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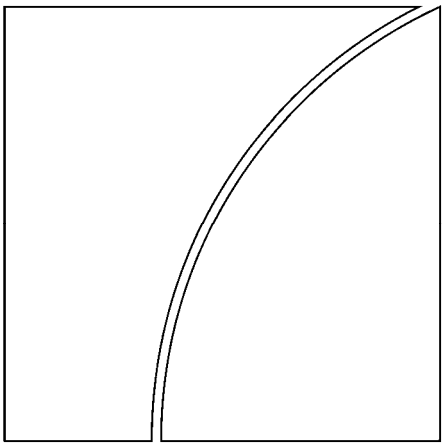

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External support and bank behaviour in the international syndicated loan market

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Abstract

Banks that enjoyed generous external financial support tended to under-price risk in the international syndicated loan market and did not show signs of innovation in their loan participations. Loans arranged by such banks had on average lower spreads (controlling for risk and other characteristics) and these banks retained loans that were on average priced below market. When supported banks' investment strategy differed materially from that of the average bank it was in holding less specialised portfolios, in aligning more closely with market trends, and in exhibiting lower persistence in their sectoral allocations.

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Contents

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Blaise Gadanecz, Kostas Tsatsaronis and Yener Altunbaş*

Introduction

Banking is an area of economic activity of intense interest to public policy. In addition to regulation, public sector involvement often includes control or, even, outright ownership of banking institutions. Control is often sought in order to achieve public policy objectives such as the channelling of funds to particularly vulnerable economic sectors, or borrowers with unduly limited access to credit. Public sector interest is often associated with the existence of explicit forms of financial support or the market perceptions of implicit guarantees should the banks come under stress. Banking is also a business of taking and managing risk. The theory of moral hazard suggests that ill-conceived insurance against downside risks may lead to distorted incentives and excessive risk taking by banks.

This paper focuses on the behaviour of banks that are perceived by market participants as highly likely to receive financial support in the event of distress. More specifically, it concentrates on the investment decisions of these banks in the international syndicated loan market. It investigates whether the existence of support (in the form of explicit or implicit guarantees) influences the pricing of loans in which these banks participate. It examines both the pricing of facilities in which the supported banks act as senior arrangers and the loan portfolios that they retain on their books. The paper also examines supported banks' investment decisions and in particular whether they use the benefits derived from the protection of their balance sheet to support borrowers in "niche" markets. Such an attribute would be indicative of a special character and/or a prescribed role that would set these institutions apart from the typical non-supported bank.

A distinguishing feature of this paper is that in analysing these questions, it takes an international perspective. This is true not only in terms of the banks that are examined, which

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come from a number of different countries, but also in terms of the specific market of focus, which is open to international competition. The benefits are two-fold. Firstly, the international syndicated loan market permits the comparison of the behaviour of banks that come from different countries within a fairly standardised environment. It is a market where a "non-levelled playing field" can give a competitive advantage to players that owe their lower funding costs to the existence of guarantees. Secondly, the examination of the behaviour of banks in an open, international market also helps to reduce the influence of national circumstances, which typically complicate cross-border studies. A further element of cross-border comparability is the fact that the level of state support is identified on the basis of the "support ratings" assigned by an international rating agency.

The results associate a high level of support with bank loan portfolios that include a higher proportion of under-priced facilities. Similarly, the presence of a supported bank as a senior arranger in a loan syndicate is associated with lower loan spreads for the facility compared to a market benchmark, and hence an under-pricing of the underlying risk.

At the same time, the investment choices of state supported banks are not significantly different from those of their competitors in any fundamental ways. There is no evidence, therefore, that supported status translates into a special role. To the contrary, there is some evidence that trend-following is more pronounced among supported banks. Namely, that their lending patterns follow broad market trends and that their credit extension decisions are less sensitive to the strength of their balance sheet than the typical bank that is not subject to the same support. These results are more pronounced in the case of state-owned banks and are considerably weaker in the case of large banks, for which the expectation of support may stem from their systemic importance rather than their ownership structure.

The implicit conclusion from this analysis is that support does not give rise to institutions that have a fundamentally different investment orientation from that of the average bank. Investment patterns of supported banks track more closely the market average than those made by their non-supported peers. However, state support does seem to be associated with a certain degree of carelessness about the pricing of risk and (implicitly) a business strategy of winning mandates by competing on the price of loans rather than on the strength of the services provided.

The paper presents three interesting methodological aspects. First, it constructs a portfolio of loan participations for each bank on the basis of information on individual loans. This permits the calculation of the average characteristics of the loans included in a bank portfolio and, in particular, the average pricing of these exposures. Second, the behaviour of banks with different characteristics (supported banks, large banks, state-owned banks) is benchmarked

against the overall market (defined as all banks participating in the international loan syndication) to detect different patterns in investment behaviour. Third, information on individual loan participations is matched with information on the balance sheet of individual banks to investigate, at a micro-level, whether banks' characteristics are associated with specific patterns in their syndicated lending activities.

An important limitation of the analysis is the focus on only one facet of the overall business of supported banks, namely, their activities in the international syndicated loan market. In particular, the paper does not analyse either the behaviour of these institutions in their domestic market or their activities in the securities markets. While this limitation is a drawback in terms of characterising the overall impact of support, the results indicate that there are areas of banking activity (such as the international loan participations) where supported banks tend to compete for size on the basis of consistently lower pricing. This suggests that state support may have implications that go beyond the national markets.

The rest of the paper is organised in six sections. The next section reviews related literature and lays down the main questions for the analysis. The second section gives an overview of the data and the empirical methodology describing, in particular, the two perspectives we adopt in our analysis. The third section discusses the result of the baseline pricing equation we employ throughout most of the paper. Section 4 discusses the results of our analysis from the perspective of the individual loan. By contrast, section 5 takes the perspective of individual banks and looks at the nature of their syndicated loan portfolio. The final section concludes and offers some suggestions for further work.

1. The main questions and related literature

Support of banking institutions is a common element in the financial policy of many countries. This support can range from implicit guarantees that are not officially defined, to outright state ownership and control. The adverse impact of external support on individual and collective incentives of banks is, of course, well recognised. The expectation of external financial support in the event of stress creates moral hazard and can lead to excessive risk-taking. This paper focuses on the nexus of those issues in the context of the international syndicated loan market. As such, it stands on the intersection of two strands in the literature. The first strand examines empirically the effects of safety nets and in particular public sector support on the investment behaviour and risk taking of banking organisations. The second strand examines the organisation and pricing in the international syndicated loan market.

Safety nets are intended to reduce the broader economic costs of financial distress but they also can create moral hazard. Permanent, ex ante guarantees on bank liabilities, or even

state ownership, weaken competition and distort managerial incentives. Managers of supported banks may exert lower effort than their private sector counterparts or divert resources for political or personal objectives.[1] Moreover, support creates risk-shifting incentives. This idea is crisply explained by Merton (1977, 1978) who interprets deposit insurance as a put option held by the bank on its own assets, the value of which increases with the bank's leverage and asset volatility (risk).[2] A number of empirical studies find a positive link between the safety net and bank risk-taking. For example, Hovakimian and Kane (2000) find evidence that deposit insurance is associated with higher bank risk-taking. Their result is echoed in Gropp et al (2007). By contrast, De Nicoló and Loukoianova (2006) do not find that public ownership is associated with riskier banks. Another set of studies indicate that safety nets weaken the influence of market discipline on risk management and control, allowing capital buffers to be smaller or interest rates on banks' liabilities to be lower and less sensitive to the underlying risk profile of the bank (see for example, Demirgüç-Kunt and Huizinga (2004), Baumann and Nier (2003), Gropp, et al (2007)).[3]

Risk-shifting may also take the form of business expansion into areas where supported banks may have limited or no expertise. Jiménez and Saurina (2004) report that, following financial sector deregulation, Spanish savings banks expanded their lending into new geographical areas or business sectors.[4] Competition for business brought about an adverse selection problem (in the sense formulated by Shaffer (1998)) when these institutions offered to all borrowers loan contracts with collateral requirements more suitable to high-quality borrowers.[5]

More closely related to this study, Sapienza (2004) finds that state-owned banks charge lower interest rates than do privately owned banks, after controlling for borrower riskiness. More generally, Gropp et al (2007) provide evidence of competitive externalities that stem from the existence of explicit or implicit guarantees for banks in the domestic context. In accordance with the predictions of Hakenes and Schnabel (2004) they find strong evidence

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1 Dinç (2005) shows that government-owned banks increase their lending in election years relative to private banks. Brown and Dinç (2005) provide evidence that political concerns can significantly delay government action (closure, nationalisation and the like) to sort out problem banks. They show that such action is less likely to happen before elections that after, controlling for macroeconomic and bank-specific factors. Kroszner and Strahan (1996) provide similar evidence for the US Savings and Loans crisis while Kane (1989) attributes this episode to ill-designed deposit insurance and slowness in effecting closures of problem banks.

2 See Kane et al (2003) for a further discussion of this issue.

3 Investors' ability to assess default and to incorporate the resulting information into bond and stock prices makes market discipline a suitable tool to assist regulatory goals in the banking industry (Herring (2004)).

4 The risk-return decisions of savings banks are not necessarily subject to the same level of shareholder scrutiny as are those of privately owned commercial banks.

5 Acharya et al (2006) also argue that diversification into new sectors by financial institutions lacking sufficient expertise may lower monitoring effectiveness and increase bank risk.

that guarantees have an adverse effect on the risk-taking of non-supported, competitor banks. Somewhat surprisingly, they find no significant effect on risk-taking by the supported banks themselves. They interpret this result as indicative of the boost to charter value due to state support dominates the higher value of the implicit put to the bank.

The second related strand in the literature is more specialised and focuses on the pricing of loans in the international syndicated market. For an extensive description of the overall structure of this market the reader is referred to Gadanecz (2004), while Altunbaş et al (2006) discuss the structure of fees and pricing of facilities. Empirical investigations on the determinants of loan pricing have identified a number of loan characteristics that have an impact on spreads. These will be discussed in more detail in the next section. Of particular interest is a study on the integration of the international syndicated loan market by Carey and Nini (2007) that identifies a pricing discrepancy between the European and US segments. Loan spreads in the latter segment tend to be persistently higher after controlling for facility characteristics. The authors do not attribute this difference to any particular factor but find that it is very robust to the empirical specification of the test. The findings in this paper offer a potential, albeit only very partial, explanation. Loan contracts signed in Europe tend to be arranged more often by supported banks, which are more prone to underpricing these facilities.

In the context of the literature discusses above, this paper focuses on two specific questions related to the influence that public sector support on the behaviour of banks in the international syndicated loan market. The first question is whether the participation of supported banks in a loan syndicate might distort pricing. In this context, the paper distinguishes between banks that are expected to be supported because the state has an important ownership stake in them and those that may receive support because of their systemic importance. A related issue is whether the prices on the loan participations that supported banks retain on their books tend to differ from those retained by other banks. The second question relates to whether the overall investment patterns of supported banks differ in any substantial way from those of other banks. Of particular interest would be patterns that might indicate of a special role played by these banks as a counterpart to their supported status. This role would presumably manifest itself in terms of patterns that suggest persistent, innovative or specialised behaviour that deviates from that of the average bank in the market.

2. Empirical methodology and data

This section provides an overview of the international syndicated loan market and describes the main variables used in the analysis. It also outlines the main questions addressed and explains how they relate to the two complementary empirical perspectives adopted in this study: the one focusing on the individual loan facility and the other looking at individual banks and their behaviour.

The international syndicated loan market is a fairly open cross-border market, relatively free of idiosyncratic national institutional features and as such provides an interesting context for the analysis of the influence of state support on bank behaviour.[6] Borrowers are typically large corporations or sovereign entities. The typical lending syndicate structure involves a small group of senior banks and a wider group of junior participant banks. *Senior* banks form the core of the syndicate, which provides the seed funds and sets the key facility parameters such as loan terms and pricing. A group of *junior* banks also takes up shares in the loan but plays only a secondary role in the design and structure of the facility. Senior syndicate members retain voluntarily a substantial fraction of the loan in addition to sharing among themselves any residual amount that is not placed with junior participating banks.

Syndicate members are compensated for their participation through the interest rate on the loan and fees.[7] Since the loans represent funding commitments the interest rate is typically expressed as a spread over LIBOR and it applies only on the amount that is actually drawn. A number of fees, which are expressed as a proportion of the amount raised and are paid either upfront or periodically through the life of the facility, compensate the participating banks for their specific role in providing funds, organising the syndicate and in taking on the associated risks.

The syndicated loan information has been extracted from the Dealogic Loanware database. Each loan facility record identifies the members of the syndicate and their role as senior or junior members. It also contains information about the share of the loan retained by syndicate members. This information is complete for senior syndicate members. On occasion, when only the total amount allocated to the junior syndicate members is identified, the allocation is assumed to have been effected on a pro rata basis. The database also provides information about several characteristics of the facility (such as currency of denomination, maturity, purpose etc) and describes the structure of syndication fees and the

[6] For an overall description of the structure and behaviour of the international syndicated loan market see Gadanecz (2004).

[7] For more detailed discussion on the structure of fees see Altunbaş et al (2006).

spread. For the analysis in this paper information on almost 24,000 loan facilities has been extracted over the period 1993-2001. Since there are no good reasons to believe that specific types of loan might present particularities in their pricing (beyond the characteristics that are explicitly controlled for in the regression) no particular filtering was applied in the selection of these loans other than the requirement that the database included information on all relevant variables. All variables used in the analysis are detailed in the Annex which also includes a Table with summary statistics.

The information on the individual loan facilities was combined with information on the syndicate banks extracted from Bankscope. This database contains details about the balance sheet composition and income statement of individual banks. Of particular interest for the questions at hand are the variables related to the credit worthiness of the banks and, especially, the support rating assigned by Fitch Ratings.[8]

In addition to the more traditional types of creditworthiness assessment, Fitch Ratings assigns to banks ratings related to the strength of outside support. The so-called *support rating* is an assessment of the likelihood and level of outside financial support that the bank may receive from outside entities (the government, its owners or third parties) in case of financial difficulty. The rating scale ranges from very high support (level 1) to no support (level 5). For the purposes of this paper banks with a rating of 1 or 2 are identified as "supported". This choice was based on the characterisation that Fitch gives to these rating classes in its manual. Level 1 support indicates "a clear legal guarantee or state support would be forthcoming". Level 2 is assigned in cases where "state support would be forthcoming in the absence of a legal guarantee". This choice is consistent with other studies in the literature that rely on the same indicator of safety net support.[9] The ratings methodology does not strictly identify the government purse as the source of financial support. However, for the higher support rating categories the methodology points to the existence of a legal commitment or highlights the systemic importance of the institution in the national and/or international arena. For the purpose of this analysis this is treated as being practically tantamount to government support. No private entity would have the resources or the incentives to provide this financial support in the case of financial difficulty.

The reliance on ratings information has important advantages over alternative measures of financial support for banks. It guarantees a certain level of international comparability

[8] Among rating agencies Fitch Ratings historically has paid particular attention to rating banking firms.

[9] See for example Gropp et al (2006). Baumann and Nier (2006) use the same threshold to define the banks that have a high support rating. They focus on the potential distorting effects that outside support might have on market discipline and in their discussion they treat banks in these two support categories as de facto protected by the safety net.

regarding these assessments, which is very important in a study involving cross-country comparisons. Because the institutional structures of banking systems vary significantly across countries empirical approaches relying on the national classification or on statistical methods to select the banks that are more likely to be "bailed out" are fraught with difficulties. There are no *a priori* reasons to believe that there are systematic biases in the ratings.

Table 1 gives an overview of the distribution of banks across the support ratings for two selected years in the sample. Slightly more than half of the banks are classified as **supported** banks (ie they have support rating equal to 1 or 2). However, in the later years, while their numbers grew only slightly their share of total assets boomed, suggesting that supported banks' growth outpaced that of the average bank. Support ratings are reviewed continuously and it is possible for a bank to migrate across support rating classes. However, these migrations are much less common than the migrations in the credit ratings of the banks.

The fact that supported banks are larger on average is not surprising. The systemic implications from the failure of a bank are typically directly related to its size. We have thus assigned the indicator variable **large** to institutions that fulfil at least one of the following criteria: (i) they are among the 100 largest institutions (by asset size) worldwide; or (ii) are among the three largest institutions in their own country; or (iii) have more than 10% of domestic banking assets. These criteria are checked on an annual basis.

The effects of government support on bank behaviour might be stronger for those institutions that are outright owned by the state. To control for this possibility, we rely on information about bank ownership in Bankscope and assign the indicator variable **public** to those institutions in which the public sector ownership exceeds 15%.[10]

The inclusion of these two additional characteristics of banks should guard against the possibility that the results are driven by factors that might be associated with state support but are primarily due to size or ownership.

Two analytical perspectives

In order to obtain a more comprehensive picture of the behaviour of supported banks in the international syndicated loan market the empirical analysis proceeds in two complementary perspectives: one focusing on individual loans, and the other focusing on individual banks.

[10] Central banks, multilateral government banks, specialised government credit institutions and entities indirectly held by the state sector were also flagged as public.

The first perspective focuses on individual loan facilities, which become the unit of analysis, and the main questions analysed relate to the impact that the support status of the arranger bank may have on pricing (spread). Loan spreads for facilities where supported banks participate as senior syndicate members are compared to the results from a benchmark pricing regression. A separate regression compares the relative importance of the factors driving the size of the loan that is retained by the senior arrangers in the case of supported banks and other banks. A higher retained share of the loan for borrowers who make their first appearance in the syndicated loan market by the supported bank arrangers would be consistent with a special role by these banks. In addition, the relative sensitivity of the retained portion of the loan to the state of the bank's financial condition may also reveal a tendency of supported banks to be more or less conservative in their risk management.

Following this individual loan perspective, the upper panel of Table 2 presents initial evidence that average spreads on loans that include supported banks in the syndicate tend to be lower than loans that do not. The right-hand side column shows that the average spread for loans where at least one of the syndicate members is a supported bank is on average 31bps lower than other loans. Spreads are even lower when a participating bank is state controlled (68 bps). However, the picture becomes less clear cut when one looks more closely at the table entries that correspond to the intersection of supported status, on the one hand, and size or state ownership, on the other. The spreads for loans with supported smaller or supported state controlled banks in the syndicate do not appear to be statistically different from loans where the syndicate includes smaller or state controlled banks, which, however, are not perceived as being supported.

The second, complementary, perspective puts banks in the centre and adopts individual institutions as the unit of analysis. For each bank/year combination a portfolio of loan participations is constructed by aggregating the shares retained by the particular institution in all syndicates in which it participated during the year. The composition and patterns of change in these portfolios are compared across supported and non-supported banks. Particular emphasis is placed on the on the degree of portfolio diversification across geographic and industrial sector exposures as well as the similarity between the bank portfolio and that of the "market" (defined as all syndicated loans captured in the dataset). Banks with a mission to address a market failure should be less prone to align themselves closely with broad market trends and should display more distinctive (idiosyncratic) patterns in their investment decisions. From the same bank-specific perspective, the average (risk-adjusted) spreads on the portfolios of loans that banks elect to retain would reveal the overall risk-return preferences of these institutions. Banks that systematically retain loans with lower

risk-adjusted spreads should be viewed as having a high appetite for risk that is not matched by commensurate ex ante reward.

The lower panel of Table 2 presents average spread statistics for loan portfolios of different types of banks that are suggestive of important differentials in the holdings of supported and non-supported banks. The loan size-weighted average spread on loan portfolios of supported banks is about 43 bps lower than the comparable spread on portfolios of non-supported banks. Unlike the case with loan spreads the differences between supported and not-supported banks are also evident when support is interacted with state ownership (43 bps) and especially with small size (70 bps). At the same time, the differences across these ownership and size classifications of banks are not statistically meaningful conditional on the bank being identified of having supported status.

3. Baseline pricing regression

The spreads presented in Table 2 are averages across all facilities and have not been adjusted for risk and other loan characteristics. In order to account for the observable differences across loans, this section estimates a benchmark pricing equation for loan spreads. The drivers of spreads relate to the specific characteristics of each loan, to the attributes of the individual borrower but also to the general conditions prevailing in the global loan market at the time when the loan was arranged. We refer to this as the *baseline model* and use it as a benchmark for the evaluation of loan pricing. In particular, the discrepancies between actual loan spreads and those implied by the model are interpreted as measuring the extent to which a particular loan might be priced more richly or more tightly than the market average. We also estimate a similar model for the "all-in" cost that includes the level of various fees as well as the spread. This is a more comprehensive measure of the final cost to the borrower than the spread alone, especially because many fee components are payable up front and are independent of whether the loan has been drawn or not. This section discusses the variables of particular interest for the subsequent analysis. The complete list of variables is described in the Annex where Table A.1 presents summary statistics.

Among the characteristics of the loan facility the regression includes variables that are linked to the loan's size and maturity length, as well as identifiers for the presence of various risk mitigants in the form of collateral, or different forms of guarantees (either explicit or implicit)

offered by third parties.[11] In addition, following the work of Carey and Nini (2007), who identify a spread gap between the European and US loan market, it includes two dummy variables to indicate whether it was signed in Europe before the introduction of the single currency (ie up to 1998) or afterwards (1999–2001).

The second set of variables in the benchmark pricing regression relates to the characteristics of the borrower. It includes dummies that control for credit rating, the business sector of the borrower and the declared purpose of the loan, since it is observed that capital markets demand a premium for financing facilities related to corporate actions and restructurings. It also includes an indicator variable that identifies the first time that a borrower appears to have accessed the international syndicated loan market according to the Loanware database. Borrowers that are new to the market and hence unfamiliar to potential lenders are arguably expected to be facing higher borrowing costs.

The third set of controls relates to market conditions, as spreads are likely to be affected by overall liquidity in financial markets or prevailing investor attitudes towards risk taking. To this effect we have included a full set of year dummies to capture the overall market environment but also a number of more specific controls which include a measure of the overall activity in the syndicated loan market identified by the total value of facilities signed in the same year. We also include two proxies for overall liquidity in the international markets in the form of the level of the Libor interest rate and the weighted average of short-term interest rates in the G3 economies.[12]

Table 3 shows the results of this baseline model estimation. The coefficients are in line with the existing literature on the pricing of syndicated loans. In line with Carey and Nini (2007), we find that loans originated on the European market carry significantly lower spreads. Spreads increase with maturity and decrease with the size of the facility. Everything else equal, externally guaranteed loans carry lower spreads while the presence of collateral tends to be associated with higher interest rates. The latter result, which is commonly observed in the literature, is attributed to the fact that lenders demand (and obtain) collateral pledges only from those borrowers that pose higher risk (see for example Saurina (2005)). Similarly, first-time borrowers in the international loan market borrow at slightly higher spreads than repeat borrowers. Surprisingly, the proxies for overall market conditions do not have an important effect in the pricing regression. Arguably, their influence is subsumed by the year dummies that account for most of the systematic variation in the spreads. Finally, for the purposes of

[11] For a discussion of the role of guarantees on pricing see Sorge and Gadanecz (2008).

[12] The weights are based on the relative GDP of United States, Japan and Germany.

this paper, it should be noted that the model fit is quite good. The value of R^2 at 43% for the spread regression is near the top of the range of similar goodness of fit measures reported in the literature.

The results for the all-inclusive measure of cost are very similar to those of the spread, but less precise. The fit is less good (R^2 at 43%) and only a few of the explanatory variables seem to have a significant explanatory power for the level of fees associated with the loans. Fees decline with loan maturity and increase (moderately) with size. Among the other variables, none seems to have any economically significant effect or be statistically significant. In view of these results we will concentrate exclusively on loan spreads for the remainder of our analysis.

4. Looking at individual loans

This section takes individual loans as the unit of analysis and focuses on the presence of supported banks in the senior group of syndicate members. As discussed above, the senior arranger group plays a key role in the structure and pricing of the loan whereas junior members that join the syndicate at a later stage act more as price takers. The section asks two questions: (i) are there systematic effects on pricing that are associated with the presence of supported banks as senior arrangers? (ii) are there any differences in the share of the loan retained by the senior group of banks for those loans? These issues are examined in turn below.

4.1 The influence of special banks on individual loan spreads

The investigation of impact from supported bank presence on individual loan spreads proceeds by augmenting the baseline regression by selected variables that indicate the presence and role of banks of various types in the lending syndicate. For instance the coefficient of an indicator variable that signals the presence of a supported bank in the syndicate (or in some specifications in the group of the senior arrangers) would signal the extent to which this participation might affect the size of the loan spread. In addition, regressions that include a variable that measures the share of the loan retained by the banks of particular type would provide a more continuous range: as the impact on loan pricing may be linked to the overall size of their participation.

Table 4 reports the relevant coefficient from those regressions. The results show that the participation of supported banks in the syndicate is statistically linked to lower spreads. Such loans have spreads that are on average almost 3 bps lower than other loans after controlling for different loan characteristics, and risk. In the case of large banks, the reduction in spread

is very similar (3.6 bps). However, the effect is most particularly pronounced in the case of banks where the state has a significant ownership stake. For loans in which these banks participate, the effect on the spread exceeds 16 bps and, in addition, it is more significant statistically.

Turning to the regressions utilising the retained share of the various bank types as a proxy for influence in pricing Table 4 shows a similar pattern of results. For every 1% of the loan retained by a supported bank, there is, on average, a quarter of a basis point reduction in spread, implying that if supported banks are holding half of the loan the spread could be as much as 12,5 bps lower than the average loan with no supported bank participation in the syndicate. Also when using this measure the estimated impact on spreads is strongest in the case of state owned banks. For every 1% of the loan retained by such banks the spread over LIBOR tends to be 0.84 bps lower, implying that if half of the loan was retained by state controlled banks the spread would be expected to be 42 bps lower.

The right hand side columns of Table 4 report the results from the same set of regressions repeated by using variables indicating the presence of supported or state controlled banks in the senior group of arrangers. The results are qualitatively very similar indicating a negative effect on loan spreads from the presence of supported banks and a much stronger effect in the case of state owned institutions. The exact numerical results are slightly stronger when it comes to supported banks' role in the senior group where the coefficient of the indicator dummy is nearly twice as large as in the case when these banks are general participants in the syndicate.

Carey and Nini (2007) present evidence that international syndicated loans signed in the US market tend to carry higher spreads than those signed in the European market. Given the above results and the possibility that supported banks activity may not be evenly spread across the two markets it is possible that bank support levels may be linked to this difference in spreads. The benchmark pricing equation controls for facilities arranged in European market indicating that the impact identified in Table 4 is additional to any effect related to the location of the deal. In order to better understand the relationships between external support and loan market Table 4a reports the estimated coefficients for a number of interaction variables that have been added to the baseline regression. The results reinforce the message from the previous regression linking the presence of state controlled banks in the syndicate with lower spreads. Interestingly, this effect is not significant for loans signed in the European market but it is present for US market loans (–18.47bps) and especially in other markets (ie not US or Europe) where it exceeds 30bps. The results are almost identical whether the analysis encompasses all bank participations or it is restricted to the senior arranger group.

In sum, these results in this section point towards a small but very significant effect associated with the presence of banks with high support ratings in international loan syndicates. Their participation either as junior members or senior arrangers tends to shave basis points off the loan spread even after controlling for the risk and other loan characteristics. While the impact on spreads after controlling for risk is much smaller than the unconditional figures shown in Table 2, the patterns are the same. The estimated effect is much more pronounced in the case of banks in which the public sector has significant ownership state (and, hence, presumed control). By contrast, the estimated impact is weakest in the case of large banks, indicating that size alone is not an important driver of this effect on spreads. The loan under-pricing effect appears to be linked to the adverse incentives created by state support (and especially ownership) on smaller institutions, which may also be less competitive in the international syndicated loan market than larger institutions.

4.2 Do supported banks retain a higher share of the loan?

Senior arrangers play a key role in shaping the terms and structure of a loan facility and determining its pricing. Junior participants are quite passive and act mainly as price takers. Having observed that support is associated with lower loan spreads compared to underlying risk, it is possible that senior banks may retain smaller portions of underpriced loans, effectively engaging in risk shifting. This hypothesis is tested by a regression of spreads on the unexplained proportion of the risk as proxied by the residuals of the benchmark pricing equation.

In the same context one can also examine a number of other hypotheses related to the behaviour of state supported banks in the syndicated loan market. More specifically, we examine whether supported banks tend to help borrowers that make their first foray into the international market by retaining a larger portion of their loan, thus taking a larger portion of the associated risk. In addition, we explore whether the presence of a senior arranger bank of the same nationality as the borrower is associated with a higher share retained by senior banks, in other words whether by retaining higher shares of debt facilities issued by borrowers from the same country, supported banks assist these borrowers in their first forays to the international market.

Finally, one can examine whether the retained share varies systematically with the financial condition of the banks in the senior syndicate banks. To this end, we construct indicators of the syndicate banks' health (capitalisation, loan provisions-to-asset ratio and liquid asset ratio) in the form of weighted averages of the indicators for the member banks using as

weights the shares of their participation. To avoid simultaneity problems, those indicators are lagged by one year in the regression.

The regression[13] of retained shares on these variables is estimated over a sample of more than 16,000 loans facilities that possess all the necessary information, as well as in split samples according to whether a special bank is a member of the senior syndicate or not. As it is evident from Table 5, the explanatory power of the regression is not very high for the broad sample, but increases very substantially in the case of the sub-samples that focus on banks with particular characteristics. The pattern of significantly estimated coefficients across groups reveals some interesting points.

While senior banks tend to typically retain about one-quarter of the loan (25.9%), syndicates that include state supported banks tend to retain far smaller shares. The average retained share by state supported banks is the lowest. However, the larger the share of supported banks within the arranger group, the larger the overall share of the loan that is retained by this group. In other words, supported banks tend to hold higher senior shares in loans that are very widely held by junior and non-supported banks. We interpret the combined message from these coefficients as an indication that supported banks tend to not smaller portions of the loans they originate than other banks. This evidence could be consistent with risk shifting. However, when examining directly the relationship between the unexplained component of the loan spread and the retained share by senior supported banks we do not find corroborative evidence in the form of a significant negative relationship. The coefficient on residual risk is small and not meaningful.

Senior banks tend to retain a 3 percentage points larger share of loans issued for first-time borrowers in the international market. In these facilities, supported and large senior banks tend to retain more than the average bank (9.08 and 8.3 percentage points respectively). This is probably an indication that the senior banks provide some form of certification as to the credit worthiness of these newcomers to the syndicated loan market. However, the same is not true for state owned banks. There is no relationship between the retained share of those lenders and the fact that the loan is arranged for a first-time borrower. Likewise, the interaction dummy between the first time borrower indicator variable and the status of the senior syndicate members in the arranger league tables (which we consider a proxy for reputation of the lender) is statistically and economically significant (10 percentage points) only in the case where public sector banks are present in the syndicate in a senior capacity. This implies that public sector lenders are only engaged in certification when they are

[13] Refer to the Annex for a detailed description of the variables used in the regression.

themselves well established in the international syndicated loan market. Finally, there is no evidence, that supported banks retain greater shares of loans granted to borrowers from the same country.

While there is no evidence of risk shifting from the supported senior members to the junior members of the syndnicate, we observe that the decision regarding the portion of the loan retained by the senior banks in those syndicates that include state supported banks tends to be less responsive to their financial health. On average, the lower the quality of the syndicate's overall loan book (as measured by the average level of loan loss provisions of the participating banks) the lower is the share of the specific loan they retain. Senior banks may be using their relationship with the borrower to bring a loan to the market (and collect the fees), but they might refrain from taking large participations if their balance sheet is weakened by low quality loans. State supported banks, however, do not conform to this pattern of behaviour. The estimated coefficients for supported and large banks are insignificant, indicating that these banks' investment decisions are less sensitive to their own condition. State owned banks provide again the exception as they seem to be holding a larger share of the loan when their equity-to-assets ratio is lower, indicating a risk seeking strategy.

Overall, the results in this section constitute weak evidence that external support for banks is related to risk-seeking behaviour. This relationship is strongest in the case of state controlled institutions, and in particular those that are not major players in the international syndicated loan market (as proxied by their lower share in the arranger league tables).

5. Looking at individual banks

In the previous section we focused on the analysis of the pricing and structure of individual loans and established that the presence of state supported banks has a compressing impact on spreads without any evidence of a more prudent or innovative behaviour by these institutions. In this section we shift the focus towards the institutions themselves and analyse the impact of state support from the perspective of the individual bank. To this end, we construct for each bank in our data a portfolio of their retained shares from all the loans they participated in during a calendar year. We look at the composition and changes in these portfolios for supported and other banks as they compare to the overall market. In particular we look at three types of characteristics: the degree of diversification, the similarity to the market portfolio of loans and the degree of turnover from one year to the next. We will discuss these in turn below. Finally, we examine the pricing of their overall portfolio of new

loan participations for each year with a view to establishing whether they do hold loan assets that are fairly priced.

5.1 Patterns of portfolio composition

How does the portfolio composition of supported banks differ form that of other banks? Do these banks show evidence of innovative behaviour, or do they simply follow market trends? This is the question on which we focus in this section. If state support is provided as a quid pro quo for that pays closer attention to borrower categories that are overlooked by the market, one should observe that supported institutions exhibit distinct investment patterns. If on the other hand, supported bank lending patterns are not very different from those of the average bank, then the logic of offering more generous safety net support to those institutions could be questioned.

To examine these issues in the context of the international syndicated loan market, we have extracted information about the industrial sector and country of origin of the borrower. The loans in the sample are grouped into broader categories depending on the nationality of the borrower or its main sector of activity. For the geographic classification we have used the BIS classification that distinguishes among individual countries for the advanced economies but classifies emerging markets into broader regional groups.[14] For the sectoral classification we rely on the FTSE scheme that distinguishes between eight broad industrial sectors. The analysis below is conducted along both those dimensions.

Specialisation

Concentration in a particular type of borrower can signal that a bank may seek specialisation in its investment strategy. Strictly speaking, concentration is neither a necessary nor a sufficient condition for the bank to play a beneficial social role in lending to borrowers with limited access to funding, but it is nevertheless a sign consistent with individuality in its investment approach. To look at the concentration patterns of the banks in our sample we have calculated for each bank/year portfolio the Herfindahl indices of country and sector concentration by adding the squared percentage shares across the categories and divided by 100. Thus calculated, the index value ranges between 0 and 100 with more concentrated (respectively, more diversified) portfolios having higher (respectively, lower) scores. We then compute the average index value for supported, large or publicly owned banks for each year

[14] For details see the statistical tables and associated notes in any of the BIS Quarterly Review issue.

and compare them to the overall sample. The construction of the Herfindahl indices is described in the Annex in greater detail.

The results of this comparison are shown in Table 6 that reports the average value of the concentration index for each category of banks and the statistical significance for the difference in the averages across groups. Under the heading “unconditional” the table reports the differences in investment concentration between supported and not supported banks, between banks of different size and between those that are state or privately controlled. In addition the table reports conditional means for supported banks across different size and ownership groups. The upper panel of the table refers to the geographical concentration of loan portfolios, whereas the lower panel relates to the concentration in terms of the sector of the borrower. We observe that the concentration figures are overall quite high. This is a consequence of the existence of a relatively large number of banks that have a small number of loan participations each year.

A simple comparison between the two panels in the table suggests that bank loan portfolios tend to be more concentrated geographically than by industrial sector. The comparison between supported and non-supported bank portfolios is, however, much less pronounced. The values of the index are broadly similar across the two groups of banks. The statistical tests of equality between groups means indicate that supported banks portfolios are less concentrated in the country dimension. The same thing is true for the portfolios of supported banks that are state owned. For our purposes, it suffices to note that overall special banks do not seem to stand out as having more specialised portfolios. If anything, in terms of their country exposure, they tend to be more diversified than non-supported banks.

Herding

Banks that play a particular role in financing should be less inclined to follow market trends. In this section we look at the year-to-year patterns of change in state supported banks’ portfolios and we examine whether they differ from those that characterise the market as a whole. We label this behaviour as “herding” and perform a comparison by looking at the changes in the share allocation of the loan portfolios along the geographical and sector groups described above.

More specifically, we start by calculating for each bank-year pair in the data the share of the loan portfolio that consists of loans to the particular class of borrowers. We then calculate the changes in these shares from one year to the next. We repeat the same exercise for the aggregate market portfolio of all loans granted in a given year. Finally, we calculate the rank correlation between those changes in portfolio shares between individual banks and the market as a whole. The resulting measure will be higher the higher the degree of similarity in

the changes in the exposures between the individual banks and the "average" bank in the sample. A negative correlation indicates that the bank increases (decreases) its exposure to the groups that the market has decreased (increased) its lending. A high positive correlation would be interpreted as evidence of herding. The construction of the rank correlations is described in the Annex in greater detail.

The main message from the rank correlation values shown in Table 7 is that the differences in apparent behaviour between the banks of different types are not very pronounced. The overall unconditional comparison between not-supported and supported banks' lending patterns show that the latter correlate significantly more closely with the market as a whole. The average rank correlation for the two groups is –0.21% and 4.62% respectively for the country allocation and 2.75% and 4.59% for the sector dimension. The differences along the size and ownership categories unconditionally as well as conditionally on support status are not statistically significant although they show similar patterns as with the portfolio concentration statistics: state owned banks have a somewhat higher tendency to "herd". Overall, the message from this comparison is that supported banks tend to be somewhat less "idiosyncratic" than the average non-supported bank. A tendency to conform more to aggregate trends in the market casts some doubt on whether these banks play a particular role in channelling funds to borrowers that due to market failures are shunned by other lenders.

Churning

The third dimension of behaviour relates to the degree of turnover in bank portfolios. High turnover in terms of investment portfolio allocation would be indicative of frequently changing direction in investment strategy. We interpret this as "churning" (to borrow a term from the asset management jargon) as opposed to having a focused long-term strategy. The measure of turnover is based on the calculations we made for the herding statistics. We take the absolute values of the changes in the allocation shares we computed in our investigation of herding and compute averages for the different groups of banks for each year in the sample. This turnover measure can take values between 0 (an unchanged portfolio) and 200 (a portfolio where there are absolutely no common exposures between the two years). The construction of the turnover measures is described in the Annex in greater detail.

The results of this calculation are shown in Table 8. They indicate that supported banks tend to "churn" more than their non-supported peers. The effect is more pronounced for the turnover measured in the geographical allocation dimension of their loan portfolios. This tendency of high turnover in terms of the geographic composition of the portfolio is also more pronounced among banks under public sector ownership.

The overall messages from the comparison of investment patterns of supported and non-supported banks indicate that there are no major differences in the behaviour of the latter that indicate a special role in their lending strategy. If anything, the differences in behaviour point towards a less idiosyncratic strategy and one that tends to follow the general trends in the broader market. State support tends to be associated with more diffused portfolios, greater tendency to move with the market and higher turnover. These characteristics are not consistent with a determined investment policy of lending to specific types of borrowers that may be overlooked by non-supported banks.

5.2 Underpricing of portfolios

The final question we ask is whether state supported banks tend to hold on average loan portfolios that are underpriced. In section 4 we established that supported status and in particular state ownership of arranger banks is associated with loans that tend to carry spreads that are lower than the average for their risk characteristics. The question asked here is whether supported banks tend to hold in their portfolios a larger proportion of such loans or whether they tend to balance them with loans that are more richly priced.

To examine this effect, we calculate the average mispricing of the portfolio of loans held by each bank as a weighted average of the residuals from the baseline pricing equation we described in section 3, using as weights the loan participation amounts for each bank. The residuals are both positive and negative and they will tend, by construction, to cancel each other out to the extent that they are due simply to idiosyncratic pricing errors. However, a large negative value of these residuals for a particular bank portfolio would indicate that it includes a large amount of under-priced loans.

We then regress these measures of portfolio mispricing on a number of bank characteristics (lagged by one year), the indicator variables for supported status, size and state ownership. In separate regressions we also include interaction terms between support status on one hand and size categories or state ownership on the other hand. Finally, we include in the regression the measures of the degree of portfolio concentration, herding and churning exhibited by the specific bank. The idea behind the latter variables is to test whether banks that are more likely to be market followers and have a high tendency to churn their portfolios are also likely to hold under-priced loans on their books.

Table 9 presents the results. The regression has very low explanatory power. This should not be very surprising given that the dependent variable is a variable that represents mainly idiosyncratic risk.

Nevertheless, one clear result emerges. Special banks tend to systematically hold loan portfolios that are underpriced by about 11bps compared to the market. The coefficient is not only statistically significant but also economically important given that it refers to entire portfolios of loans and not single exposures. For comparison, a similar difference in spread separates the AA from the A class of loans. Similar magnitude effects are also present in portfolios of banks that are large and those that are state owned as it can be seen form the second and third column of the table.

To better gauge the effect of public support we have run the regression with interaction dummy terms flagging those supported banks that are also large or publicly owned (two right-hand-side columns). The results seem to strengthen our conclusions. Among the supported banks those that are smaller and/or public seem to systematically hold portfolios that are more underpriced (by 30 and 18 bps respectively). Loan investment decisions by larger banks that may also enjoy an implicit public guarantee do not seem to be as distorted as those for smaller banks. It seems that it is the direct impact of explicit public support that leads to a more relaxed attitude towards credit risk.

All variables that relate to the investment behaviour of banks (concentration, turnover and trend-following) do not appear to have an impact on the pricing of the portfolios held by the banks. The coefficients are all small and statistically insignificant. There does not seem to be a systematic link between this behaviour and loan underpricing.

Concluding remarks

This paper examines the investment decisions of banks that receive (or are expected to receive) financial support, in case of trouble. More specifically it focuses on the patterns they exhibit in the international syndicated loan market either as senior arrangers or as general investors.

The overall picture that emerges suggests that supported banks are not fundamentally different from other banks in a number of dimensions. They are very much “typical banks”, in the sense that their portfolios track closely overall market trends (in many cases more closely than it is the case for other types of banks). They show little in terms of contrarian, persistent or innovative investment patterns. In fact, when these patterns differ from those exhibited by non-supported banks, it is because supported banks are more like the market average, not less.

This conformism of banks is not per se a negative attribute. It suggests, however, that there is very little that is special in terms of the investment decisions of supported banks. This is

inconsistent with a description of a mission for those institutions that emphasises the public good nature of their activity. Supported banks are not very special and do not appear very active in seeking out borrowers that are shunned by the loan market.

Where supported banks seem to differ substantially from their peers is the attitude towards risk. Supported banks hold portfolios of loans that are on average lower priced than a market benchmark (although some of these lower spreads may be recouped in the form of higher fees, meaning that they may be substituting revenue for risk compensation). Moreover, as senior arrangers they tend to be involved in initiating loans that carry thinner spreads that the average loan with similar characteristics. Finally, they also seem to be less responsive to indicators of balance sheet risk in deciding whether to invest on a particular loan as compared to other banks.

This relatively relaxed attitude towards risk is more problematic from a policy perspective. It is an indication that support distorts the incentives of these banks and encourages risk taking that is not remunerated by market expected returns. Combined with a non-innovative attitude towards investment also suggests that these banks are likely to be using the funding benefits of their status to engage in price competition in the international loan market. This behaviour is not compatible with the typical motivation for support, and is akin to an abuse of their privileged status.

These results shed a sceptical light on the beneficial impact of state support. Clearly, the data used in this paper cannot examine the overall behaviour of the banks, but only a small component in their activities in the international arena. More research is needed to generate a more complete picture of the impact of support on the banks. Nevertheless, the results suggest that there are externalities from state support that go beyond the national markets. Hence, they warrant a more careful consideration of the conditions at which support is made available and the governance structures in these institutions.

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Tables

Table 1

Distribution of bank types (1995, 2000, numbers and total assets, $bn)

		Big	Small	Public	Private	Total
1995	Supported	313	3	18	298	316
		32,704	18	1,559	31,163	32,722
	Not supported	162	139	46	256	301
		8,205	389	536	8,057	8,594
	Total	475	142	64	554	618
		40,910	406	2,095	39,221	41,316
2000	Supported	389	40	60	369	429
		74,262	685	5,452	69,495	75
	Not supported	191	202	50	344	393
		38,893	1,935	2,735	38,092	40,828
	Total	580	242	110	713	822
		113,155	2,619	8,188	107,587	115,775

Sources: Dealogic, BankScope.

Table 2

Average loan spreads (in bps)

For all loans, by bank presence[1, 2]

	Big presence	No big presence	State presence	No public presence	Total
Supported presence	155	206	115	161	155
No supported presence	180	191	113	187	186
Total	161	191	114	172	

By bank type[1], portfolio averages

	Big	Small	State	Private	Total
Supported	137	131	112	139	136
Not supported	160	201	155	182	179
Total	144	198	133	161	

[1] All numbers in individual contiguous cells of the table (comparing average loan spreads for the various combinations of support, size and ownership horizontally or vertically) are statistically different at the 5% level, except when comparing two numbers that are in an area marked in grey. [2] For instance, the intersection of "Supported presence" and "Big presence" denotes the average spread on those loans where there is at least one supported and one large bank present in the syndicate.

Sources: Dealogic, BankScope, authors' calculations.

Table 3

Baseline regression: Selected variables

Dependent variable	Libor spread (bps)	Fees (bps)	Combined (bps)
Constant	125.6**	22.6*	148.5**
Log (loan size)	–18.9**	1.7	–17.2**
Maturity			
1 to 3 years	–29.3**	–6.7	–36.0**
3 to 6 years	–18.0**	–9.8	–27.7**
>6 years	7.4**	–11.7	–4.4
Guarantees	–18.8**	1.3**	–17.9**
Collateral	40.7**	–0.4	40.2**
First time borrower	11.0**	1.9	13.0**
Corporate control loan	121.8**	–1.7	120.3**
Capital structure loan	95.3**	–2.5	92.9**
[Borrower sectors and facility types not reported]			
European deal 1993–98	–44.6**	2.8**	1.9**
European deal 1999–01	–70.8**	3.9*	–66.9**
Global liquidity	–1.9	–0.8	–3.0
Libor level at signing	–1.3	–3.1	–4.3
Global market activity	0.0	0.0	0.0
Borrower rating:			
AAA	–132.8**	–10.8**	–143.6**
AA	–124.4**	–10.8**	–135.2**
A	–115.5**	–9.7**	–125.1**
BBB	–94.9**	–7.6**	–102.5**
BB	–49.9**	–4.9*	–54.8**
B	–17.3	–4.4	–21.6
CCC	13.3	–5.7	7.6
Unrated	–61.1**	–4.7	–65.8**
Adj. R^2	42.96	0.28	20.91
N	23,925	23,925	23,925

** and * denote significance at the 1 and 5% levels, respectively.

Note: The LIBOR spread, the fees and spread + fees are used as the dependent variables.

Table 4

Effect of bank type on spreads

	All participations		Senior participations only	
	Presence dummy	**Retained share**	**Presence dummy**	**Retained share**
Supported	–2.96*	–0.25**	–5.59**	–0.28**
State	–16.24**	–0.84**	–16.00**	–0.82**
Big	–3.60*	–0.20**	–1.68	–0.21**

The table reports coefficients in the baseline loan pricing regression of the Libor spread on a series of loan, borrower and general market characteristics (Table 3), augmented by the corresponding variable. The presence dummy is a binary variable denoting that a bank of the type that corresponds to the row heading was a member of the syndicate ("All participations" column) and/or a member of the senior arranger group ("Senior participations only" column). The coefficients reported in the retained share columns refer to variables that measure the total share of the loan retained by banks of the corresponding type.

** and * denote significance at the 1 and 5% levels, respectively.

Table 4a

Effect of bank type and market on spreads

	All participations			Senior participations only		
	US	**Europe**	**Other**	**US**	**Europe**	**Other**
Supported	1.80	4.63	–28.53**	0.95	0.22	–31.57**
State	–18.47**	–0.96	–33.22**	–18.40**	–1.71	–31.88**
Big	0.25	2.97	–30.59**	3.02*	0.97	–28.30**

The table reports coefficients in the baseline loan pricing regression of the Libor spread on a series of loan, borrower and general market characteristics (Table 3), augmented by the interaction dummy denoting the presence of a bank of the type indicated on the row heading and a loan signed in the market corresponding to the column header. The right-hand side of the table is restricted to bank participations in the senior arranger group only.

* and ** indicate significance at the 5% an 1% levels respectively.

Table 5

Determinants of retained share by senior arrangers[1]

	All facilities	Facilities with at least one supported bank	Facilities with at least one state-owned bank	Facilities with at least one large bank
Loan charcateristics				
Unexplained risk[2]	–0.02**	0.01	0.02*	0.00
Number of banks in syndicate[3]	1.07**	1.65**	0.19	1.51**
First time borrower	2.98**	9.08**	0.82	8.28**
First time borrower x share in arranger leaguetable	0.76**	2.31	9.95**	0.68
Nationality match between borrower and lender	–1.85	–3.83	1.92	–0.53
Share of special[4] senior banks / share of senior banks		47.26**	50.00**	37.36**
Senior banks' characteristics for previous year[5]				
Equity/assets ratio	–0.03	–0.35	–0.46*	–0.27
Loan loss provisions to loans	–1.97**	1.61	2.57	0.22
Liquidity ratio	–0.10**	0.08	0.07	–0.16**
Share in arranger leaguetable	–2.21**	–5.10**	–5.94**	–1.03**
Constant	25.89**	0.11	4.21	13.05**
Adj. R^2	3.18	10.10	29.67	6.95
Observations	16,509	3,153	591	4,838

** and * denote significance at the 1 and 5% levels, respectively

[1] The dependent variable is the retained share of all senior banks which also satisfy the criterion listed in each column. [2] Unexplained part of the LIBOR spread derived from the baseline regression. [3] Incl. junior banks. [4] Second column: supported; third column: state-owned; fourth column: large. [5] Average for syndicate.

Table 6

Specialisation in lending

CONCENTRATION COUNTRIES	UNCONDITIONAL	SIZE		OWNERSHIP	
		small	big	private	state
UNCONDITIONAL		96.97**	92.22	93.96**	90.64
STATUS non supported	95.40**				
supported	91.74	94.86*	91.53	92.06**	88.68
CONCENTRATION SECTORS	UNCONDITIONAL	SIZE		OWNERSHIP	
		small	big	private	state
UNCONDITIONAL		76.71**	73.01	73.48	78.95**
STATUS non supported	74.61				
supported	73.46	79.99**	73.06	73.13	76.62*

The cells report the average Herfindahl index for the syndicated loan portfolios of banks in each category. The index was calculated for each bank across 6 geographical categories and 8 industrial sectors depending on the characteristics of the borrower. * and ** indicate that the differences between two comparable means are statistically significant at the 5 or 1% levels, respectively.

Table 7

Trend following

HERDING COUNTRIES	UNCONDITIONAL	SIZE		OWNERSHIP	
		small	Big	private	state
UNCONDITIONAL		0.07	0.30	2.05	4.27
STATUS non supported	–0.21				
supported	4.62**	1.86	4.83	4.29	7.59
HERDING SECTORS	UNCONDITIONAL	SIZE		OWNERSHIP	
		small	Big	private	state
UNCONDITIONAL		2.02	4.61	3.82	3.45
STATUS non supported	2.75				
supported	4.59*	6.45	4.50	4.74	3.17

The cells report the average rank correlations (in %) for year-on-year changes in the syndicated loan portfolios of banks in each category. For each year we calculate the changes in the share of total portfolio exposure that is accounted for by loans to a particular class of borrowers (by geography or business sector) for the individual bank and the market as a whole. We then calculate between individual banks and the market the rank correlation of those changes in shares. In the table cells, we report the averages of these correlations across bank groups. * and ** indicate that the differences between two comparable means are statistically significant at the 5 or 1% levels, respectively.

Table 8

Portfolio churning

TURNOVER COUNTRIES	UNCONDITIONAL	SIZE		OWNERSHIP	
		small	big	private	state
UNCONDITIONAL		53.33	61.20**	57.07	74.60**
STATUS non supported	55.05				
supported	62.94**	63.48	62.92	61.60	75.71**
TURNOVER SECTORS	UNCONDITIONAL	SIZE		OWNERSHIP	
		small	big	private	state
UNCONDITIONAL		112.5	115.4	115.3**	108.5
STATUS non supported	113.1				
supported	116.0*	123.3	115.5	116.7*	109.2

The cells report the for year-on-year turnover in the syndicated loan portfolios of banks in each category. For each year we calculate the changes in the share of total portfolio exposure that is accounted for by loans to a particular class of borrowers (by geography or business sector). We take the absolute values of these changes, and compute averages for the various groups of banks for each year in the sample. * and ** indicate that the differences between two comparable means are statistically significant at the 5 or 1% levels, respectively.

Table 9

Loan underpricing and bank characteristics

	Supported	Big	State	Supported and Big	Supported and State
Liquidity	–0.09	–0.05	–0.05	–0.08	–0.08
Capital	0.61	0.86	1.21*	0.74	0.55
Provisions	1.15	1.44	1.30	1.29	1.08
Reputation	3.02**	3.58**	3.04**	2.98*	2.85*
Herding					
Country	–0.10	0.15	–0.13	–0.10	–0.20*
Sector	–3.28	–3.69	–4.04	–2.75	–3.24
Turnover					
Country	–0.02	0.01	0.02	0.02	0.03
Sector	0.02	0.03	0.02	0.02	0.02
Specialisation					
Country	0.00	–0.00	–0.00	–0.00	–0.00
Sector	–0.00	0.00	–0.00	–0.00	–0.00
Supported	–10.59**				
Big		–7.41			
Public			–12.60*		
Supported and Big				–8.77*	
Supported and Small				–30.49**	
Supported and State					–17.82*
Supported and Private					–9.88**
[Year dummies not reported]					
Constant	–11.69	–14.61	–18.65	–13.85	–8.49
Adj. R^2	3.25	2.90	3.03	3.58	3.34
N	1,673	1,685	1,695	1,662	1,672

Dependent variable: Weighted average pricing error (deviation of the loan spread from the spread predicted by the baseline loan pricing model of Table 3), in bp, for each bank, for each year.** and * denote significance at the 1 and 5% levels, respectively.

Annex: Data description

Baseline regression: standard case and controlling for involvement by type of bank (Tables 3 and 4)

Libor spread	Spread over Libor. This variable, expressed in basis points, was used as the dependent variable in the loan pricing regressions.
All-in spread	For robustness purposes, most of these regressions were also run using the all-in pricing as the dependent variable, ie the sum of the Libor spread and drawn fees.
European market, 9398, 9901	Dummy variables to indicate that the deal was signed in Europe, up to and after 1998, before and after the introduction of the euro, respectively.
Log (loan size)	Natural logarithm of loan size, in millions of US dollars
Maturity	We have included dummy variables for the following maturity buckets: 1 to 3 years, 3 to 6 years, greater than 6 years (the lower than one year bucket was omitted from the regressions as the case by default)
Guarantees	We have included dummy variables for guaranteed loan facilities: either in the form of explicit guarantees, or implicit ones (e.g. borrower is a subsidiary of another corporation).
Collateral	Binary variable for collateralised loans
First time borrower	Binary variable equal to one if the borrower has not borrowed beforehand, ie appears in the sample for the first time (note: this is delimited by the beginning of the sample, ie, 1 January 1993).
Loan purpose	We have included control variables for the following loan purposes (not all of them reported): corporate control (e.g. loan arranged to finance a merger), capital structure (e.g. for recapitalisations), general corporate purpose loan, project finance loan, property finance loan
Borrower sector	The 150+ base sector codes in Loanware had been mapped into FTSE sector classifications (dummy variables not reported): basic industry, cyclical consumer goods, cyclical services, financials, general industries, government, information technology, non-cyclical consumer goods, non-cyclical services, resources, utilities (the latter sector excluded from the regressions as the case by default).
Facility type	The following loan facility types were controlled for (not reported in the regression output): A-loan, B-loan, guarantee / CP backup facility, lease finance facility, loan facility, multiple purpose facility, note issuance facility, revolving loan, swap facility, bridge facility, trade finance loan, tax-spared loan (the latter type excluded from the regressions as the case by default).
Borrower S&P rating at signing	The following borrower ratings were controlled for: , AAA, AA, A, BBB, BB, B, CCC, not rated. (Note: S&P rating was preferred to Moody's as Loanware gets it via a direct feed and claims it is more reliable. In any case, it is more widely available in Loanware than Moody's.)
Liquidity proxy	Weighted average of short-term interest rates in the G3 economies, weights based on GDP measures of Germany, Japan and the US.
Libor level at signing	Libor interest rate at the time of signing the loan
Total loan number and amount	Total number and amount (in $m) of syndicated loans granted during year in which the facility was signed; proxies for activity on the syndicated loan market
Involvement by bank type	We controlled for the involvement of the following bank types in the syndication: supported, weak, public, large. For each of these bank types, we ran separate regressions with separate controls for their involvement. On the one hand, we included into the baseline regression a binary variable to indicate whether one or more bank(s) of a specific type had been present in the syndicate. On the other hand, we included the share (in % of the US$ loan amount) retained by these types of bank(s) on their books. A final control was to distinguish between the case where these bank types had been involved in all capacities (junior or senior) and the one where they had acted as senior arrangers.

Determinants of share retention (Table 5)

Year dummies	
Share of loan retained by supported, weak, large and public senior banks	Dependent variable (in % of the US$ loan amount), respectively for facilities with at least one supported, weak, large and public senior bank present.
Unexplained risk	Deviation of the loan spread from the spread predicted by the baseline loan pricing model based on the micro characteristics of the loan, (see above), in bp.
Number of banks in syndicate	Number of banks in syndicate including junior banks
First time borrower	Binary variable for first-time borrowers
Nationality match	Dummy variable equal to one if there is at least one arranger bank of the same nationality in the syndicate as the borrower, zero otherwise.
First time borrower x share in the arranger leaguetable	Binary variable for first-time borrowers
Share of special senior banks / share of senior banks	Share of loan retained by supported, public, large senior banks (respectively) divided by share of the loan retained by all senior banks (independent of their type)
Senior banks' characteristics for the previous year	Weighted average characteristics (equity to assets ratio, loan loss provisions to loans, liquidity ratio – defined as the ratio of liquid assets to short term liabilities –, leaguetable position) of all, supported, public, large senior banks, respectively, treating the total loan amount retained by each senior bank category as 100. Characteristics taken for year preceding the signature of the loan.
Equity to assets, loan loss provisions to loans, liquidity ratio, share in arranger leaguetable.	Same as above, but scaled by weighted average characteristics of *all* senior banks, ie. eqas1_1,2,3,4, llpl1_1,2,3,4, liq1_1,2,3,4, league1_1,2,3,4, of each bank type, are divided by the corresponding weighted average calculated for all senior banks in syndicate. In the weights of the denominator, the total amount retained by all senior banks is treated as 100,

Specialisation, herding and turnover (Tables 6, 7 and 8, respectively)

Specialisation	Each loan is classified into a country and industrial sector group on the basis of the identity of the borrower. For each bank/year portfolio we have then calculated Herfindahl indices of country and sector concentration by adding the squared percentage shares across the categories. Thus calculated, the index value ranges between 0 and 10,000 with more concentrated (less diversified) portfolios having higher scores. We then compute the average index value for "supported" and other banks for each year in our sample. The values presented in Table 6 range from 0 to 100 as we have divided the corresponding Herfindahl indices by 100 for easier readability.
Herding	We calculate year-on-year changes in the share of total portfolio exposure that is accounted for by loans to the particular class of borrowers for the individual bank and the market as a whole. We then calculate the rank correlation of those year-on-year changes in shares between individual banks and the market as a whole. The resulting measure will be higher the higher the degree of similarity in the movement of exposures between the banks and the average bank in the sample. A negative correlation indicates that the bank increases (decreases) its exposure to the groups to which the market has decreased (increased) its lending. For each bank, the correlation can range from -100% (bank does the complete opposite of the market) to 100% (bank is perfectly correlated with the market). We then report, by bank type, the average correlations with the market.
Turnover	We examine the degree of turnover in bank portfolios. We take the absolute values of the changes in the country or sector shares we computed in our investigation of herding, and compute averages for the two groups of banks for each year in the sample. This turnover measure can take values between 0 (an invariant portfolio) and 200 (a portfolio where there are no common exposures between the two years).

Underpricing vs. herding and turnover (Table 9)

Portfolio of pricing errors	Dependent variable. Weighted average pricing error (deviation of the loan spread from the spread predicted by the baseline loan pricing model based on the micro characteristics of the loan, see above), in bp, for each bank, for each year. Weighting was done by loan sizes.
liquidity, capital, provisions, reputation	Liquidity ratio, equity to assets, loan loss provisions to loans, league table ranking of bank for year preceding the year of signature of the loan.
Country and sector herding, turnover and specialisation	Bank's country and sectoral herding, portfolio churning and concentration proxies for year concerned. For each bank, herding is calculated as the rank correlation of country and sector reallocation measures between the bank and the market, comprised between -100% and 100%. The portfolio churning proxy is computed as the speed of country and sector reallocation of the portfolio, comprised between 0 and 200. Specialisation is proxied for by the Herfindahl index of the bank's portfolio (calculated for country and sector shares) divided by 100. That measure is comprised between 0 and 100.
Year dummy	
Bank type dummies (supported, large, public)	

Table A.1

Descriptive statistics on selected variables

Variable	Total		Supported		Public		Large	
	Mean	Std	Mean	Std	Mean	Std	Mean	Std
European deal 93-98	0.116	0.320	0.144	0.351	0.219	0.414	0.125	0.331
European deal 99-01	0.072	0.259	0.109	0.312	0.270	0.444	0.088	0.284
Log(loan size)	4.415	1.497	4.821	1.418	4.995	1.448	4.669	1.437
Collateral	0.360	0.480	0.321	0.467	0.264	0.441	0.331	0.471
First time borrower	0.486	0.500	0.458	0.498	0.438	0.496	0.471	0.499
Maturity								
1 to 3 years	0.251	0.433	0.241	0.428	0.314	0.464	0.240	0.427
3 to 6 years	0.404	0.491	0.403	0.491	0.379	0.485	0.408	0.491
> 6 years	0.246	0.431	0.285	0.451	0.272	0.445	0.263	0.440
Loan purpose								
Corporate control	0.233	0.423	0.251	0.251	0.169	0.375	0.245	0.430
Capital structure	0.464	0.499	0.436	0.436	0.299	0.458	0.451	0.498
General corporate purpose	0.203	0.402	0.192	0.394	0.274	0.446	0.198	0.399
Project finance	0.063	0.243	0.080	0.271	0.175	0.380	0.069	0.253
Property finance	0.010	0.098	0.008	0.088	0.006	0.074	0.009	0.092
Borrower sector								
Basic industry	0.116	0.320	0.116	0.320	0.104	0.305	0.112	0.316
Cyclical consumer goods	0.074	0.261	0.062	0.240	0.044	0.206	0.070	0.255
Cyclical services	0.209	0.407	0.196	0.397	0.144	0.351	0.204	0.403
Financials	0.179	0.383	0.189	0.392	0.297	0.457	0.185	0.389
General industry	0.028	0.165	0.028	0.165	0.014	0.118	0.027	0.162
Government	0.008	0.090	0.010	0.102	0.030	0.170	0.009	0.095
Information technology	0.047	0.211	0.038	0.191	0.024	0.153	0.042	0.201
Non-cyclical cons. goods	0.106	0.308	0.098	0.298	0.043	0.203	0.104	0.305
Non-cyclical services	0.096	0.295	0.108	0.311	0.090	0.286	0.103	0.304
Resources	0.078	0.269	0.082	0.275	0.101	0.301	0.079	0.269

Table A.1 (continued)

Descriptive statistics on selected variables

Variable	Total		Supported		Public		Large	
	Mean	Std	Mean	Std	Mean	Std	Mean	Std
Global market liquidity	2.236	0.464	2.249	0.460	2.265	0.436	2.247	0.462
Libor level at signing	5.496	0.821	5.535	0.787	5.678	0.741	5.529	0.805
Loan type								
B-loan	0.000	0.009	0.000	0.008	0.000	0.000	0.000	0.007
Guarantee facility	0.011	0.103	0.013	0.114	0.017	0.128	0.012	0.107
Lease facility	0.003	0.058	0.004	0.062	0.005	0.067	0.004	0.060
Loan facility	0.406	0.491	0.437	0.496	0.633	0.482	0.416	0.493
Multiple facility	0.001	0.022	0.001	0.027	0.000	0.000	0.001	0.024
Note facility	0.005	0.070	0.005	0.072	0.004	0.063	0.005	0.070
Revolving loan	0.557	0.497	0.519	0.500	0.305	0.461	0.544	0.498
Swap facility	0.000	0.006	0.000	0.008	0.000	0.000	0.000	0.007
Temporary facility	0.013	0.114	0.015	0.122	0.021	0.142	0.014	0.119
Trade financing	0.005	0.068	0.005	0.073	0.016	0.126	0.005	0.070
Borrower S&P rating at signing								
AAA	0.003	0.057	0.004	0.061	0.003	0.055	0.004	0.063
AA	0.014	0.119	0.017	0.128	0.011	0.102	0.016	0.127
A	0.062	0.242	0.075	0.264	0.075	0.263	0.069	0.254
BBB	0.063	0.243	0.076	0.265	0.061	0.239	0.072	0.258
BB	0.055	0.229	0.064	0.245	0.040	0.195	0.062	0.242
B	0.052	0.223	0.051	0.219	0.024	0.152	0.051	0.221
CCC	0.003	0.058	0.003	0.052	0.001	0.022	0.003	0.057
Not rated	0.741	0.438	0.707	0.455	0.787	0.410	0.717	0.450
Observations	23,914		13,996		1,991		18,864	