Bank Credit Conditions and their Influence on Productivity Growth: Company-level Evidence

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Disclaimers:

Any views expressed cannot be taken to represent those of the Bank of England or to state Bank of England policy.

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Motivation

- The productivity puzzle – it remains unclear how and to what extent the lack of credit has affected productivity

- Difficult to disentangle what is a change in credit supply and what is a change in credit demand

- A credit supply shock may reduce labour productivity:
  - Bank forbearance (prevalence of zombie companies)
  - Resource reallocation across companies hampered
  - Reduction in investment due to difficulty in accessing finance

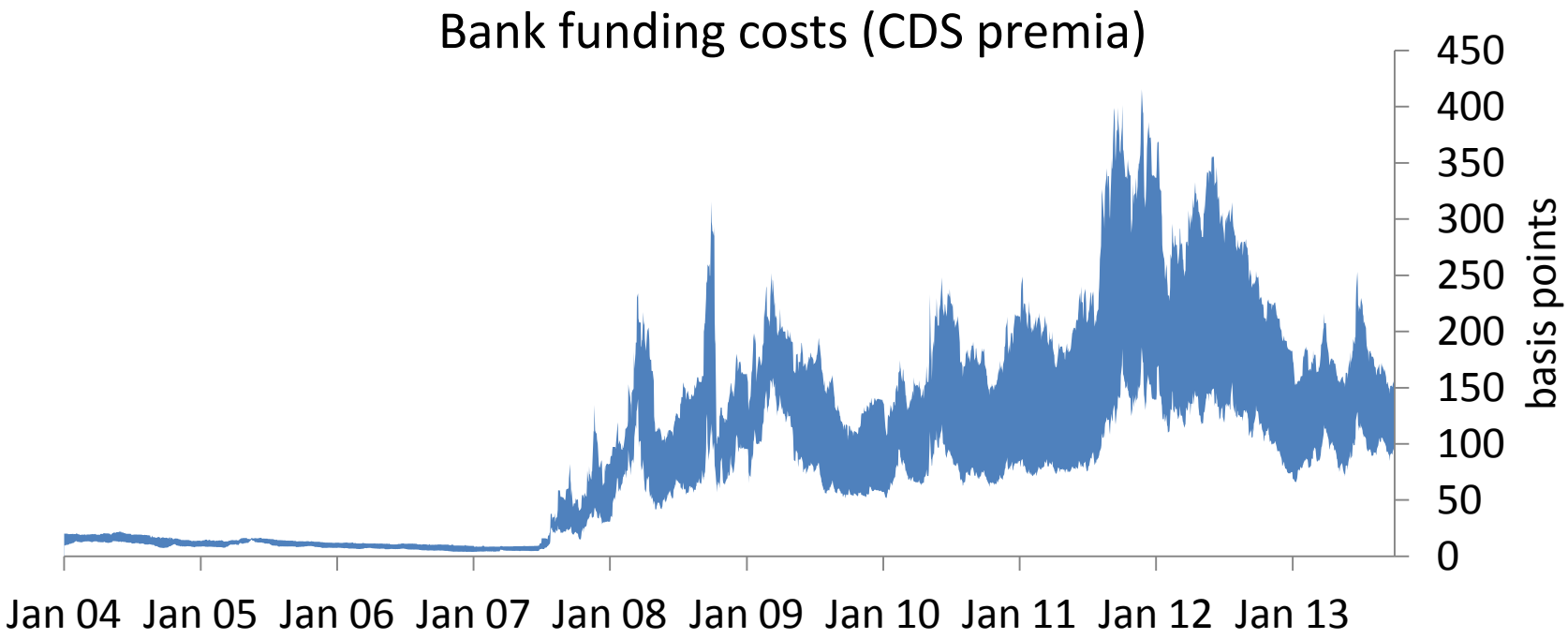
A Quasi-Experiment

- Exploit exogenous variation induced by the financial crisis in credit availability to companies to investigate impacts of credit supply shocks

- Compare outcomes for companies who were subjected to tougher credit constraints to outcomes for companies that were less likely to be constrained
  - Quasi-experimental approach
  - Divide firm observations into ‘treatment’ and ‘control’ groups based on main bank lender
  - Difficulty switching to a new lender during the crisis

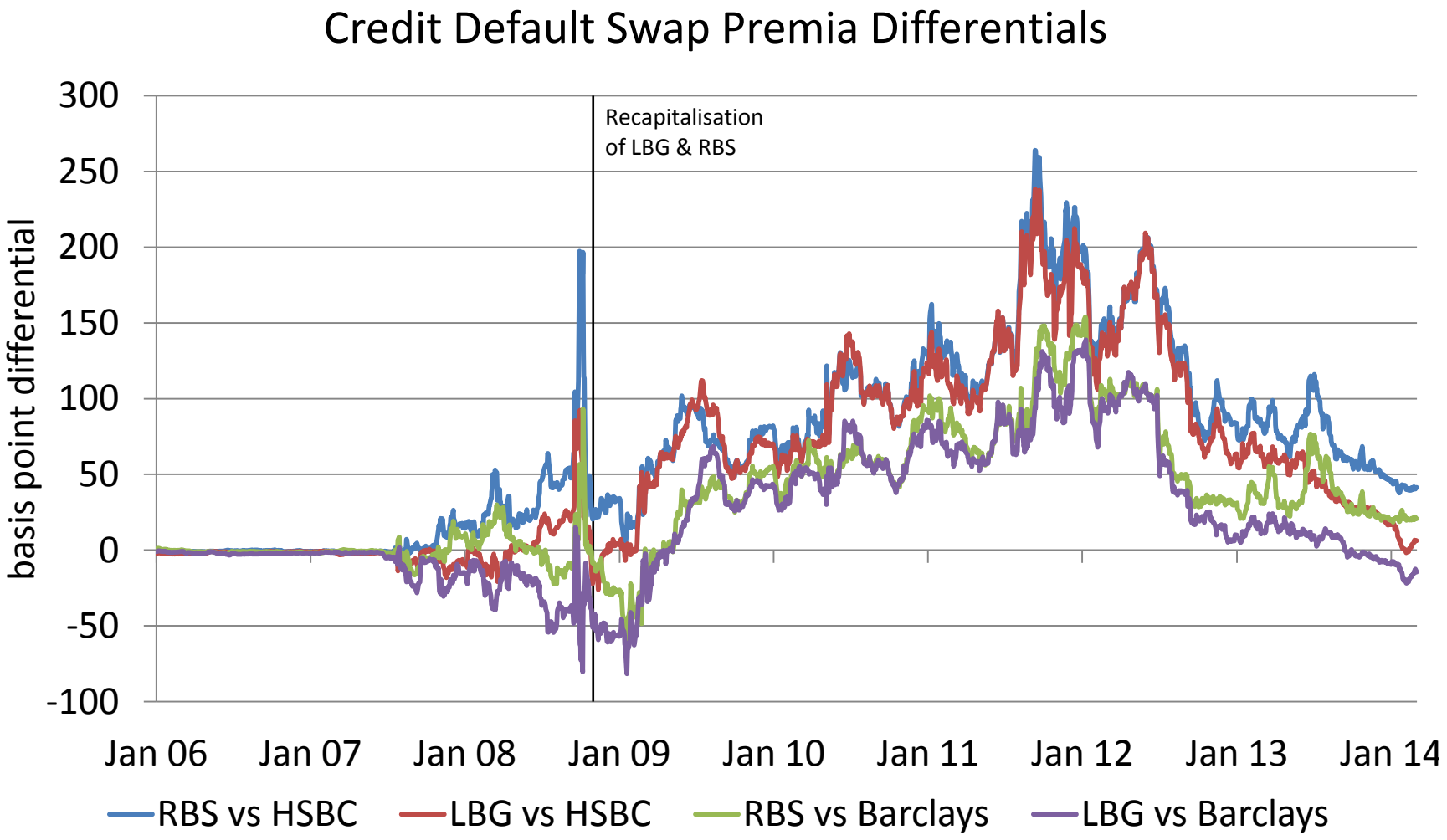
- Provide direct estimates of the impact of credit constraints on UK firms
  - Here we consider impacts on firm survival and productivity

The Different Experiences of UK Banks



From the Large Review:
Having lent aggressively in the run-up to the crisis, RBS's lending volumes to SMEs have fallen faster than peers and its market share has contracted from an unsustainably high share in 2008, to a level more consistent with its customer base.

The Different Experiences of the Big Four UK Banks



Distressed Banks

LBG	RBS	Other
BANK OF SCOTLAND	NATIONAL WESTMINSTER BANK	AIB GROUP
LLOYDS TSB	ROYAL BANK OF SCOTLAND	GOVERNOR AND COMPANY OF BANK OF IRELAND
LLOYDS BANK	ROYAL BANK OF SCOTLAND COMMERCIAL SERVICES	ANGLO IRISH BANK CORPORATION
TSB BANK	WESTMINSTER BANK	ALLIED IRISH BANKS
BANK OF WALES	RBS INVOICE FINANCE	CAPITAL HOME LOANS
HALIFAX	LOMBARD NORTH CENTRAL	FIRST TRUST BANK
HBOS	WILLIAMS & GLYN'S BANK	
TRUSTEE SAVINGS BANK	ROYAL BANK OF SCOTLAND SECURITY TRUSTEE	NORRN ROCK
TSB COMMERCIAL FINANCE	NATIONAL PROVINCIAL BANK	ALLIANCE & LEICESTER
TSB ENGLAND & WALES	ULSTER BANK	BRADFORD & BINGLEY BUILDING SOCIETY
TSB ASSET FINANCE		MORTGAGE EXPRESS

Not Distressed Banks

HSBC

HSBC BANK
MIDLAND BANK
HSBC INVOICE FINANCE
HSBC INVOICE FINANCE SECURITY HOLDER

Barclays

BARCLAYS BANK
WOOLWICH

Other

CLYDESDALE BANK
YORKSHIRE BANK
CO-OPERATIVE BANK
SANTANDER
ABBEY NATIONAL
NATIONWIDE BUILDING SOCIETY
MORTGAGE WORKS
PARAGON MORTGAGES
MORTGAGE TRUST
COUTTS & CO
COUTTS & COMPANY
CLOSE BRORS
CLOSE INVOICE FINANCE
SKIPTON BUILDING SOCIETY
NORWICH UNION MORTGAGE FINANCE
BIBBY FINANCIAL SERVICES
VENTURE FINANCE
GRIFFIN CREDIT SERVICES
ROYAL TRUST CORPORATION OF CANADA TRUSTEE
SVENSKA HANDELSBANKEN AB PUBL

Data: Financial Analysis Made Easy (FAME)

- Company Accounts information held by Companies House
  - provided by Bureau Van Dijk
  - annual historical discs
  - subsidiaries removed from the dataset
- Chargeholder recorded
  - tells us which banks a company is borrowing from
- Data issues
  - selective reporting of key accounts information
  - reporting of employment and output is particularly sparse
  - decline over time in tendency to report detailed accounting information
  - self-reporting of SIC codes

Difference-in-differences set-up

- Treatment (T) and Control (C) group
  - T = Companies with an outstanding charge with a DISTRESSED BANK at the time the bank was rescued
  - C = Companies with an outstanding charge with a NOT DISTRESSED BANK at the same time
- Track difference in the development of outcomes between the T and C groups since bank rescue/financial crisis
  - FY 2007/8 or FY 2008/9 (PRE-period) - FY 2011/12 or FY 2012/13 (POST-period)
- And compare this to differences in the development of outcomes between these two groups before the crisis

Difference-in-differences set-up (continued)

$$Y_{it} = cons + \beta_{DB} DB_i + \beta_{NDB} NDB_i$$

$$+ \gamma post + \gamma_{DB} post \times DB_i + \gamma_{NDB} post \times NDB_i$$

$$+ controls_{it} + u_i + \varepsilon_{it}$$

where $(\gamma_{DB} - \gamma_{NDB})$ identifies the effect of being stuck with a distressed bank.

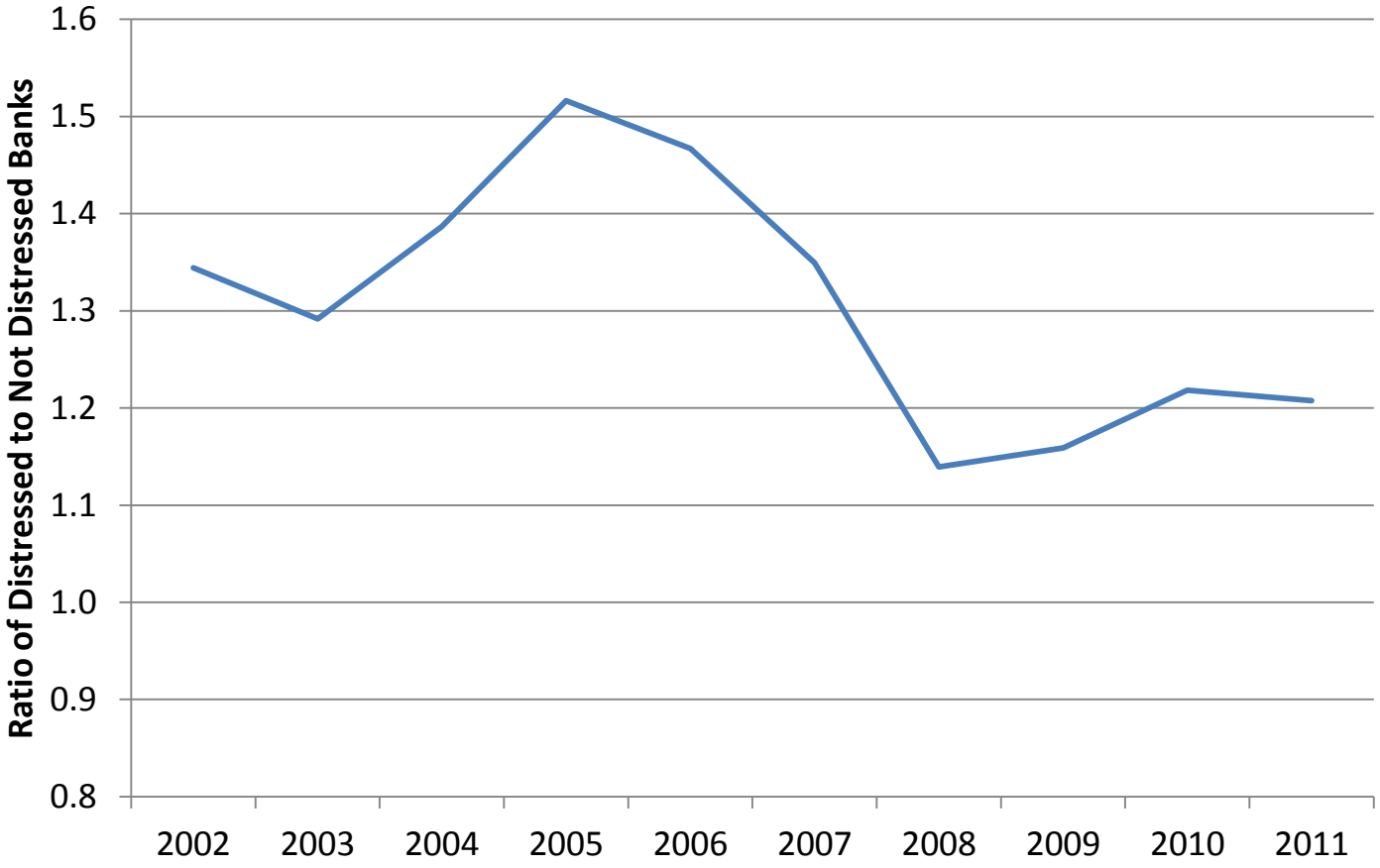
Further interactions included to distinguish the treatment effect by additional characteristics

$$+ \beta_H H_i + \gamma_H post \times H_i + \alpha_{DB} H_i \times DB_i + \alpha_{NDB} H_i \times NDB_i + \lambda_{DB} post \times H_i \times DB_i + \lambda_{NDB} post \times H_i \times NDB_i$$

where $(\lambda_{DB} - \lambda_{NDB}) + (\gamma_{DB} - \gamma_{NDB})$

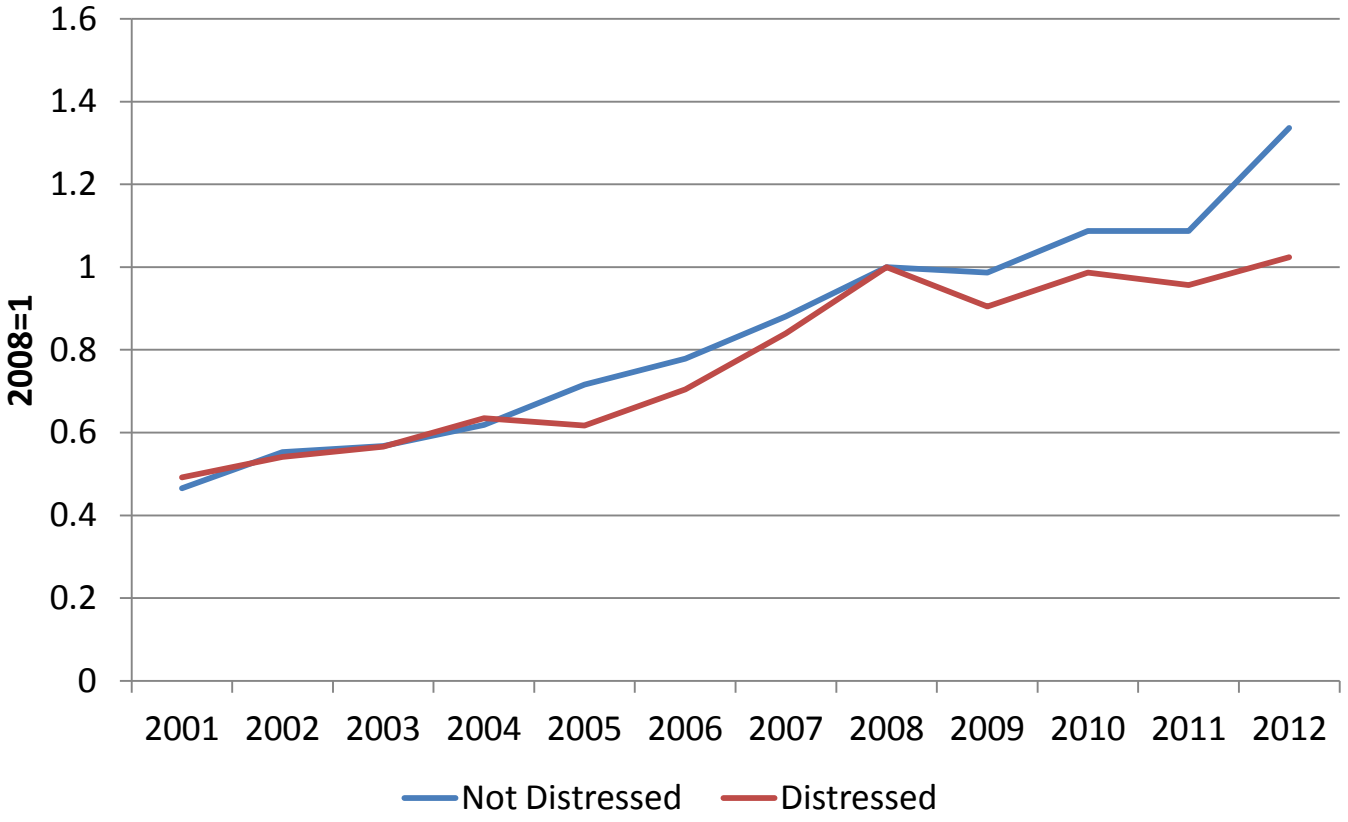
identifies the effect of being type *H* and stuck with a distressed bank.

Short term loans and overdrafts held by companies with outstanding charges in DISTRESSED and NOT DISTRESSED banks



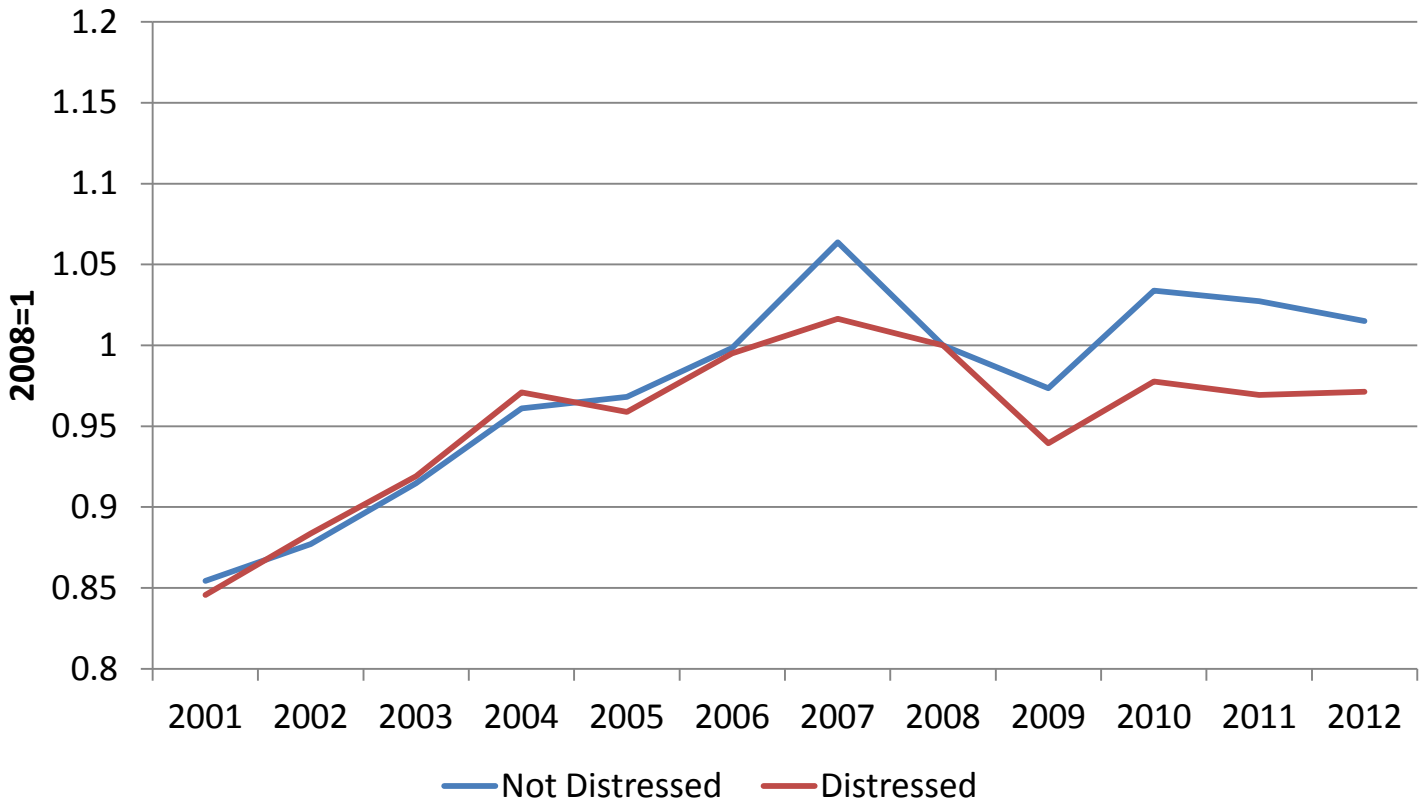
Source: FAME BvD and authors' calculations.
Notes: Companies in the non-financial non-farm business sectors excluding the Mining and Real Estate industries. Companies who do not have an outstanding charge with any other lender and who report their loans.

Median short term loans and overdrafts held by companies with outstanding charges in DISTRESSED and NOT DISTRESSED banks



Source: FAME BvD and authors' calculations.
Notes: Companies in the non-financial non-farm business sectors excluding the Mining and Real Estate industries. Companies who do not have an outstanding charge with any other lender and who report their debt.

Median labour productivity for companies with outstanding charges in DISTRESSED and NOT DISTRESSED banks



Source: FAME BvD and authors' calculations.
Notes: Companies in the non-financial non-farm business sectors excluding the Mining and Real Estate industries.
Companies who do not have an outstanding charge with any other lender and who report their debt.

PNFC Switching Between Lenders

Probability of changing lender

after:	1 year	2 years	3 years	4 years
All*	4.2	7.7	10.6	13.2
Big Four	3.3	6.1	8.6	10.7

Source: FAME BvD and authors' calculations.
Notes: Companies in the non-financial non-farm business sectors excluding the Mining and Real Estate industries. Companies who do not have an outstanding charge with any other lender. Big Four = RBS, Lloyds, HSBC, Barclays. Switching to another lender evaluated over the period 2001-2011.
*Switching between 15 categories of lender

Sample Characteristics (loan sample 2006-8)

	NDB	DB		NDB	DB
Exit rate (4 years)	0.202	0.197	Start-up	0.070	0.080
Exit rate (3 years)	0.162	0.155	Young	0.280	0.288
Total asset distribution			Foreign owned	0.045	0.052
2nd quintile	0.050	0.028	Exporter	0.042	0.040
3rd quintile	0.115	0.078	Count court judgment 0-24 mths	0.042	0.045
4th quintile	0.271	0.252	Normal credit score	0.801	0.807
5th quintile	0.549	0.628	Short term gearing >50th pctile	0.442	0.449
Group accounts	0.032	0.039	Short term gearing >75th pctile	0.180	0.182
Full accounts	0.122	0.144			
Companies	64991	75789			

Notes: Companies in the non-financial non-farm business sectors excluding the Mining and Real Estate industries. Companies who do not have an outstanding charge with any other lender and who report short term loans and overdrafts. Control group equals companies with an outstanding charge with a not distressed bank. Treatment group equals companies with an outstanding charge with a distressed bank. Financial years 2006-2008.

Sample Characteristics (productivity sample 2006-8)

	NDB	DB		NDB	DB
Exit rate (4 years)	0.108	0.109	Start-up	0.043	0.046
Exit rate (3 years)	0.083	0.082	Young	0.144	0.156
Total asset distribution			Foreign owned	0.171	0.160
2nd quintile	0.007	0.003	Exporter	0.208	0.182
3rd quintile	0.021	0.015	Count court judgment 0-24 mths	0.037	0.045
4th quintile	0.059	0.047	Normal credit score	0.953	0.960
5th quintile	0.913	0.935	Short term gearing >50th pctile	0.356	0.356
Group accounts	0.186	0.198	Short term gearing >75th pctile	0.106	0.100
Full accounts	0.441	0.441	Labour productivity >50th pctile	0.539	0.559
			Labour productivity >75th pctile	0.239	0.247
Companies	10195	13566			

Notes: Companies in the non-financial non-farm business sectors excluding the Mining and Real Estate industries. Companies who do not have an outstanding charge with any other lender and who report short term loans and overdrafts and for whom we can measure labour productivity and fixed assets. Control group equals companies with an outstanding charge with a not distressed bank. Treatment group equals companies with an outstanding charge with a distressed bank. Financial years 2006-2008.

Exit Rate effect of being with a nationalised bank

Exit period		Full sample	Loan sample	Productivity sample			
4-year		0.006 *** (0.0019)	0.011 *** (0.0037)	0.009	(0.0070)		
3-year		0.007 *** (0.0016)	0.009 *** (0.0030)	0.005	(0.0053)		
	Leverage position					Productivity position	
4-year	BELOW 50th		0.010 ** (0.0045)	0.018 **	(0.0079)	BELOW 50th	-0.007 (0.0117)
4-year	ABOVE 50th		0.012 * (0.0061)	-0.007	(0.0135)	ABOVE 50th	0.023 *** (0.0083)
3-year	BELOW 50th		0.011 *** (0.0035)	0.013 **	(0.0058)	BELOW 50th	-0.003 (0.0086)
3-year	ABOVE 50th		0.007 (0.0051)	-0.012	(0.0104)	ABOVE 50th	0.012 * (0.0061)
4-year	BELOW 75th		0.013 *** (0.0039)	0.014 *	(0.0071)	BELOW 75th	0.008 (0.0085)
4-year	ABOVE 75th		0.002 (0.0103)	-0.027	(0.0275)	ABOVE 75th	0.016 (0.0112)
3-year	BELOW 75th		0.010 *** (0.0031)	0.008	(0.0053)	BELOW 75th	0.006 (0.0064)
3-year	ABOVE 75th		0.006 (0.0085)	-0.022	(0.0210)	ABOVE 75th	0.000 (0.0083)

Notes: OLS regression; robust standard errors in brackets clustered by firm.

3-6 %points added to the exit rate

Exit Rate effects (pre-crisis falsification test)

Exit period		Full sample		Loan sample		Productivity sample				
4-year		-0.002	(0.0019)	-0.003	(0.0034)	-0.008	(0.0067)			
3-year		-0.003 *	(0.0019)	-0.001	(0.0032)	-0.007	(0.0060)			
	Leverage position							Productivity position		
4-year	BELOW 50th			-0.001	(0.0044)	-0.003	(0.0078)	BELOW 50th	-0.004	(0.0109)
4-year	ABOVE 50th			-0.006	(0.0058)	-0.016	(0.0131)	ABOVE 50th	-0.012	(0.0085)
3-year	BELOW 50th			0.000	(0.0039)	-0.005	(0.0067)	BELOW 50th	-0.008	(0.0099)
3-year	ABOVE 50th			-0.002	(0.0054)	-0.011	(0.0119)	ABOVE 50th	-0.006	(0.0073)
4-year	BELOW 75th			0.000	(0.0037)	-0.005	(0.0069)	BELOW 75th	-0.009	(0.0080)
4-year	ABOVE 75th			-0.018 *	(0.0098)	-0.036	(0.0261)	ABOVE 75th	-0.005	(0.0124)
3-year	BELOW 75th			0.001	(0.0034)	-0.003	(0.0061)	BELOW 75th	-0.010	(0.0072)
3-year	ABOVE 75th			-0.011	(0.0093)	-0.036	(0.0238)	ABOVE 75th	0.003	(0.0105)

Notes: OLS regression; robust standard errors in brackets clustered by firm.

Exit Rates by Big-4 Lender (Bilateral Comparisons)

Exit period	Bank Treatment	Bank Comparison	Full sample		Loan sample		Productivity sample	
4-year	RBS	HSBC	0.008***	(0.0026)	0.015***	(0.0053)	0.009	(0.0113)
4-year	LBG	HSBC	0.007**	(0.0031)	0.018***	(0.0062)	0.011	(0.0124)
4-year	Barclays	HSBC	-0.002	(0.0030)	0.006	(0.0060)	-0.003	(0.0118)
4-year	RBS	Barclays	0.010***	(0.0028)	0.009	(0.0054)	0.012	(0.0094)
4-year	LBG	Barclays	0.009***	(0.0033)	0.013**	(0.0063)	0.014	(0.0107)
4-year	RBS	Lloyds	0.001	(0.0029)	-0.004	(0.0056)	-0.002	(0.0101)
3-year	RBS	HSBC	0.009***	(0.0023)	0.015***	(0.0044)	0.008	(0.0085)
3-year	LBG	HSBC	0.008***	(0.0028)	0.023***	(0.0051)	0.011	(0.0095)
3-year	Barclays	HSBC	0.000	(0.0027)	0.012**	(0.0050)	0.003	(0.0091)
3-year	RBS	Barclays	0.009***	(0.0024)	0.003	(0.0044)	0.004	(0.0072)
3-year	LBG	Barclays	0.008***	(0.0028)	0.011**	(0.0052)	0.008	(0.0083)
3-year	RBS	Lloyds	0.001	(0.0025)	-0.008	(0.0046)	-0.004	(0.0077)

Notes: OLS regression; robust standard errors in brackets clustered by firm.

Summary

- Companies that borrowed from banks that became distressed (and nationalised) were
  - more likely to exit the market in the years following nationalisation compared to a counterfactual where they had borrowed from a bank that did not become distressed
- Some evidence that nationalised banks differed from other banks in contributing to the exit of
  - Lower leverage companies
  - Higher productivity companies
- Productivity in surviving companies
  - Looking at companies that stay in business we do not detect a general effect on short term loans, capital intensity, or productivity of being associated with a distressed bank (comparing several years before and after the crisis)
    - Data weaknesses may be contributing to this

Conclusions

- Did a credit supply shock contribute to a reduction in productivity?
  - Maybe yes, by contributing to the exit of potentially productive companies
  - Less differential across banks in contribution to exit of high leverage companies
    - Evidence of forbearance?
    - Or is it just that high leverage companies are more likely to exit in a recession (regardless of the lender)?
- Are credit constraints a key driver of recent productivity weakness?
  - Key explanations of recent productivity weakness need to be able to explain the weakness of productivity *within* companies
  - No obvious correlation at the sector level between the productivity deviation from trend or reallocation effects on productivity and bank dependence
- To what extent are these results applicable more widely?
  - Not clear that we can extrapolate from this experiment to credit shocks more generally
    - Banks could de-leverage in alternate ways.
    - Credit tightening by good banks might also have contributed to productivity weakness.
    - Data issues.