Online Appendix

Banks' Liability Structure and Mortgage Lending During the Financial Crisis

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Outline This online appendix is split into three sections. Section 1 provides further description of the data sources and defines the variables used in the paper. Section 2 presents a more complete version of some results shown in the text. Section 3 presents additional robustness results related to the empirical specification and the choice of regressors. It also addresses the correlation between CDA and bank size through a matching exercise.

1 Data

Mortgage Data We use a comprehensive sample of mortgage applications and originations that have been collected by the Federal Financial Institutions Examination Council under the provision of the Home Mortgage Disclosure Act (HMDA). Under this provision, the vast majority of mortgage lenders are required to report data about their house-related lending activity.[1] Due to stricter reporting requirement in urban areas, HMDA offers better coverage in MSAs covering almost 95% of all mortgage originations in 2005 in these areas (see e.g. Dell'Ariccia et al., 2008).

HMDA data became available in the early 90s and therefore our sample spans the 1992 to 2010 period. The original sample we start with includes 432 million observations. After restricting the sample to institutions which report to either Office of the Comptroller of the Currency (OCC), Federal Reserve System (FRS), or Federal Deposit Insurance Corporation (FDIC) the number of observations is reduced to 211 million. We restrict our attention to mortgage applications made at banks for owner-occupied home purchases of conventional single family properties. Our aim is to compare bank lending within a homogeneous category of credit. To minimize noise we follow Dell'Ariccia et al. (2008) and drop applications below 25 thousand dollars and above a million dollars as well as applications with missing income, census-tract, or bank information. A large share of banks originate few mortgage loans each year. Excluding these banks would help reduce noise. We therefore drop bank-years with less than 50 observations leaving us with 3393 banks with 14 million loans within 389 MSAs.

The HMDA data provide information on the year of the application (the data are available on an annual basis), the amount of the loan, the lender's decision, and the income of the

[1]Lenders are required to report if they meet certain criteria related to size, geographical location, the extent of housing-related lending activity, and regulatory status. Regarding size, a depository institution is subject to HMDA reporting requirements if it has assets of $34 million or more, as of December 31, 2004. In 2010, the Board raised this threshold to $40 million. Regarding the geographical location, lenders must report if they have offices in a Metropolitan Statistical Area (MSA) or if they are non-depository institutions with lending activities on properties located in an MSA. Lenders must also report if they are depository institutions with at least one home purchase loan or if they are non-depository institutions and they originate 100 or more home-purchase and refinancing loans. As for the regulatory status, lenders must report if they are non-depository institutions or if they are depository institutions that are federally insured or regulated.

applicant. The data also provide information on the gender and race of the applicant, as well as other information on the census tract of the property such as the median income and share of minority households. HMDA also provide information on whether originated loans were sold within the same calendar year. This allows us to compute a securitization measure at the bank level, which is simply the ratio of sold loans to total originated loans.

Call Report Data All regulated depository institutions in the United States are required to file their financial information periodically with their respective regulators. Reports of Condition and Income data are a widely used source of timely and accurate financial data regarding banks' balance sheets and the results of their operations. Specifically, every national bank, state member bank and insured non-member Bank is required by the Federal Financial Institutions Examination Council (FFIEC) to file a Call Report as of the close of business on the last day of each calendar quarter. The specific reporting requirements depend upon the size of the bank and whether or not it has any foreign offices. The availability of agency specific bank IDs in HMDA (Federal Reserve RSSD-ID, FDIC Certificate Number, and OCC Charter Number) allows us to match HMDA lenders that are depository institutions with their financials from the Call report. We use the Call report data to compute financial ratios based on banks' balance sheets. These variables, their definitions, and their corresponding code in the Call Report are shown in Table A1.

Other data We also make use of the Federal Housing Finance Agency (FHFA) data on house prices which are available at the MSA level. As a weighted, repeated sales index, the HPI measures average price changes in repeat sales or refinancing on single family properties with mortgages that have been purchased or securitized by Fannie Mae or Freddie Mac.[2] We use the HPI data at MSA level (most disaggregated level that is available for this variable) and compute the year on year changes as a measure of house price growth in a given MSA.

[2]Compared to S&P/Case-Shiller indexes, the HPI offers a more comprehensive coverage of housing price trends in the U.S. metropolitan areas.

To control for geographical characteristics that could affect house price growth in a region we supplement our dataset with a land topology-based measure of housing supply elasticity constructed by Saiz (2010). Glaeser, Gyourkou, and Saiz (2008) show that in areas with high elasticity of housing supply the growth in house prices tends to be moderate and in line with inflation.

2 Expanded Tables

Due to our empirical specification, the number of regressors is very large. In addition to the fixed effects and loan characteristics, we control for 11 bank variables in each of the 19 years in our sample (1992-2010). Showing 209 coefficients in each table is not practical even in the online appendix, we thus focus on the key variables only with the exception of Table 5 in the text which shows all coefficients on bank variables. However, in the case of the jumbo falsification tests in Table 9 we have only shown the coefficient on the interaction between CDA and Jumbo due to space constraints. For completeness, Tables B1 and B2 in here present the estimates on the other relevant coefficients. These tables show that the fake jumbo dummy is not a predictor of the rejection rate, while the CDA coefficient continues to have the expected sign and significance as in the other regressions.

3 Additional results

3.1 Using contemporaneous bank variables

In all the regressions in Section 3 we control for the lag of bank characteristics, specifically for the value from the fourth quarter of the preceding year (i.e., beginning of current year value). We do so to ensure that bank characteristics precede and are not a result of bank lending decisions during the year. Here we show how using contemporaneous measures instead affects our results. Table C1 shows the results from the benchmark regression. We

continue to find that the coefficient on CDA turns negative and significant during the crisis. The main difference with the earlier results is the significance on the coefficients in 2009 and 2010 and the small decrease in the magnitude of the coefficient in 2008. Table C2 shows the results from the jumbo regression, 10% band. Our main results continue to hold with the 2008 coefficient on the interaction between the Jumbo dummy and CDA being negative and significant with a similar magnitude.

3.2 Controlling for trading assets

The trading assets category in the Call Report is not available before 1995. We therefore did not control for this category in the benchmark and jumbo regressions in the table. Here we reduce the sample in order to show how controlling for trade affects our results. The results from the benchmark regressions are shown in Table C3. For comparison we first show in the upper panel the benchmark regression without trade on the reduced sample (1996-2010). The lower panel shows the estimated coefficients when we do control for trading assets. Note that the coefficients on CDA remain broadly unchanged during the boom and the crisis years. As for the coefficients on trading assets, with the exception of 1996 and 1997, trading assets is asssociated with a lower rejection rate in almost all pre-crisis years. The coefficient becomes non-significant during the crisis, which is an interesting finding and in line with expectations that trading assets would have a negative effect on the supply of credit during the crisis. Nevertheless this effect seems orthogonal to the CDA effect that is documented in the paper. Controlling for trading assets in the Jumbo regressions has also no significant impact on our findings (not shown).

3.3 Changes vs. levels in CDA

We have shown that the level of exposure to wholesale funding has a significant effect on lending decisions during the crisis. Here we ask whether changes in the exposure prior to the crisis mattered. For example, did banks that increased their wholesale funding most during

the housing boom reduce the credit most during the crisis? The liquidity channel hypothesis suggests that what matters for credit supply is the bank liability structure, a stock variable, at the time of the crisis. Nevertheless we do address this issue here in Table C4. In the first panel we look at the correlation between the level and the changes in CDA over time. First, we see a high correlation between the CDA in 2008 (that is Q4-2007 level) and that in 2005 and even 2000. That is, the level of CDA is quite persistent. Second, we see some evidence of a catch-up effect. Higher levels of CDA predict, on average, a smaller increase in CDA (or larger decrease in CDA) in the future. This can be seen from the negative correlation between CDA00 and Δ_{00-05} CDA as well as the negative correlation between CDA05 and Δ_{05-08}.

Panel B compares the results from the benchmark estimation (on 2005-2010 data) using level in CDA (first row) vs. changes (second and third rows).[3] We find that changes in CDA alone are not significant predictors of rejection rates during that period.

3.4 Bank Size and Matching

In this subsection, we further address the imbalance in bank size between wholesale and retail banks. As shown in Table 2 and Table 3 in the paper, size is correlated with CDA. While we do control for size along other bank characteristics in all regressions except the baseline, here we further seek to address this issue non-parametrically. Doing so is also likely help to reduce the heterogeneity in other banking characteristics. As we have also discussed in the paper, some more modest correlation between other bank characteristics and CDA seem to simply reflect the correlation between size and CDA. This is for example illustrated in Table C5. It shows that, with few exceptions, most variables are more correlated with size than CDA; size 'explains' much better the variation in these variables and adding CDA to the regression of the banking variable on size barely improves R^2.

For the matching exercise to be meaningful it needs to be done on a balanced sample.

[3] We do not include the full sample since we want the control variables to precede bank decisions.

To avoid reducing the sample of banks too much, we focus on the 2005-2010 period since our key results are from the crisis period. This also helps balancing banks within the wholesale and retail categories since CDA did not change significantly over that period. We use the lower CDA quartile in 2005 as a cutoff for wholesale banks. Our balanced sample consists of 99 wholesale and 94 retail banks.[4]

The distribution of log size before and after balancing is shown in Table C6. The table shows that the matching has successfully addressed the imbalance in bank size. The p-values from both the T-test and the Kolmogorov-Smirnov Test show that we cannot refute the hypotheses that the post-matching subsamples have the same mean and distribution. This was clearly not the case prior to the matching.

Table C7 shows the pre- and post-matching T-test and KS-test p-values for all the balance sheet variables we have examined so far. We find that by matching banks we have also substantially addressed other imbalances in the data. In fact, the T-test shows that we cannot reject that the mean of all these variables is the same across both subsamples. The KS-test suggests that the distribution of all variables except, leverage and C&I loans ratio, is also not statistically significant across the matched sub-samples.

The size-related robustness results are shown in Table C8. The first column shows the benchmark results from the 2005-2010 period, which are in line with our previous results.[5] We then divide the sample based on the $1 billion assets cutoff in 2005 and show the results seperately for banks below and above the cutoff. We find that the relation between CDA hold in both subsamples, although it is significantly larger in the sample of larger banks. Small banks are typically regional banks with high CDA ratios. The results suggest that the positive impact of core deposits taper off at high CDA levels. In the third and fourth column

[4]Using the lower CDA quartile in 2005 as a cutoff for wholesale banks gives us 797 retail and 265 wholesale on which the pre-matching comparison is made. We then balance the sample which leaving us with 497 banks, with 120 wholesale banks. We then match these 120 wholesale banks (one-to-one matching) to retail banks. We then match retail banks to wholesale banks. This double matching allows us to eliminate outlier matches and keep only bank pairs that are matched in both procedures. Similar results are obstained if we drop matches that are too far apart, using a variant of *caliper matching* (Cochran and Rubin, 1973).

[5]Note that unlike Table C4, which was illustrative, we now control for all bank characteristics in the benchmark regression in the paper.

we repeat a similar exercise with the $10 billion cutoff instead. Finally in the last column we run the regression on the matched banks. We find a remarkably similar coefficient despite the reduction in the size of the sample. This result greatly assuages concerns related to the correlation of CDA with other bank balance sheet variables.

Table A1

Variable Name	Definition	Call Report Code
Size	log of total assets	ln(RCFD2170)
Leverage ratio	Total equity capital/ total assets	RCFD3210/RCFD2170
Profitability ratio	Net income / total assets	RIAD4340/RCFD2170
Liquidity ratio	Held-to-maturity securities, total + Available-for-sale securities, total + Federal funds sold in domestic offices + Securities purchased under agreement to resell+ Noninterest-bearing balances and currency and coin + Interest-bearing balances / Total assets	(RCFD1754+RCFD1773+RCONB987+ RCFDB989+RCFD0081+RCFD0071) /RCFD2170
Unused Commitments ratio	Total Unused Commitments / Total assets + Total unused commitments	(RCFD3423)/(RCFD2170+RCFD3423)
Return on Equity ratio	Net income/ total equity capital	RIAD4340/RCFD3210
Loss provisions ratio	Provision for loan and lease losses / Total assets	RIAD4230/RCFD2170
Loans secured by properties ratio	Revolving, open-end loans secured by 1-4 family residential properties and extended under lines of credit + All other loans secured by 1-4 family residential properties: secured by first liens + All other loans secured by 1-4 family residential properties: secured by junior liens + Real estate loans secured by multi-family (5 or more) residential properties / Total Assets	(RCON1797+RCON5367+RCON5368 +RCON1460)/RCFD2170
Loans secured by real estate	Loans secured by real estate/Total assets	RCFD1410
Construction loans	Construction and land development loans / total assets	RCON1415/RCFD2170
C&I Loans ratio	C&I loans / Total assets	RCON1766/RCFD2170
lndividual loans ratio	(Loans to individuals for household, family, and other personal expenditures (i.e., consumer loans) (includes purchased paper): Credit cards + Other revolving credit plans + Other consumer loans)/total assets	(RCFDB538+ RCFDB539 + RCFD2011)/RCFD2170
Securities ratio	(Held-to-maturity + Available-for-sale securities (from Schedule RC-B, column D))/Total assets	(RCFD1754 + RCFD1773)/RCFD2170
Federal funds ratio	(Federal funds sold in domestic offices + Securities purchased under agreements to resell)/total assets	RCONB987+ RCFDB989/RCFD2170
Trading assets ratio	Trading assets/total assets	RCFD3545/RCFD2170

Table B1: Jumbo falsification tests: 80-100 band

Notes: This table shows some of the coefficient not shown in Table 9 in the paper, due to space constraints. The estimation is based on regression (2) in the paper, with the exception that the Jumbo cutoff is not the true cutoff but an imaginary one, as a falsification test. We estimate the regression over a Sample A which includes loans bewteen 80 and 100 percent of the true jumbo limit, and assumes a fake jumbo limit at 90 percent. We only show the main coefficients, which are those on CDA, Jumbo, and the interaction between CDA and Jumbo for each year since the regression includes a large set of regressors including yearly coefficients on bank characteristics.

	1992	**1993**	**1994**	**1995**	**1996**	**1997**	**1998**	**1999**	**2000**	**2001**
Year	-0.2263	-0.4661***	-0.1461	-0.2552	-0.1941	0.0123	-0.0093	0.2904**	0.3316***	0.0855
	(0.1802)	(0.1443)	(0.1819)	(0.1562)	(0.1434)	(0.1667)	(0.1401)	(0.1367)	(0.1239)	(0.1468)
CDA	0.0850	0.1454*	0.1017	0.1096*	0.1128*	0.1376**	0.0976	0.0515	0.0813	0.0390
	(0.0764)	(0.0795)	(0.0693)	(0.0628)	(0.0592)	(0.0683)	(0.0726)	(0.0465)	(0.0564)	(0.0816)
Jumbo	-0.0054	0.0307	0.0060	0.0114	0.0065	0.0385	0.0218	0.0211	0.0059	0.0302
	(0.0346)	(0.0383)	(0.0357)	(0.0241)	(0.0276)	(0.0270)	(0.0324)	(0.0225)	(0.0162)	(0.0287)
Jumbo X CDA	0.0150	-0.1199	0.0377	0.0351	0.0307	-0.0132	-0.0149	-0.0170	-0.0276	0.0957
	(0.1201)	(0.1037)	(0.0722)	(0.0665)	(0.0830)	(0.0543)	(0.0562)	(0.0454)	(0.0718)	(0.1377)

	2002	**2003**	**2004**	**2005**	**2006**	**2007**	**2008**	**2009**	**2010**
Year	0.0578	-0.1839	-0.0966	-0.2711*	0.0800	-0.1445	0.6993***	0.5158	0.2008
	(0.1279)	(0.1638)	(0.1590)	(0.1644)	(0.1825)	(0.1871)	(0.2341)	(0.3937)	(0.2628)
CDA	0.0316	0.0713	0.0324	0.0349	0.0428	0.0307	-0.2965***	-0.0667	-0.1023
	(0.0432)	(0.0547)	(0.0497)	(0.0538)	(0.0695)	(0.0777)	(0.0943)	(0.2137)	(0.1436)
Jumbo	0.0144	0.0005	0.0034	0.0070	-0.0327	-0.0050	-0.0096	-0.0392	-0.0194
	(0.0278)	(0.0262)	(0.0110)	(0.0210)	(0.0245)	(0.0171)	(0.0218)	(0.0344)	(0.0473)
Jumbo X CDA	0.0543	0.1003	-0.0445	-0.0230	0.0428	-0.0017	-0.0232	0.0211	0.1150
	(0.0918)	(0.0913)	(0.0338)	(0.0362)	(0.0438)	(0.0554)	(0.1421)	(0.3175)	(0.2613)

Table B2: Jumbo falsification tests: 100-120 band

Notes: This table shows some of the coefficient not shown in Table 9 in the paper, due to space constraints. The estimation is based on regression (2) in the paper, with the exception that the Jumbo cutoff is not the true cutoff but an imaginary one, as a falsification test. We estimate the regression over a Sample A which includes loans bewteen 100 and 120 percent of the true jumbo limit, and assumes a fake jumbo limit at 110 percent. We only show the main coefficients, which are those on CDA, Jumbo, and the interaction between CDA and Jumbo for each year since the regression includes a large set of regressors including yearly coefficients on bank characteristics.

	1992	**1993**	**1994**	**1995**	**1996**	**1997**	**1998**	**1999**	**2000**	**2001**
Year	-0.9913**	-0.5453**	-0.3956	-0.3203	-0.2023	-0.0719	-0.2054	0.3738**	0.3477**	0.1388
	(0.4070)	(0.2316)	(0.2622)	(0.2230)	(0.2622)	(0.2307)	(0.1792)	(0.1666)	(0.1705)	(0.2102)
CDA	-0.0090	0.3830***	0.1531**	0.0573	0.0573	0.0763	0.1213	0.0897	0.0276	-0.0579
	(0.1330)	(0.1302)	(0.0771)	(0.0922)	(0.0842)	(0.0745)	(0.0956)	(0.0599)	(0.0754)	(0.1104)
Jumbo	0.0143	0.0778	-0.0213	-0.0436	-0.0359	0.0168	0.0158	0.0125	0.0068	-0.0624
	(0.0646)	(0.0680)	(0.0504)	(0.0478)	(0.0538)	(0.0329)	(0.0313)	(0.0217)	(0.0414)	(0.0686)
Jumbo X CDA	0.0150	-0.1199	0.0377	0.0351	0.0307	-0.0132	-0.0149	-0.0170	-0.0276	0.0957
	(0.1201)	(0.1037)	(0.0722)	(0.0665)	(0.0830)	(0.0543)	(0.0562)	(0.0454)	(0.0718)	(0.1377)
	2002	**2003**	**2004**	**2005**	**2006**	**2007**	**2008**	**2009**	**2010**	
Year	-0.0521	-0.3599*	-0.2197	-0.3871*	0.2218	0.0823	0.4682	1.8260	0.0165	
	(0.1875)	(0.2050)	(0.2020)	(0.2227)	(0.2122)	(0.3240)	(0.4217)	(1.1644)	(0.3098)	
CDA	-0.0086	0.0187	0.1070*	-0.0214	-0.0612	-0.1025	-0.5099***	0.1840	-0.1526	
	(0.0881)	(0.1059)	(0.0620)	(0.0695)	(0.0906)	(0.1347)	(0.1784)	(0.4866)	(0.1898)	
Jumbo	-0.0486	-0.0633	0.0215	0.0239	-0.0256	-0.0072	0.0007	-0.0417	-0.0738	
	(0.0519)	(0.0492)	(0.0145)	(0.0149)	(0.0243)	(0.0301)	(0.0709)	(0.1562)	(0.1535)	
Jumbo X CDA	0.0543	0.1003	-0.0445	-0.0230	0.0428	-0.0017	-0.0232	0.0211	0.1150	
	(0.0918)	(0.0913)	(0.0338)	(0.0362)	(0.0438)	(0.0554)	(0.1421)	(0.3175)	(0.2613)	

Table C1: Benchmark regression - contemporaneous bank measures

Notes: This table shows the coefficient estimations from the regression in (1) but without lagging bank characetristics. All estimations include year (α_t), bank (λ_k), and MSA (μ_m). We cluster standard errors at the bank and MSA level. To preserve space we only show the coefficients on α_t, CDA_{t-1}, and Z_{t-1}.

	1992	**1993**	**1994**	**1995**	**1996**	**1997**	**1998**	**1999**	**2000**	**2001**
Year	-0.3088*	-0.2804	-0.1871	-0.2115	-0.0203	0.0769	-0.1729	0.0653	-0.0205	-0.0065
	(0.1791)	(0.1753)	(0.1608)	(0.1409)	(0.1477)	(0.1775)	(0.1241)	(0.1087)	(0.1161)	(0.1232)
CDA	0.1334*	0.1650**	0.1532*	0.1435**	0.0271	-0.0394	0.1056*	0.0653	0.1108**	0.0525
	(0.0796)	(0.0737)	(0.0793)	(0.0656)	(0.0680)	(0.0951)	(0.0634)	(0.0498)	(0.0445)	(0.0427)
Leverage	0.4624*	0.4717*	0.2341	0.2301	-0.0898	0.0737	0.4313	0.1598**	-0.2775	0.0712
	(0.2363)	(0.2424)	(0.2439)	(0.1722)	(0.1707)	(0.3508)	(0.2658)	(0.0678)	(0.2013)	(0.1022)
Size	0.0202**	0.0167*	0.0096	0.0114	0.0119	0.0122	0.0128*	0.0015	0.0039	0.0034
	(0.0095)	(0.0094)	(0.0086)	(0.0084)	(0.0078)	(0.0089)	(0.0077)	(0.0068)	(0.0069)	(0.0070)
Profitability	1.3591	1.6452*	1.0136	0.4810	-1.1671	-5.1269***	-2.3763***	1.0140	0.2186	-0.4565
	(0.9066)	(0.9215)	(0.7750)	(0.6085)	(0.8620)	(1.7266)	(0.7612)	(0.7885)	(0.2478)	(0.7723)
Liquidity	-0.1300	-0.1121	-0.1488	-0.0815	-0.0386	-0.0779	-0.1056	-0.1312**	-0.0301	0.0211
	(0.2177)	(0.1376)	(0.1419)	(0.1268)	(0.0599)	(0.1153)	(0.0665)	(0.0560)	(0.0772)	(0.0575)
Unused Commitments	0.2994***	0.2122**	0.2140***	0.1483**	0.1531**	0.1311	0.1970*	0.0821	0.0270	0.0556
	(0.0809)	(0.0927)	(0.0734)	(0.0695)	(0.0776)	(0.0961)	(0.1007)	(0.0540)	(0.0683)	(0.0614)
Securitization	-0.0429	-0.1440**	-0.0446	-0.0518**	-0.0389	-0.1217***	-0.0371	-0.0624**	-0.0361	-0.0384**
	(0.0347)	(0.0595)	(0.0300)	(0.0229)	(0.0260)	(0.0426)	(0.0279)	(0.0272)	(0.0240)	(0.0170)
Prop2assets	0.0367	-0.0313	-0.0052	0.0275	-0.0466	-0.1333	0.0279	-0.0415	0.0303	0.0116
	(0.1185)	(0.0393)	(0.0328)	(0.0373)	(0.0687)	(0.1039)	(0.0710)	(0.0475)	(0.0478)	(0.0541)
Cons2assets	0.1352	0.1813	-0.0810	-0.0670	-0.2817*	-0.0268	-0.1902	-0.4052***	-0.3854**	-0.1661
	(0.1609)	(0.1732)	(0.2423)	(0.1866)	(0.1657)	(0.4406)	(0.2745)	(0.1410)	(0.1940)	(0.1126)
PPL2assets	1.5947*	2.6503*	2.2798	1.3451	0.9272	-1.8208	-0.6346	-2.2699*	1.6356	-0.5771
	(0.9466)	(1.5429)	(1.7831)	(1.4845)	(1.6510)	(2.9114)	(2.3009)	(1.2368)	(1.5740)	(1.1834)
CLI2assets	-0.1689	-0.1797	-0.0618	0.0798	-0.1855	-0.0384	0.1431	-0.0129	0.2753***	0.1694*
	(0.1053)	(0.1113)	(0.0942)	(0.1005)	(0.1602)	(0.2417)	(0.1411)	(0.1019)	(0.0979)	(0.0904)

Table C1 (continued)

	2002	2003	2004	2005	2006	2007	2008	2009	2010
Year	-0.0541	-0.0346	-0.1820	-0.2690**	-0.0885	-0.0052	0.2446*	0.3787**	0.2436
	(0.1255)	(0.1192)	(0.1116)	(0.1146)	(0.1272)	(0.1458)	(0.1413)	(0.1782)	(0.1575)
CDA	0.0514	-0.0700	0.0173	-0.0201	0.0489	-0.0117	-0.2261***	-0.2009***	-0.2049**
	(0.0454)	(0.0535)	(0.0368)	(0.0440)	(0.0458)	(0.0578)	(0.0611)	(0.0730)	(0.0821)
Leverage	-0.1157	0.0017	0.0041	0.2675*	-0.0259	0.1963	-0.0731	0.0608	0.5090
	(0.1506)	(0.1951)	(0.1482)	(0.1586)	(0.2097)	(0.2287)	(0.1103)	(0.3205)	(0.3479)
Size	0.0024	0.0012	0.0047	0.0067	0.0007	-0.0024	-0.0045	-0.0080	-0.0027
	(0.0075)	(0.0067)	(0.0067)	(0.0064)	(0.0061)	(0.0067)	(0.0066)	(0.0074)	(0.0059)
Profitability	-0.9806	1.0557	-0.1788	-2.0988***	1.1698**	1.3681*	-0.7632	0.0350	2.3213***
	(0.6963)	(0.7955)	(0.5495)	(0.5964)	(0.5217)	(0.8082)	(0.7931)	(0.3259)	(0.5930)
Liquidity	0.1557**	0.0044	0.2571***	0.3192***	0.1612**	0.1218**	0.1148	-0.0042	0.1227
	(0.0678)	(0.0900)	(0.0629)	(0.0535)	(0.0653)	(0.0611)	(0.0844)	(0.0972)	(0.0839)
Unused Commitments	0.1432**	0.2365**	0.1257*	0.1971**	0.1452**	0.2673***	0.2965***	0.1467*	-0.0896
	(0.0644)	(0.1022)	(0.0757)	(0.0844)	(0.0614)	(0.0955)	(0.0880)	(0.0804)	(0.0736)
Securitization	-0.0358*	-0.0180	-0.0074	-0.0734***	-0.0480**	-0.0417	-0.0237	-0.0294	-0.0149
	(0.0198)	(0.0213)	(0.0215)	(0.0251)	(0.0235)	(0.0258)	(0.0272)	(0.0239)	(0.0300)
Prop2assets	0.0756	0.2310***	0.1952***	0.3545***	0.0818	0.1000	0.0461	-0.0655	-0.1138
	(0.0662)	(0.0840)	(0.0539)	(0.0599)	(0.0662)	(0.0696)	(0.0743)	(0.1063)	(0.0894)
Cons2assets	-0.0415	0.0226	0.1985**	0.2199**	0.0898	0.2140*	-0.0174	-0.1425	-0.0726
	(0.0871)	(0.0925)	(0.0841)	(0.0920)	(0.1085)	(0.1239)	(0.1070)	(0.1359)	(0.1275)
PPL2assets	0.0271	-5.7456***	-1.9571*	-2.5559	-1.8778	-4.5585*	-0.5770	2.8203	5.3797***
	(1.0981)	(2.1758)	(1.0041)	(2.1325)	(1.2684)	(2.5737)	(2.7642)	(1.7910)	(1.7468)
CLI2assets	0.2185*	0.4635***	0.4315***	0.5563***	0.4102***	0.0974	0.0821	-0.1127	-0.1827
	(0.1172)	(0.1375)	(0.1071)	(0.1203)	(0.1277)	(0.1529)	(0.1693)	(0.1647)	(0.1592)

Table C2 : Jumbo cutoff regression: 10 percent band - contemporaneous bank measures

Notes: This table shows the coefficient estimates from the regression in (2) in the paper. We estimate a linear probability model to examine the impact of banks' core deposits to assets ratio (CDA) on the relative rejection rate of jumbo loans in each year. The regression is estimated on subsample of loans straddling the jumbo cutoff that are within 90% and 110% of the yearly jumbo cutoff. The CDA and other banking variables are contemporaneous in this table. Standard errors are clustered at the bank and MSA level. To preserve space we only show a subset (the main) coefficients.

	1992	**1993**	**1994**	**1995**	**1996**	**1997**	**1998**	**1999**	**2000**	**2001**
Year (α_t)	-0.2987*	-0.2576	-0.1467	-0.3333	-0.1872	0.0944	-0.0365	0.3211**	0.3196*	0.1909*
	(0.1652)	(0.1754)	(0.1659)	(0.2090)	(0.1521)	(0.1499)	(0.1423)	(0.1347)	(0.1634)	(0.1152)
CDA	0.0953	0.1897***	0.1243**	0.1675**	0.1131**	0.0195	0.0898	-0.0386	0.0276	-0.0408
	(0.0619)	(0.0607)	(0.0557)	(0.0681)	(0.0486)	(0.0549)	(0.0674)	(0.0560)	(0.0498)	(0.0487)
Jumbo	-0.0331	0.0160	0.0224	0.0305	0.0159	-0.0060	0.0381*	0.0021	0.0228*	0.0867***
	(0.0410)	(0.0416)	(0.0404)	(0.0383)	(0.0328)	(0.0326)	(0.0205)	(0.0182)	(0.0125)	(0.0333)
Jumbo X CDA	0.0577	0.0099	-0.0292	-0.0435	-0.0003	0.0033	-0.0323	0.0227	-0.0435*	-0.0672
	(0.0644)	(0.0635)	(0.0490)	(0.0556)	(0.0439)	(0.0435)	(0.0356)	(0.0319)	(0.0228)	(0.0572)
	2002	**2003**	**2004**	**2005**	**2006**	**2007**	**2008**	**2009**	**2010**	
Year (α_t)	0.0990	-0.1511	-0.1528	-0.2002	0.2123	0.0937	0.7829***	0.5522***	0.8882***	
	(0.1209)	(0.1339)	(0.1468)	(0.1371)	(0.1832)	(0.1760)	(0.2263)	(0.2143)	(0.3242)	
CDA	-0.0168	-0.0915	0.0008	-0.0872*	-0.0274	-0.0435	-0.1734**	-0.1924	-0.0977	
	(0.0482)	(0.0620)	(0.0531)	(0.0482)	(0.0626)	(0.0721)	(0.0826)	(0.1218)	(0.1823)	
Jumbo	0.0235	0.0353	-0.0014	0.0003	0.0207	0.0754***	0.1894***	0.1196**	-0.0445	
	(0.0193)	(0.0242)	(0.0078)	(0.0070)	(0.0220)	(0.0243)	(0.0366)	(0.0494)	(0.0357)	
Jumbo X CDA	-0.0281	-0.0634	-0.0049	0.0034	-0.0099	-0.0347	-0.2024***	-0.1921*	0.0936	
	(0.0317)	(0.0476)	(0.0224)	(0.0142)	(0.0405)	(0.0431)	(0.0648)	(0.1003)	(0.0683)	

Table C3: Benchmark robustness - controlling for trading assets

Note: This table reports the estimated coefficients from the benchmark regression (regression (1) in the text) adding trading assets as a control. The main regression in the table does not control for trading assets since these are not available before 1995. Since controlling for trading assets imply a reduction in the sample period we first, in the upper panel show results from the estimation excluding trading over the 1996-2010 period. In the lower panel we add trading assets. Note that both regressions control for other bank characteristics, bank and MSA fixed effects, and cluster standard errors at the bank and MSA level.

Without Trade									
	1996	**1997**	**1998**	**1999**	**2000**	**2001**	**2002**	**2003**	**2004**
Year	0.1110	0.0361	-0.2019	0.1178	0.1058	-0.0041	-0.0003	0.1084	-0.0430
	(0.1364)	(0.1534)	(0.1729)	(0.1325)	(0.1407)	(0.1296)	(0.1305)	(0.1479)	(0.1408)
Size	0.0093	0.0189**	0.0175**	-0.0015	0.0003	0.0038	0.0019	-0.0026	0.0016
	(0.0080)	(0.0088)	(0.0072)	(0.0070)	(0.0084)	(0.0075)	(0.0080)	(0.0077)	(0.0077)
CDA	0.0259	0.0143	0.1228*	0.0859	0.1119*	0.1189**	0.0916**	0.0566	0.0150
	(0.0743)	(0.0897)	(0.0672)	(0.0528)	(0.0602)	(0.0566)	(0.0454)	(0.0585)	(0.0499)
	2005	**2006**	**2007**	**2008**	**2009**	**2010**			
Year	-0.2489*	-0.0167	-0.1798	0.3844**	0.2983	0.2171			
	(0.1408)	(0.1305)	(0.1617)	(0.1614)	(0.2065)	(0.1485)			
Size	0.0053	-0.0028	0.0028	-0.0082	-0.0085	-0.0018			
	(0.0072)	(0.0068)	(0.0070)	(0.0080)	(0.0087)	(0.0073)			
CDA	0.0590	0.0714	0.0623	-0.2620***	-0.1145	-0.1576			
	(0.0458)	(0.0527)	(0.0636)	(0.0594)	(0.1064)	(0.0880)			

Table C3 (continued)

With Trade									
	1996	**1997**	**1998**	**1999**	**2000**	**2001**	**2002**	**2003**	**2004**
Year	-0.0662	-0.1231	-0.1869	0.0950	0.0951	-0.0377	-0.0007	0.1322	-0.0466
	(0.1246)	(0.1336)	(0.1509)	(0.1167)	(0.1293)	(0.1179)	(0.1269)	(0.1205)	(0.1270)
Size	0.0055	0.0100	0.0192**	0.0026	0.0040	0.0078	0.0053	0.0031	0.0036
	(0.0073)	(0.0080)	(0.0081)	(0.0070)	(0.0075)	(0.0073)	(0.0079)	(0.0075)	(0.0079)
Trade	0.5061*	0.8052**	-0.7582**	-0.7175***	-0.8466**	-0.7211**	-0.5589*	-0.6858***	-0.2700
	(0.2857)	(0.3735)	(0.3278)	(0.2318)	(0.3873)	(0.3146)	(0.2950)	(0.1877)	(0.2287)
CDA	0.1386***	0.1151	0.1144*	0.0943**	0.1078*	0.1250**	0.0820	0.0153	0.0118
	(0.0522)	(0.0788)	(0.0622)	(0.0449)	(0.0613)	(0.0581)	(0.0522)	(0.0519)	(0.0468)
	2005	**2006**	**2007**	**2008**	**2009**	**2010**			
Year	-0.2058*	0.0048	-0.1701	0.3086**	0.1600	0.2040			
	(0.1201)	(0.1178)	(0.1733)	(0.1541)	(0.1804)	(0.1547)			
Size	0.0125*	0.0048	0.0077	-0.0050	-0.0061	-0.0017			
	(0.0075)	(0.0073)	(0.0070)	(0.0079)	(0.0086)	(0.0076)			
Trade	-0.8138***	-0.9114***	-0.6111***	-0.3187	-0.1523	-0.4726			
	(0.2372)	(0.2436)	(0.2111)	(0.2024)	(0.3108)	(0.3710)			
CDA	0.0025	-0.0068	0.0286	-0.2483***	-0.0861	-0.1405			
	(0.0438)	(0.0450)	(0.0811)	(0.0641)	(0.0960)	(0.0948)			

Table C4: CDA level vs. change

Note: Panel A shows the correlation between levels and changes in CDA over time. Panel B presents regression results from three different specifications. The first specification in the first row is the same as regression (1) in the paper, except that we only look at the 2005-2010 period and for simplicity do not control for other banking characteristics. In the second row we simply replace CDA with the change in CDA between 2000 and 2005. In the third row we replace CDA with the change in CDA between 1995 and 2005. Standard errors are clustered at the bank and MSA level.

Panel A: Correlations

	CDA	CDA05	CDA00	D9505CDA	D0005CDA	D0508CDA
CDA	1					
cda05	0.8008	1				
cda00	0.7092	0.8039	1			
D9505CDA	0.3504	0.5566	0.1348	1		
D0005CDA	0.1425	0.3087	-0.3176	0.6718	1	
D0508CDA	0.1583	-0.4646	-0.2767	-0.3994	-0.2982	1

Panel B: Benchmark regressions

	2005	**2006**	**2007**	**2008**	**2009**	**2010**
CDA	-0.0566	0.0494	-0.0521	-0.3230***	-0.1897	-0.1973
	(0.1448)	(0.0946)	(0.0948)	(0.1077)	(0.1524)	(0.1355)
Delta00-05	-2.9067	-2.7042	-3.0019	-2.5896	-2.7224	-2.8629
	(9.7927)	(9.6809)	(9.7019)	(9.5654)	(9.5072)	(9.5186)
Delta95-05	0.6729	0.6717	0.7914	0.9510	0.7537	0.5170
	(0.7367)	(0.7213)	(0.7524)	(0.8514)	(0.9464)	(0.8898)

Table C5: Correlations addendum

Notes: This table reproduces the first two columns from Table 3 in the paper. In addition to these correlations between bank characteristics and CDA and Size (First and second columns, respectively) it shows the R-square of a simple regression of the row ratio on CDA and size and then CDA and Size (columns 3, 4, and 5).

	CDA	Size	R2 with CDA	R2 with Size	R2 with both
Size (log of total assets)	-0.3752	1			
Leverage	-0.0781	-0.1134	0.0061	0.0129	0.0298
Profitability	-0.0793	0.2093	0.0063	0.0438	0.0438
Liquidity	0.1259	0.0899	0.0159	0.0081	0.0377
Unused Commitments	-0.2918	0.4015	0.0851	0.1612	0.1844
Securitization	-0.0359	-0.1024	0.0013	0.0105	0.0169
Return on Equity	-0.0357	0.2819	0.0013	0.0794	0.0852
Loss provisions to assets	-0.2446	0.0742	0.0598	0.0055	0.0602
Loans secured by residential properties	0.0406	-0.2038	0.0016	0.0415	0.043
Real estate loans to assets	0.0862	-0.3382	0.0074	0.1144	0.1163
Construction Loans to assets	-0.0549	-0.1128	0.003	0.0127	0.0237
C&I loans to assets	-0.1035	0.1084	0.0107	0.0117	0.0163
Individual loans to assets	-0.0441	0.128	0.0019	0.0164	0.0164
Trading assets to assets	-0.1908	0.3263	0.0364	0.1065	0.1119

Table C6: Balancing tests for the bank matching exercise

Notes: This table illustrates the effectiveness of our procedure that matched banks based on their total assets (in log). Panel A compares the mean, median and standard deviation between the wholesale and retail sample (see text on the construction of these samples). It also presents the p-values from the mean equality test and from the Kolmogorov-Smirnov equality of distribution test. Panel B presents the same statistics from the matched sample.

	Wholesale				Retail			T-test	KS-test
	Mean	Median	St.Dev		Mean	Median	St.Dev	P-Val	P-Val
A: Pre Matching									
N=265	14.16	13.58	1.86	N=797	13.2	13.05	1.2	0.00	0.00
B: Post Matching									
N=99	13.89	13.41	1.55	N=94	14.01	13.59	1.6	0.58	0.99

Table C7: Pre- and post-matching comparison of bank balance sheet characteristics

Notes: This table shows the mean t-stat test and the distributional kolmogorov-Smirnov (KS) test test before and after matching banks based on size.

	Before matched		**After matched**	
	Mean Test	KS Test	Mean Test	KS Test
Size (log of total assets)	0.000	0.000	0.58	0.99
Leverage	0.113	0.001	0.411	0.013
Profitability	0.028	0.720	0.298	0.792
Liquidity	0.560	0.037	0.430	0.290
Unused Commitments	0.000	0.029	0.858	0.105
Securitization	0.824	0.984	0.493	0.723
Return on Equity	0.062	0.101	0.723	0.442
Loss provisions to assets	0.003	0.367	0.221	0.377
Loans secured by residential properties	0.623	0.387	0.288	0.238
Real estate loans to assets	0.000	0.000	0.255	0.898
Construction Loans to assets	0.210	0.367	0.933	0.822
C&I loans to assets	0.199	0.000	0.111	0.038
Individual loans to assets	0.160	0.141	0.297	0.458
Trading assets to assets	0.000	0.002	0.527	1.000

Table C8: Robustness tests: regressions by size and comparison of pre- and post-matching results

Notes: This table shows the estimated coefficients from the benchmark regression (see regression (1) in the paper) on the 2005-2010 sample. In columns (2) and (3) we estimate the regression on banks that are smaller and larger than 1 billion USD in total assets in 2005, respectively. In columns (4) and (5) we change the cutoff to 10 billion. In column (6) we show the estimated coefficients from the reduced and balanced sample through the bank size matching exercise. All standard errors are clustered at the bank and MSA level.

	Benchmark	**1 billion in assets**		**10 billion in assets**		**Matched banks**
Year		**less**	**more**	**less**	**more**	
2005	0.0603	-0.0135	0.1150	0.0343	0.0329	0.0524
	(0.0636)	(0.0249)	(0.0795)	(0.0324)	(0.1167)	(0.0511)
2006	0.1185*	0.0008	0.1511*	0.0771**	0.1257	-0.0222
	(0.0650)	(0.0213)	(0.0800)	(0.0362)	(0.1161)	(0.0672)
2007	0.0866	-0.0325	-0.1338	0.0862	-0.1696	-0.0731
	(0.0656)	(0.0272)	(0.0831)	(0.0591)	(0.1101)	(0.0711)
2008	-0.2566***	-0.0767**	-0.2967***	-0.1068***	-0.3212***	-0.2604***
	(0.0688)	(0.0361)	(0.0908)	(0.0349)	(0.1139)	(0.0973)
2009	-0.1262	-0.0279	-0.1685	-0.0231	-0.2116	-0.0884
	(0.1119)	(0.0333)	(0.1417)	(0.0398)	(0.1972)	(0.1503)
2010	-0.1596*	-0.0053	-0.1508	-0.0298	-0.0828	-0.0683
	(0.0844)	(0.0360)	(0.1010)	(0.0343)	(0.1288)	(0.1337)
N banks	1430	752	678	1002	428	193
N observations	6,189,189	535,607	5,653,582	1,274,980	4,914,209	2,008,109