	0.370	0.602	0.000

Event	Date	Full sample	G-SIB	Non-G-SIB	G-SIB vs Non-G-SIB	GIIPS	Non GIIPS	GIIPS vs Non-GIIPS
	Cumulated average	-0.523%	-0.281%	-0.591%	0.31%	-2.061%	0.118%	2.179%***
	T-test	-0.463	-0.186	-0.554	0.761	-1.205	0.118	-3.348
	p-value	0.645	0.853	0.581	0.449	0.232	0.907	0.003

**Table 42:** Abnormal bank CDS spreads – Junior vs Senior CDS spreads - Nord LB

Event	Date	Full sample	G-SIB	Non-G-SIB	G-SIB vs Non-G-SIB	GIIPS	Non GIIPS	GIIPS vs Non-GIIPS	
	Average	0.272	-0.153	0.504	-0.657	0.665	0.058	0.607	
	T-test	-0.251	0.142	-0.313	1.261	-0.233	-0.145	-0.801	
	p-value	0.802	0.887	0.755	0.218	0.817	0.885	0.439	
EC approves NordLB State aid	05/12/19	Cumulated average	0.268	-0.417	0.641	-1.058	0.846	-0.047	0.893
	T-test	0.174	-0.272	0.279	-1.421	0.208	-0.083	0.707	
	p-value	0.862	0.786	0.781	0.165	0.836	0.934	0.494	

## 4 Conclusion

The JRC was requested by DG FISMA to support the work of the Evaluation Working Group established by the FSB by replicating the analysis developed by Schäfer et al (2017). This paper analysed the reactions of CDS and stock markets to selected bail-in events occurred in Europe during the period 2011-2014. Using the methodology applied in this paper, the JRC replicated the results of the paper and also extended it assessing the markets' reactions to more recent events.

The first step was to reconstruct the database on European senior and junior CDS spreads and on stocks used by Schäfer et al (2017). The comparison of selected statistics allowed concluding that, although for some banks the differences were rather substantial, the final dataset built by the JRC was similar to the one by Schäfer et al (2017).

As a second step, the JRC implemented the event study methodology applied in the paper and replicated both the baseline analyses on senior CDS spreads and stock markets and the analysis on the difference between junior and senior CDS spreads.

JRC results on the senior CDS spreads and stock markets confirmed those by Schäfer et al (2017), as the majority of events classified as significant by the JRC were also identified as significant by the paper. Also the sign and magnitude of the coefficients, although not identical, were similar. When focusing on the differences between junior and senior CDS, results were slightly less aligned. Replicating the two cross-sectional regressions led to mixed results, mainly because the relationship between the dependent variable and the main explanatory variables appeared to be quite volatile.

The present report also analyze the markets' reactions to more recent events not analysed in the paper by Schafer et al. (2017), namely the resolution of the Spanish bank Banco Popular in 2017, the introduction of the new Banking Package by the European Commission spanning the period 2016-2019, the precautionary recapitalization of MPS, the no-action of SRB for the Italian Banca Popolare di Vicenza S.p.A. and Veneto Banca S.p.A, and finally the direct investment by the German Government in NordLB.

This report provides evidence that, taken as a whole, events and announcements no longer seem to trigger abnormal reactions in bank funding markets after the bank prudential and resolution reforms have been implemented as of 2016, with the notable exception of the banking package Council agreement of May 2018 (which further tightens the applicable prudential and resolution rules). This event triggers a sharp negative reaction for the CDS market, where prices for protection increase, and a negative response of the equity market, where stock prices decrease. As in Schäfer et al (2017), the results suggest that the expectations of a bail-out are reduced since the introduction of the new restructuring regime of bail-in.

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## Annexes

### Annex 1. Dataset Comparison

**Table 43:** Dataset comparison – Senior CDS spreads

BANK	COUNTRY	JRC REDUCED SAMPLE					DIFFERENCES (IN BP) WRT SCHÄFER ET AL (2017) DATASET			
		OBS	MEAN	STD	MIN	MAX	MEAN	STD	MIN	MAX
BAWAG PSK Bank fuer Arbeit und Wirtschaft und Oesterreichische	Austria	639	-0.122	4.109	-26.85	26.93	-0.021	-0.036	-	-
Erste Group Bank AG	Austria	639	-0.089	3.181	-20.976	19.48	-0.017	-0.022	-	-
Raiffeisen Bank International AG	Austria	521	-0.143	2.993	-19.59	19.15	-0.009	-0.792	5.87	-8.71
KBC Bank NV	Belgium	639	-0.109	4.406	-24.83	54.63	-0.009	-0.026	-	-
DEXIA	Belgium	639	-0.112	10.582	-59.675	86.04	-0.109	2.226	12.743	27.27
Danske Bank A/S	Denmark	639	-0.105	3.76	-37.71	29.83	0.002	0.007	-	-
Societe Generale SA	France	639	-0.122	5.798	-31.84	30.76	-0.044	-0.053	-	-
BANQUE FEDERATIVE DE CREDIT MUTUEL	France	639	0.035	3.217	-7.6	57	0.203	-2.07	37.09	12.18
BNP Paribas SA	France	639	-0.061	4.624	-20.76	26.09	-0.03	-0.074	-	-
Credit Agricole SA	France	639	-0.089	6.07	-28.96	34.49	-0.043	-0.026	-	-
Credit Lyonnais SA	France	639	-0.084	6.69	-31.41	39.84	-0.04	0.095	0.99	6.35
Natixis SA	France	639	-0.058	3.362	-19.2	24.235	-	-	-	-
Bayerische Landesbank	Germany	639	0.074	3.576	-22.48	32.63	0.047	-0.095	18.28	3.38
Commerzbank AG	Germany	639	0.008	6.132	-41.2	63.21	-0.019	-0.615	-0.01	-37.31
Deutsche Bank AG	Germany	639	-0.047	3.755	-17.15	17.6	-0.02	-0.034	-	-
HSH NORDBANK	Germany	639	0.023	4.909	-25.9	86.595	0.016	0.077	13.43	47.225
IKB Deutsche Industriebank AG	Germany	639	-0.227	4.419	-21.88	21.01	-0.022	-0.053	-	-1.77
Landesbank Baden Wuerttemberg	Germany	639	-0.005	3.395	-19.69	34.68	-	-0.08	-	-5.04
Landesbank Hessen Thueringen Girozentrale	Germany	639	-0.078	4.52	-33.4	35.65	-	-	-	-
Portigon AG	Germany	639	0.195	5.455	-39.39	59.81	-	-	-	-
UniCredit Bank AG	Germany	639	-0.186	2.989	-17.48	14.62	0.048	0.043	4.82	-
NATIONAL BANK OF GREECE	Greece	639	-2.159	67.899	-112.33	552.53	0.001	-0.055	0.439	-5.36
Alpha Bank SA	Greece	639	-1.383	37.908	-283.45	484.226	-1.409	29.662	-799.875	177.805
Bank of Ireland	Ireland	639	0.05	18.788	-100.89	172.48	2.135	-1.14	193.2	201.176
Banca Italease SpA	Italy	639	-0.029	8.216	-67.532	76.48	0.061	-0.489	1.37	-39.97
Intesa Sanpaolo SpA	Italy	639	-0.062	8.471	-36.83	35.87	0.007	-0.105	-0.042	-7.41
Mediobanca Banca di Credito Finanziario SpA	Italy	639	-0.042	6.887	-41.27	75.76	-0.095	-1.031	-2.93	-4.968
UniCredit SpA	Italy	639	-0.028	8.892	-40.22	42.71	-0.003	-0.053	-	-
Unione di Banche Italiane SpA	Italy	639	-0.162	7.147	-67.89	53.444	-0.071	-0.101	-	-
Banca Monte dei Paschi di Siena SpA	Italy	639	0.256	13.967	-55.751	98.707	0.001	-0.005	-	-
BANCO POPOLARE	Italy	639	0.054	11.915	-47.225	49.785	-0.047	-0.139	-	-
Banca Nazionale del Lavoro SpA	Italy	639	-0.045	5.88	-29	43.14	-	-	-	-
ING Bank NV	Netherlands	639	-0.111	3.78	-19.26	20.13	-0.198	-10.799	87.742	-68.35
SNS BANK	Netherlands	639	-0.41	10.43	-182.725	41.3	-0.032	-0.156	-	-
Coöperatieve Rabobank UA	Netherlands	639	-0.084	2.405	-12.04	12.702	-0.021	-0.086	-	2.84
DNB Bank ASA	Norway	639	-0.019	2.419	-10.5	20.5	-0.568	3.43	-83.025	-48.56
Banco Comercial Portugues SA	Portugal	639	-0.453	15.221	-125.88	77.34	-0.004	-0.014	-	-

BANK	COUNTRY	JRC REDUCED SAMPLE					DIFFERENCES (IN BP) WRT SCHÄFER ET AL (2017) DATASET			
		OBS	MEAN	STD	MIN	MAX	MEAN	STD	MIN	MAX
Banco Espírito Santo SA em Liquidacao	Portugal	639	0.101	21.117	-311.77	260.97	0.024	0.691	4.11	6.09
Banco de Sabadell SA	Spain	639	0.117	9.449	-73.105	66.62	0.116	-0.171	-	-
Banco Popular Espanol SA	Spain	639	0.101	9.341	-56.237	67.14	-0.027	7.389	-235.6	176.96
Banco Santander SA	Spain	639	-0.132	7.56	-32.94	31.87	-0.077	-0.203	-	-
Bankinter SA	Spain	639	0.223	9.409	-54.24	68.45	-0.137	-0.356	2.769	-1.79
Banco Bilbao Vizcaya Argentaria SA	Spain	639	-0.168	7.77	-36.89	34.64	-0.114	-1.725	18.36	-7.018
Fundacion Bancaria Caixa d Estalvis i Pensions de Barcelona	Spain	639	0.549	9.969	-31	155	-0.051	-0.202	-	-
Fundacion Caja Mediterraneo	Spain	556	-0.697	14.687	-126.408	92.35	-0.091	-0.206	-	-7.52
Svenska Handelsbanken AB	Sweden	639	-0.059	1.385	-6.66	9.16	0.318	2.232	17.9	97.18
Skandinaviska Enskilda Banken AB	Sweden	639	-0.103	1.694	-9.88	12.81	-0.478	-0.033	-	-
NORDEA	Sweden	639	-0.079	2.922	-19.795	13.765	0.041	-0.344	3.22	-3.65
Swedbank AB	Sweden	639	-0.096	2.258	-14.32	15.93	0.108	-1.324	7.12	-5.31
UBS AG	Switzerland	639	-0.16	3.044	-11.96	15.65	-0.031	-41.078	-12.415	1.635
Credit Suisse Group AG	Switzerland	639	-0.095	3.044	-12.59	14.16	-0.015	-0.036	-	-
Royal Bank of Scotland Group PLC	UK	639	-0.053	5.823	-35.79	23.29	-0.011	-0.054	-	-
Barclays Bank PLC	UK	639	-0.027	4.222	-27.09	18.95	-0.015	-0.034	-	-
HSBC Bank PLC	UK	639	-0.08	3.031	-12.12	17.02	-0.047	-0.13	-	-6.33
Lloyds Bank PLC	UK	639	-0.136	5.178	-33.55	22.25	-0.021	-0.07	-	-
Santander UK PLC	UK	639	-0.179	4.123	-29.21	34.07	-0.017	-0.034	-	-
Standard Chartered Bank	UK	639	-0.041	3.747	-20.57	24.36	-0.025	-0.123	-	-1.26

Note: Norddeutsche Landesbank Girozentrale and Banco Bpm SpA are not reported in the Table because they do not have available quotes for the period 2011-2014.



**Table 44:** Dataset comparison - stock returns

BANK	COUNTRY	JRC REDUCED SAMPLE					DIFFERENCES (IN PP) WRT SCHÄFER ET AL (2017) DATASET			
		OBS	MEAN	STD	MIN	MAX	MEAN	STD	MIN	MAX
Erste Group Bank AG	Austria	639	0.000	0.022	-0.164	0.067	-	-	-	-
Raiffeisen Bank International AG	Austria	639	0.000	0.023	-0.096	0.098	0.1	-	-	0.1
Dexia SA	Belgium	639	0.005	0.131	-0.333	0.500	0.1	0.1	-	-
KBC Groep NV	Belgium	639	0.001	0.026	-0.093	0.107	-	-	-	-
Central Cooperative Bank AD	Bulgaria	639	0.002	0.029	-0.241	0.269	0.1	0.2	-13	11.2
First Investment Bank AD	Bulgaria	639	0.002	0.027	-0.111	0.157	-	-0.2	13	-11.2
Zagrebacka Banka dd	Croatia	639	0.000	0.016	-0.070	0.077	-	-0.2	-0.2	-0.3
Komerčni Banka as	Czech Republic	639	0.000	0.015	-0.058	0.074	-	-	-	-
Danske Bank A/S	Denmark	639	0.001	0.016	-0.094	0.067	-	-	-	-
Jyske Bank A/S	Denmark	639	0.001	0.015	-0.045	0.105	-	-	-	-
Ringkjøbing Landbobank A/S	Denmark	639	0.001	0.009	-0.028	0.036	-	0.1	-	-
Sydbank A/S	Denmark	639	0.001	0.013	-0.046	0.056	-	-	-	-
Aktia Bank Abp	Finland	639	0.001	0.012	-0.064	0.071	-	-	-	-
Pohjola Pankki Ord Shs	Finland	639	0.001	0.018	-0.059	0.181	-	-	-	-
BNP Paribas SA	France	639	0.000	0.020	-0.057	0.097	-	-	-	-
CIC Ord Shs	France	639	0.001	0.010	-0.074	0.059	0.1	0.1	-	1.2
Credit Agricole SA	France	639	0.001	0.024	-0.080	0.087	-	-	-	-
Natixis SA	France	639	0.001	0.023	-0.122	0.225	-	-	-	-
Societe Generale SA	France	639	0.001	0.023	-0.072	0.103	-	-	-	-
Commerzbank AG	Germany	639	-0.001	0.024	-0.097	0.119	-	-	-0.5	0.9
Deutsche Bank AG	Germany	639	-0.001	0.018	-0.067	0.087	-	-	0.4	-
IKB Deutsche Industriebank Ord Shs	Germany	639	0.002	0.049	-0.156	0.421	-	0.3	-2.8	8.5
Quirin Privatbank AG	Germany	639	0.000	0.021	-0.104	0.115	-	-0.2	-2.4	-0.6
Umweltbank AG	Germany	639	0.000	0.004	-0.026	0.048	-0.1	-1.8	21.3	-16.9
Aareal Bank AG	Germany	639	0.002	0.022	-0.069	0.093	-	-	-0.4	-0.7
Alpha Bank SA	Greece	639	0.001	0.053	-0.192	0.297	-	-0.1	0.8	0.3
Piraeus Bank SA	Greece	639	-0.001	0.059	-0.295	0.285	0.1	0.1	-	-0.2
Eurobank Ergasias SA	Greece	639	-0.003	0.076	-0.300	0.297	-	0.2	0.2	0.3
National Bank of Greece SA	Greece	639	-0.003	0.058	-0.497	0.273	-0.1	0.4	-22.9	0.1
OTP Bank Nyrt	Hungary	639	0.000	0.018	-0.061	0.067	-	-	-	-
AIB Group plc	Ireland	639	0.001	0.044	-0.242	0.318	0.1	-0.3	-	0.9
Bank of Ireland	Ireland	639	0.000	0.036	-0.229	0.163	-	-	-0.1	-0.1
Banca Carige SpA Cassa di Risparmio di Genova	Italy	639	-0.002	0.028	-0.173	0.129	-	0.1	-	-
Banca Monte dei Paschi di Siena SpA	Italy	639	0.000	0.039	-0.201	0.213	-	-	-	-
Banco Bpm SpA	Italy	639	0.000	0.031	-0.104	0.111	-0.1	-	-	-
Banca Popolare di Sondrio ScpA	Italy	639	-0.001	0.022	-0.072	0.095	-	-	-	-
Bper Banca SpA	Italy	639	0.000	0.030	-0.107	0.134	-	-	-	-
Credito Emiliano SpA	Italy	639	0.001	0.023	-0.103	0.084	-	-	-	-
Banca Piccolo Credito Valtellinese SpA	Italy	639	-0.001	0.027	-0.103	0.168	-	0.1	-	-
Intesa Sanpaolo SpA	Italy	639	0.001	0.025	-0.096	0.126	-	-	-	-

BANK	COUNTRY	JRC REDUCED SAMPLE					DIFFERENCES (IN PP) WRT SCHÄFER ET AL (2017) DATASET			
		OBS	MEAN	STD	MIN	MAX	MEAN	STD	MIN	MAX
Mediobanca Banca di Credito Finanziario SpA	Italy	639	0.000	0.024	-0.094	0.089	-	-	-	-
Unione di Banche Italiane SpA	Italy	639	0.001	0.027	-0.092	0.088	-	-	-	-
UniCredit SpA	Italy	639	0.000	0.026	-0.088	0.143	-	-	-	-
Liechtensteinische Landesbank AG	Liechtenstein	639	0.000	0.018	-0.073	0.070	-	-	-	-
VP Bank AG	Liechtenstein	639	0.000	0.013	-0.052	0.049	-	0.1	-	-
Dnb ASA	Norway	639	0.001	0.016	-0.107	0.073	-	-	-	-
Sparebank 1 SR Bank ASA	Norway	639	0.001	0.013	-0.053	0.059	-	-	-	-
ING Groep NV	Netherlands	639	0.001	0.021	-0.074	0.093	0.1	-	-	-1.5
Van Lanschot Kempen NV	Netherlands	639	0.000	0.018	-0.090	0.125	-	-	-	-
Bank Handlowy w Warszawie SA	Poland	639	0.000	0.020	-0.084	0.067	-	0.1	-0.5	-3
Bank Polska Kasa Opieki SA	Poland	639	0.000	0.016	-0.071	0.068	-	-	-	-
mBank SA	Poland	639	0.001	0.018	-0.056	0.097	-	-	-	-
Alior Bank SA	Poland	639	0.000	0.019	-0.079	0.097	-	-0.1	0.5	3
ING Bank Śląski SA	Poland	639	0.000	0.017	-0.096	0.072	-	-	-	-
Powszechna Kasa Oszczedności Bank Polski SA	Poland	639	0.000	0.014	-0.054	0.048	-	-	-	-
Banco BPI Ord Shs	Portugal	639	0.001	0.024	-0.084	0.134	-	-	-	-
Banco Comercial Portugues SA	Portugal	639	0.001	0.031	-0.129	0.269	-	-	0.1	-
Banco Espirito Santo Class N Ord Shs	Portugal	639	-0.003	0.042	-0.421	0.197	-	-	-	-
Patria Bank SA (BUCURESTI)	Romania	639	0.001	0.021	-0.147	0.149	-	-	-	-
Banca Transilvania SA	Romania	639	0.001	0.015	-0.068	0.064	-	-	-	-
Banco de Sabadell SA	Spain	639	0.000	0.023	-0.075	0.139	-	0.1	-	-
Banco Popular Espanol Ord Shs	Spain	639	-0.001	0.027	-0.123	0.147	-	-	-	-
Banco Santander SA	Spain	639	0.000	0.020	-0.073	0.107	-	-	-	-
Bankinter SA	Spain	639	0.001	0.026	-0.072	0.139	-	-	-	-
Banco Bilbao Vizcaya Argentaria SA	Spain	639	0.000	0.021	-0.078	0.107	-	-	-	-
Caixabank SA	Spain	639	0.001	0.022	-0.100	0.169	-	-	-	-
Nordea Bank Abp	Sweden	639	0.001	0.014	-0.058	0.056	-	0.1	-	-
Skandinaviska Enskilda Banken AB	Sweden	639	0.001	0.014	-0.051	0.082	-	-	-	-
Svenska Handelsbanken AB	Sweden	639	0.000	0.013	-0.077	0.043	-	0.1	-	-
Swedbank AB	Sweden	639	0.001	0.015	-0.079	0.105	-	-	-	-
Banque Cantonale Vaudoise	Switzerland	639	0.000	0.011	-0.070	0.074	-	-	-	-
Vontobel Holding AG	Switzerland	639	0.000	0.015	-0.055	0.103	-	-	-	-
Credit Suisse Group AG	Switzerland	639	0.000	0.017	-0.105	0.054	-	-	-	-
Julius Baer Gruppe AG	Switzerland	639	0.000	0.015	-0.074	0.083	-	-	-	-
Luzerner Kantonalbank AG	Switzerland	639	0.000	0.008	-0.031	0.042	-	0.1	-	-
St Galler Kantonalbank AG	Switzerland	639	0.000	0.004	-0.032	0.022	-	-0.7	1.8	-2.9
UBS Group AG	Switzerland	639	0.000	0.016	-0.077	0.073	-	-	-	-
Valiant Holding AG	Switzerland	639	-0.001	0.015	-0.104	0.060	-	-	-	-
Zuger Kantonalbank	Switzerland	639	0.000	0.008	-0.031	0.054	-	-	-	-
Barclays PLC	UK	639	0.000	0.021	-0.155	0.087	-	-	-	-
HSBC Holdings PLC	UK	639	0.000	0.011	-0.035	0.047	-	-	-	-

BANK	COUNTRY	JRC REDUCED SAMPLE					DIFFERENCES (IN PP) WRT SCHÄFER ET AL (2017) DATASET			
		OBS	MEAN	STD	MIN	MAX	MEAN	STD	MIN	MAX
Lloyds Banking Group PLC	UK	639	0.001	0.019	-0.061	0.083	-	-	-	-0.1
Royal Bank of Scotland Group PLC	UK	639	0.000	0.023	-0.115	0.108	-	-	-	-
Standard Chartered PLC	UK	639	0.000	0.017	-0.164	0.071	-	-	-	-

**Table 45:** Dataset comparison - Junior CDS spreads

BANK	COUNTRY	JRC REDUCED SAMPLE					DIFFERENCES (IN BP) WRT SCHÄFER ET AL (2017) DATASET			
		OBS	MEAN	STD	MIN	MAX	MEAN	STD	MIN	MAX
Banca Monte dei Paschi di Siena	Italy	639	-0.052	15.842	-80.158	96.58	-0.006	-0.078	-	-
Banca Nazionale del Lavoro	Italy	639	-0.066	9.022	-63.83	77.05	0.029	0.011	-	-
Banco Bilbao Vizcaya Argentaria	Spain	639	-0.033	7.789	-50.57	47.96	-0.01	-0.003	-	-
Banco Comercial Portugues	Portugal	639	0.328	25.553	-313.72	411.9	0.078	-5.763	153.79	-244.71
Banco Espirito Santo	Portugal	639	0.467	25.876	-359.29	239.59	0.005	-0.001	-	-
Banco Popolare	Italy	639	0.155	12.417	-63.048	110.26	-0.008	0.005	-	-
Banco Popolare di Milano	Italy	639	-0.166	14.754	-78.91	116.05	-0.004	0.001	-	-
Banco Popular Espanol	Spain	639	0.39	23.175	-246.433	205.544	0.052	-0.037	-	-
Banco Sabadell	Spain	639	0.362	20.175	-263.157	178.62	0.058	-0.031	-	-
Banco Santander	Spain	639	0.007	7.669	-32.45	63.42	-0.01	0.001	-	-
Bank of Ireland	Ireland	639	-0.477	43.709	-400.68	277.45	-0.038	-0.011	-	-
Barclays	United Kingdom	639	-0.086	5.133	-41.95	29.76	0.01	0.001	-	-
Bawag	Austria	639	0.096	11.838	-180.989	180.79	-0.012	-0.004	-	-
Bayerische Landesbank	Germany	639	-0.13	7.365	-62.172	54.27	0.019	0.017	-	-
Bnp Paribas	France	639	0.017	5.448	-53.38	30.69	0.003	0.003	-	-
Commerzbank	Germany	639	-0.211	8.944	-60.49	51.35	-0.006	-0.002	-	-
Credit Agricole	France	639	-0.041	7.574	-48.89	53.69	0.009	0.001	-	-
Credit Lyonnais	France	639	-0.057	5.855	-30.5	33.8	0.026	-	-	-
Credit Suisse	Switzerland	639	-0.065	3.019	-18.59	17.06	-	-	-	-
Danske Bank	Denmark	639	-0.009	4.534	-41.65	31.52	-0.016	-0.387	9.49	14.288
Deutsche Bank	Germany	639	-0.094	4.339	-23.79	18.76	0.007	0.005	-	-
Erste Group Bank	Austria	639	-0.117	3.872	-30.626	32.604	0.006	-0.003	-	-
Hsbc	United Kingdom	639	0.004	2.5	-13.85	15.14	0.005	0.001	-	-
Ing Bank	Netherlands	639	0.022	3.061	-12.086	24.12	-0.018	-0.065	-	-
Intesa Sanpaolo	Italy	639	-0.1	8.192	-37.2	52.83	0.084	0.091	-4.845	3.37
Kbc	Belgium	639	-0.101	9.555	-54.63	155.42	0.006	-0.002	-	-
Lloyds	United Kingdom	639	-0.13	6.994	-63.92	38.45	0.023	-0.011	-	-
Nordea	Sweden	639	-0.044	1.624	-14.518	10.111	-0.005	0.002	-	-
Raiffeisen Zentralbank	Austria	639	-0.032	7.517	-78.92	82.89	0.002	-	-	-
Skandinavia Enskilde Banken	Sweden	639	-0.106	2.911	-23.54	22.473	0.002	-0.001	-	-
Societe Generale	France	639	-0.117	5.449	-29.558	30.72	0.007	0.01	-	-
Standard Chartered	United Kingdom	639	0.011	3.579	-14.281	40.46	-	-	-	-
Svenska Handelsbanken	Sweden	639	-0.035	1.68	-12.97	11.28	-	-	-	-

BANK	COUNTRY	JRC REDUCED SAMPLE					DIFFERENCES (IN BP) WRT SCHÄFER ET AL (2017) DATASET			
		OBS	MEAN	STD	MIN	MAX	MEAN	STD	MIN	MAX
Swedbank	Sweden	639	-0.085	1.972	-14	14.13	0.003	-0.003	-	-
The Co-Operative Bank	United Kingdom	639	-0.021	21.664	-235.344	438.676	-	-	-	-
Ubi Banca	Italy	639	-0.035	7.481	-101.45	48.52	-	-	-	-
Ubs	Switzerland	639	-0.024	2.989	-16.82	12.32	0.001	-	-	-
Unicredit	Italy	639	-0.021	6.456	-28.441	37.03	0.01	0.005	-0.001	-
Unicredit Bank (HYB)	Germany	639	-0.063	5.132	-62.94	33.98	-	-	-	-

## Annex 2. Additional Results for the Replication Exercise

The results reported in this Section replicate the event studies presented in Section 3.1 and are run using the entire set of banks, without removing those belonging to the country where the given event took place.

**Table 46:** Abnormal bank CDS spreads differences- creditor bail-in Denmark – full dataset

Event	Date		Full sample	G-SIB	Non-G-SIB	G-SIB vs Non-G-SIB	GIIPS	Non GIIPS	GIIPS vs Non-GIIPS
Amagerbanken: bail-in of senior debt	06/02/11	Average	-1.187	2.606	-2.744	<b>5.35**</b>	-6.066	1.388	-7.454
		T-test	-0.061	-0.420	-0.267	-4.031	-0.509	-0.192	-1.512
		p-value	0.805	0.517	0.605	0.045	0.475	0.661	0.219
		Cumulated average	-4.777	-0.651	-6.469	5.818	-12.151	-0.885	-11.266
		T-test	0.485	0.013	0.733	2.353	1.009	0.038	1.706
		p-value	0.486	0.909	0.392	0.125	0.315	0.844	0.192

**Table 47:** Abnormal bank stock returns - creditor bail-in Denmark – full dataset

Event	Date		Full sample	G-SIB	Non-G-SIB	G-SIB vs Non-G-SIB	GIIPS	Non GIIPS	GIIPS vs Non-GIIPS
Amagerbanken: bail-in of senior debt	06/02/11	Average	0.741%	1.111%	0.654%	0.457%	0.056%	1.049%	-0.992%
		T-test	-0.513	-0.586	-0.460	-0.383	-0.001	-2.009	-0.507
		p-value	0.476	0.447	0.500	0.538	0.976	0.161	0.479
		Cumulated average	0.778%	1.271%	0.662%	0.609%	-0.009%	1.131%	-1.14%
		T-test	0.274	0.372	0.229	0.330	0.000	1.134	0.324
		p-value	0.602	0.544	0.634	0.567	0.997	0.290	0.571

**Table 48:** Abnormal bank CDS spreads differences - creditor bail-in Spain – full dataset

Event	Date		Full sample	G-SIB	Non-G-SIB	G-SIB vs Non-G-SIB	GIIPS	Non GIIPS	GIIPS vs Non-GIIPS
Spanish bank rescue plan implies bail-in	10/07/12	Average	-0.548	-3.326	0.563	-3.889	0.186	-0.956	1.142
		T-test	-0.006	-0.294	-0.005	-0.541	0.000	-0.053	-0.010
		p-value	0.938	0.588	0.943	0.462	0.989	0.819	0.921
		Cumulated average	-0.765	-2.676	0	-2.676	0.991	-1.74	2.731
		T-test	0.006	0.094	0.000	0.126	0.003	0.086	0.028
		p-value	0.939	0.759	1.000	0.722	0.960	0.769	0.867
		German government backs rescue plan	19/07/12	Average	-1.907	-0.326	-2.539	2.213	-3.511
T-test	-0.076			-0.003	-0.105	-0.171	-0.064	-0.065	-0.046
p-value	0.783			0.957	0.745	0.679	0.800	0.799	0.830

Event	Date		Full sample	G-SIB	Non-G-SIB	G-SIB vs Non-G-SIB	GIIPS	Non GIIPS	GIIPS vs Non-GIIPS
		Cumulated average	2.543	4.225	1.871	2.354	2.057	2.814	-0.757
		T-test	0.066	0.245	0.028	0.096	0.011	0.245	0.002
		p-value	0.797	0.621	0.867	0.757	0.917	0.621	0.963
		Average	3.359	4.721	2.827	1.894	3.898	3.067	0.831
		T-test	-0.238	-0.564	-0.135	-0.116	-0.074	-0.667	-0.005
		p-value	0.626	0.453	0.713	0.733	0.786	0.414	0.946
Spain pushes national bank resolution plan	02/08/12	Cumulated average	3.84	13.548	0.052	<b>13.496*</b>	-4.398	8.293	-12.691
		T-test	0.153	2.292	0.000	2.911	0.046	2.407	0.532
		p-value	0.695	0.130	0.996	0.088	0.830	0.121	0.466

**Table 49:** Abnormal bank stock returns - creditor bail-in Spain – full dataset

Event	Date		Full sample	G-SIB	Non-G-SIB	G-SIB vs Non-G-SIB	GIIPS	Non GIIPS	GIIPS vs Non-GIIPS
		Average	0.566%	0.729%	0.527%	0.201%	-0.516%	1.05%	-1.567%
		T-test	-0.181	-0.148	-0.184	-0.045	-0.045	-1.135	-0.722
		p-value	0.672	0.702	0.669	0.832	0.832	0.290	0.398
Spanish bank rescue plan implies bail-in	10/07/12	Cumulated average	0.655%	1.718%	0.404%	1.314%	-0.211%	1.042%	-1.253%
		T-test	0.120	0.406	0.053	0.946	0.004	0.552	0.228
		p-value	0.730	0.526	0.818	0.334	0.952	0.460	0.634
		Average	-0.013%	-0.148%	0.019%	-0.167%	0.213%	-0.114%	0.327%
		T-test	0.000	-0.006	0.000	-0.030	-0.008	-0.013	-0.032
		p-value	0.992	0.939	0.988	0.863	0.930	0.909	0.859
German government backs rescue plan	19/07/12	Cumulated average	-1.869%	-3.165%	-1.564%	-1.602%	-3.542%	-1.118%	-2.424%
		T-test	0.980	1.353	0.811	1.372	1.065	0.639	0.874
		p-value	0.325	0.248	0.371	0.245	0.305	0.426	0.353
		Average	0.506%	0.677%	0.465%	0.212%	0.256%	0.618%	-0.362%
		T-test	-0.125	-0.106	-0.127	-0.044	-0.010	-0.326	-0.037
		p-value	0.725	0.746	0.723	0.835	0.920	0.570	0.848
Spain pushes national bank resolution plan	02/08/12	Cumulated average	-0.051%	-0.948%	0.16%	-1.108%	0.177%	-0.153%	0.33%
		T-test	0.001	0.105	0.008	0.609	0.002	0.010	0.016
		p-value	0.980	0.747	0.931	0.438	0.961	0.920	0.901

**Table 50:** Abnormal bank CDS spreads differences – creditor bail-in Netherlands – full dataset

Event	Date		Full sample	G-SIB	Non-G-SIB	G-SIB vs Non-G-SIB	GIIPS	Non GIIPS	GIIPS vs Non-GIIPS
Nationalization of the SNS Reaal	01/02/13	Average	3.151	2.787	3.293	-0.506	5.565	1.846	3.719
		T-test	-0.954	-0.840	-0.913	-0.070	-0.801	-1.004	-0.586
		p-value	0.329	0.360	0.339	0.791	0.371	0.317	0.444
		Cumulated average	<b>11.558**</b>	<b>9.176**</b>	<b>12.488**</b>	-3.312	<b>22.865***</b>	<b>5.447**</b>	<b>17.419**</b>
		T-test	6.339	4.493	6.483	1.488	6.674	4.312	6.352
		p-value	0.012	0.034	0.011	0.223	0.010	0.038	0.012

**Table 51:** Abnormal bank stock returns – creditor bail-in Netherlands – full dataset

Event	Date		Full sample	G-SIB	Non-G-SIB	G-SIB vs Non-G-SIB	GIIPS	Non GIIPS	GIIPS vs Non-GIIPS
Nationalization of the SNS Reaal	01/02/13	Average	0.28%	0.05%	0.334%	-0.284%	-0.295%	0.537%	-0.832%
		T-test	-0.106	-0.002	-0.157	-0.105	-0.031	-0.709	-0.370
		p-value	0.745	0.968	0.693	0.747	0.860	0.403	0.545
		Cumulated average	<b>-2.39%*</b>	<b>-3.79%**</b>	<b>-2.06%*</b>	-1.727%	<b>-3.95%*</b>	<b>-1.69%*</b>	-2.258%
		T-test	3.831	4.770	2.967	1.906	2.784	3.472	1.341
		p-value	0.054	0.032	0.089	0.172	0.099	0.066	0.250

**Table 52:** Abnormal bank CDS spreads differences – creditor bail-in Cyprus – full dataset

Event	Date		Full sample	G-SIB	Non-G-SIB	G-SIB vs Non-G-SIB	GIIPS	Non GIIPS	GIIPS vs Non-GIIPS
Eurozone Finance ministers: bail-in as option	11/02/13	Average	0.372	-0.158	0.579	-0.737	2.545	-0.802	3.347
		T-test	-0.021	-0.004	-0.045	-0.167	-0.261	-0.265	-0.694
		p-value	0.885	0.951	0.833	0.683	0.610	0.607	0.405
		Cumulated average	-1.167	-3.744	-0.161	-3.584	2.026	-2.893	4.918
		T-test	0.102	1.033	0.002	1.950	0.082	1.701	0.740
		p-value	0.750	0.310	0.967	0.163	0.775	0.192	0.390
Proposal in CY to tax bank deposits	18/03/13	Average	<b>6.234**</b>	<b>6.026**</b>	<b>6.315**</b>	-0.289	<b>11.009**</b>	<b>3.653**</b>	<b>7.356*</b>
		T-test	-5.695	-4.175	-5.742	-0.027	-5.288	-4.268	-3.796
		p-value	0.017	0.041	0.017	0.869	0.022	0.039	0.051
		Cumulated average	<b>11.60***</b>	<b>11.86***</b>	<b>11.51***</b>	0.36	<b>19.15***</b>	<b>7.52***</b>	<b>11.636**</b>
		T-test	9.739	7.985	9.402	0.021	7.903	8.931	4.687
		p-value	0.002	0.005	0.002	0.885	0.005	0.003	0.030

Event	Date		Full sample	G-SIB	Non-G-SIB	G-SIB vs Non-G-SIB	GIIPS	Non GIIPS	GIIPS vs Non-GIIPS
Bail-in of senior debt	25/03/13	Average	<b>6.877***</b>	<b>8.046***</b>	<b>6.42**</b>	1.626	<b>10.626**</b>	<b>4.85***</b>	5.776
		T-test	-6.736	-7.257	-5.782	-0.873	-4.878	-7.190	-2.356
		p-value	0.009	0.007	0.016	0.350	0.027	0.007	0.125
		Cumulated average	<b>17.78***</b>	<b>14.89***</b>	<b>18.91***</b>	-4.021	<b>36.39***</b>	<b>7.73***</b>	<b>28.66***</b>
		T-test	22.242	12.275	24.772	2.637	28.231	9.020	28.620
		p-value	0.000	0.000	0.000	0.105	0.000	0.003	0.000

**Table 53:** Abnormal bank stock returns – creditor bail-in Cyprus – full dataset

Event	Date		Full sample	G-SIB	Non-G-SIB	G-SIB vs Non-G-SIB	GIIPS	Non GIIPS	GIIPS vs Non-GIIPS
Eurozone Finance ministers: bail-in as option	11/02/13	Average	0.065%	0.188%	0.036%	0.151%	-0.178%	0.174%	-0.352%
		T-test	-0.005	-0.022	-0.002	-0.029	-0.011	-0.065	-0.068
		p-value	0.942	0.881	0.967	0.866	0.915	0.799	0.795
		Cumulated average	0.982%	2.345%	0.661%	1.684%	1.477%	0.76%	0.717%
		T-test	0.603	1.737	0.284	1.756	0.388	0.616	0.139
		p-value	0.440	0.192	0.595	0.189	0.535	0.435	0.710
Proposal in CY to tax bank deposits	18/03/13	Average	<b>-1.626%*</b>	<b>-2.324%*</b>	-1.462%	-0.862%	-1.777%	<b>-1.55%**</b>	-0.219%
		T-test	-3.000	-2.932	-2.726	-1.099	-1.133	-4.998	-0.032
		p-value	0.087	0.091	0.103	0.298	0.291	0.028	0.858
		Cumulated average	<b>-4.32%***</b>	<b>-5.38%***</b>	<b>-4.07%***</b>	-1.309%	<b>-7.06%***</b>	<b>-3.09%***</b>	<b>-3.97%**</b>
		T-test	10.475	7.772	10.455	1.254	8.853	9.724	5.264
		p-value	0.002	0.007	0.002	0.266	0.004	0.003	0.025
Bail-in of senior debt	25/03/13	Average	<b>-1.755%*</b>	<b>-3.19%**</b>	-1.416%	<b>-1.78%**</b>	-2.771%	<b>-1.299%*</b>	-1.472%
		T-test	-3.156	-5.210	-2.302	-4.767	-2.444	-3.222	-1.292
		p-value	0.080	0.025	0.134	0.032	0.122	0.077	0.259
		Cumulated average	<b>-2.89%**</b>	<b>-3.973%*</b>	<b>-2.642%*</b>	-1.331%	<b>-5.64%**</b>	-1.664%	<b>-3.97%**</b>
		T-test	4.201	3.938	3.919	1.304	4.956	2.584	4.618
		p-value	0.044	0.051	0.051	0.257	0.029	0.112	0.035



**Table 54:** Abnormal bank CDS spreads – creditor bail-in Portugal – full dataset

Event	Date		Full sample	G-SIB	Non-G-SIB	G-SIB vs Non-G-SIB	GIIPS	Non GIIPS	GIIPS vs Non-GIIPS
Creditor bail-in - Banco Espírito Santo	01/08/14	Anticipatory	<b>8.367***</b>	3.086	<b>10.428***</b>	<b>-7.342***</b>	<b>20.759***</b>	1.669	<b>19.089***</b>
		T-test	16.937	2.090	24.727	35.176	35.845	1.388	59.819
		p-value	0.000	0.152	0.000	0.000	0.000	0.242	0.000
	04/08/14	Average	-1.487	-1.452	-1.501	0.049	-3.054	-0.641	-2.413
		T-test	-0.535	-0.463	-0.512	-0.002	-0.776	-0.204	-0.956
		p-value	0.467	0.499	0.476	0.968	0.381	0.652	0.331
	04/08/14	Cumulated average	<b>-8.747***</b>	-4.737	<b>-10.31***</b>	<b>5.574***</b>	<b>-20.88***</b>	-2.187	<b>-18.69***</b>
		T-test	9.138	2.431	11.936	10.011	17.909	1.176	28.328
		p-value	0.003	0.123	0.001	0.002	0.000	0.282	0.000

**Table 55:** Abnormal bank stock returns– creditor bail-in Portugal – full dataset

Event	Date		Full sample	G-SIB	Non-G-SIB	G-SIB vs Non-G-SIB	GIIPS	Non GIIPS	GIIPS vs Non-GIIPS
Creditor bail-in - Banco Espírito Santo	01/08/14	Anticipatory	0.217%	0.672%	0.111%	0.561%	-0.31%	0.454%	-0.763%
		T-test	0.103	0.899	0.024	1.046	0.047	1.082	0.415
		p-value	0.750	0.346	0.877	0.310	0.829	0.302	0.522
	04/08/14	Average	-0.028%	0.115%	-0.061%	0.176%	-0.049%	-0.018%	-0.031%
		T-test	-0.002	-0.028	-0.008	-0.108	-0.001	-0.002	-0.001
		p-value	0.967	0.869	0.930	0.743	0.972	0.966	0.979
	04/08/14	Cumulated average	-0.267%	0.178%	-0.372%	0.55%	-1.825%	0.431%	-2.256%
		T-test	0.080	0.033	0.141	0.522	0.850	0.508	1.881
		p-value	0.778	0.857	0.708	0.472	0.360	0.478	0.174

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