

Separating Retail and Investment Banking: Evidence from the UK

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 - ▶ Major differences in regulation across jurisdictions
 - ▶ Prominent US regulators and politicians calling for stricter separation
- ▶ And important evidence gaps remain
 - ▶ Identification difficult because exogenous shocks to universal bank structures are rare

This paper

- ▶ We study major recent UK banking regulation
 - ▶ “Ring-fencing”
 - ▶ Requires large universal banks to separate retail deposit-taking and investment banking into separate subsidiaries
- ▶ Focus on novel “deposit funding channel”
 - ▶ Universal banks can no longer use retail deposits to fund investment banking
- ▶ Direct effects on treated banks:
 - ▶ Universal banks rebalance from capital market activities to mortgage lending
- ▶ Spillover effects on mortgage market:
 - ▶ Increased concentration
 - ▶ More risk-taking by smaller competitors

Contributions to literature

- ▶ Large empirical literature debates implications of separating universal banks
 - ▶ Kroszner and Rajan (1994), Puri (1994, 1996), Drucker and Puri (2005, 2007), Yasuda (2005), Neuhann and Saidi (2018), etc.

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 - ▶ But recent policy debates emphasise potential for benefits of *deposit funding* to accrue to capital market activities (Vickers 2012, Liikanen 2012, Hoenig 2017)

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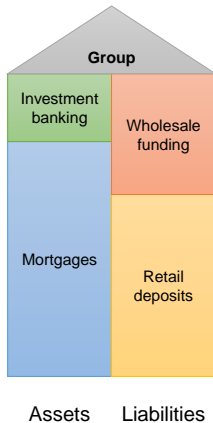
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- ▶ We show impact on **both retail and corporate lending**
 - ▶ Existing papers focus on corporate lending and securities markets
 - ▶ But modern universal banks also play large role in retail markets
- ▶ We estimate both direct effects on universal banks themselves and **spillover effects on competitors**
 - ▶ Existing papers study direct effects only

UK ring-fencing regulation

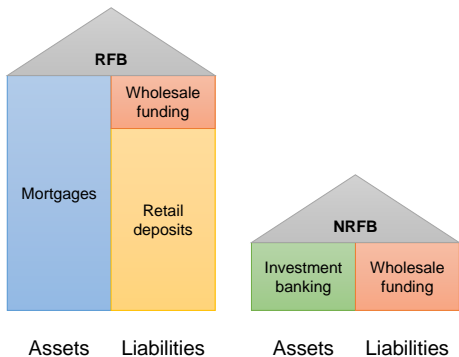
- ▶ Ring-fencing requires large banking groups to split into subsidiaries:
 - ▶ Retail deposits in **Ring-Fenced Bank (RFB)**
 - ▶ Investment banking in **Non-Ring-Fenced Bank (NRFB)**
- ▶ Restrictions on intragroup exposures prevent banks from circumventing requirements via intragroup contracts
- ▶ Legislation passed in 2013; requirements in force from January 2019
- ▶ Applies to five large banking groups (retail deposits > £25 billion)
- ▶ Motivation:
 - ▶ Easier to resolve investment bank separately from retail bank
 - ▶ Reduce probability that government bails out investment bank to save retail bank
 - ▶ Reduce excessive risk-taking by removing implicit subsidy for investment bank

Stylised example

Before ring-fencing



After ring-fencing



Deposit funding channel

- ▶ By design, ring-fencing reduces potential for investment banking risks to 'infect' retail bank
 - ▶ E.g. investment bank can more easily be resolved separately
- ▶ But new constraints imposed by ring-fencing likely to change banks' incentives to engage in different activities
 - ▶ Hence implications for credit conditions in different markets

Deposit funding channel

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 - ▶ E.g. investment bank can more easily be resolved separately
- ▶ But new constraints imposed by ring-fencing likely to change banks’ incentives to engage in different activities
 - ▶ Hence implications for credit conditions in different markets
- ▶ We highlight previously-undocumented **deposit funding channel**
 - ▶ Retail deposits might provide benefits relative to wholesale funding
 - ▶ Household preferences for liquidity (Stein 2012)
 - ▶ Deposit insurance (Stein 1998; Hanson et al 2015)
 - ▶ Market power (Drechsler, Savov and Schnabl 2017)
 - ▶ Ring-fencing implies that retail deposits can only fund RFB and cannot fund NRFB
 - ▶ \implies lower RFB funding costs & higher NRFB funding costs
 - ▶ \implies incentive to *rebalance* from NRFB (capital markets) to RFB (retail lending)

UK's 15 biggest mortgage lenders hit by price war

Legislation designed to cut risk in the banking sector has flooded the market with capital

Financial Times, 2019

The continued compression in mortgage rates may have been driven in part by the impact of ring-fencing on mortgage competition. Ring-fenced banks (RFBs) are subject to

Bank of England *Financial Stability Report*, 2019

LONDON, Sept 29 (Reuters) - Ring-fencing regulation is increasing the cost and cutting the profitability of syndicated lending for UK banks, which is

Reuters, 2017

Empirical strategy

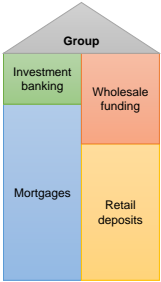
- ▶ Loan-level data for two markets:
 - ▶ **RFB**: Domestic retail mortgages (PSD)
 - ▶ **NRFB**: Global syndicated lending (DealScan)
- ▶ Sample period: run-up to ring-fencing implementation (2010 – 2019)
- ▶ Main loan-level regression specification:

$$\text{Loan}_{i,l,t} = \beta \left(\Delta \text{Retail funding}_i \times \% (\text{Post})_{l,t} \right) + \text{Controls}_{i,l,t} + \varepsilon_{i,l,t}$$

- ▶ $\text{Loan}_{i,l,t}$ = price or volume of loan l originated by bank i at time t
- ▶ $\Delta \text{Retail funding}_i$ = change in retail funding ratio as a result of ring-fencing
 - ▶ Between-bank variation
- ▶ $\% (\text{Post})_{l,t}$ = proportion of loan maturity that falls after implementation
 - ▶ Within-bank variation
- ▶ Controls include **bank-time fixed effects** (among others)

ΔRetail funding;

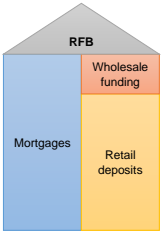
Before ring-fencing



$$\frac{\text{Retail deposits}}{\text{Total assets}} =$$

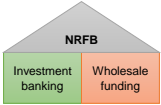
60%

After ring-fencing



75%

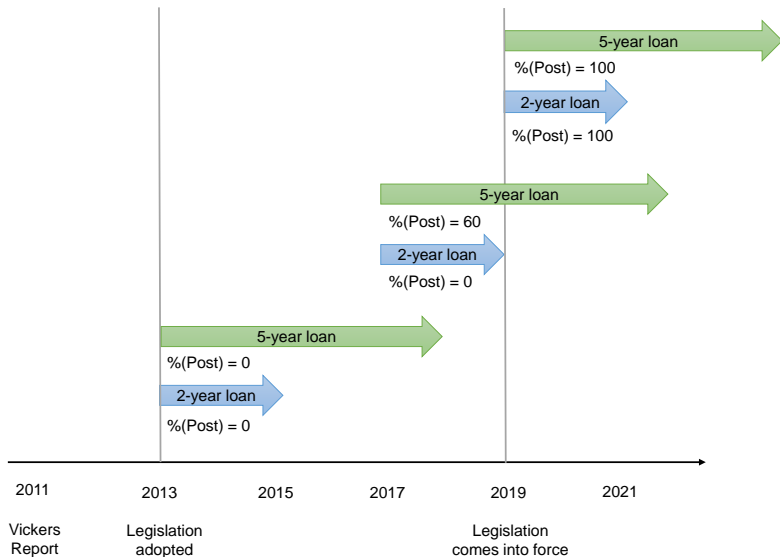
$$\Delta(\text{Retail funding})_i^{RFB} = 15\text{pp}$$



0%

$$\Delta(\text{Retail funding})_i^{NRFB} = 60\text{pp}$$

$\%(\text{Post})_{l,t}$



Impact on mortgage spreads

- ▶ Does ring-fencing cause affected banks to cut mortgage spreads?
- ▶ Loan-level regressions:

$$\text{Spread}_{i,l,t} = \beta \left(\Delta \text{Retail funding}_i^{\text{RFB}} \times \% (\text{Post})_{l,t} \right) + \text{Controls}_{i,l,t} + \varepsilon_{i,l,t}$$

where i = bank, l = loan, t = month

- ▶ Fixed effects
 - ▶ Bank-month
 - ▶ Product-month (product = maturity & LTV)
 - ▶ Bank-product
 - ▶ Location-month
- ▶ Loan-level controls
 - ▶ LTI, loan size, credit history, etc.
- ▶ Bank-level controls
 - ▶ Size, RoA, cash ratio, capital ratio, wholesale funding ratio
 - ▶ Lagged and interacted with $\% (\text{Post})_{l,t}$

Ring-fencing reduces mortgage spreads

$$\text{Spread}_{i,l,t} = \beta \left(\Delta \text{Retail funding}_i^{\text{RFB}} \times \%(\text{Post})_{l,t} \right) + \text{Controls}_{i,l,t} + \varepsilon_{i,l,t}$$

Dependent variable:	Interest rate spread _{<i>i,l,t</i>}					
	(1)	(2)	(3)	(4)	(5)	(6)
	OLS	OLS	OLS	OLS	IV	IV
$\Delta \text{Retail funding}_i^{\text{RFB}} \times \%(\text{Post})_{l,t}$	-0.461*** (0.157)	-1.011*** (0.163)	-0.859*** (0.136)	-0.817*** (0.137)	-0.955*** (0.184)	-0.938*** (0.184)
Loan-level controls	No	No	Yes	Yes	Yes	Yes
Bank-level controls	No	Yes	Yes	Yes	Yes	Yes
Bank-month fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
Maturity-LTV-month fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
Bank-maturity-LTV fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
Location-month fixed effects	No	No	No	Yes	No	Yes
Observations	4,570,771	4,528,616	4,518,056	4,324,803	4,518,056	4,324,803
R^2	0.824	0.820	0.846	0.867	-	-
First-stage F -statistic	-	-	-	-	43.3	46.0

Impact on mortgage quantities

- ▶ Do cheaper mortgages lead to larger market shares?
- ▶ Define product = maturity & LTV
- ▶ For each bank, compute quarterly market share for each product
- ▶ Bank-product-quarter level regressions:

$$\text{Market share}_{i,j,t} = \beta \left(\Delta \text{Retail funding}_i^{RFB} \times \%(\text{Post})_{j,t} \right) + \text{Controls}_{i,j,t} + \varepsilon_{i,j,t}$$

where i = bank, j = product, t = quarter

Ring-fencing increases mortgage quantities

$$\text{Market share}_{i,j,t} = \beta \left(\Delta \text{Retail funding}_i^{\text{RFB}} \times \%(\text{Post})_{j,t} \right) + \text{Controls}_{i,j,t} + \varepsilon_{i,j,t}$$

Dependent variable:	Market share _{i,j,t}				
	(1)	(2)	(3)	(4)	(5)
	OLS	OLS	IV	WLS	W2SLS
$\Delta \text{Retail funding}_i^{\text{RFB}} \times \%(\text{Post})_{j,t}$	0.149*** (0.043)	0.216*** (0.033)	0.249*** (0.053)	0.133** (0.061)	0.168* (0.088)
Bank-level controls	No	Yes	Yes	Yes	Yes
Bank-quarter fixed effects	Yes	Yes	Yes	Yes	Yes
Bank-maturity-LTV fixed effects	Yes	Yes	Yes	Yes	Yes
Observations	241,009	204,086	204,086	204,086	204,086
R ²	0.721	0.721	-	0.901	-
First-stage F-statistic	-	-	20.4	-	19.1

Impact on syndicated lending

- ▶ Syndicated loan = loan extended to one borrower by multiple lenders
- ▶ Borrowers typically large corporates
- ▶ Intensive margin regressions:

$$\text{Log(Loan size)}_{i,l,t} = \beta \left(\Delta \text{Retail funding}_i^{\text{NRF B}} \times \% (\text{Post})_{l,t} \right) + \alpha_{i,t} + \delta_l + \varepsilon_{i,l,t}$$

where i = bank, l = loan facility, t = month

- ▶ Loan fixed effects δ_l control for borrower demand (Khwaja and Mian 2008)
- ▶ Results:
 - ▶ More affected banks provide smaller loan quantities [▶ Results](#)
 - ▶ And participate in fewer loans [▶ Results](#)
 - ▶ Effect is larger for loans to foreign borrowers

Spillover effects on mortgage market

Concentration

- ▶ Do increased market shares of large universal banks lead to increase in market concentration?
- ▶ We construct district-level measure of exposure to ring-fencing based on historical lending footprints of treated banks
- ▶ Result: Local markets with greater historical exposure to treated banks *become more concentrated* (HHI)

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Risk-taking

- ▶ How do smaller (untreated) banks respond to increased competitive pressure from treated banks?
- ▶ We construct bank-level measure of (indirect) exposure to ring-fencing for untreated banks, based on historical lending footprints
- ▶ Result: Untreated banks more exposed to increased competitive pressure *increase risky lending*
- ▶ Consistent with Keeley (1990) franchise value model

Conclusions and policy implications

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 - ▶ Banks unable to use retail deposits to fund capital market activities
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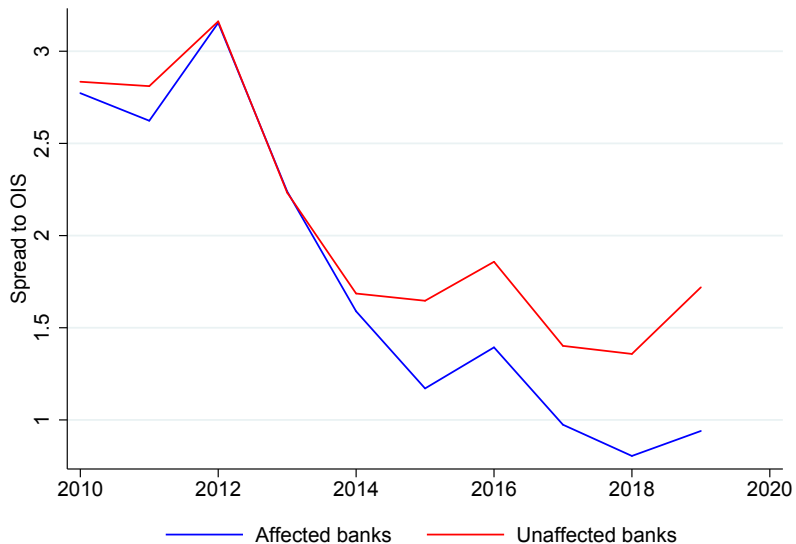
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 - ▶ But this is mainly focused on *foreign* borrowers

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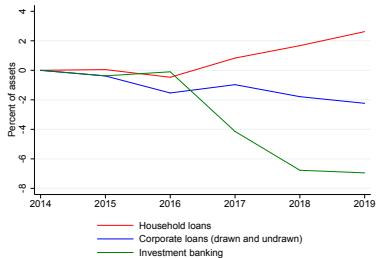
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- ▶ Expansion of consumer credit mirrored by reduction in credit supply to large corporates
 - ▶ But this is mainly focused on *foreign* borrowers
- ▶ Ambiguous longer-term impacts on retail credit market
 - ▶ Increased market power for large banks
 - ▶ Increased risk-taking by small banks

ADDITIONAL SLIDES

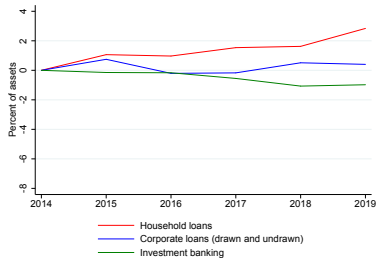
Mortgage spreads



Changes in balance sheet allocation



Affected banks



Unaffected banks

Syndicated lending: intensive margin

Dependent variable:	Log(Loan size) _{i,t}				
	(1)	(2)	(3)	(4)	(5)
	OLS	OLS	OLS	OLS	OLS
$\Delta \text{Retail funding}_t^{\text{NRFB}} \times \%(Post)_{i,t}$	-0.520***				
	(0.186)				
$\Delta \text{Retail funding}_t^{\text{NRFB}} \times \%(Post)_{i,t} \times \text{Term loan}_i$		-0.367**			
		(0.171)			
$\Delta \text{Retail funding}_t^{\text{NRFB}} \times \%(Post)_{i,t} \times \text{Non-term loan}_i$		-0.584***			
		(0.172)			
$\Delta \text{Retail funding}_t^{\text{NRFB}} \times \%(Post)_{i,t} \times \text{Leveraged loan}_i$			-0.416**		
			(0.185)		
$\Delta \text{Retail funding}_t^{\text{NRFB}} \times \%(Post)_{i,t} \times \text{Non-leveraged loan}_i$			-0.550**		
			(0.220)		
$\Delta \text{Retail funding}_t^{\text{NRFB}} \times \%(Post)_{i,t} \times \text{Lead arranger}_{i,l}$				-0.420***	
				(0.158)	
$\Delta \text{Retail funding}_t^{\text{NRFB}} \times \%(Post)_{i,t} \times \text{Participant}_{i,l}$				-0.717***	
				(0.197)	
$\Delta \text{Retail funding}_t^{\text{NRFB}} \times \%(Post)_{i,t} \times \text{UK borrower}_i$					-0.185
					(0.204)
$\Delta \text{Retail funding}_t^{\text{NRFB}} \times \%(Post)_{i,t} \times \text{Foreign borrower}_i$					-0.606***
					(0.208)
Difference between coefficients		-0.217*	-0.135	-0.297**	-0.421**
		(0.114)	(0.229)	(0.132)	(0.192)
Bank-month fixed effects	Yes	Yes	Yes	Yes	Yes
Loan facility fixed effects	Yes	Yes	Yes	Yes	Yes
Bank-category fixed effects	-	Yes	Yes	Yes	Yes
Observations	139,779	139,157	139,602	139,653	139,710
R ²	0.968	0.968	0.968	0.974	0.968

Syndicated lending: extensive margin

Dependent variable:	Log(Number loans) _{j,c,t}				
	(1)	(2)	(3)	(4)	(5)
	OLS	OLS	OLS	OLS	OLS
$\Delta \text{Retail funding}_{i,t}^{\text{NRFB}} \times \%(\text{Post})_{j,t}$	-1.359*** (0.486)				
$\Delta \text{Retail funding}_{i,t}^{\text{NRFB}} \times \%(\text{Post})_{j,t} \times \text{Term loan}_c$		-0.651** (0.263)			
$\Delta \text{Retail funding}_{i,t}^{\text{NRFB}} \times \%(\text{Post})_{j,t} \times \text{Non-term loan}_c$		-1.114*** (0.415)			
$\Delta \text{Retail funding}_{i,t}^{\text{NRFB}} \times \%(\text{Post})_{j,t} \times \text{Leveraged loan}_c$			-0.419** (0.195)		
$\Delta \text{Retail funding}_{i,t}^{\text{NRFB}} \times \%(\text{Post})_{j,t} \times \text{Non-leveraged loan}_c$			-1.239*** (0.435)		
$\Delta \text{Retail funding}_{i,t}^{\text{NRFB}} \times \%(\text{Post})_{j,t} \times \text{Lead arranger}_c$				-0.958*** (0.331)	
$\Delta \text{Retail funding}_{i,t}^{\text{NRFB}} \times \%(\text{Post})_{j,t} \times \text{Participant}_c$				-0.935** (0.415)	
$\Delta \text{Retail funding}_{i,t}^{\text{NRFB}} \times \%(\text{Post})_{j,t} \times \text{UK borrower}_c$					-0.735*** (0.272)
$\Delta \text{Retail funding}_{i,t}^{\text{NRFB}} \times \%(\text{Post})_{j,t} \times \text{Foreign borrower}_c$					-1.005*** (0.354)
Difference between coefficients		-0.463*** (0.175)	-0.820*** (0.275)	0.023 (0.162)	-0.270* (0.160)
Bank-quarter fixed effects	Yes	Yes	Yes	Yes	Yes
Maturity-quarter fixed effects	Yes	-	-	-	-
Maturity-quarter-category fixed effects	-	Yes	Yes	Yes	Yes
Bank-category fixed effects	-	Yes	Yes	Yes	Yes
Observations	1,168,600	2,337,200	2,337,200	2,337,200	2,337,200
R ²	0.411	0.335	0.340	0.332	0.404