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Have public bailouts made banks' loan books safer?[1]

In response to the financial crisis, the authorities in a number of countries used public funds to recapitalise their banks. Did a reduction of risk in banks' lending follow these rescue operations? To help answer this question, we analyse the balance sheets and syndicated loan signings of 87 large internationally active banks. As loan signing volumes started diminishing across the board in 2009, our evidence shows that rescued banks did not reduce the risk of their new lending significantly more than non-rescued banks. Our results are relevant for the ongoing assessment of public bank rescue programmes.

JEL classification: G15, G21, G32, E51.

As the bankruptcy of Lehman Brothers dramatically shook financial markets and investor confidence in September 2008, authorities around the globe announced bank rescue packages. The aim of these measures was to ensure the solvency of systemically important financial institutions and to restore confidence in the financial system. Bank recapitalisations using public funds in the G10 countries totalled close to $500 billion during the period 2007–10 (Brei et al (2011)). The appropriateness and effects of these programmes are still under assessment.[2] In this special feature we examine whether the rescue operations were followed by a greater reduction of risk in new loans made by rescued banks compared to those that were not rescued. Have bank rescues helped make institutions with risky lending activities safer, as one might expect?

To address these questions, we focus on the market for syndicated loans, where a group of banks jointly extends credit to a single borrower. In particular, we examine the balance sheets and syndicated loan signings of 87 large internationally active banks from industrial economies, approximately half of which received public financial support during the crisis. With close to $7 trillion

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[2] See, for instance, Black and Hazelwood (2012) or Diamond and Rajan (2011).

of new facilities signed in 2007, syndicated lending has been one of the largest sources of corporate funding. Syndicated loans also form a significant component of banks' total portfolio of commercial and industrial loans.[3] Importantly, the available information on individual borrowers (like sector or nationality) and loan transaction terms (such as spreads, maturities or guarantees) makes the syndicated loan market a good laboratory for analysing bank risk.

We find no evidence that rescued banks reduced the riskiness of their new lending more than non-rescued banks in response to the crisis and the public rescues. Even as lending volumes decreased across the board in 2009, rescued banks continued to write riskier syndicated loans, as reflected by their involvement in the leveraged loan segment and in the spreads charged on the facilities that they originated. We also find, unsurprisingly, that the syndicated lending of banks that later received a bailout was riskier before the crisis than that of non-rescued institutions.

In the remainder of this article, we first outline the main questions, referring to some of the relevant literature. Thereafter we explain the data sample and methodology. In the analysis that follows we first look at whether the riskiness of banks' syndicated loan signings carries information content for the subsequent bailouts. We then move on to the key question of this research and explore whether and to what extent rescued banks cut the riskiness of their new loans in response to the crisis and the bailouts. The final section concludes.

Public support, incentives and risk: the main questions

Between early 2007 and early 2009, the banking sectors of a number of major industrial countries moved from being highly profitable into deep crisis. Many banks lost up to two thirds of their stock market values. Authorities responded by conducting outsize rescue operations in the form of extended deposit insurance, guarantees of newly issued bank debt, capital injections, asset insurance and asset purchases.[4] In this article we focus on bailouts in the form of recapitalisations[5] using public funds and directed at individual banks by their home authorities.

Expected public support can distort banks' risk-taking incentives …

The expectation of state support may give rise to moral hazard and lead banks to engage in higher risk-taking. Distortions often accompany bank rescues (Diamond and Rajan (2009, 2011), Farhi and Tirole (2012)). However, some might argue that in times of crisis, the objective of recapitalisations and other forms of public support is at least partly to prevent banks from cutting

[3] The market is representative in the sense that during 2000–10, the syndicated loan exposure of the banks that we analyse represented up to 18% of their total loans outstanding. For an overall description of the structure and behaviour of the international syndicated loan market, see Gadanecz (2004). For an analysis of its collapse during the crisis, see Chui et al (2010).

[4] King (2009) gives an overview of announced packages, with further detail and analysis provided in Panetta et al (2009), Petrovic and Tutsch (2009), Borio et al (2010), Brei et al (2011) and Brei and Gadanecz (2012).

[5] Involving preferred shares, warrants, mandatory convertible notes, core Tier 1 capital or debt swaps.

back on risk-taking too much, so as to avoid a major credit crunch. Thus, state intervention in times of stress needs to strike a balance between, on the one hand, limiting the adverse impact on the real economy and, on the other, containing moral hazard (Borio et al (2010)).[6] Bearing this in mind, public recapitalisations, once they have occurred, can help make banks safer. When banks receive a bailout, the public sector's involvement in the banking sector increases, and so should its power to curb the riskiness of banking activities. Actual recapitalisations may also strengthen banks' monitoring incentives and reduce moral hazard by putting at risk more equity, from a broader array of sources (Holmstrom and Tirole (1997), Hellmann et al (2000), Mehran and Thakor (2011)). Lastly, policy interventions tend to be associated with higher regulatory supervision (Berger et al (2012)).

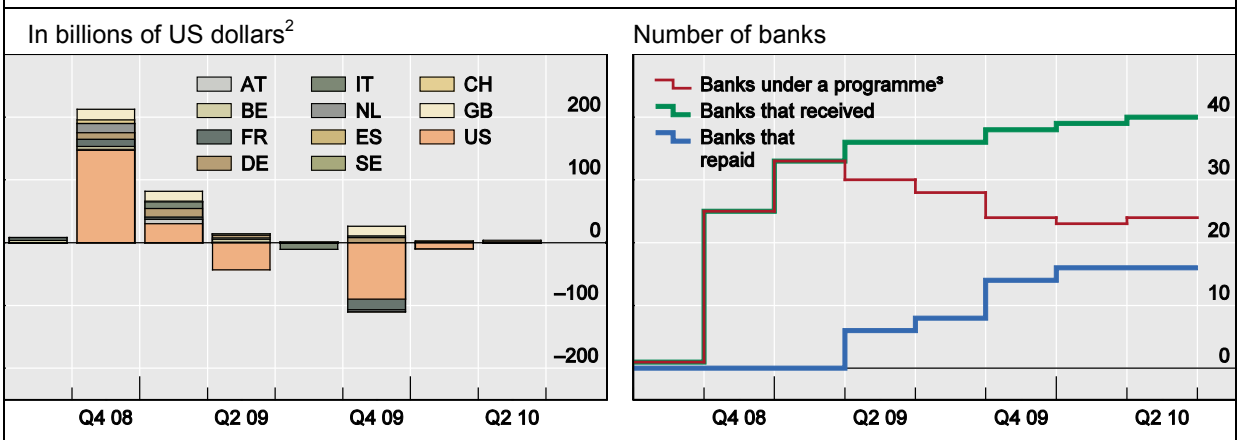
… but actual rescues can make them safer

Public rescue operations and sample characteristics

Large public rescues occurred in 2008 and 2009

We analyse if the public rescue measures granted to banks in 14 major economies (the G10 countries plus Austria, Australia and Spain) were associated with a decrease in the riskiness of the new syndicated loan signings by these banks. We use as a control sample a set of large systemically important institutions that did not receive public support (see box for a description of the data set). After controlling for mergers, acquisitions and missing data, our final sample comprises 87 bank holding companies. These institutions cover $54 trillion of bank assets, which correspond to 52% of worldwide banking assets reported in *The Banker* at end-2010. Of these banks, 40 institutions (corresponding to 56% of the sample's total assets) became subject to a public recapitalisation programme between Q3 2008 and Q2 2010.

Public recapitalisations[1]



AT = Austria; BE = Belgium; CH = Switzerland; DE = Germany; ES = Spain; FR = France; GB = United Kingdom; IT = Italy; NL = Netherlands; SE = Sweden; US = United States.

[1] Data up to July 2010. [2] At constant 2010 exchange rates. Negative numbers: (net) repayments. [3] Number of institutions under a recapitalisation programme (number of institutions which received public funds minus those that repaid).

Sources: Central banks; Bloomberg; authors' calculations. Graph 1

[6] Penalising shareholders and managers, as well as imposing strict conditions and restrictions in exchange for support, are mechanisms that can help achieve the second objective.

The data set

Information on bank rescue measures, comprising 14 jurisdictions (the G10 countries plus Austria, Australia and Spain) was collected from publicly available sources[①] between October 2008 and September 2010. We augmented the set of rescued banks with a control sample of large systemically important banks which did not receive a public rescue. We combined this information with two data sets. First, we took annual consolidated bank financial statements from Bankscope and adjusted them for mergers and large acquisitions.[②] Second, we extracted individual syndicated loan transactions from Dealogic Loan Analytics. That database provides information on syndicated loan facilities, such as loan size, terms, leverage and type, as well as on a number of borrower characteristics including nationality, sector and credit rating. Information is also available on the identity of the banks that participated in the syndications (allowing the merging with the Bankscope data), as well as the amounts that they committed (making it possible to calculate individual "portfolios" of syndicated loan signings for each bank for each year). Roughly 84,000 loans were recorded in the database for the period 2000–10 for our sample of banks, each comprising on average eight individual participating banks.[③]

Matching of these information sets allows us to compute the average characteristics of the new loans written in a given year by a particular bank, for instance the average pricing of these exposures. Furthermore, the behaviour of banks with different characteristics (eg those which received a public recapitalisation versus those which did not) can be compared to detect different patterns in investment decisions.

[①] Eg news reports, official websites of national authorities, banks' media releases and investor relations materials. [②] Following Brei et al (2011), the decision to work with consolidated statements reflects the fact that these banks operate on a consolidated worldwide basis and, importantly, that the public recapitalisations occurred at the consolidated entity, rather than at the subsidiary, level. The statements are annual, because most banks did not report consistently at a quarterly frequency over the sample period 2000–10. To avoid discontinuities in the financial statements caused by large acquisitions, we constructed pro forma banks by aggregating the reported positions of the acquiring and acquired banks prior to the takeover. [③] Where banks' exact participation shares were not available in Dealogic Loan Analytics, we assigned equal shares of any unallocated loan amounts, in line with the literature.

As shown in Graph 1, these recapitalisations totalled close to $350 billion between 2008 and 2010. Most of the funds were injected in Q4 2008 and Q1 2009, primarily in the United States (with the TARP), as well as in France, Germany, the Netherlands and the United Kingdom. Banks had repaid about 50% of the capital injections by September 2010 (mainly in France and the US).

Syndicated lending makes up a significant part of banking activities for all banks in our sample. Although there are national differences,[7] on average signings of such loans accounted for 18% of banks' total loans during 2000–10.

Banks that received a rescue differed in a number of ways from those that did not. Both before and during the crisis, rescued banks were larger as a group than non-rescued ones, as measured by their total assets (Table 1). The business models[8] also seem to differ. Before the crisis, rescued banks had a lower average loan-to-asset ratio than non-rescued banks (46% versus 49%,

[7] Relative to total loans outstanding, syndicated loan issues have been most significant for banks headquartered in the US (38% of their total loans), France (26%), Switzerland and Canada (24% in each case). Least involved have been Austrian, Belgian, Italian, Spanish and Swedish banks (below 10% of their total loans in each case).

[8] Altunbaş et al (2011) feature an empirical analysis of bank risk and business models, together with a literature review.

Rescued and non-rescued banks: overview[1]

	Rescued		Non-rescued	
Number of banks	**40**	**40**	**47**	**47**
Bank characteristics (year-end, USD trn)	**2007**	**2010**	**2007**	**2010**
Assets	31.29	30.38	21.82	24.01
Deposits	11.62	11.81	9.54	11.29
Loans	13.57	13.48	10.00	11.34
Syndicated loan signings	4.57	2.11	2.35	1.76
Net income	0.15	0.11	0.14	0.12
Balance sheet ratios (period averages, %)	**Pre-crisis[2]**	**Δ crisis**	**Pre-crisis**	**Δ crisis**
Total loans relative to total assets	45.6	–1.8	48.6	–1.3
Total deposits relative to total assets	39.6	–1.9	46.7	–1.8
Profitability (ROE)	12.4	–14.6***	9.8	–2.9***
Impaired loans over total lending	2.0	2.3***	2.8	–0.5*

[1] The sample period is 2000–10 and includes 87 banks and 927 observations. "Rescued" denotes banks which received a public recapitalisation during 2008–10, while "non-rescued" indicates banks which did not receive such support. [2] "Pre-crisis" = 2000–07. "Δ crisis" is the value during the crisis (2008–10) minus the pre-crisis value (2000–07). ***, ** and * indicate that the differences are significant at the 1%, 5% and 10% levels, respectively, based on a weighted t-test.

Sources: Bankscope; Dealogic; authors' calculations. Table 1

respectively). That could indicate that they may have been holding more securities or securitised more of their customer loans (Altunbaş et al (2009)). On the liability side, rescued banks relied to a greater extent on non-deposit funding (by 7% of assets pre-crisis), a possible source of vulnerability to a freeze of wholesale funding markets (Huang and Ratnovski (2011)). The crisis severely dented the profitability of both rescued and non-rescued banks. Not surprisingly, the financial crisis hit rescued banks most. Their profitability (gauged by ROE) plunged during the crisis (from 12% to –2%), while it fell less abruptly in the case of non-rescued banks (from 10% to 7%). Likewise, rescued banks' ratio of impaired to total loans jumped more sharply during the crisis (either because they were facing more impaired loans or because the rescues were associated with higher recognition of such loans).

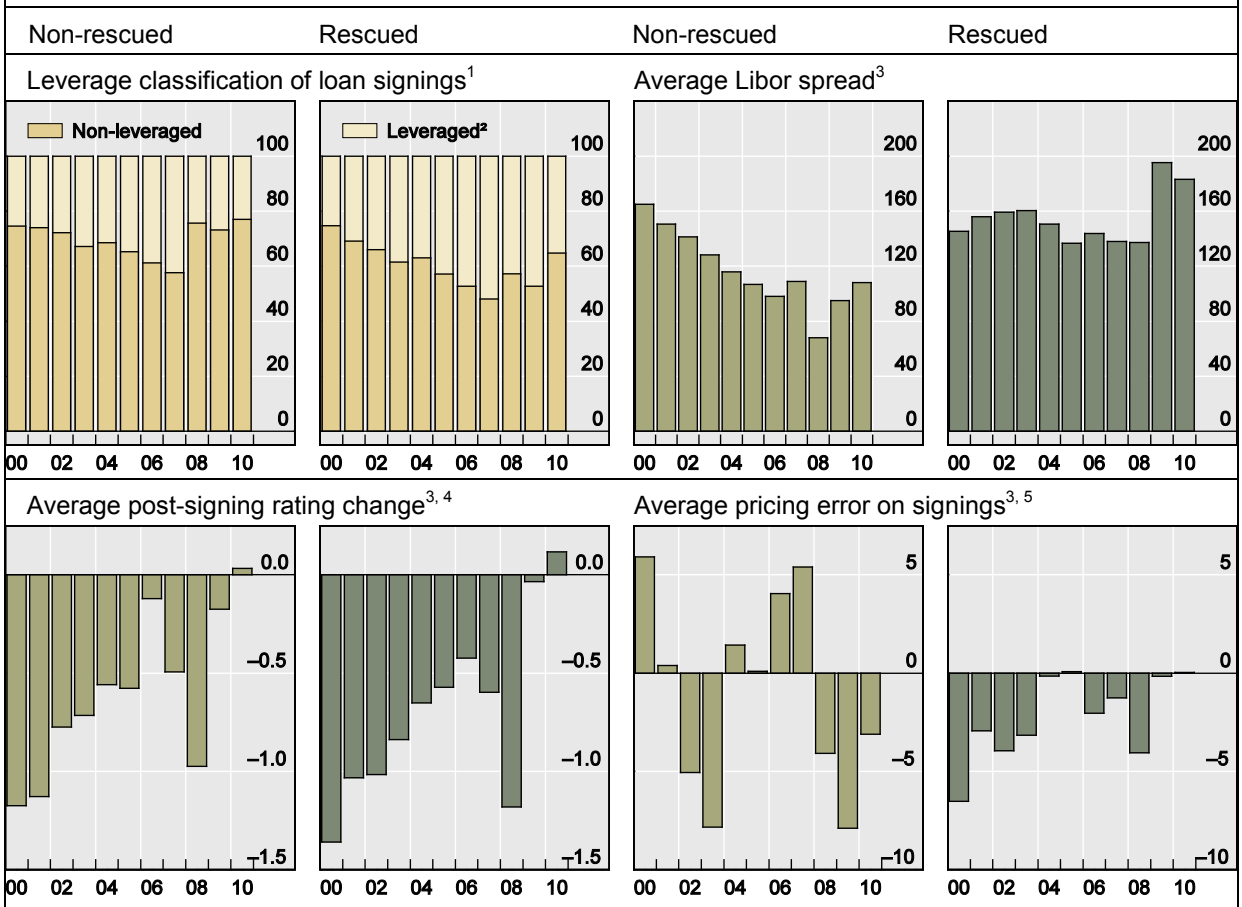
Have bailouts been associated with riskier loan signings before the crisis?

Rescued banks participated in riskier loans before the crisis

Several risk indicators consistently show higher risk in the flow of syndicated loans written before the crisis by banks that later received a rescue, relative to non-rescued banks. Of particular relevance are signings of leveraged loans[9] as a share of total syndicated lending, the Libor spreads on the loan

[9] We divide loans into two categories: leveraged and non-leveraged. We rely on the definition of Dealogic Loan Analytics for leveraged loans, which is based on borrower financial leverage, loan spreads, borrower ratings and loan purpose (especially leveraged buyouts). For the purposes of this special feature we also include in the leveraged category those facilities

Risk in the syndicated loan market by bank type



[1] As a percentage of participation amounts. [2] Sum of leveraged and highly leveraged up to and including 2008 (reported as two separate categories by Dealogic). [3] Weighted by loan participation amounts. [4] Difference (in notches) between the borrower's current rating and the rating at signing, with higher scores corresponding to better ratings. As such, a score of +2 should be read as an average post-signing upgrade of two notches for all signings. [5] Difference between the observed spread over Libor and the spread predicted by a linear regression incorporating observable loan features (size, maturity, guarantees, collateral, facility purpose and type), borrower characteristics (sector, rating, first-time borrower) and the state of the market (total volumes, level of interest rates).

Sources: Bankscope; Dealogic; authors' calculations. Graph 2

signings and the average rating changes of borrowers after the loans were signed (see Graph 2 and the "Pre-crisis" columns of Table 2).

Before the crisis, banks that later received a rescue wrote more leveraged loans as a share of their total syndicated lending (39%) than their non-rescued peers (33%). Moreover, average Libor spreads (weighted by participation amounts) on rescued banks' new loan signings were significantly higher compared to non-rescued banks' (149 versus 127 basis points). And the average maturity of rescued banks' loans was higher than that of non-rescued banks. In addition, borrowers who had been granted syndicated loans by rescued banks were subsequently downgraded to a greater extent than borrowers who had received loans from non-rescued institutions.

identified by Dealogic as "highly leveraged". Dealogic ceased to distinguish between highly leveraged and leveraged for loans signed after 2008, and since then have reported only leveraged versus non-leveraged status. Every loan is classified according to the definition which was valid when it was signed. It is not possible to reclassify earlier loans when the definition changes.

Syndicated lending of rescued versus non-rescued banks[1]							
	Rescued		Non-rescued		Rescued minus non-rescued		
	Pre-crisis	Δ crisis	Pre-crisis	Δ crisis	Pre-crisis	During crisis	Δ crisis
Syndicated loan signings relative to total assets (%)	12.1	–4.9***	8.1	–1.6***	4.0***	0.7	–3.3***
Share of leveraged loans in new signings (%)	38.5	3.3**	32.5	–7.7***	6.0***	17.0***	11.0*
Average Libor spread on new signings (bp)	148.8	23.1***	126.7	–36.4***	22.1***	81.6***	59.5***
Average rating change[2] (notches)	–0.8	0.4***	–0.7	0.3***	–0.1**	0.0	0.1
Average maturity of new signings (years)	4.5	1.2***	4.3	–0.2	0.2**	1.6**	1.4
Average pricing error[3] on new signings (bp)	–2.5	1.1	0.5	–5.6**	–3.0**	3.6	6.7

[1] See Table 1, footnotes 1 and 2. Averages are weighted either by total assets or syndicated loan participations. "During crisis" = 2008–10. [2] See Graph 2, footnote 4. [3] See Graph 2, footnote 5.

Sources: Bankscope; Dealogic; authors' calculations. Table 2

These results suggest that rescued banks may have had a more relaxed attitude towards risk before the crisis. As such, engaging in riskier loans is not necessarily undesirable if the corresponding price (Libor spread) is appropriate, or if the bank manages them well (better than other banks).

Their loans have been underpriced

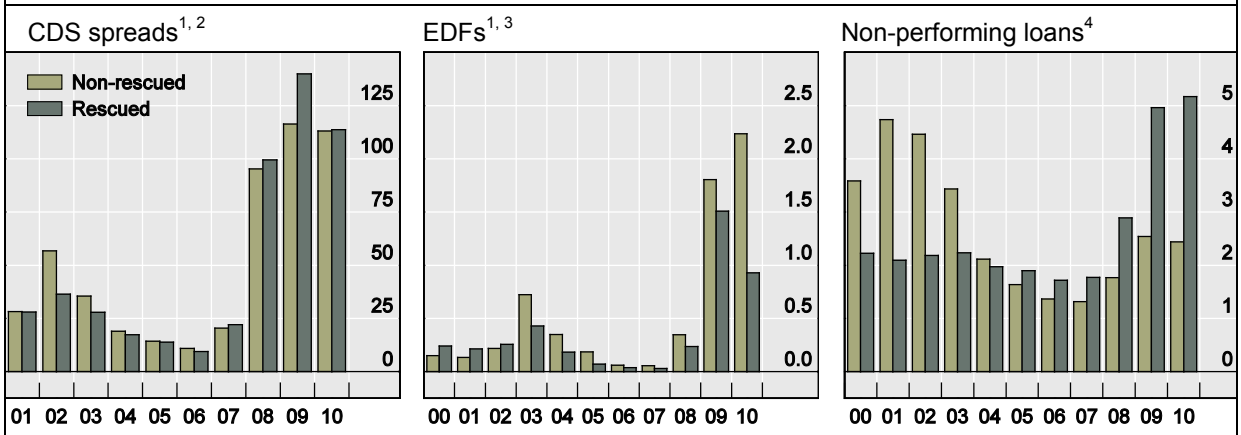
To interpret the findings further, we look at the "pricing error" on the loan signings relative to a benchmark. Following Carey and Nini (2007) and Gadanecz et al (2008), we calculate these errors by taking the difference between the observed syndicated loan spread over Libor, and the spread predicted by a regression incorporating observable loan features (size, maturity, guarantees, collateral, facility purpose and type), borrower characteristics (sector, rating, first-time borrower) and the state of the market (total volumes, level of interest rates). We calculate the resulting score for every year on every bank's signings (weighted by participation amounts). Negative (positive) pricing errors suggest that banks "underprice" ("overprice") risk according to this model.

It is interesting to note that before the crisis, rescued institutions had been participating in facilities that were systematically more underpriced (in the sense of being below a benchmark predicted by observable risk factors) than those of non-rescued banks. We surmise that they may not have been properly compensated for the higher risk they took on, adding to their vulnerability when the crisis hit.

Differences in risk were not apparent in market-based measures

Market and accounting measures did not pick up the difference in riskiness. Indeed, CDS spreads and EDF measures did not appear higher for rescued banks than for non-rescued banks before the crisis (Graph 3). Given that both rescued and non-rescued banks in our sample are systemically important, it is hard to conclude that any differences in these market and accounting measures are due to differential expectations of bailouts, consistent with broader evidence that such indicators tend to act more like

Alternative measures of bank riskiness



[1] Weighted by total assets. [2] On five-year CDS contracts, in basis points. [3] Averages of expected probabilities, weighted by bank size, that a bank will default within one year, in per cent. [4] As a percentage of total loans outstanding.

Sources: Bankscope; Markit; Moody's; authors' calculations. Graph 3

contemporaneous than leading indicators of financial distress (Borio and Drehmann (2009)). And non-performing loan ratios were higher before the crisis for non-rescued banks, which may have been more diligent in recognising them than their rescued peers, although this is also influenced by accounting standards.

All in all, signs of higher risk before the crisis in rescued banks' syndicated loan signings suggest that such risk measures carry information about the subsequent incidence of public rescues.[10] Having established this, in the next section we use the risk measures derived from the syndicated loan market to test whether rescued banks reduced the risk of their new loans relatively more than their non-rescued peers in response to the crisis.

Did rescued banks cut the riskiness of their loan signings more than non-rescued banks in response to the crisis?

In this section we compare changes in the riskiness of loan signings of rescued and non-rescued banks in response to the crisis. We calculate the corresponding changes in the risk proxies discussed above with respect to new loan signings. We test the statistical significance of the difference between the crisis and pre-crisis values, comparing the crisis responses across rescued and non-rescued institutions.

Measured by loan leverage, spreads and maturities …

During the crisis, rescued banks did not reduce the riskiness of their new syndicated lending compared to their non-rescued peers. In fact, our results suggest that the relative riskiness of their lending increased. This is apparent when comparing how the two types of institutions changed their participation in leveraged facilities (relative to their total new signings), as well as the average Libor spread on those signings and the corresponding average maturities. As shown in the rightmost column of Table 2, for both loan leverage and spreads,

[10] In Brei and Gadanecz (2012), we corroborate this finding econometrically by means of a logit regression which explains the probability of receiving public financial support. That model confirms that leveraged lending is a significant determinant of public rescues.

the differences, calculated as rescued banks' minus non-rescued banks' crisis-related changes, are positive and statistically significant (11 percentage points and 60 basis points, respectively).

The riskiness of non-rescued banks' new syndicated lending diminished with the onset of the crisis. These institutions cut their participation in leveraged loans from 33% to 25% of their total new signings (change shown in the fourth column of Table 2, together with the crisis-related changes in their other loan risk proxies, all of them statistically significant with the exception of average maturities). Moreover, the average Libor spread on non-rescued banks' new signings fell by 36 basis points. These findings are consistent with the collapse of the leveraged loan market during the crisis (Chui et al (2010)) and also with a move towards less risky lending.

… rescued banks remained riskier

At the same time, rescued banks increased the riskiness of their new signings. They participated to a greater extent in leveraged loans (with the share of such loans in their total new signings rising from 39% to 42%; we report this and other statistically significant different changes in the second column of Table 2). They also increased the average spread on their new signings by 23 basis points (while raising the average maturity). In response to the crisis and particularly during 2009–10, they aligned their pricing to better reflect the observed risk factors, although the increase is not statistically significant. Again, these findings point to a possibly more relaxed attitude of rescued banks towards risk.[11]

During the crisis, spreads on rescued banks' domestic syndicated loan signings increased more strongly than those on their foreign exposures (Brei and Gadanecz (2012), Graphs 5a and 5b). That could be indicative of either higher risk, or higher margins exploiting a degree of imperfect competition or monopolistic power in home markets (Santos (2011)).

Concluding remarks

In this special feature, we examine whether large internationally active banks which received public rescue packages during 2008–10 reduced the riskiness of their syndicated lending during the crisis relatively more than non-rescued institutions. Our analysis shows that this is not the case. Specifically, rescued banks continued to add to the share of leveraged loans in their total signings. They also kept increasing the average maturity and Libor spreads of their new loans (which, however, remained underpriced with respect to a standard benchmark). Unsurprisingly, rescued banks were riskier than non-rescued ones along all these dimensions also prior to the crisis.

[11] The causal relation between risk and bailouts may be that rescued banks wrote riskier syndicated loans before the crisis than non-rescued ones, insofar as they were expecting to receive public financial support (the moral hazard argument). Conversely, riskier lending could have necessitated bailouts. The result that rescued banks did not reduce the riskiness of their syndicated loan signings in response to the crisis, at least not relatively more than non-rescued institutions, holds even when allowing for the possibility that bailouts are endogenously determined (see Brei and Gadanecz (2012) for a two-stage regression analysis of bank risk, using an instrumented public bailout variable).

A limitation of the analysis is the focus on only one facet of the banking business: the international syndicated loan market. At the utmost, syndicated loan issuance accounts for 18% of the total loans of the banks in our sample and, as such, cannot characterise their overall behaviour. Furthermore, all our risk proxies pertain to new lending (a flow measure), which has an influence on, but cannot totally characterise, banks' overall risk profile (a stock measure). However, we find that indicators extracted from syndicated lending do convey interesting risk information not contained in market-based proxies like CDS spreads or EDF measures, or balance sheet indicators such as non-performing loan ratios.

It is not surprising that rescued banks' (syndicated) lending was riskier than that of non-rescued banks prior to the public recapitalisations. Indeed, it is consistent with the literature on the effect (actual or expected) of state support on bank risk. Rescued banks' incentives to monitor risks might be distorted by the implicit bailout guarantee. It could also be that during the crisis rescued banks' inefficiency in providing loans at competitive spreads was compounded by the higher funding costs that they were facing themselves. In any case, the absence of a reduction in the riskiness of rescued banks' syndicated lending relative to non-rescued institutions warrants further cost-benefit analysis of the rescue operations.

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