Online Appendix for

"Disentangling the Effects of a Banking Crisis: Evidence from German Firms and Counties"

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Appendix A Firm Summary Statistics

I present summary statistics for the firm panel by six bins of Commerzbank dependence in Appendix Table A.VII. In general, the table shows no linear relationship between Commerzbank dependence and firm characteristics. For instance, mean employment is less than 800 in the top two bins, for firms with Commerzbank dependence over 0.4. Employment is largest for firms in the mid-category, while the bins with low Commerzbank dependence have mean employment between 800 and 1,000. The average wage is fairly stable across the bins. The mean of total liabilities behaves similarly to employment. Firms with no Commerzbank dependence are somewhat of an outlier as they hold a large stock of liabilities given their employment and capital stock. The standard errors are large, however, indicating that the differences between the bins are not statistically significant. To conduct a test with greater statistical power, I pool all firms with a Commerzbank relationship and compare them to firms with zero Commerzbank dependence. I find no statistically significant difference between the two groups (t-statistic: 0.31). Bank loans over total liabilities are similar across bins. This suggests that the degree of Commerzbank dependence is not correlated with firms' dependence on banks.

Appendix Table A.II carries out a regression-based test of whether Commerzbank dependence is correlated with firm observables before the lending cut. I regress firm Commerzbank dependence ($CB\,dep_f$) on a cross-section of firm observables from 2006. The coefficients have the interpretation of the approximate change in Commerzbank dependence following a 100 percent increase in the regressor. Only the coefficient on ln capital has a coefficient that is statistically significantly different from zero. The estimate implies that a 100 percent increase in

the capital stock is associated with a 0.014 decrease in Commerzbank dependence. There is no difference in the value of financial assets or the amount of bank loans. I therefore conclude that while there are slight differences between firms dependent on Commerzbank and other firms in the firm panel, they are not large.

Appendix B   Commerzbank's Trading Losses

This section provides more institutional detail on the trading losses that forced Commerzbank to cut lending.

Appendix B.A   Interpreting Financial Analyst Research Reports

Understanding the details of Commerzbank's trading losses is not trivial, because almost no bank publishes its detailed financial asset holdings. A more promising resource are research reports by financial analysts. I use the investment database Thomson Reuters Investext to extract relevant research reports on Commerzbank before and during the financial crisis. I focus on the period from 2008 to 2009, as these were the loss-making years, extracting all the available reports from Thomson Reuters Investext for this period. I also consider the most relevant reports from the years before and after, to understand the build-up of Commerzbank's trading portfolio and the years after the lending cut. Overall, I analyze the 110 research reports listed at the end of the references section of the Appendix.

I formulate nine questions in Appendix Table A.VIII that relate to the origin and nature of Commerzbank's trading losses. For each question, I begin by counting the number of reports that can provide any relevant information to a question. I then categorize the reports into three categories. Either they offer a clear conclusion (Answer yes/no) or they give information without committing either way (Answer unclear).

To illustrate my method, consider question 1 of Appendix Table A.VIII. This questions asks whether trading income was more volatile at Commerzbank than at other German banks. One report mentions that Commerzbank's trading portfolio remained "resilient when even the large investment banks were struggling", so it gets classified as answering no to question 1 (Kepler Cheuvreux 6/11/2006). Many reports analyze movements in trading income, describing strengths and weaknesses, but do not make an explicit judgment on the relative volatility of the trading portfolio. These get classified as providing an unclear answer to question 1.

Questions 2, 8, and 9 are categorized in the same manner as question 1. Questions 3 to 7 are of a different style, asking whether a certain factor is mentioned explicitly as cause of Commerzbank's losses during the financial crisis of 2008/09. There are no unclear answers for these questions.

Commerzbank announced its acquisition of Dresdner Bank in 2008 and completed it in January 2009. From mid-2008 onward, there are few reports that analyze Dresdner Bank separately, so I report results combining the information for the new, enlarged Commerzbank for the period after 2008. When I generally refer to Commerzbank, this includes Dresdner Bank.

In what follows, I describe the narrative of Commerzbank's trading losses, drawing on the reports of Appendix Table A.VIII, financial statements, and additional secondary sources.

Appendix B.B The Expansion Into Trading During the Early 2000s

From the early 2000s onward, German banks began increasing their international activities. The main actors were the large commercial banks, Commerzbank, Deutsche Bank, and Dresdner Bank (which was acquired by Commerzbank in January 2009), as well as the publicly owned Landesbanken. Unlike their competitors from France, Spain, and Italy, this internationalization was not driven by retail branching into foreign countries. Instead, German banks focused on trading on international financial markets (Hardie and Howarth 2013).

There was political support for this expansion, as Germany was suffering from anemic growth and a recession in 2003. Politicians hoped trading profits would allow banks to raise credit supply. For example, the federal 2003 *Kleinunternehmerförderungsgesetz* (law for the promotion of small businesses) introduced tax benefits for financial institutions involved in securitization, and the 2005 coalition agreement mentioned the development of securitization markets as a policy goal. The securitization of German assets had only been legally regulated from 1997, so these markets were small and unimportant before and during the financial crisis of 2008/09.

Commerzbank took part in this trading expansion, but not to an extraordinary degree relative to the other banks. The share of trading assets out of total assets at Commerzbank rose from 12 percent in 1999 to 22 percent in 2005, the eve of the United States subprime mortgage crisis. The other two large commercial banks had a bigger trading division than Commerzbank already in the 1990s, because

Commerzbank's historic focus had been corporate credit. Dresdner Bank's share of trading assets out of total assets was 35 percent in 2005 (1999 data unavailable), and Deutsche Bank went from 27 percent in 1999 to 45 percent in 2005 (source: bank annual reports). For the Landesbanken, there was a similar range, with HSH Nordbank at 13.4 percent in 2006 and WestLB at 32.5 in 2007 (Hardie and Howarth 2013).

Commerzbank's and Dresdner Bank's increased trading activities coincided with two developments on financial markets. First, the rise of subprime mortgage lending in the United States, which peaked in 2006. German banks invested heavily in investment-grade-rated asset-backed securities based on the United States mortgage market and sold by American investment banks. Second, the expansion of the Icelandic banking sector. The total assets of Icelandic banks increased more than sixfold (in real terms) between 2003 and 2007 and their total assets grew to 10 times the value of Icelandic GDP. The Icelandic banks relied on financing from European bond markets, interbank credit lines, and wholesale market funding (Flannery 2009). By lending to the Icelandic banks, Commerzbank became more exposed to Iceland than the other German banks. However, this was not considered a risky strategy by the analysts at the time.

For the period 2004 to 2007, the research reports relevant to question 1 of Appendix Table A.VIII do not suggest that Commerzbank's and Dresdner Bank's trading income was more volatile or riskier than trading income of Deutsche Bank or the Landesbanken. Nine reports describe the year-by-year changes in trading income at different banks without identifying which banks were more volatile. I classify reports of this kind as giving no clear answer. If indeed there was excess volatility in trading incomes or if analysts believed that the trading portfolio was riskier, one would have expected the analysts to mention this in the reports. The lack of a clear statement can therefore be interpreted as evidence against higher volatility at Commerzbank and Dresdner Bank. Two of the reports mention that Commerzbank's trading income was stable relative to the other banks ("normal trading profit" Deutsche Bank Equity Research 7/02/2006; "trading result continued its remarkable stability" Kepler Cheuvreux 6/11/2006).

The capital ratios of German banks strengthen the impression that Commerzbank did not take on more risk than other German banks before the crisis. In 2005, the tier 1 capital ratio at Commerzbank was at 8 percent, Dresdner Bank at 10 percent, Deutsche Bank at 8.7 percent, and the aggregate of German banks at 7.8 percent.

Appendix B.C   The Relation Between Trading and Loan Portfolios

Question 2 of Appendix Table A.VIII asks whether the loan portfolios of Commerzbank and Dresdner Bank were riskier or more cyclical than other banks'. The answer is no. The research reports considered the loan portfolios of Commerzbank and Dresdner Bank a source of income stability and strength. The reports argue that the banks' long-term banking relationships to firms and households were reliable sources of income, because the German market is based on relationship lending and because the German economy is relatively stable. (For example: "We like Commerzbank, which benefits from relatively high exposure to German corporate lending." Deutsche Bank Equity Research 16/01/2004; Commerzbank's "strong progression in Mittelstand" JPMorgan 10/08/2007; Dresdner Bank's "retail client base is an important lever for revenues" Natixis 22/11/2006). In particular, Commerzbank was known for its strong position in the Mittelstand, the German group of small and medium-sized firms ("firmly established relationships with this client group, which is not easily penetrated by the large international banks, but has demand for a broad range of lucrative products." Bear Stearns & Co. Inc. 5/09/2005). Figure II confirms the remarkable stability of interest income before the lending cut.

There is no evidence in any of the reports that Commerzbank's or Dresdner Bank's trading portfolios were supposed to hedge the loan portfolio (question 3 of Appendix Table A.VIII). The reports analyze the income streams for the lending division entirely separately from the trading and investment banking divisions ("conceptually separate Commerzbank into three banks" CA Cheuvreux 13/11/2008). One would have expected the bank management to point out cross-hedges between the lending and the trading portfolios in their communication to the analysts, in order to convince them that overall income was relatively stable. The fact that they did not suggests there were no such hedges.

Figure II shows that trading income varied in every year between 2004 to 2008, while net interest income remained on a gentle upward trend throughout the period. Following the trading losses in 2008, we would have expected the performance of firms dependent on Commerzbank and net interest income to improve, if there had been a hedging relationship. Instead, there was initially no change in 2008, followed by the firms underperforming and net interest income slowly declining in the following years. Thus the behavior of trading and net interest income confirms that there was no hedging relationship.

Appendix B.D   The Trading Losses 2007-09

Why did Commerzbank suffer severe losses during the financial crisis? None of the 83 relevant reports I examined blame the losses on the German loan portfolio (question 4 in Appendix Table A.VIII). Given the discussion in the previous subsection on the nature of the loan portfolio and the stability of net interest income, this is not surprising. Several reports praise the income generated by the corporate loan and retail divisions from 2007 until the final quarter of 2008, even as trading losses were unfolding. (For example: "Mittelstand once again with a strong performance" ESN/equinet Bank 4/11/2008; Dresdner's "retail business continues to generate healthy returns" Deutsche Bank Equity Research 28/02/2008).

87 percent of reports explicitly mention losses and write-downs in asset-backed securities (ABS) related to the United States subprime mortgage crisis as loss drivers at Commerzbank and Dresdner Bank. These ABS include collateralized debt obligations, residential mortgage-backed securities, and credit default swaps. As the price of the ABS fell, the banks had to write down their values and sell at a loss. The research reports cite figures released by the banks to financial analysts to underscore the influence of the ABS on the banks. Dresdner Bank lost 1.3 billion Euro on its ABS trading portfolio in 2007, which on its own can explain around 75 percent of the difference in its trading income to the previous year. The remainder is accounted for by spill-over effects from the subprime mortgage crisis to other financial markets, as liquidity and confidence in trading markets declined (breakdown of figures in CA Cheuvreux 24/04/2008). The story for Commerzbank is similar, as around 84 percent of its 2007 trading losses are due to losses in subprime ABS (Credit Suisse - Europe 25/03/2008).

By mid-2008, Commerzbank and Dresdner Bank were severely weakened, but there were no acute fears of bankruptcy. They were in a similar position to the other German banks (Commerzbank "handled the financial crisis relatively well" Kepler Cheuvreux 7/08/2008; "Dresdner has not done worse than other banks" Deutsche Bank Equity Research 28/02/2008). This changed when Lehman Brothers declared insolvency on 15 September 2008. As wholesale funding markets froze, the three large Icelandic banks were taken into government custody in October 2008, and their international creditors lost their deposits. Figures released to analysts by Commerzbank and Dresdner Bank confirm that the bulk of the losses in 2008 and 2009 can be explained by the ABS trading portfolios and items that had to be written down because of Lehman Brothers' and the Icelandic banks' insol-

vency (see, for instance, ESN 1/12/2009 and Credit Suisse - Europe 26/02/2009). These were the main factors behind the equity capital shortages at Commerzbank and Dresdner Bank (questions 5 to 7 in Appendix Table A.VIII).

The importance of the insolvency of Lehman Brothers and the Icelandic banks can be seen in the timing of the 2008 quarterly results. Both Commerzbank and Dresdner Bank achieved positive earnings in the first and second quarters. The significant 2008 losses that we see in Figure II are entirely driven by third and fourth quarter trading losses and write-downs. Losses related to ABS write-downs continued throughout 2009.

The German bond markets did not deteriorate in this period, so Commerzbank's and Dresdner Bank's ABS losses were unrelated to the German economy. Germany saw a low default rate of around 0.3 percent for securitized transactions issued between 2005 and 2007, while in the United States subprime mortgage market the default rate was around 20 percent (International Monetary Fund 2011). The index for German mortgage covered bonds (iBoxx Euro Hypothekenpfandbriefe) rose by 18 percent between the end of 2006 and 2009. The index for German corporate bonds (RDAX) gained 17 percent in the same period. In comparison, the index for US AAA-rated subprime ABS (ABX.HE-AAA 07-1) fell by around 65 percent and the index for A-rated subprime ABS (ABX.HE-A 07-1) by over 95 percent.

The reason for the trading losses was the failure of the management of Commerzbank and Dresdner Bank to recognize the institutional instability that the financial crisis had caused in other institutions. Commerzbank wrote in its 2008 annual report: "We were encouraged by the US Treasury Department's rescue of Bear Stearns and for too long shared the market's mistaken belief that Lehman was too big to fail." Similarly, it had been too tentative in reducing its exposure to the Icelandic banks.

This is what differentiated it from Deutsche Bank, which profited from consequently hedging its ABS portfolio and shorting the subprime mortgage market, after the first signs of distress became apparent in 2007 (Fox-Pitt Kelton Cochran Caronia Waller 2/01/2008; O'Donnell and Nann 2008; Landler 2008). A number of Landesbanken followed a similar trading strategy as Commerzbank, for example Bayern LB, Sachsen LB, and West LB. However, they were publicly owned, and could rely on quick government funding at all stages of the crisis, preventing equity capital shortages and hence a lending cut (see Appendix E for details on the Landesbanken).

Appendix B.E   Commerzbank's 2009 Acquisition of Dresdner Bank

The insurance company Allianz had acquired Dresdner Bank in 2001. The aim was to exploit economies of scale and build a nationwide branch network offering "bankassurance", the combined retail of banking and insurance products. By 2007, it became clear that the plan had failed. The research reports and the media blamed management errors and the complexity of the task of merging the world's largest insurer with Germany's third-largest bank (CA Cheuvreux 24/04/2008). In late 2007 Allianz decided to give up the plan of "bankassurance", sell Dresdner, and refocus on its core business of insurance.

Commerzbank's management had first expressed interest in expanding in 2007. Commerzbank wanted to enlarge its German retail banking customer base and it was worried about being a takeover target itself (Schultz 2008). Dresdner Bank, with its solid and traditional retail banking division, was a natural option. The proposed acquisition got much political support, as German politicians were fond of the idea of a second "national banking champion", next to Deutsche Bank. German finance minister Steinbrück and Commerzbank head Blessing appeared on national television together to explain the deal.

Commerzbank and Dresdner Bank had got relatively well through the first two quarters of 2008. The acquisition plan was announced on 31 August 2008 and to be completed on 12 January of 2009. The analyst reports welcomed the deal. Out of eleven reports released around the time of the announcement, nine were explicitly positive (question 8 in Appendix Table A.VIII). Morgan Stanley, for instance, welcomed the deal as "making perfect strategic sense" (Morgan Stanley 1/09/2008). One report delivered no clear judgment, and one argued the purchase price Commerzbank had to pay was too high.

The unexpected Lehman Brothers bankruptcy threw both banks into severe financial distress. Given their similar trading strategy discussed in the previous subsection, it is not surprising that the Commerzbank and Dresdner Bank contributed approximately evenly to the 12 billion Euro in negative profits and write-downs of the combined, enlarged Commerzbank in 2008 (based on my own calculations using the banks' annual reports). 48 percent of the 12 billion Euro were due to operations at the "old" Commerzbank and 52 percent due to the "old" Dresdner Bank. It is thus likely that both banks would have had to cut lending even if it had not been for the acquisition. Testing for heterogeneity, I find that the lending cut affected firms and counties similarly, independent of whether they were initially served by

Commerzbank or Dresdner Bank.

Appendix B.F   Recovery by 2011

The German government fund Soffin supported Commerzbank twice, on 3 November 2008 and on 8 January 2009, but was unable to entirely prevent a lending cut. Overall, Soffin provided Commerzbank with 18.2 billion Euro in equity and bought a 25 percent stake in the bank, around two-thirds of Soffin's total engagement. Commerzbank was the only large lender in Germany to be subsidized by Soffin. Only three other, specialized banks received capital from Soffin (two smaller real estate banks, Aareal Bank and Hypo Real Estate Group, and the former Landesbank West LB/Portigon), which shows that Commerzbank was uniquely affected.

The equity capital losses had forced Commerzbank to shrink its assets, in order to improve the tier 1 capital ratio, reduce risk exposure, and gain the trust of investors. This resulted in a lending cut to its customers in 2009 and 2010. The Commerzbank management subsequently refocused the bank on its core business of lending to German firms and households, whilst downsizing the trading and investment banking division. The research reports generally comment favorably on the success of the new strategy (question 9 in Appendix Table A.VIII). Losses due to the subprime mortgage crisis are not mentioned anymore from 2011. One key piece of evidence for Commerzbank's recovery is that around 14.3 billion of the 18.2 billion in equity had been repaid by Commerzbank to the government by mid-2011. From 2010 onward, lending by Commerzbank moved in parallel to other commercial banks once again (Figure I).

Appendix C   Further Firm Survey Results

Appendix Table A.IX reports robustness checks on the survey results of Section III.A. Column (1) shows that the effect in 2009 is not driven by the inclusion of the lagged dependent variable from 2006. The effect also remains stable and statistically significant at the 10 percent level when including county fixed effects in column (2). The year 2003 is an interesting comparison to 2009, because it was also a recessionary year. It is the first year, in which the question on bank loans was asked in the survey. The results in columns (3) to (6) of Appendix Table A.IX show no association between Commerzbank dependence and bank loan supply or firms' product demand conditions in 2003. This implies that Commerzbank's loan supply

was not more cyclical than other banks'. It also suggests that firms dependent on Commerzbank did not face different demand conditions in recessions.

I examine three survey questions on demand conditions, to test whether differences in product demand might affect the performance of firms dependent on Commerzbank. Appendix Table A.X analyzes responses to the question "Are your business activities constrained by low demand or too few orders: yes or no?", Table A.XI to "Currently we perceive our backlog of orders to be: comparatively large, sufficient / typical for the season, or too small?", and Table A.XII to "Tendencies in the previous month - The demand situation has: improved, remained unchanged, or deteriorated?". Firms are asked these questions at multiple times during the year, so I use the annual average of responses as outcome variable in the regressions. For these demand questions, none of the coefficients on Commerzbank dependence are statistically significant in any year, and most are of small magnitude. This indicates that neither before, during, or after Commerzbank's lending cut were there differences in the product demand for firms dependent on Commerzbank.

Appendix D Firm Financial Assets

The bulk of Commerzbank's trading losses occurred between 2007 and 2009. I test whether firms dependent on Commerzbank experienced a decrease in the value of their financial assets at the same time. If Commerzbank gave firms investment advice correlated with the strategy of its own trading division, one would expect such an effect.

Appendix Table A.XIII presents the results. The outcome is the symmetric growth rate of the value of the firm's financial assets in the given period. If a firm begins and ends the period with no financial assets, the growth rate is set to zero. There is no association between Commerzbank dependence and the change in financial assets from 2007 to 2009. The insignificant point estimate in column (2) implies that the growth of financial assets from 2007 to 2009 at a firm fully dependent on Commerzbank was 3.6 percentage points higher than at a firm with no Commerzbank relationship. This result makes sense, given that the analyst reports presented in Appendix B suggest there was little coordination across the trading and corporate lending divisions at Commerzbank. Columns (1) analyzes the year before 2007, column (3) the year after 2009, column (4) a bivariate specification without controls, and column (5) adds county fixed effects. There is no significant effect in any specification.

Appendix E   An Identification Strategy Based on Savings Banks' Support to the Landesbanken

Appendix E.A   The Literature Analyzing Affected Savings Banks

Germany has eleven Landesbanken. Each operates in a restricted region, either one federal state or a group of states. The Landesbanken are jointly owned by the federal states and the savings banks of their region. During the financial crisis, five Landesbanken announced significant losses in their trading portfolios: Sachsen LB, HSH Nordbank, WestLB, Bayern LB, and Landesbank Baden-Württemberg. Following Popov and Rocholl (2015), I define a savings bank to be "affected" if it owns one of the five Landesbanken with trading losses during the crisis.

Puri et al. (2011), Hochfellner et al. (2015), and Popov and Rocholl (2015) argue that the affected savings banks financially supported the Landesbanken they owned, and that this led the savings banks to cut lending. Below, I add further evidence to their analysis. First, I find little evidence that affected savings banks contributed significantly to the support measures to the Landesbanken, lost equity capital, or reduced lending following losses at their Landesbanken.[1] Second, I replicate the findings in Popov and Rocholl (2015) (henceforth PR). I show that the correlation between firm performance and affected savings banks disappears once I add the firm-level controls I use in my paper. There is also no association between firm growth and having an affected Landesbank as relationship bank, and there is no effect on counties.

Appendix E.B   The Public Support Measures to the Landesbanken

Appendix E.B.1   Support to Sachsen LB

A detailed narrative for the case of Sachsen LB, the first Landesbank to announce losses, is available from the European Commission investigation report on whether the public support given to Sachsen LB constituted illegal state aid (Kroes 2008). In the middle of August 2007, financial markets became suspicious that Sachsen LB was heavily affected by the subprime mortgage crisis. The bank was unable to finance itself on wholesale markets as a result.

On 17 August, the funding problems were publicly announced. On the same day, German banking regulators, the state government of Saxony, and represen-

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[1]A research report by Fitch confirms this: "Sparkassen-Finanzgruppe Vollständiger Ratingbericht", 15 July 2014, page 16

tatives of the savings banks and other Landesbanken agreed that the other Landesbanken and DekaBank (jointly owned by all the German Landesbanken and all German savings banks) would purchase a set of subprime assets from Sachsen LB. On 26 August, the Landesbank Baden-Württemberg agreed to take over Sachsen LB and immediately injected capital. When further unexpected losses arose in late 2007, the state government of Saxony provided a guarantee for losses from Sachsen LB's securities portfolio of 2.75 billion Euro to Landesbank Baden-Württemberg, in addition to financing a separate investment vehicle that contained troubled assets with 8.75 billion. Sachsen LB and Landesbank Baden-Württemberg were not required to pay back the public funding. Because Sachsen LB was publicly owned, the public support measures were decided within days after it ran into difficulties. There was only a very short period of distress, during which Sachsen LB and the associated savings would have had time to cut lending.

The European Commission does not mention any capital injections or guarantees by the regional savings banks of Saxony to Sachsen LB. The annual report of the savings banks that partially owned Sachsen LB (Sachsen Finanzgruppe Geschäftsbericht 2007, page 4) reports "the sale of Sachsen LB produced no financial burden for the savings banks." The average equity capital of the savings banks that partially owned Sachsen LB grew by 8 percent in 2007, the year of Sachsen LB's distress and subsequent sale. As comparison, Commerzbank lost 68 percent of its equity capital from 2007 to 2009. The aggregate equity capital of German banks except Commerzbank rose by seven percent from 2007 to 2009. Overall, there is little evidence to suggests that the savings banks were strongly affected by the losses at Sachsen LB.

Appendix E.B.2   Support to HSH Nordbank

In 2008, the owners of HSH Nordbank provided 2 billion Euro of equity capital to the bank (Almunia 2011a). The savings bank association of Schleswig-Holstein contributed 78 million Euro of this in the form of silent participation and 170 million Euro in the form of a convertible bond. Following further losses, a second rescue package in 2009 included 3 billion Euro in equity capital and liquidity guarantees totaling 27 billion. The savings banks did not participate in this second package. The contribution of the savings banks to the support measures to HSH Nordbank amounted to less than one percent of the total package and to 0.7 percent of the savings banks' 2008 total assets. Lending to businesses by the savings banks

of Schleswig-Holstein rose by 3.8 percent and new mortgage issuance rose by 17 percent in 2008 (data from the annual reports).

Appendix E.B.3   Support to West LB

The European Commission (Almunia 2011b) reports two support measures for WestLB from 2007 to 2010. The first measure in January 2008 was a guarantee to secure toxic assets held in WestLB's subsidiary Phoenix Light. The savings banks association of North-Rhine Westphalia guaranteed 1 billion Euro. The federal state and municipal governments guaranteed 4 billion Euro.

The second measure in November 2009 involved a 3 billion Euro capital injection by Soffin, the German government fund. In addition, it was agreed that the savings banks would only be responsible for 4.5 billion Euro of losses, independent of what the actual requirements of WestLB would be. These 4.5 billion Euro would have to be paid only after 25 years. In the meantime, the government would guarantee for the amount. Under standard financial regulations, the savings banks would have been responsible for 50 percent of losses immediately, as they held a 50 percent stake in WestLB. The combined equity capital of savings banks in 2008 was 14.4 billion Euro. This capital buffer and the possibility to accrue earnings over 25 years before paying for losses ensured the savings banks would not become insolvent due to their involvement with WestLB. The support measures for WestLB occurred in 2008 and 2009. Between the end of 2007 and 2009, the aggregate equity capital of savings banks in North-Rhine Westphalia rose by 11 percent.

Appendix E.B.4   Support to Bayern LB

Bayern LB reported losses from its exposure to asset-backed securities starting in February 2008. In December 2008, Bayern LB received 10 billion Euro in equity capital and a guarantee for losses of 4.8 billion from the federal state government of Bavaria. The savings bank association of Bavaria did not contribute to these measures (Almunia 2013). The losses at Bayern LB led to write-downs of a moderate size at the Bavarian savings banks, a total of 0.5 billion Euro in the year 2008, relative to total assets of 160 billion Euro (Krämer 2009). All Bavarian savings banks recorded a positive profit for 2008. The annual reports of Bayern LB state that aggregate loans by the savings banks in Bavaria rose by 4 percent between the end of 2007 and 2009.

Appendix E.B.5   Support to Landesbank Baden-Württemberg

Until late 2008, Landesbank Baden-Württemberg had not recorded serious losses. It was perceived strong enough by its management to take over Sachsen LB in 2007 (Kroes 2009). But after the Lehman Brothers insolvency, Landesbank Baden-Württemberg urgently required funding due to write-downs and trading losses on securities. On 21 November, Landesbank Baden-Württemberg announced that it would receive 5 billion Euro in equity capital from its owners. The contribution was in proportion to the ownership share (Gubitz 2013). The state's savings banks association owned 35.6 percent of Landesbank Baden-Württemberg and therefore contributed 1.8 billion Euro. This is not a negligible amount, considering the aggregate equity capital of the savings banks in Baden-Württemberg was 7.1 billion Euro at the end of 2007. Nevertheless, between the end of 2007 and 2009, the aggregate equity capital of savings banks in Baden-Württemberg rose by 6 percent. Lending to non-banks increased by 5 percent (data from the annual reports).

Appendix E.B.6   Lending by the Affected Savings Banks

I analyze the Bureau van Dijk database Bankscope, which reports the lending stock for over 90 percent of the German savings banks.[2] I find that the affected savings banks, on average, increased their lending to non-financial customers by 2 percent between 2006 and 2008, and by 7 percent from 2006 and 2010. This suggests they did not cut lending. To test this conclusion further, I run bank-level regressions of the growth of lending on a dummy for affected savings banks. I use the change in lending between 2006 and 2010 as outcome.

The results are in Appendix Table A.XIV. Column (1) compares the affected to unaffected savings banks. Savings banks across Germany are similar in structure, scope, and customer type, so this is a natural comparison. Affected savings banks grew their lending by 8 percent more relative to the unaffected.[3] Column (2) compares the affected savings banks to all similar banks, by adding dummies for bank size, federal state, cooperative banks, real estate banks, and commercial banks. Column (3) controls for the pre-trend. The outcome in column (4) is the change in lending between 2006 and 2008. Column (5) uses the symmetric growth of lending between 2006 and 2010 as outcome to limit the influence of outliers.

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[2]Bankscope also includes information on the history of the banks, including bank mergers. I hand-code all mergers since 2006 based on this information. For the years before a merger, I sum the lending stock of the merging banks, and keep one observation per institution, as of 2012.

[3]The results are unchanged when I weight regressions by the banks' lending stock in 2006.

There is no evidence in any specification that affected savings banks reduced their lending relative to other banks.

The savings banks that owned WestLB and Landesbank Baden-Württemberg contributed more to the rescue of their respective Landesbanken than the other affected savings banks, as I describe above. I add a dummy for affected savings banks in these two regions in column (6). The point estimate is positive, small, and insignificant, which indicates no difference in loan growth.

Appendix E.C   The Relationship Between Affected Savings Banks and Firm Employment

The results on equity capital and lending in the previous subsection raise the question whether the correlation between relationship to an affected savings bank and firm employment losses in PR can be interpreted as a causal effect. I extend the analysis in PR to examine this question. I replicate the sample in PR using the description in their paper. I use my Creditreform dataset to identify firms' relationship banks in the year 2006. The treatment variable is a dummy for whether a firm has an affected savings bank among its relationship banks, interacted with a dummy for the treatment period in PR, the years 2009 to 2012.

PR present their main results in Table 3 of their paper. They find that firms with an affected savings bank among their relationship banks reduced employment by an average of 1.1 percent in the period 2009 to 2012. The results of my replication exercise are in Appendix Table A.XV. In all the regressions, standard errors are clustered at the level of the firm. Columns (3) to (7) estimate panel specifications identical to PR. The point estimate in column (3) implies an employment loss of 0.5 percent at firms with an affected savings bank among their relationship banks. Columns (1) to (2) of Appendix Table A.XV estimate cross-sectional specifications, using my large employment cross-section dataset. The outcome is the ln employment difference between 2008 and 2012, which corresponds to the ln outcome variable in PR. The estimate in column (1) implies that firms with an affected savings bank among their relationship banks experienced an employment loss of 1.5 percent. The coefficient is statistically significant at the 1 percent level. Hence, I can replicate their findings.

I propose two additional control variables. These are the age and industry of the firm, measured in the year 2006. Firm age is important because the literature has frequently found correlations between age and growth (Haltiwanger et al. 2013).

In my data, dependence on an affected savings bank is positively and significantly correlated with age, even when conditioning on firm size. The reason is that savings banks traditionally have a public mandate to lend to business startups. I control for industry at the two-digit level of the German classification scheme WZ2008. Since savings banks only operate in their municipality, differences in the industrial composition of the municipal economy will lead to differences in the exposure of banks to industries. Controlling for ln age and industry shrinks the estimate in the employment cross-section dataset in column (2) towards zero, and it becomes statistically insignificant. Similarly, the point estimate in the panel specification of column (4) switches sign to positive, is of small magnitude, and insignificant. The 95 percent confidence interval in column (4) excludes employment losses greater than 0.5 percent. The coefficient on age has the expected negative sign and is significant.

Column (5) uses fixed effects for age bins, rather than ln age, to control for age-related differences in employment growth. The three age bins are for firms founded before 1990, from 1990 to 2000, and after 2000. The coefficient on savings banks remains small, positive, and statistically insignificant. Column (6) adds a number of controls that PR propose: the natural logarithm of firm assets, the capital-to-assets ratio, the profit-to-assets ratio, and the cash flow-to-assets ratio. To measure profits, I use the German balance sheet item Betriebsergebnis and to measure cash-flow I use Jahresüberschuss. PR control for the annual, time-varying value of these variables. This could be problematic, because assets, capital, profit, and cash-flow are likely to be outcomes of a credit shock. The coefficient on the affected savings banks in column (6) remains positive, but becomes statistically significant, suggesting the estimates are biased.

In column (7), I add a dummy to the specification that indicates whether the firm has a Commerzbank branch among its relationship banks, interacted with a post-treatment dummy. This measures a firm's relationship to Commerzbank the same way that PR measure a firm's relationship to an affected savings bank. The coefficient is significant at the 1 percent level. It implies that firms with Commerzbank as one of their relationship banks reduced employment by 1.9 percent. I also test whether firms that had one of the affected Landesbanken as relationship bank reduced employment. The coefficient is close to zero and statistically insignificant.

Appendix E.D   The Relationship Between Affected Savings Banks, Regional Growth, and Household Debt

I call a county "affected" if it is served by one of the affected savings banks. I test if affected counties grew more slowly using a county panel specification, such as the one in Table VIII, column (1). The coefficient on the dummy for affected counties is 0.009 (standard error: 0.008). Thus, there is no effect of dependence on affected savings banks on county growth.

I examine the relationship between household debt and affected savings banks by using the nationally representative GSOEP. Around one-third of total bank loans to German households are issued by the savings banks and Landesbanken, so changes in their household loan supply may have significant consequences. The regressions I run are equivalent to the ones I report in Table V of my paper. The outcome is the symmetric growth rate of private debt from 2007 to 2012. 97 percent of GSOEP respondents entered the information before August 2007, so the observation for 2007 represents the state before the losses at the Landesbanken were announced. The regressor of interest is a dummy for individuals in affected counties. The coefficient on the dummy is small and insignificant at -0.01 (standard error: 0.03). Controlling for ln mortgage debt in 2002, ln other debt in 2002, and a dummy for any debt in 2002, the coefficient on the dummy becomes positive, but remains insignificant and small (point estimate: 0.01, standard error: 0.03). This suggests that household debt in the affected counties did not change.

Appendix F   An Identification Strategy Based on Other Banks' Trading Losses

Appendix F.A   The Literature on Other Banks with Trading Losses

A recent paper by Dwenger et al. (2015) (henceforth DFS) uses two instruments to identify exogenous variation in German firms' bank loan supply in the recent crisis. The first is a firm's dependence on an affected savings bank, which is the same variation PR use. I discuss this in detail in Appendix E. The second instrument in DFS is the average of the trading losses of the firm's relationship banks. In their Table 1, DFS list the main German banks affected by trading losses. The table includes a number of Landesbanken, IKB, Deutsche Bank, HypoVereinsbank, DZ Bank, KfW, and Commerzbank (including Dresdner Bank).

Below, I extend the analysis in DFS by showing that their results are entirely

driven by Commerzbank's lending cut. I find no evidence for a lending cut by any other bank. I then explain why the trading losses did not force other banks to cut lending. A number of institutional details played a role, such as a banks' hedging strategies, ownership structures, and pre-crisis capital buffers.

Appendix F.B   Replicating the Dataset of DFS

I follow Section 3 and Footnote 27 of DFS to replicate their dataset. Their sample spans the years 2006 to 2010. As first regressor, I calculate the firm's fraction of relationship banks that had trading losses, out of all the firm's relationship banks. I call this the firm's dependence on banks with trading losses. I define banks with trading losses as the banks listed in Table 1 of DFS. As an example: If a firm has two relationship banks, one being IKB and the other Commerzbank, the dependence on banks with trading losses would be 1. I also calculate the firm's dependence on all the other banks with trading losses, except Commerzbank. The firm from the previous example would have a value of 0.5 for this measure. DFS use two outcome variables, the ln annual growth rates of employment and fixed assets.

Appendix F.C   The Relationship Between Banks with Trading Losses and Firm Employment

Appendix Table A.XVI presents results for the type of specification used by DFS. Column (1) shows a negative and statistically significant effect on employment of dependence on a bank with trading losses. It implies that the annual growth rate of employment at a firm fully dependent on banks with trading losses was 1.2 percentage points lower in the years 2006 to 2010. This is the reduced-form effect that DFS capture in their IV specification of their Table 5. Column (2) tests the robustness of the coefficient by adding the firm controls from my paper. These controls are not in DFS. The coefficient falls to one-third of its value and becomes statistically insignificant.

In column (3), I split the regressor into two. I include my measure of firm Commerzbank dependence and the measure of dependence on all the other banks with trading losses, except Commerzbank. The coefficient on Commerzbank is negative and statistically significant. It implies a reduction in the annual employment growth of firms entirely dependent on Commerzbank by 1.1 percentage points.[4]

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[4]The coefficients in Table VI refer to the employment loss over four years, while this point estimate refers to the annual loss. Therefore, both types of regression estimate an employment loss

The point estimate on the measure of dependence on the other banks with trading losses is positive, small, and insignificant. Columns (4) and (5) replace the interaction dummy d with a dummy for the years 2008 to 2010 and a dummy for 2007 to 2010, respectively. This tests whether the other banks had an effect in the early years of the financial crisis. I find no effect. In column (6), I add the lagged growth rate of sales to the specification, as suggested by DFS. I also add county fixed effects interacted with d. This controls for cross-regional differences, for example due to regional demand shocks or differences in business regulation. The coefficients remain similar.

I investigate whether the zero coefficient on the other banks with trading losses masks heterogeneous effects across the individual banks. I have already examined the affected Landesbanken in Appendix E, so here I focus on the other banks mentioned in Table 1 of DFS. I add measures of dependence on each of these banks to the regression in column (7). None of the point estimates are statistically significant and they all imply smaller losses than the coefficient on Commerzbank dependence. In column (8), I use the annual growth rate of fixed assets as the outcome variable and run the same specification. The results confirm that there was no significant effect of dependence on these banks on firm growth.

The first three columns of Appendix Table A.XVII re-examine the employment effect of dependence on banks with trading losses using the sample and specification of my large employment cross-section. The results are similar to what I find when I use the sample and specification of DFS.

As a final check, I run county-level regressions analogous to the ones reported in Table VIII. The outcome is ln county GDP. The regressor of interest is the average dependence of firms in the county on other banks with trading losses, except Commerzbank, interacted with a dummy for the years 2009 to 2012. I find a small and insignificant coefficient on the county dependence on these other banks with trading losses, in unreported results. The effect of county Commerzbank dependence in the same regression remains robust.

Appendix F.D Institutional Details on the Other Banks With Trading Losses

I briefly explain why trading losses at these other banks did not have effects on firms. The case of KfW is similar to the Landesbanken discussed in Appendix E.

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between 4 to 5 percent from Commerzbank's lending cut, despite the considerable differences in sampling design and specification.

It is the national development bank, jointly owned by the government of Germany and the federal states. When trading losses at KfW became apparent, the government immediately stepped in. In fact, KfW was charged with several public credit extension programs to help households during the financial crisis. For example, KfW raised its mortgage commitments to households by 26.5 percent during the crisis.

IKB does not play an important role in the loan supply of German firms. In my Creditreform sample of relationship banks, only 0.1 percent of firms list IKB as one of their relationship banks. For the firms that do have an IKB relationship, over 90 percent have at least two other relationship banks. Therefore, when IKB became financially affected, firms were able to switch to their other relationship lenders. Similarly, in Table VI I find that firms with positive, but low Commerzbank dependent did not cut employment following Commerzbank's lending cut.

DZ Bank and HypoVereinsbank had large equity capital buffers, so they were able to absorb trading losses relatively well. The tier 1 capital ratio at DZ Bank was 14 percent in 2006. DZ Bank is the central bank of the cooperative sector and owned by the cooperative banks, which were not generally affected by the crisis and would have been able to provide support in the hypothetical scenario of a capital shortage. Similarly, the tier 1 capital ratio of HypoVereinsbank was 15.7 percent in 2006. HypoVereinsbank is part of the international UniCredit Group, which eased its access to funding.

Deutsche Bank profited from consequently hedging its ABS portfolio and shorting the subprime mortgage market, after the first signs of distress became apparent in 2007 (see the research report by Fox-Pitt Kelton Cochran Caronia Waller, "European Banks: Credit Crisis - Stock Impact", 2 January 2008). While it made losses on the ABS trading portfolio, these were evened out by its hedging strategy. This enabled Deutsche Bank to expand its lending in Germany during the financial crisis. For example, mortgage lending in its private customer division rose by 21.7 percent between 2007 and 2010.[5]

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[5]The point estimates on Deutsche Bank dependence in columns (7) and (8) of Appendix Table A.XVI are both negative and statistically insignificant. In column (4) of Appendix Table A.XVII, I show that this is not a general pattern. The sample is the large employment cross-section and the outcome is the ln employment growth rate. The coefficient on Deutsche Bank dependence is small, statistically insignificant, and positive.

Appendix G   A Proxy for the Change in Bank Loans

Data on county-level loans are not available in Germany. This section proposes a proxy to measure by how much county-level bank loans fell due to Commerzbank's lending cut.

Appendix G.A   Constructing a Proxy for the Change in Bank Loans due to Commerzbank's Lending Cut

The proxy for county-level bank loans is based on two quantities. First, the aggregate reduction in bank loans by Commerzbank. I calculate this as the difference between Commerzbank's lending stock to German customers in 2007 and a counterfactual value for 2010. To calculate the counterfactual value, I assume that in the absence of the trading losses, Commerzbank's lending stock would have developed in parallel to the other banks from 2007 to 2010.

The second quantity aims to measure the share that loans to each county took in Commerzbank's loan portfolio before the lending cut. I use the Creditreform dataset of relationship banks to measure this. For each firm, I calculate how many Commerzbank branches are among its relationship banks. I sum the number of Commerzbank relationships in each county. Similarly, I sum the number of Commerzbank relationship in the whole dataset. The second quantity is then the number of Commerzbank relationships in each county divided of Commerzbank relationships in the whole dataset. I call this second quantity the "Commerzbank loan share of the county."

The product of the two quantities is a proxy for how much bank loans fell in a county because of Commerzbank's lending cut. The accuracy of this proxy relies on two assumptions. The first assumption is that the Commerzbank loan share of the county (the second quantity) can be accurately measured using the method described above. This requires that the number of Commerzbank relationships in the Creditreform dataset is proportional to the true number of relationship for each county. To gauge how likely this assumption is to hold, I use the German Business Register as benchmark. There are some differences between the Creditreform dataset and the Business Register. For example, in the Business Register, 13.9 percent of firms are located in the former GDR (excluding Berlin). In the Creditreform dataset, it is 17.2 percent. If this represents a consistent bias towards the former GDR, the proxy would overestimate the lending cut to counties in the former GDR.

The second assumption states that Commerzbank reduced its lending to a county in proportion to the Commerzbank loan share of the county (the second quantity). Figure A.II shows that the effect of Commerzbank dependence on bank loans is stable across different dimensions of firm heterogeneity, which supports this assumption.

Appendix G.B   Result Using the Proxy

I turn to estimating the effects of changes in bank loans on GDP growth, using the proxy calculated above. The outcome is county GDP growth between 2008 and 2012, normalized by the level of county GDP in 2007. The regressor of interest is the proxy, also normalized by county GDP in 2007. This eases the interpretation of the coefficient as the effect of a one Euro increase in bank loans on the level of GDP. The control variables, weights, and standard error calculations are identical to Table VIII. The (unreported) results imply a one Euro decrease in bank loans leads to a 1.58 Euro fall in GDP, with a standard error of 0.53. In comparison, Peek and Rosengren (2000) find that a one USD drop in bank loans corresponds to a loss of USD 1.11 in construction activity. The regression using the proxy therefore confirms that the lending cut lowered county growth. It is important to recall that the estimate is likely to overstate the causal effect of bank loans, because there are multiple other channels through which a lending cut affects firm and county growth (see Section I.A).

Appendix H   The Effect of Export Dependence on Counties and Firms

Section VI.B shows that the effects of Commerzbank's temporary lending cut persisted beyond the duration of the lending cut. Are such persistent effects a general response to economic shocks? In this section, I use the fall in export demand during the Great Recession to investigate whether the effects of export demand shocks persist (Behrens et al. 2013; Eaton et al. 2016).

I exploit heterogeneity across firms and counties in export dependence. Aggregate trade statistics show that German real exports fell by 14.3 percent from 2008 to 2009. By 2011, exports had recovered, as they grew by 24 percent from 2009 to 2011. If export demand shocks only have transitory effects, then counties and firms with high export dependence should have experienced lower growth during the years of the export demand shock, but by 2011 they should have recovered.

For both firms and counties, I construct a dummy variable for being in the top quartile of the distribution of the export share. Appendix Table A.XVIII reports that GDP in export-dependent counties was on average 1.1 percent lower in 2009 and 2010. The point estimate for 2011, however, is of the opposite sign, larger in absolute terms, and statistically different. This means that export-dependent counties entirely made up the output shortfall in under two years. The dynamics are similar for firms, as shown in Appendix Table A.XIX. Employment at export-dependent firms was on average 1.8 percent lower in 2009 and 2010. But by 2011, they had recovered to the level of the other firms, outgrowing them by 2 percent in 2011. Hence, export-dependent firms and counties converged to the growth path of unaffected firms and counties in under two years.

Appendix References

Almunia, Joaquin, "Beschluss der Kommission vom 20.09.2011 über die staatliche Bei-hilfe C 29/2009 (ex N264/2009) der Bundesrepublik Deutschland an die HSH Nord-bank," 2011. European Commission Directorate-General for Competition.

— , "Beschluss der Kommission vom 20.12.2011 über die staatliche Beihilfe C 40/2009 und C 43/2008 für die Umstrukturierung der WestLB AG," 2011. European Commission Directorate-General for Competition.

— , "Beschluss der Kommission vom 05.02.2013: Staatliche Beihilfe SA.28487 (C 16/2009 ex N 254/2009) Deutschlands und Österreichs zugunsten der Bayerischen Lan-desbank," 2013. European Commission Directorate-General for Competition.

Behrens, Kristian, Gregory Corcos, and Giordano Mion, "Trade Crisis? What Trade Crisis?," *Review of Economics and Statistics*, 2013, *95* (2), 702–709.

Dwenger, Nadja, Frank M. Fossen, and Martin Simmler, "From Financial to Real Economic Crisis: Evidence from Individual Firm-Bank Relationships in Germany," 2015. DIW Berlin Discussion Paper 1510.

Eaton, Jonathan, Samuel Kortum, Brent Neiman, and John Romalis, "Trade and the Global Recession," *American Economic Review*, 2016, *106* (11), 3401–38.

Flannery, Mark J., "Iceland's Failed Banks: A Post-Mortem," *Report for the Icelandic Special Investigation Commission*, 2009.

Gehrke, Birgit, Rainer Frietsch, Peter Neuhäusler, Christian Rammer, and Mark Leidmann, "Listen wissens- und technologieintensiver Güter und Wirtschaftszweige," 2010. Studien zum deutschen Innovationssystem 19-2010.

— , — , — , — , **and** — , "Neuabgrenzung forschungsintensiver Industrien und Güter," 2013. Studien zum deutschen Innovationssystem 8-2013.

Gubitz, Benjamin, *Das Ende des Landesbankensektors: Der Einfluss von Politik, Management und Sparkassen*, Springer Gabler, 2013.

Haltiwanger, John, Ron S. Jarmin, and Javier Miranda, "Who Creates Jobs? Small Versus Large Versus Young," *Review of Economics and Statistics*, 2013, *95* (2), 347–361.

Hardie, Iain and David Howarth, *Market-Based Banking and the International Financial Crisis*, Oxford University Press, 2013.

Hochfellner, Daniela, Joshua Montes, Martin Schmalz, and Denis Sosyura, "Winners and Losers of Financial Crises: Evidence from Individuals and Firms," 2015.

International Monetary Fund, "Germany: Technical Note on the Future of German Mortgage-Backed Covered Bond (Pfandbrief) and Securitization Markets," 2011. IMF Country Report No 11/369.

Klein, Sebastian, *Die Strategie der Grossbanken in den Bundesländern*, Springer Fachmedien Wiesbaden GmbH Finanz, 1993.

Krämer, Christian, "BayernLB-Krise beschert Sparkassen hohe Abschreibungen," *Reuters*, 7 April 2009 2009.

Kroes, Neelie, "State aid C 9/2008 (ex CP 244/07 and ex NN 8/08) - Germany, Sachsen LB, 27 February 2008," 2008. European Commission Directorate-General for Competition.

— , "Beschluss der Kommission vom 15.12.2009 über die staatliche Beihilfe Nr. C 17/2009 (ex N 265/2009) Deutschlands zur Umstrukturierung der Landesbank Baden-Württemberg," 2009. European Commission Directorate-General for Competition.

Landler, Mark, "Deutsche Bank Escapes Subprime Losses," *The New York Times*, 8 February 2008.

O'Donnell, John and Patricia Nann, "Commerzbank Says Subprime Bill Mounting," *Reuters*, 22 January 2008.

Peek, Joe and Eric S. Rosengren, "Collateral Damage: Effects of the Japanese Bank Crisis on Real Activity in the United States," *American Economic Review*, 2000, *90* (1), 30–45.

Popov, Alexander and Jörg Rocholl, "Financing Constraints, Employment, and Labor Compensation: Evidence from the Subprime Mortgage Crisis," 2015.

Puri, Manju, Jörg Rocholl, and Sascha Steffen, "Global Retail Lending in the Aftermath of the US Financial Crisis: Distinguishing Between Supply and Demand Effects," *Journal of Financial Economics*, 2011, *100* (3), 556–578.

Schultz, Stefan, "Verkauf der Dresdner Bank: Warum Deutschland eine neue Superbank braucht," *Der Spiegel*, 25 August 2008.

Research Reports Listed by Date

Year	Month	Day	Source of Report	Title of Report
2004	1	16	Deutsche Bank Equity Research	German Banks: The Re-Turn
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2006	2	7	Deutsche Bank Equity Research	Commerzbank AG : Back To Normality. Downgrade To Hold.
2006	11	6	Kepler Cheuvreux	Commerzbank : Upside After A Solid Quarter
2006	11	22	Natixis	Allianz - Dresdner Bank, A New Growth Driver For The Group
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2008	1	28	UBS Equities	Commerzbank "Factoring In A Tougher Environment" (Neutral) Zieschang
2008	2	14	Thomson Reuters StreetEvents	Crzby - Event Transcript Of Commerzbank AG Conference Call, Feb. 14, 2008 / 8:15Am Et
2008	2	15	Bear Stearns & Co. Inc.	CBKG.DE: Q4 2007 Results Solid Results In Difficult Markets
2008	2	15	Societe Generale	Commerzbank-Target Price Downgrade Q4 07 - A Solid End To 2007 With Manageable "Crisis" Impact
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2008	2	27	Auerbach Grayson & Co., Inc.	Allianz Holding - Excellent Results For Insurance Business And Asset Management (Germany)
2008	2	28	Deutsche Bank Equity Research	Allianz : Breaking The Bank?
2008	3	25	Credit Suisse - Europe	CBKG.F: Commerzbank - Resilience > Perception
2008	4	8	Moody's	Negative Outlook For German Banking System Reflects Impact Of Credit Crisis And Sectoral Challenges
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2008	5	8	UniCredit Research	Commerzbank (Hold) - Unspectacular Q1 Numbers, In Our View
2008	5	13	Deutsche Bank Equity Research	German Banks : Amended: Still Facing Headwinds
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2008	8	28	JPMorgan	Commerzbank : Working Through The Numbers Of A Potential Commerz/Dresdner Deal
2008	9	1	Morgan Stanley	Commerzbank: Dresdner Deal: Initial Take
2008	9	1	Warburg Research GmbH	Commerzbank
2008	9	2	Fortis Bank Financial Markets	Credit Research - Banks: All Recommendations Revised Down On Dresdner And Commerzbank, Benoit Feliho, Christine Passieux
2008	9	2	Kepler Cheuvreux	Landsbanki Kepler Research: Reduce On Commerzbank (AGM)
2008	9	2	Macquarie (formerly Oppenheim Research) – Historical	No Guts, No Glory?
2008	9	2	Moody's	Moody's Downgrades Dresdner Bank's Ratings To Aa3
2008	9	4	MF Global (Historical)	Mf Global Securities - Commerzbank - Buy - Tp €25 - Initiation Report
2008	9	12	Natixis	Commerzbank - Integration Time
2008	10	31	UniCredit Research	Commerzbank (Hold) - Preview Of Q3/08 Figures
2008	11	3	Macquarie (formerly Oppenheim Research) – Historical	Superior Way To Raise Capital
2008	11	3	Raymond James Europe RJEE/RJFI	Commerzbank - Q3 2008 Earnings And Capital Raising.
2008	11	3	Thomson Reuters StreetEvents	Crzby Conference Call Final Transcript, 3-Nov-08 9:00Am Cet
2008	11	4	ESN/ equinet Bank	Equinet (4.11.2008): Commerzbank With Weak Q3 Results (Hold, Tp Eur 10)
2008	11	4	Natixis	Commerzbank - A Sound Move
2008	11	5	Warburg Research GmbH	Commerzbank
2008	11	13	CA Cheuvreux	Commerzbank: The Good, The Bad And The New Bank Integrating Complexity
2008	11	28	Natixis	Commerzbank - Revisions To Terms Of Dresdner Acquisition
2008	12	12	Macquarie (formerly Oppenheim Research) – Historical	Downgrade To Sell - Falling Behind
2008	12	12	Macquarie (formerly Oppenheim Research) – Historical	Falling Behind
2009	1	1	Global Markets Direct	Commerzbank AG - Financial And Strategic Analysis Review
2009	1	7	JPMorgan	Commerzbank : Challenges Ahead - Resuming Coverage With Uw
2009	1	7	UBS Equities	Commerzbank "Tough Times Ahead" (Neutral) Zieschang
2009	1	9	UBS Equities	Commerzbank "Taxpayer Steps In Again" (Neutral) Zieschang

Year	Month	Day	Source	Title
2009	1	12	ESN	German Banks : German Banks: Still No Light At The End Of The Tunnel
2009	1	13	Moody's	Moody's Affirms Commerzbank'S Aa3 Long-Term Ratings, Stable Outlook
2009	1	13	Moody's	Moody's Affirms Dresdner Bank's Aa3 Long-Term Ratings, Stable Outlook
2009	2	12	Morgan Stanley	Commerzbank: Many Hurdles & Very Little Visibility: Underweight
2009	2	19	Kepler Cheuvreux	Commerzbank - Yellow Submarine
2009	2	26	Credit Suisse - Europe	Credit Suisse Breakfast Banker - Financial News - Thursday, 26 February 2009
2009	2	26	JPMorgan	Commerzbank : Dresdner Q4 Numbers Cause Further Erosion Of Nav - Alert
2009	3	20	UniCredit Research	Sector Report - German Banks
2009	3	30	Deutsche Bank Equity Research	Commerzbank: Flirting With Disaster
2009	5	11	Macquarie (formerly Oppenheim Research) – Historical	Capital Position Worse Than Assumed
2009	5	12	Credit Suisse - Europe	CBKG.F: Commerzbank - Cash Is King
2009	5	12	Standard & Poor's	Commerzbank AG And Dresdner Bank AG Outlooks To Negative On Worsening Credit Conditions; A/A-1 Ratings Affirmed
2009	5	12	Warburg Research GmbH	Commerzbank
2009	5	13	JPMorgan	Commerzbank : Capital Raising Required
2009	8	6	BHF-BANK AG	Commerzbank - Sell, Target Price: Eur 4.00
2009	8	6	Deutsche Bank Equity Research	Commerzbank : A Levered View On Abs Prices
2009	8	7	Auerbach Grayson & Co., Inc.	Auerbach Grayson: Commerzbank - Losses In Q2, But Without Any Nasty Surprises (Germany)
2009	8	7	JPMorgan	Commerzbank : Q209, Still In The Red
2009	8	7	Kepler Cheuvreux	Commerzbank - Not A Good Restructuring Play
2009	8	7	Societe Generale	Commerzbank - Quarterly Results - Too Early To Judge Whether Major Dilution Can Be Avoided
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2009	8	13	Fox-Pitt Kelton Cochran Caronia Waller	Questioning Capital – Downgrade To Underperform
2009	8	20	UBS Equities	Commerzbank "Downgrade To Sell" (Sell) Zieschang
2009	11	5	Auerbach Grayson & Co., Inc.	Auerbach Grayson: Commerzbank - Weak Q3 Results (Germany)
2009	11	5	Deutsche Bank Equity Research	Commerzbank : Unconvincing Proposition Despite Subsidies
2009	11	5	JPMorgan	Commerzbank : Results Q309 - Alert
2009	11	5	Macquarie (formerly Oppenheim Research) – Historical	Quality Of Results Matters
2009	11	5	Natixis	Commerzbank - Earnings Boosted By A €435M Provision Release On Toxic Assets
2009	11	6	Natixis	Commerzbank - Too Many Balance Sheet Risks
2009	11	27	Deutsche Bank Equity Research	Commerzbank : Roadmap 2012 In Spotlight
2009	11	30	Warburg Research GmbH	Commerzbank
2010	2	23	JPMorgan	Q409 Results Snapshot Before The Call - Alert
2010	2	23	Macquarie (formerly Oppenheim Research) – Historical	Negative Earnings Surprise Driven By Trading
2010	2	23	Raymond James Europe RJEE/RJFI	Commerzbank: Worrying Q4 Figures But Upbeat Guidance
2010	2	24	Credit Suisse - Europe	CBKG.F: Commerzbank - Still Under Water
2010	2	24	Deutsche Bank Equity Research	Commerzbank : 2010 - Transition To Operating Profitability

Year	Month	Day	Source	Title
2010	2	24	Societe Generale	Commerzbank - 12M Target Downgrade - Tangible Book Takes Another Hit In Q4. Soffin Repayment Still Unresolved
2010	2	24	UBS Equities	Commerzbank "Tough Quarter And Subdued 2010 Outlook" (Sell) Zieschang
2010	2	25	ESN/ equinet Bank	Commerzbank - Review Q4 Results (Reduce, Tp Eur 4.60)
2011	2	23	CA Cheuvreux	Commerzbank - 2/Outperform - Q4-10 Results Well Above Estimates
2011	2	23	JPMorgan	Commerzbank : Q4 Earnings Above Consensus, Focus On Soffin Repayment And Rwa Reduction - Alert
2012	2	23	Deutsche Bank Equity Research	Commerzbank : Cinderellabank Has Not Arrived At The Ball (Yet)
2012	2	23	JPMorgan	Commerzbank : Q411 Results: Better Than Expected Adj. Pbt But All Eyes Remain On Capital - Alert
2012	2	24	Morgan Stanley	Commerzbank: Capital Ok, Eps Still At Risk
2012	2	24	Societe Generale	Commerzbank - Full-Year Results - Capital Shortfall Reduced – Poor Organic Capital Generation And Too Many Risks
2012	2	27	ESN/ equinet Bank	Commerzbank Q4 Results All In All In Line With Exp., Capital Increase Should Ease Investors' Concerns About CBK'S Capital Position - Company Update
2012	2	28	UBS Equities	Commerzbank "Sell Rating Reiterated" (Sell) Zieschang

Appendix Tables

Table A.I: Establishment of Commerzbank branches in West Germany

	(1) 1948-1970	(2) 1948-1970	(3) 1948-1970	(4) 1925-1948	(5) Pre-1925
Distance instrument	0.094	0.090	0.077	0.021	0.010
	(0.031)	(0.032)	(0.033)	(0.020)	(0.017)
Observations	324	324	324	324	324
R^2	0.122	0.122	0.136	0.088	0.359
Zonal FE	Yes	Yes	Yes	Yes	Yes
Urban FE	No	Yes	Yes	Yes	Yes
Ln population	No	No	Yes	Yes	Yes
Population density	No	No	Yes	Yes	Yes
Estimator	OLS	OLS	OLS	OLS	OLS

Notes: This table examines the effect of Commerzbank's post-war break-up on its branch network. It reports regressions using a cross-section of West German counties. The data are hand-collected from the historic annual reports of Commerzbank. The outcome variable is a dummy for whether Commerzbank established a branch in the county during the respective period given in the column title. The regressor of interest is the distance instrument, the negative of the county's distance to the closest post-war Commerzbank head office, in 100 kilometers. The zonal fixed effects are dummies for the three post-war banking zones of North Rhine-Westphalia, Northern, and Southern Germany. The urban fixed effect is a dummy for counties with a year 2000 population density greater than 1,000 inhabitants per square kilometer. The ln population and population density are continuous variables from the year 2000. Standard errors are robust. Columns (1) to (3) show that from 1948 to 1970, Commerzbank was more likely to establish a new branch in counties close to its temporary, post-war head offices. Columns (4) and (5) report no significant association in the period before or after.

Table A.II: Commerzbank dependence and firm variables in 2006

	(1)	(2)
ln age	-0.015	-0.011
	(0.009)	(0.010)
ln value added	0.018	0.022
	(0.015)	(0.020)
ln capital	-0.014	-0.024
	(0.006)	(0.008)
Investment rate	0.009	-0.009
	(0.016)	(0.020)
ln employment	0.011	0.010
	(0.012)	(0.016)
ln liabilites	0.008	0.009
	(0.012)	(0.012)
ln bank loans	0.002	0.000
	(0.007)	(0.007)
ln financial assets		0.001
		(0.002)
Observations	2,011	1,618
R^2	0.307	0.340
Industry FE	Yes	Yes
County FE	Yes	Yes
Estimator	OLS	OLS

Notes: This table reports estimates from cross-sectional firm regressions of CB dep on firm variables. The data are from the firm panel for the year 2006. The variables are defined as in Table I. The regression includes fixed effects for 70 industries and 357 counties. Standard errors are two-way clustered at the level of the industry and the county.

Table A.III: County GDP and the distance to cities

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)
Distance instrument*d	-18.309 (3.253)	-14.493 (4.205)	-18.165 (4.050)	-17.279 (3.850)	-17.950 (3.635)	-17.420 (3.932)	-16.857 (3.605)	-19.595 (3.017)	-19.310 (2.916)	-17.328 (3.839)	-19.294 (3.826)	-18.167 (3.795)	-17.298 (3.856)
Dist to Düsseldorf*d	0.845 (2.618)												
Dist to Frankfurt*d		-4.218 (3.111)											
Dist to Hamburg*d			1.166 (1.821)										
Dist to Berlin*d				3.016 (2.510)									
Dist to Dresden*d					-2.071 (2.795)								
Dist to Munich*d						-0.146 (1.858)							
Dist to Cologne*d							-0.385 (2.789)						
Dist to Essen*d								1.945 (2.458)					
Dist to Dortmund*d									1.806 (2.364)				
Dist to Stuttgart*d										-1.864 (1.872)			
Dist to Bremen*d											2.371 (1.940)		
Dist to Hannover*d												1.322 (2.670)	
Dist to Leipzig*d													-0.580 (3.320)
Observations	5,005	5,005	5,005	5,005	5,005	5,005	5,005	5,005	5,005	5,005	5,005	5,005	5,005
R^2	0.361	0.362	0.361	0.362	0.361	0.361	0.361	0.361	0.361	0.362	0.362	0.361	0.361
Number of counties	385	385	385	385	385	385	385	385	385	385	385	385	385
County FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Controls*d	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Estimator	OLS	OLS	OLS	OLS	OLS	OLS	OLS	OLS	OLS	OLS	OLS	OLS	OLS

Notes: This table reports the effect of the distance instrument and the linear distances to other cities on county GDP. The distance instrument is the negative of the county's distance to the closest post-war Commerzbank head office, in 100,000 kilometers. All regressions include the full set of control variables from Table VIII, but not the linear distances. The data include the years 2000 to 2012. The regressions are weighted by year 2000 population, and the standard errors are calculated as in Table VIII.

Table A.IV: The distance instrument and county characteristics

		(1)	(2)
OUTCOMES			
(1) GDP Growth 2005-08	Coeff	-0.005	-0.005
	Std Err	(0.004)	(0.006)
	R^2	0.008	0.035
(2) GDP Growth 2000-05	Coeff	-0.004	0.000
	Std Err	(0.004)	(0.008)
	R^2	0.011	0.030
(3) GDP Growth 2002-03 (recession year)	Coeff	0.001	-0.003
	Std Err	(0.002)	(0.004)
	R^2	0.004	0.019
(4) Empl Growth 2005-08	Coeff	-0.003	0.004
	Std Err	(0.002)	(0.003)
	R^2	0.010	0.049
(5) Professional services share	Coeff	0.028	-0.001
	Std Err	(0.017)	(0.043)
	R^2	0.098	0.111
(6) Shipping share	Coeff	0.000	0.001
	Std Err	(0.000)	(0.001)
	R^2	0.001	0.072
(7) Metal manufacturing share	Coeff	-0.052	-0.021
	Std Err	(0.012)	(0.023)
	R^2	0.068	0.128
(8) Other manufacturing share	Coeff	-0.008	-0.032
	Std Err	(0.009)	(0.024)
	R^2	0.009	0.061
(9) Non-tradable share	Coeff	0.006	-0.005
	Std Err	(0.010)	(0.022)
	R^2	0.014	0.033
(10) Unemployment rate	Coeff	0.015	0.000
	Std Err	(0.002)	(0.004)
	R^2	0.526	0.644
(11) Debt index	Coeff	0.086	0.026
	Std Err	(0.012)	(0.034)
	R^2	0.154	0.299
CONTROLS			
Linear distances to post-war head offices		No	Yes
Former GDR FE		Yes	Yes

Notes: The reported estimates are coefficients on the distance instrument from cross-sectional OLS county regressions. Each coefficient is from a different regression. A positive coefficient implies the outcome value is greater for counties close to a post-war head office. Rows (1) to (4) show that the distance instrument is not correlated with county growth before Commerzbank's lending cut. Rows (5), (7), (10), and (11) show statistically significant raw correlations between the distance instrument and the county employment shares of professional services, the metal manufacturing share, the unemployment rate, and the household debt index. These correlations disappear once one conditions on the three linear distances to Commerzbank's three post-war head offices Düsseldorf, Frankfurt, and Hamburg. There are no statistically significant correlations between the distance instrument and the other industry shares. The distance instrument is the negative of the county's distance to the closest post-war head office, in 100 kilometers. The growth rates are in natural logarithms. The industry shares are employment shares in 2006. Professional services include WZ2008 industry categories 69-75; shipping 50; metal manufacturing 23-29; other manufacturing 9-22 and 30-32; and non-tradables are defined in Section VI.A. The unemployment rate is from 2006. Debt index is a 2003 measure of county household leverage, calculated by credit rating agency Schufa (Privatverschuldungsindex). The weights and standard error calculations are explained in Table VIII.

Table A.V: High-innovation industries

WZ2008 Code	Industry
20.2	Manufacture of pesticides and other agrochemical products
21	Manufacture of basic pharmaceutical products and preparations
25.4	Manufacture of weapons and ammunition
26	Manufacture of computer, electronic and optical products
30.3	Manufacture of air and spacecraft and related machinery
30.4	Manufacture of military fighting vehicles
20.1	Manufacture of basic chemicals, fertilisers and nitrogen compounds, plastics and synthetic rubber in primary forms
20.4	Manufacture of soap and detergents, cleaning and polishing preparations, perfumes and toilet preparations
20.5	Manufacture of other chemical products (explosives, glues, essential oils, man-made fibres)
27	Manufacture of electrical equipment (electric motors, generators, transformers and electricity distribution and control apparatus)
28	Manufacture of machinery and equipment (e.g. engines, turbines, fluid power equipment, gears, furnaces, solar heat collectors, lifting and handling equipment, power-driven hand tools, non-domestic cooling and ventilation equipment, machinery for mining, quarrying and construction)
29.1	Manufacture of motor vehicles
29.3	Manufacture of parts and accessories for motor vehicles
30.2	Manufacture of railway locomotives and rolling stock
33.2	Installation of industrial machinery and equipment

Notes: This table reports the industries with an internal share of R&D spending over revenue above 2.5 percent (OECD cut-off), classified by Gehrke et al. (2010).

Table A.VI: Low-innovation industries

WZ2008 Code	Industry
8.1	Quarrying of stone, sand and clay
9	Mining support service activities (for petroleum, natural gas and other mining and quarrying)
16.1	Sawmilling and planing of wood
23.7	Cutting, shaping and finishing of stone
25.1	Manufacture of structural metal products
35.3	Steam and air conditioning supply
36	Water collection, treatment and supply
37	Sewerage
38.2	Waste treatment and disposal
39	Remediation activities and other waste management services
41.1	Development of building projects
43.9	Other specialised construction activities
45.1	Sale of motor vehicles
46.5	Wholesale of information and communication equipment
46.9	Non-specialised wholesale trade
47.3	Retail sale of automotive fuel in specialised stores
49.3	Other passenger land transport
49.4	Freight transport by road and removal services
50	Water transport (passenger and freight)
52.1	Warehousing and storage
53.2	Other postal and courier activities
56.1	Restaurants and mobile food service activities
59.2	Sound recording and music publishing activities
68.1	Buying and selling of own real estate
70.1	Activities of head offices
74.1	Specialised design activities
74.2	Photographic activities
78	Employment activities (employment placement and agency)
80	Security and investigation activities
81.1	Combined facilities support activities
81.3	Landscape service activities
82	Office administration, office support, and other business support

Notes: This table reports the industries with the lowest innovation activities, classified by Gehrke et al. (2013) using data from the Mannheim Innovation Panel.

Table A.VII: Summary statistics by bins of Commerzbank dependence

			Range of Commerzbank dependence				
	0	0.01-0.24	0.25-0.32	0.33-0.4	0.41-0.75	0.75-1	Total
Commerzbank dep	0	0.182	0.250	0.332	0.502	1	0.156
	(0)	(0.0199)	(0)	(0.00830)	(0.0720)	(0)	(0.228)
No of relationship banks	2.433	5.577	4	3.768	3.059	1.192	2.997
	(1.311)	(0.647)	(0)	(1.359)	(1.222)	(0.398)	(1.544)
Employment	831.9	982.8	840.8	1,567.4	729.3	799.9	913.7
	(14,674.6)	(2,587.4)	(4,502.6)	(6,603.1)	(2,699.2)	(1,411.5)	(11,592.5)
Wage	32.50	32.08	30.81	31.72	30.57	33.11	32.04
	(60.92)	(7.777)	(9.429)	(9.484)	(10.98)	(15.54)	(47.15)
Capital	44,699.8	86,334.2	29,697.3	145,522.9	36,887.9	62,554.4	57,711.6
	(258,037.3)	(255,992.6)	(108,208.6)	(1,496,140.7)	(106,876.7)	(134,632.3)	(544,582.6)
Investment rate	0.258	0.205	0.280	0.298	0.328	0.368	0.271
	(0.366)	(0.220)	(0.317)	(0.378)	(0.410)	(0.415)	(0.363)
Liabilities	172,542.4	84,362.6	93,348.5	217,748.4	93,014.3	79,574.5	152,628.5
	(4,653,805.1)	(278,210.9)	(788,451.4)	(2,254,805.0)	(528,174.0)	(169,250.5)	(3,657,557.1)
Bank debt/liabilities	0.501	0.483	0.477	0.434	0.448	0.449	0.483
	(0.266)	(0.246)	(0.241)	(0.242)	(0.262)	(0.281)	(0.261)
Firms	1,182	163	151	224	238	53	2,011

Notes: The range of Commerzbank dependence in the relevant bin is given in the top row. The data are from the firm panel for the year 2006. The variables are defined as in Table I.

36

Table A.VIII: Insights from the research reports

Question	Number of relevant reports	Answer yes	Answer no	Answer unclear
1) Was the trading income more volatile than at other German banks from 2004 to 2007?				
- at Commerzbank	11	0	2	9
- at Dresdner Bank	4	0	0	4
2) Was the loan portfolio to German firms and households riskier than at other German banks from 2004 to 2007?				
- at Commerzbank	11	0	11	0
- at Dresdner Bank	5	0	5	0
3) Does the report mention that the trading and lending divisions cross-hedged risk from 2004 to 2009?				
- at Commerzbank	85	0	85	0
- at Dresdner Bank	42	0	42	0
4) Does the report mention that the German loan portfolio contributed to Commerzbank's losses from 2008 to 2009?	83	0	83	0
5) Does the report mention that exposure to Iceland contributed to Commerzbank's losses from 2008 to 2009?	83	8	75	0
6) Does the report mention that exposure to asset-backed securities or the subprime mortgage crisis contributed to Commerzbank's losses from 2008 to 2009?	83	72	11	0
7) Does the report mention that exposure to Lehman Brothers contributed to Commerzbank's losses in 2009?	83	8	75	0
8) Judging in 2008, is Commerzbank's acquisition of Dresdner Bank a strategically sound move?	11	9	1	1
9) Did Commerzbank stabilise after 2010?	10	8	0	2

Notes: This table summarizes insights from the research reports listed after the reference section of the Appendix. A relevant report is a research report from the given period that contains information relevant to the given question. Reports either offer a clear conclusion (Answer yes/no) or give information in support of both sides, without committing either way (Answer unclear). For interpretation and illustrative examples, see Appendix B.

Table A.IX: Robustness checks for the firm survey results

OUTCOME	(1) Bank loans	(2) Bank loans	(3) Bank loans	(4) Demand constraint	(5) Orders backlog	(6) Demand change
YEAR	2009	2009	2003	2003	2003	2003
Firm CB dep	-0.393	-0.381	0.040	-0.119	0.184	-0.080
	(0.185)	(0.232)	(0.367)	(0.350)	(0.292)	(0.317)
Dep var from 2006		0.376				
		(0.084)				
Observations	1,032	1.032	642	756	768	768
Industry FE	Yes	Yes	Yes	Yes	Yes	Yes
State FE	Yes	No	Yes	Yes	Yes	Yes
Size Bin FE	Yes	Yes	Yes	Yes	Yes	Yes
ln age	Yes	Yes	Yes	Yes	Yes	Yes
County FE	No	Yes	Yes	Yes	Yes	Yes

Notes: This table reports estimates from OLS cross-sectional firm regressions for different years, using data from the confidential ifo Business Expectations Panel. The outcome variables, the interpretation of the coefficients, and standard error calculations are explained in Tables III, A.X, A.XI, and A.XII.

Table A.X: Firm survey on product demand constraints

YEAR	(1) 2007	(2) 2008	(3) 2009	(4) 2010	(5) 2011	(6) 2012
Firm CB dep	-0.191	-0.196	-0.076	-0.121	0.281	0.194
	(0.121)	(0.133)	(0.148)	(0.156)	(0.175)	(0.197)
Dep var from 2006	0.655	0.561	0.409	0.450	0.503	0.421
	(0.032)	(0.035)	(0.034)	(0.037)	(0.044)	(0.045)
Observations	980	991	1,032	945	856	808
R^2	0.482	0.370	0.262	0.287	0.304	0.259
Industry FE	Yes	Yes	Yes	Yes	Yes	Yes
State FE	Yes	Yes	Yes	Yes	Yes	Yes
Size Bin FE	Yes	Yes	Yes	Yes	Yes	Yes
ln age	Yes	Yes	Yes	Yes	Yes	Yes

Notes: This table reports estimates from OLS cross-sectional firm regressions for different years, using data from the confidential ifo Business Expectations Panel. The outcome variable is the answer to the question: "Are your business activities constrained by low demand or too few orders: yes or no?" It is standardized to have zero mean and unit variance. The coefficients are interpreted as the standard deviation increase in demand constraints from increasing Commerzbank dependence by one. The variables are defined and the standard errors calculated as in Table III.

Table A.XI: Firm survey on the backlog of product orders

YEAR	(1) 2007	(2) 2008	(3) 2009	(4) 2010	(5) 2011	(6) 2012
Firm CB dep	0.108	0.119	0.025	0.051	0.048	-0.304
	(0.105)	(0.140)	(0.155)	(0.186)	(0.160)	(0.223)
Dep var from 2006	0.662	0.527	0.416	0.453	0.489	0.390
	(0.028)	(0.039)	(0.045)	(0.043)	(0.041)	(0.050)
Observations	914	910	919	852	802	737
R^2	0.632	0.412	0.273	0.312	0.342	0.230
Industry FE	Yes	Yes	Yes	Yes	Yes	Yes
State FE	Yes	Yes	Yes	Yes	Yes	Yes
Size Bin FE	Yes	Yes	Yes	Yes	Yes	Yes
ln age	Yes	Yes	Yes	Yes	Yes	Yes

Notes: This table reports estimates from OLS cross-sectional firm regressions for different years, using data from the confidential ifo Business Expectations Panel. The outcome variable is the answer to the question: "Currently we perceive our backlog of orders to be: comparatively large, sufficient / typical for the season, or too small?" It is standardized to have zero mean and unit variance. The coefficients are interpreted as the standard deviation increase in the backlog of orders from increasing Commerzbank dependence by one. The variables are defined and the standard errors calculated as in Table III.

Table A.XII: Firm survey on product demand changes

YEAR	(1) 2007	(2) 2008	(3) 2009	(4) 2010	(5) 2011	(6) 2012
Firm CB dep	0.130	0.014	-0.008	-0.243	-0.050	-0.042
	(0.151)	(0.155)	(0.192)	(0.177)	(0.169)	(0.222)
Dep var from 2006	0.549	0.437	0.376	0.455	0.486	0.328
	(0.054)	(0.056)	(0.057)	(0.059)	(0.064)	(0.079)
Observations	914	910	919	852	802	736
R^2	0.424	0.278	0.227	0.324	0.317	0.181
Industry FE	Yes	Yes	Yes	Yes	Yes	Yes
State FE	Yes	Yes	Yes	Yes	Yes	Yes
Size Bin FE	Yes	Yes	Yes	Yes	Yes	Yes
ln age	Yes	Yes	Yes	Yes	Yes	Yes

Notes: This table reports estimates from OLS cross-sectional firm regressions for different years, using data from the confidential ifo Business Expectations Panel. The outcome variable is the answer to the question: "Tendencies in the previous month - The demand situation has: improved, remained unchanged, or deteriorated?" The coefficients are interpreted as the standard deviation improvement in the demand situation from increasing Commerzbank dependence by one. The variables are defined and the standard errors calculated as in Table III.

Table A.XIII: Firm financial assets and Commerzbank dependence

VARIABLES	(1) 2006-07	(2) 2007-09	(3) 2009-10	(4) 2007-09	(5) 2007-09
Firm CB dep	-0.022	0.036	0.022	0.018	-0.040
	(0.094)	(0.092)	(0.084)	(0.068)	(0.112)
Observations	1,816	1,816	1,816	1,816	1,816
R^2	0.062	0.060	0.059	0.000	0.219
ln age	Yes	Yes	Yes	No	Yes
Size Bin FE	Yes	Yes	Yes	No	Yes
Industry FE	Yes	Yes	Yes	No	Yes
State FE	Yes	Yes	Yes	No	No
County FE	No	No	No	No	Yes
Import and Export Share	Yes	Yes	Yes	No	Yes
Estimator	OLS	OLS	OLS	OLS	OLS

Notes: This table reports estimates from cross-sectional firm regressions. The outcome is the symmetric growth rate of the value of the firm's financial assets in the given period. If a firm begins and ends the period with no financial assets, the growth rate is set to zero. The control variables and the standard error calculations are the same as in Table VI.

Table A.XIV: Loan growth and affected savings banks

VARIABLES	(1)	(2)	(3)	(4)	(5)	(6)
Affected savings bank	0.080	0.031	0.083	0.045	0.080	0.078
	(0.014)	(0.066)	(0.077)	(0.009)	(0.014)	(0.017)
Savings bank	-0.116			-0.088	-0.115	-0.116
	(0.019)			(0.013)	(0.015)	(0.019)
Loan growth 2003-05			0.015			
			(0.112)			
Savings bank in BW or NRW						0.005
						(0.016)
Observations	1,284	1,284	953	1,528	1,513	1,284
R^2	0.005	0.023	0.025	0.005	0.008	0.005
State FE	No	Yes	Yes	Yes	No	No
Bank Type FE	No	Yes	Yes	Yes	No	No
Bank Size FE	No	Yes	Yes	Yes	No	No
Estimator	OLS	OLS	OLS	OLS	OLS	OLS

Notes: This table reports estimates from cross-sectional regressions of bank loan growth on a dummy for affected savings banks. All outcomes are ln differences, except for column (5), which is the symmetric growth rate. Affected is defined as owning a Landesbank with trading losses during the financial crisis. Savings bank is a dummy for savings banks. Bank type FE are dummies for cooperative banks, real estate banks, and commercial banks. Bank size FE are ten dummies for the deciles of the distribution of the bank's lending stock in 2006. The data are from Bankscope. Standard errors are robust.

Table A.XV: Firm employment and affected savings banks

OUTCOME	(1)	(2)	(3)	(4)	(5)	(6)	(7)
	Ln employment growth 2008-12		Ln employment (panel specification)				
Firm relation to affected savings bank	-0.015 (0.005)	-0.003 (0.005)					
Firm ln age		-0.080 (0.004)					
Firm relation to affected savings bank*d			-0.005 (0.004)	0.003 (0.004)	0.001 (0.004)	0.012 (0.005)	0.001 (0.004)
Firm ln age*d				-0.064 (0.003)		-0.046 (0.004)	-0.062 (0.003)
Firm ln assets						0.208 (0.008)	
Firm equity / assets						-0.011 (0.016)	
Firm cash-flow / assets						-0.000 (0.000)	
Firm profit / assets						0.000 (0.000)	
Firm relation to CB*d							-0.019 (0.004)
Firm relation to affected Landesbank*d							-0.001 (0.008)
Observations	45,537	45,537	438,254	438,254	438,254	173,072	438,254
R^2	0.000	0.000	0.005	0.012	0.013	0.064	0.012
Number of firms	45,537	45,537	83,410	83,410	83,410	39,659	83,410
Firm FE	No	No	Yes	Yes	Yes	Yes	Yes
Year FE	No	No	Yes	Yes	Yes	Yes	Yes
Industry FE	No	Yes	No	No	No	No	No
Industry FE*d	No	No	Yes	Yes	Yes	Yes	Yes
Age Bin*d	No	No	No	No	Yes	No	No
Estimator	OLS	OLS	OLS	OLS	OLS	OLS	OLS

Notes: This table reports tests the effect of having an affected savings bank as relationship bank on employment. Affected savings banks own a Landesbank with trading losses during the financial crisis. For details, see Appendix E. The outcome in columns (1) and (2) is the ln difference in employment between 2008 and 2012. Columns (3) to (7) replicate the sample and panel specification in Popov and Rocholl (2015), where the outcome is ln employment. Standard errors are clustered at the level of the firm.

Table A.XVI: Firm employment and other banks with trading losses (1)

VARIABLES	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Firm dep on banks with trading losses*d	-0.012 (0.003)	-0.004 (0.003)						
Firm CB dep*d			-0.011 (0.004)	-0.010 (0.004)	-0.009 (0.004)	-0.010 (0.006)	-0.011 (0.004)	-0.011 (0.007)
Firm dep on other banks with trading losses (except CB)*d			0.001 (0.004)			0.001 (0.006)		
Firm dep on other banks with trading losses (except CB)*d(2008-10)				0.004 (0.004)				
Firm dep on other banks with trading losses (except CB)*d(2007-10)					0.005 (0.003)			
Firm DtB dep*d							-0.006 (0.005)	-0.009 (0.008)
Firm KfW dep*d							0.058 (0.047)	0.042 (0.063)
Firm IKB dep*d							0.058 (0.066)	0.004 (0.063)
Firm HypoVereinsbank dep*d							0.001 (0.007)	-0.010 (0.010)
Firm DZ Bank dep*d							0.016 (0.021)	0.083 (0.046)
Firm dep on affected savings banks	0.008 (0.003)	0.006 (0.003)	0.006 (0.003)	0.007 (0.003)	0.008 (0.003)	0.009 (0.005)	0.006 (0.003)	0.012 (0.003)
Firm lagged change in sales						0.069 (0.007)		
Observations	188,233	188,233	188,233	188,233	188,233	73,851	188,233	314,803
R^2	0.001	0.004	0.004	0.004	0.004	0.017	0.004	0.004
Year FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Ln Age*d	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Size Bin*d	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Industry FE*d	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Import and Export Share*d	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes
County FE*d	No	No	No	No	No	No	No	No
Estimator	OLS	OLS	OLS	OLS	OLS	OLS	OLS	OLS

Notes: This table reports firm regressions, replicating the specification and sample of Dwenger et al. (2015). The outcome in columns (1) to (7) is the firm's annual ln employment growth rate. In column (8), it is the annual ln growth rate of fixed assets. The sample includes the years 2006 to 2010. The other banks with trading losses banks are the German banks, except Commerzbank, that held a large share of loss-making assets during the financial crisis, as listed in Table 1 of Dwenger et al. (2015). For details, see Appendix F. Standard errors are clustered at the level of the firm.

Table A.XVII: Firm employment and other banks with trading losses (2)

VARIABLES	(1)	(2)	(3)	(4)
Firm dep on banks with trading losses	-0.028	-0.010		
	(0.011)	(0.011)		
Firm CB dep			-0.050	-0.054
			(0.016)	(0.016)
Firm dep on other banks with trading losses (except CB)			0.019	
			(0.013)	
Firm DtB dep				0.005
				(0.018)
Observations	48,101	48,101	48,101	48,101
R^2	0.000	0.019	0.019	0.019
Ln Age	No	Yes	Yes	Yes
Size Bin	No	Yes	Yes	Yes
Industry FE	No	Yes	Yes	Yes
Import and Export Share	No	Yes	Yes	Yes
Estimator	OLS	OLS	OLS	OLS

Notes: This table reports cross-sectional firm regressions. The outcome is ln employment growth between 2008 and 2012. The other banks with trading losses banks are the German banks, except Commerzbank, that held a large share of loss-making assets during the financial crisis, as listed in Table 1 of Dwenger et al. (2015). For details, see Appendix F. Standard errors are clustered at the level of the firm.

Table A.XVIII: County GDP and export dependence

Export-dependent*d	-0.011
	(0.008)
Export-dependent*d(2011)	0.012
	(0.006)
Export-dependent*d(2012)	0.009
	(0.007)
CB dep*d	-0.138
	(0.065)
Observations	5,005
R^2	0.360
Number of counties	385
County FE	Yes
Year FE	Yes
Former GDR FE*d	Yes
Industry Shares*d	Yes
Population*d	Yes
Pop density*d	Yes
GDP per capita*d	Yes
Debt Index*d	Yes
Import Share*d	Yes
Export Share*Linear Trend	Yes
Landesbank in crisis*d	Yes
Estimator	OLS

Notes: This table reports estimates from county panel regressions. The outcome is ln GDP. Export-dependent is a dummy variable for counties in the top quartile of the distribution of the average export share (fraction of exports out of total revenue, averaged across firms in the county). d is a dummy for the years following the lending cut, 2009 to 2012. d(2011) and d(2012) are dummies for the years 2011 and 2012 respectively. The control variables, weights, standard error calculations, the years covered by the data, and the definition of R^2 are explained in Table VIII.
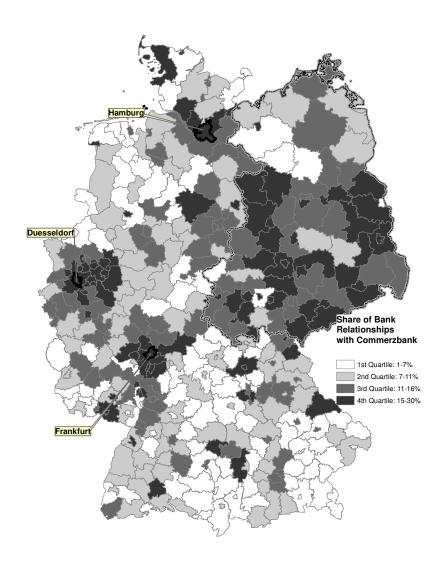
Table A.XIX: Firm employment and export dependence

Export-dependent*d	-0.018
	(0.012)
Export-dependent*d(2011)	0.020
	(0.007)
Export-dependent*d(2012)	0.041
	(0.010)
CB dep*d	-0.052
	(0.015)
Observations	12,066
R^2	0.126
Number of firms	2,011
Firm FE	Yes
Year FE	Yes
ln age*d	Yes
Size Bin FE*d	Yes
Industry FE*d	Yes
County FE*d	Yes
Import Share*d	Yes
Estimator	OLS

Notes: This table reports estimates from firm panel regressions. The outcomes is ln employment. Export-dependent is a dummy variable for firms in the top quartile of the distribution of the export share. d is a dummy for the years following the lending cut, 2009 to 2012. d(2011) and d(2012) are dummies for the years 2011 and 2012 respectively. The data include the years 2007 to 2012. The control variables and the standard error calculations are the same as in Table VI.
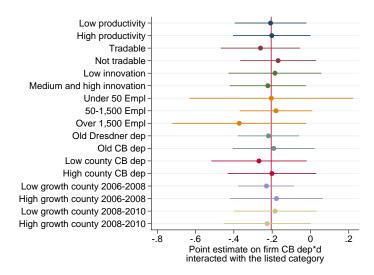
Appendix Figures

Figure A.I: Commerzbank dependence across German counties in 2006

Notes: This map illustrates the Commerzbank dependence of German counties in the year 2006. I measure Commerzbank dependence using a dataset of the year 2006 relationship banks of 112,344 German firms. County Commerzbank dependence is the average of firm Commerzbank dependence for firms with their head office in the county. Two insights emerge from the map. First, counties around the post-war head offices Düsseldorf, Frankfurt, and Hamburg are more likely to depend on Commerzbank. Second, the former GDR is more dependent on Commerzbank. The reason is that Commerzbank followed a unique branch expansion strategy in the former GDR after German reunification in 1990 (Klein 1993). The other German banks simply took over the pre-existing branch networks of the former GDR state banks, while Commerzbank built up its own. The potential endogeneity resulting from Commerzbank's expansion in the former GDR is one of the motivations for the distance instrument.

Figure A.II: The lending cut to different categories of firms

Notes: This figure plots coefficients from several firm panel regressions. The outcome is firm ln bank loans. Each color represents a different regression. The plotted point estimates are the coefficients on dummies for the category listed on the left, interacted with firm CB dep*d. The horizontal lines are 95 percent confidence intervals. The red, vertical line represents the average effect of CB dep*d on ln bank loans of -0.205. High (low) labor productivity is above (below) median 2006 valued added divided by employment. Tradability and innovation intensity are defined in Section VI.A. Old Dresdner dep refers to dependence on Dresdner Bank branches, which were then acquired and rebranded by Commerzbank. High (low) county CB dep and county growth are defined as above (below) the median. The control variables and the standard error calculations are the same as in column (4) of Table IV.