Bank Credit Conditions and UK Company Performance

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

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 the stock of fixed capital

Related Literature

- Assessing the impact of credit constraints on real economic outcomes using variation in ease of access to external finance induced by the financial crisis in a natural experiment type approach
  - Employment, unemployment and firm closure
    - Bentolila, Jansen, Jiménez and Ruano, CEPR DP 9776, 2013.
    - Duygan-Bump, B., Levkov, A., and Montoriol-Garriga, J., Federal Reserve Bank of Boston QAU WP QAU10-6, 2011.
  - Investment
    - Almeida, H., Murillo, C., Laranjeira, B. and Weisbenner, S., NBER WP 14990, 2009.
  - Productivity
    - On-going research at the Bank of England

- The importance of financial circumstances for firms' investment decisions
  - Difficulties in assessment due to issues of reverse causation
    - See review by Bond, S. and J. Van Reenen (2007) in J. Heckman and E. Leamer, eds. *Handbook of Econometrics*

- Growing literature that seeks to understand the reasons for the current productivity puzzle

The Different Experiences of UK Banks

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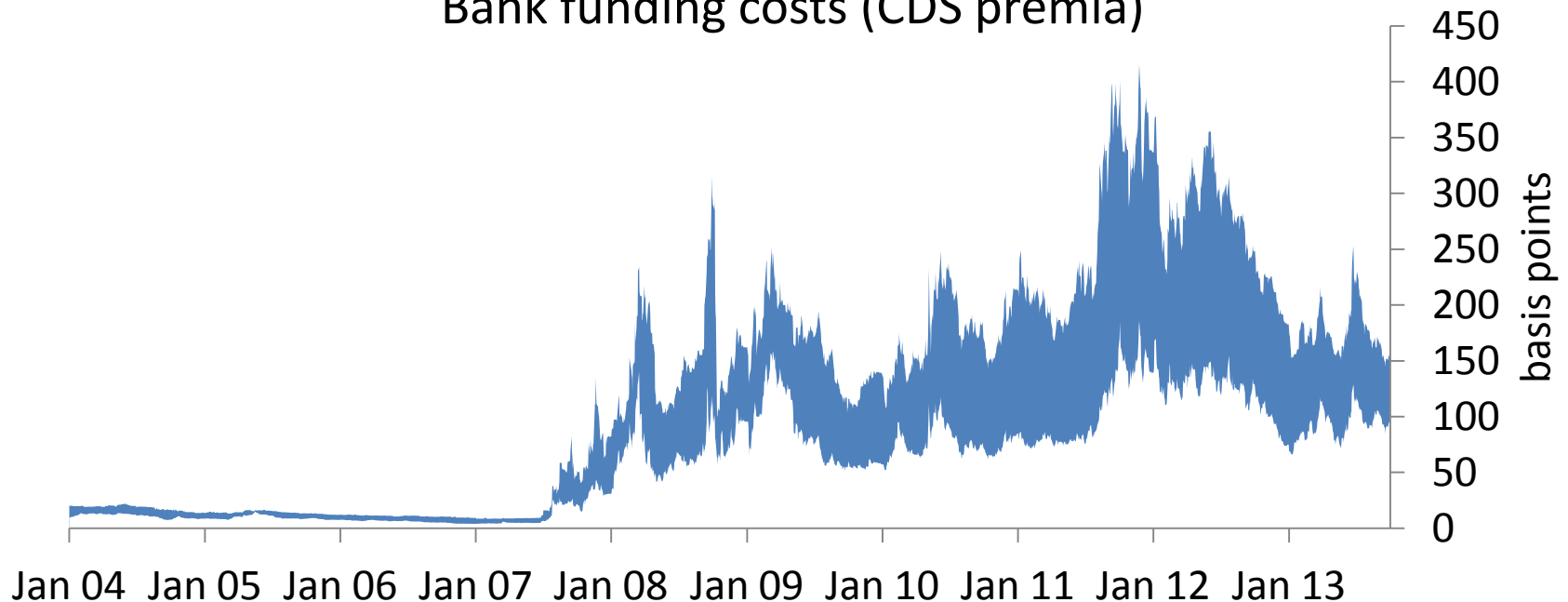
From the Large Review:
Having lent aggressively in the run-up to the crisis, RBS's lending volumes to SMEs have fallen faster than peers and its market share has contracted from an unsustainably high share in 2008, to a level more consistent with its customer base.

The Different Experiences of the Big Four UK Banks

## Credit Default Swap Premia Differentials
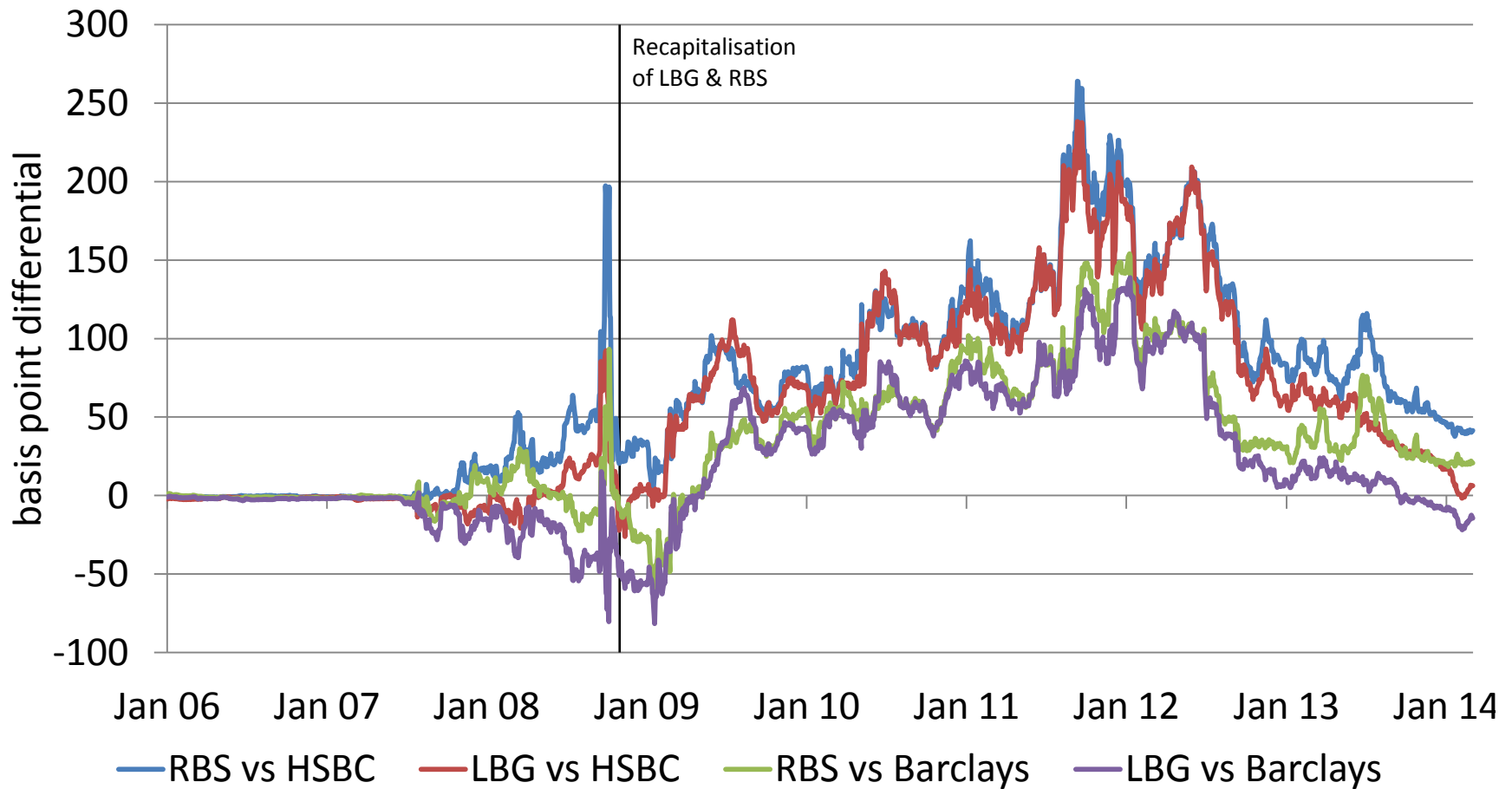
Data: Financial Analysis Made Easy (FAME)

- 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; better coverage of fixed assets
    - decline over time in tendency to report detailed accounting information
    - self-reporting of SIC codes

Difference-in-differences set-up

- Define Treatment (T) and Control (C) group
  - T = Companies with an outstanding charge with RBS before the credit crunch and with above median short term leverage
  - C = Companies with an outstanding charge with HSBC before the credit crunch or with RBS and with below median short term leverage

- Track difference in the development of outcomes between the T and C groups since the financial crisis
  - FY 2007/8 - FY 2011/12

- And compare this to differences in the development of outcomes between these two groups in a 'normal' period (i.e. a pre-recession period)

- Formally

$$Y_{it+4} - Y_{it} = \gamma RBS_{it} I(t \geq 2007) + \alpha RBS_{it} + yr_t \times ind_t^{2-dig} + \theta X_{it} + \varepsilon_{it}$$

  - Where ɣ identifies the differential effect of credit constraints associated with being attached to a distressed bank

- Outcomes (Y) considered
  - Log (1+Debt)
  - Log (1+Fixed Assets)
  - Indicator equal to one if a company is inactive (zero otherwise)

Debt held by companies with outstanding charges: RBS relative to HSBC
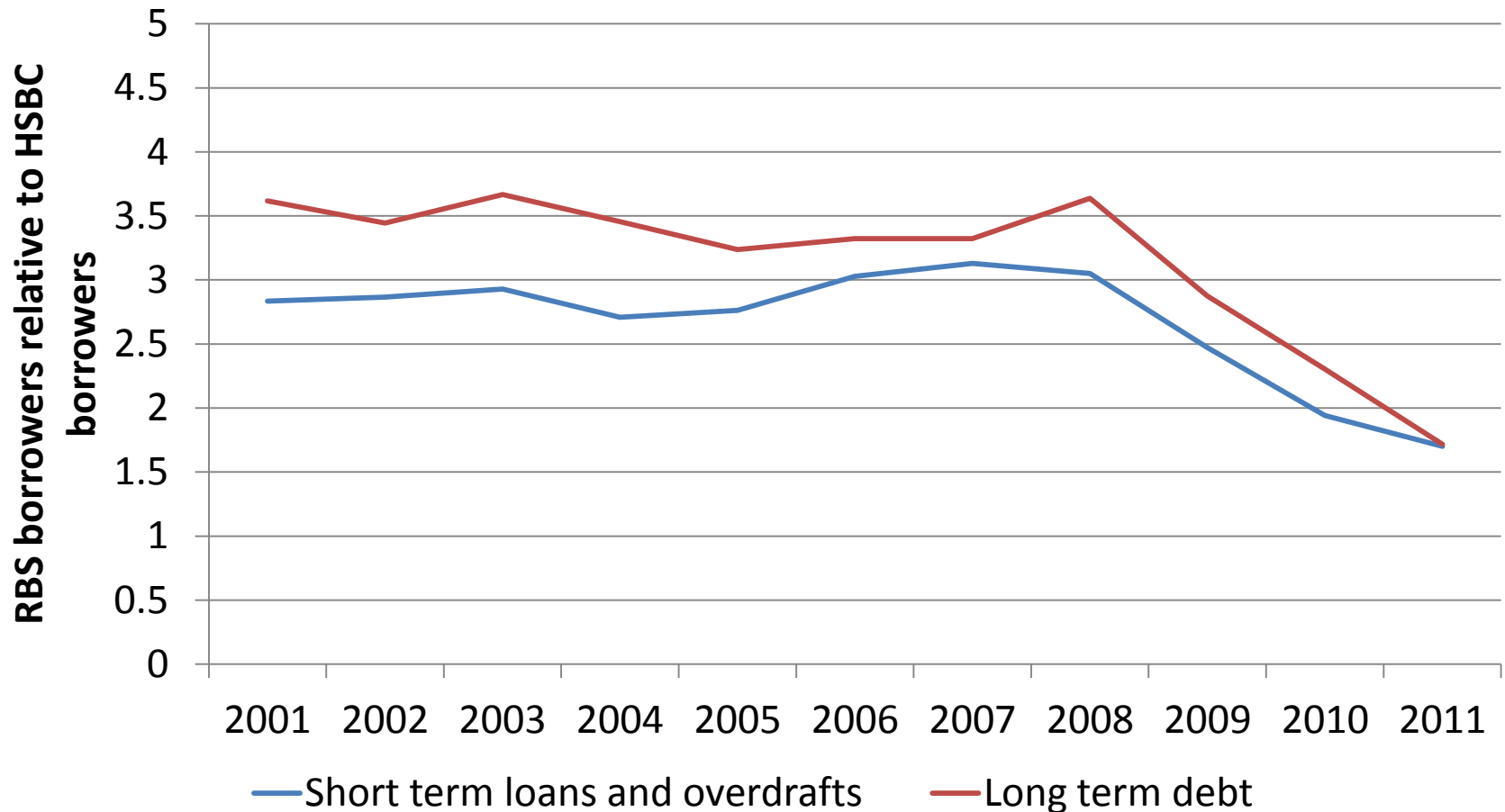
Source: FAME BvD and authors' calculations.
Notes: Companies in the non-financial non-farm business sectors excluding the Mining, Utilities and Real Estate industries.
Companies who do not have an outstanding charge with any other lender and who report their debt.

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
HSBC	2.8	5.3	7.6	9.6
RBS	3.2	5.9	8.2	10.2

Sample Characteristics

	Control	Treatment		Control	Treatment
Exit rate	0.193	0.229	Start-up	0.110	0.111
Total asset distribution			Young	0.333	0.331
2nd quintile	0.061	0.055	Foreign owned	0.028	0.044
3rd quintile	0.145	0.160	Exporter	0.034	0.034
4th quintile	0.300	0.330	Foreign subsidiaries	0.006	0.005
5th quintile	0.477	0.435	Count court judgment 0-24 mths	0.053	0.062
Group accounts	0.030	0.020	Normal credit score	0.713	0.579
Full accounts	0.110	0.122	Short term gearing	0.278	0.620
Missing loans at time t+4	0.516	0.474	Collateral	0.383	0.373
			Companies	33727	14451

Notes: Companies in the non-financial non-farm business sectors excluding the Mining, Utilities 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 HSBC before the credit crunch or with RBS and with below median short term leverage. Treatment group equals companies with an outstanding charge with HSBC before the credit crunch or with RBS and with below median short term leverage.

Short Term Loans and Overdrafts

DPV: 4-year change in log real loans

		Impact estimate t=2004, 2007		Falsification test t=2001, 2004	
		coeff	pval	coeff	pval
OLS	all	-0.191	(0.109)	-0.061	(0.394)
Robust regression	all	-0.130 ***	(0.001)	-0.036 *	(0.056)
OLS	stayers	-0.054 **	(0.021)	0.032	(0.526)
Robust regression	stayers	-0.032 ***	(0.000)	0.026	(0.225)
Observations	all	23862		29930	
	stayers	14091		19950	

Notes: Sample includes firms that had an outstanding charge with either HSBC or RBS at times t and that did not have an outstanding charge with any other lender and for whom we observe short term loans. Treatment group includes fimrs with RBS with above median leverage. Companies in the non-financial non-farm business sectors excluding the Mining, Utilities and Real Estate industries. p-values in brackets. All regressions include the following controls, measured at time t: size (measured by the quintile in the distribution of total assets), group accounts, full accounts are filed, start-up (age 0-2 years), young (age 0-5 years), foreign owned, exporter, owns foreign subsidiaries, county court judgements in last 2 years, normal credit score, short term leverage (short term loans relative to total assets), collateral (fixed assets relative to total assets), filing quarter, 2-digit industry dummies and their interactions with times t, treatment group indicator. OLS standard errors clustered by chargeholder. Robust standard errors. Loans deflated by 2 and 3 digit industry GVA deflators. Stayers weighted to sample total by industry, year, size, and bank.

$$Y_{it+4} - Y_{it} = \gamma RBS_{it} I(t \geq 2007) + \alpha RBS_{it} + yr_t \times ind_t^{2-dig} + \theta X_{it} + \varepsilon_{it}$$

Fixed Assets

DPV: 4-year change in log real capital

		Impact estimate t=2004, 2007		Falsification test t=2001, 2004	
		coeff	pval	coeff	pval
OLS	all	-0.123	(0.250)	-0.084 *	(0.067)
Robust regression	all	-0.071 ***	(0.000)	-0.012	(0.239)
OLS	stayers	-0.039 **	(0.014)	-0.021	(0.310)
Robust regression	stayers	-0.014 ***	(0.000)	-0.006	(0.498)
Observations	all	23862		29930	
	stayers	14091		19950	

Notes: Sample includes firms that had an outstanding charge with either HSBC or RBS at times t and that did not have an outstanding charge with any other lender and for whom we observe short term loans. Treatment group includes fimrs with RBS with above median leverage. Companies in the non-financial non-farm business sectors excluding the Mining, Utilities and Real Estate industries. p-values in brackets. All regressions include the following controls, measured at time t: size (measured by the quintile in the distribution of total assets), group accounts, full accounts are filed, start-up (age 0-2 years), young (age 0-5 years), foreign owned, exporter, owns foreign subsidiaries, county court judgements in last 2 years, normal credit score, short term leverage (short term loans relative to total assets), collateral (fixed assets relative to total assets), log capital, filing quarter, 2-digit industry dummies and their interactions with times t, treatment group indicator. OLS standard errors clustered by chargeholder. Robust standard errors. Capital deflated by 2 and 3 digit industry GVA deflators. Stayers weighted to sample total by industry, year, size, and bank.

$$Y_{it+4} - Y_{it} = \gamma RBS_{it} I(t \geq 2007) + \alpha RBS_{it} + yr_t \times ind_t^{2-dig} + \theta X_{it} + \varepsilon_{it}$$

Exit Rates

DPV: 4-year exit rate				
	Impact estimate		Falsification test	
	t=2004, 2007		t=2001, 2004	
	coeff	pval	coeff	pval
probit	0.029 ***	(0.000)	0.002	(0.767)
Observations	48,058		51,997	

Notes: Sample includes firms that had an outstanding charge with either HSBC or RBS at times t and that did not have an outstanding charge with any other lender and for whom we observe short term loans. Treatment group includes fimrs with RBS with above median leverage. Companies in the non-financial non-farm business sectors excluding the Mining, Utilities and Real Estate industries. p-values in brackets. All regressions include the following controls, measured at time t: size (measured by the quintile in the distribution of total assets), group accounts, full accounts are filed, start-up (age 0-2 years), young (age 0-5 years), foreign owned, exporter, owns foreign subsidiaries, county court judgements in last 2 years, normal credit score, short term leverage (short term loans relative to total assets), collateral (fixed assets relative to total assets), filing quarter, 2-digit industry dummies and their interactions with times t, treatment group indicator. Standard errors clustered by chargeholder. Marginal effects.

$$Y_{it+4} - Y_{it} = \gamma RBS_{it} I(t \geq 2007) + \alpha RBS_{it} + yr_t \times ind_t^{2-dig} + \theta X_{it} + \varepsilon_{it}$$

Conclusions so far

- Did a credit supply shock reduce productivity?
    - Little evidence of forbearance (outside real estate)
    - Some evidence that an adverse supply shock has reduced growth in the capital stock, which in turn is likely to have reduced labour productivity growth

- Are credit constraints a key driver of recent productivity weakness?
    - Our estimates measure only a partial effect
    - Much of the estimated capital stock effect occurs through company closure
        - Company closure has been relatively weak
        - We do not know what happens to the capital stock when a business closes
    - Key explanations of recent productivity weakness need to be able to explain the weakness of productivity within companies

- Further research
    - Instrumental variables
    - Direct estimates of credit constraints on productivity
        - Possibility of linking FAME to ONS datasets
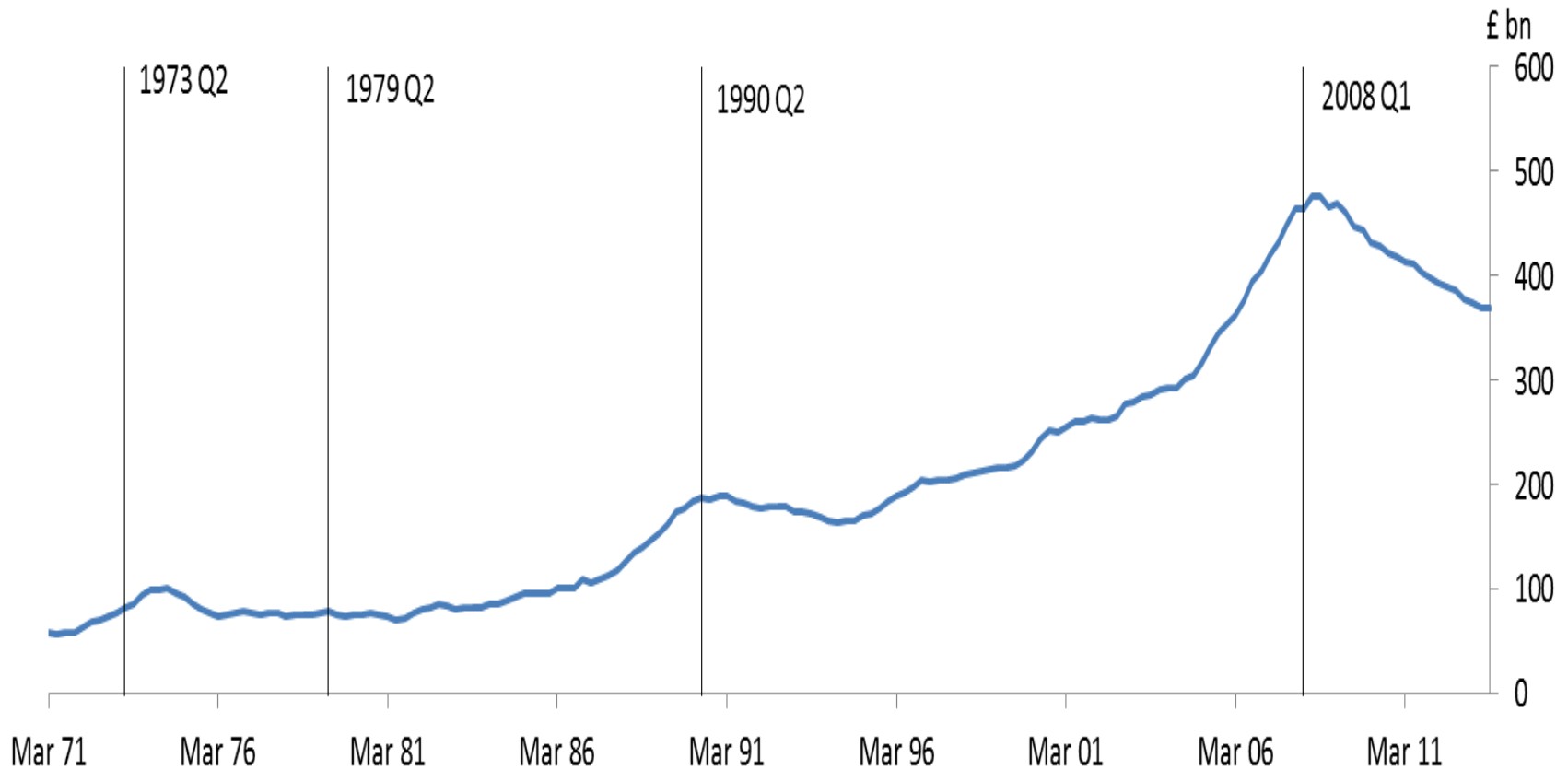
BACKGROUND SLIDES

Constant price GDP per worker (£billion, per quarter)
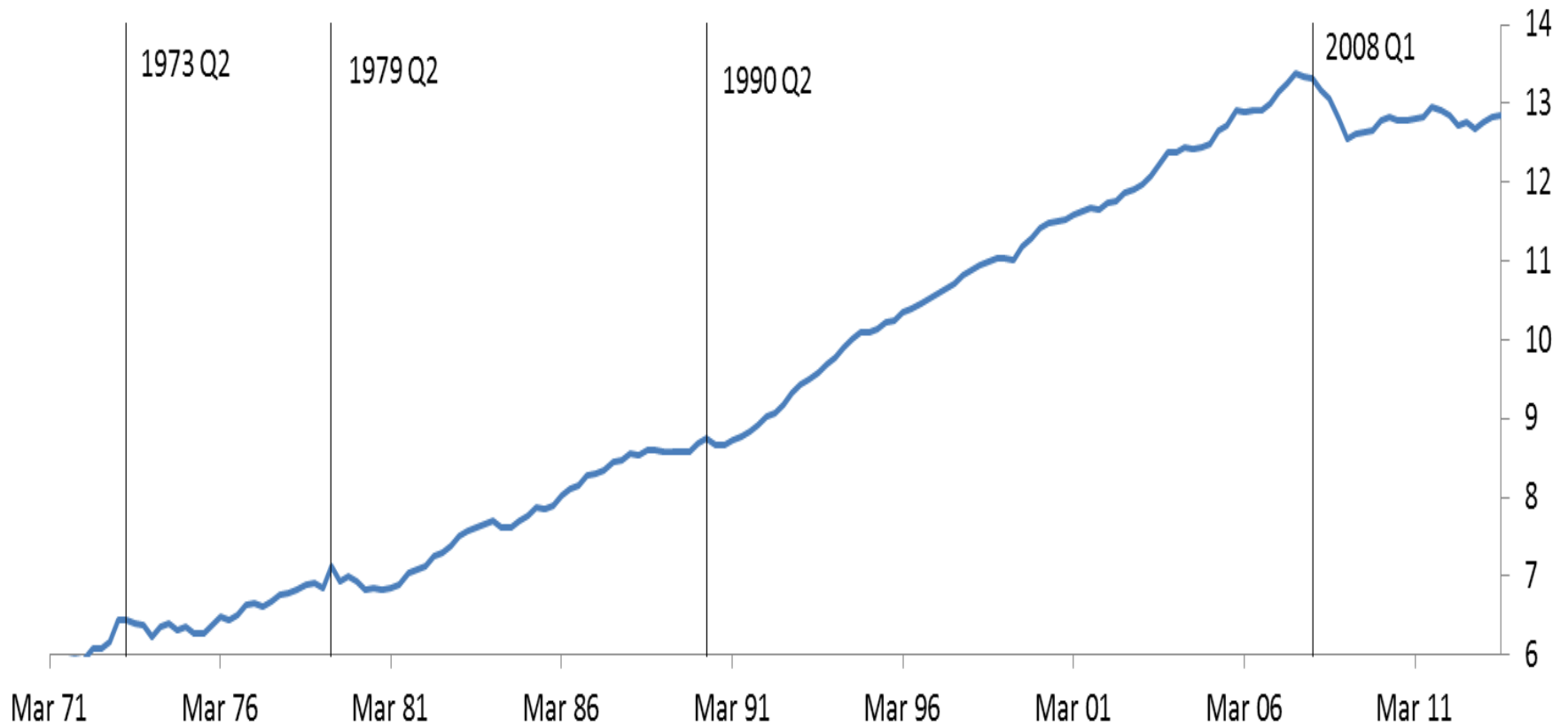
Source: Office for national statistics

Definition: Constant price output per head

Real stock of PNFC bank debt outstanding

Source: Bank of England
Definition: Stock of M4 lending to PNFCs (vwnq.q) adjusted for write-offs deflated by GDP deflator (pgdpdef.q)
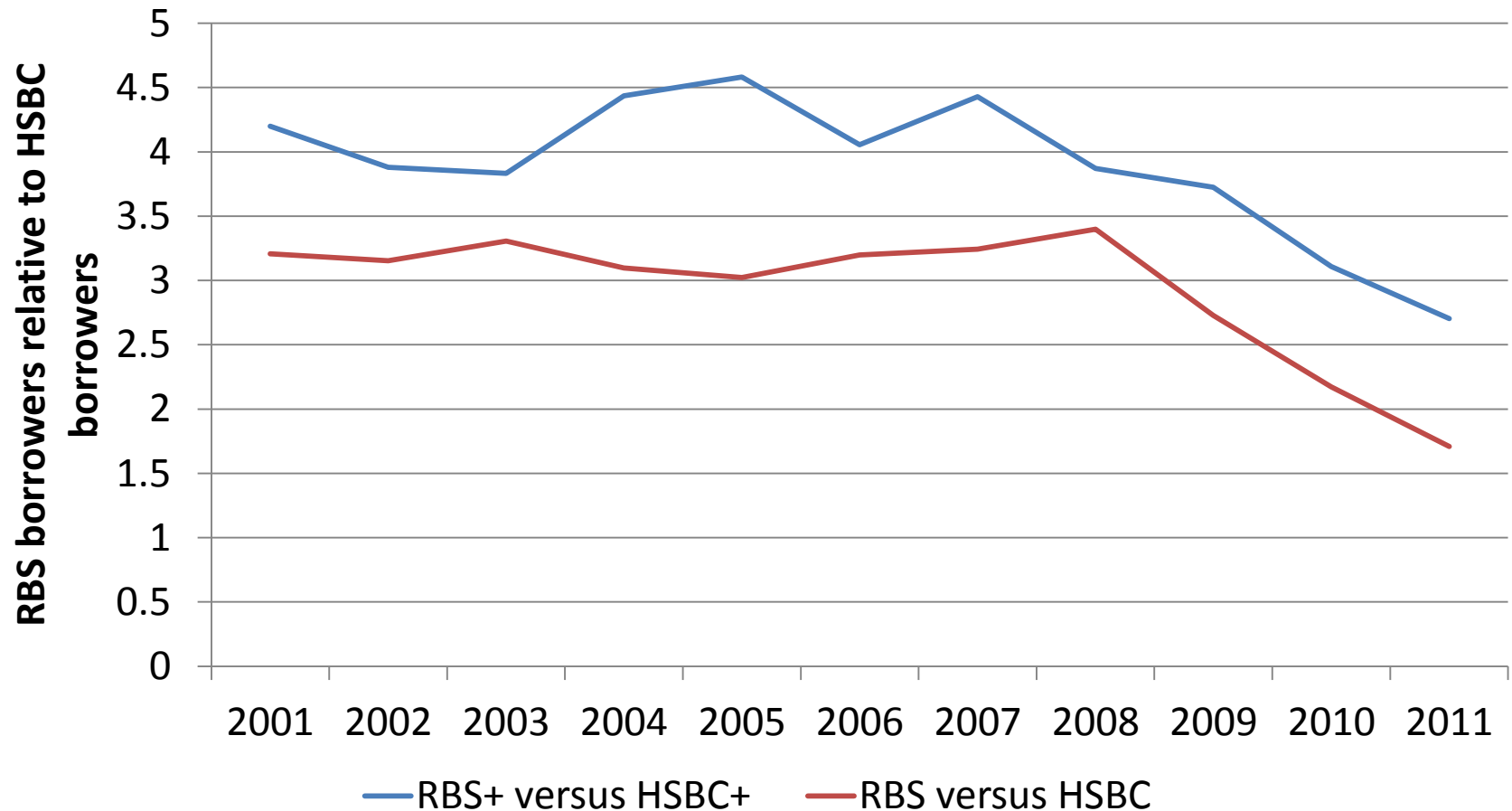
RBS

HSBC

NATIONAL WESTMINSTER

ROYAL BANK OF SCOTLAND

LOMBARD NORTH CENTRAL

WILLIAMS & GLYN'S

NATIONAL PROVINCIAL

ULSTER

HSBC

MIDLAND

Debt held by companies with outstanding charges: RBS relative to HSBC (companies may have charges with others)

Source: FAME BvD and authors' calculations.
Notes: Companies in the non-financial non-farm business sectors excluding the Mining, Utilities and Real Estate industries.
Companies who report their debt. RBS+ and HSBC+ also have outstanding charges with other banks.