

# Leverage Regulation and Market Structure: A Structural Model of the UK Mortgage Market

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Online PhD-Level Classes in Empirical Household Finance  
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Charts and estimates use data provided by the Financial Conduct Authority.

# Motivation

- ▶ **Mortgages:**

- ▶ Main liability for households in developed and some developing countries (Campbell, 2013; Ramadorai, 2017)
- ▶ At the origin of financial crisis (Akerlof et al, 2014; Mian and Sufi, 2015)

- ▶ Several EU countries & US adopt **leverage regulation** → limit exposure to real estate

- ▶ Risk-weighted capital requirements
- ▶ Maximum Loan-To-Value, Loan-To-Income, Debt-To-Income

- ▶ ... still a lot of **uncertainty about their effects in equilibrium**

- ▶ Uncertainty in the cost banks will pass on to borrowers
- ▶ Feedback effects leverage regulation-market structure

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- ... still a lot of **uncertainty about their effects in equilibrium**
    - Uncertainty in the cost banks will pass on to borrowers ► Decline Ownership
    - Feedback effects leverage regulation-market structure ► Increase Concentration

# Research Questions

- ▶ What are the **costs** of leverage regulations for lenders?
- ▶ How do lenders **pass-through** these costs to borrowers?
- ▶ Do leverage regulations have **unintended consequences**?
  - ▶ regulatory arbitrage
  - ▶ reduced competition

# This Paper

## 1. **Loan-level Data**

- ▶ Universe of mortgage originations in UK (1.5M obs)
- ▶ Lenders' risk-weighted capital requirements

## 2. **New identification strategy**

- ▶ Variation within bank - across asset classes for mortgages
- ▶ Capital requirements to identify demand elasticity to rate (IV)

## 3. **Structural IO model:**

- ▶ Demand: discrete-continuous choice of mortgage-loan size
- ▶ Supply: pricing with default-refinancing risks and leverage regulation

## 4. **Counterfactual leverage regulations:**

- ▶ Trade-offs: competition, risk, market size
- ▶ Inform design of policies currently under discussion

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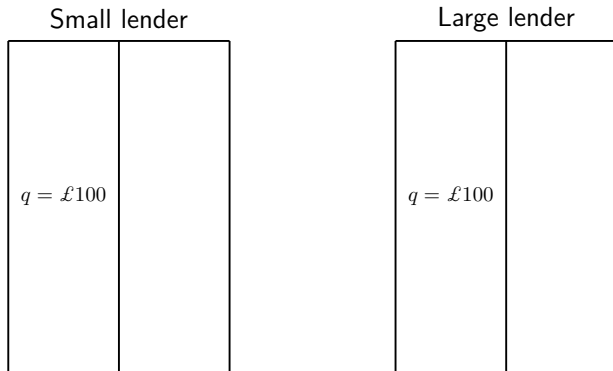
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# Leverage Regulation: An Example



- ▶ Asset: Mortgage £100; Loan-to-value 75%

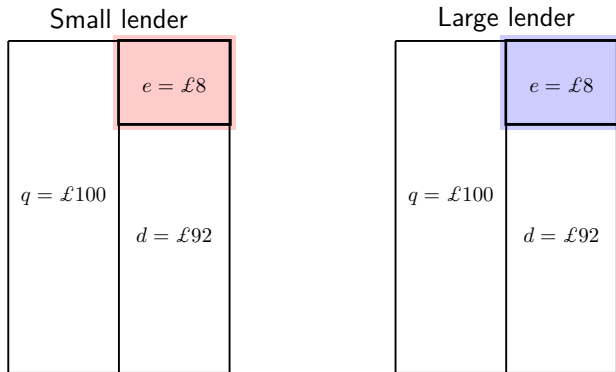
- ▶ Liability: Debt + Equity

  - ▶ Equity = £100 × Capital requirement (8%)

  - ▶ Debt = £100 × 75% = £75

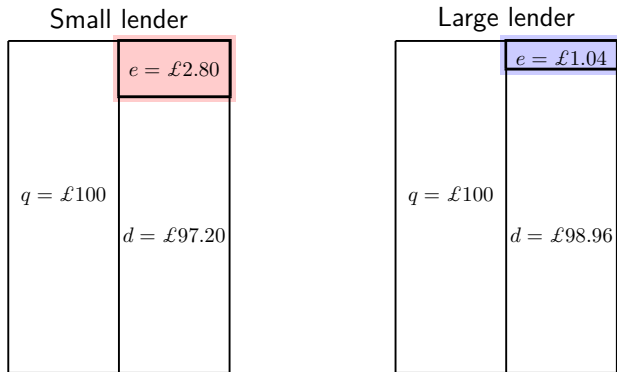
  - ▶ Total assets = £100 = Total liabilities (£75 + £25)

# Leverage Regulation: An Example



- ▶ Asset: Mortgage £100; Loan-to-value 75%
- ▶ Liability: Debt + Equity
  - ▶ Equity = £100 × Capital requirement (8%)
    - ▶ Small lender: Standard model (35%)
    - ▶ Large lender: Internal rating-based model (13%)

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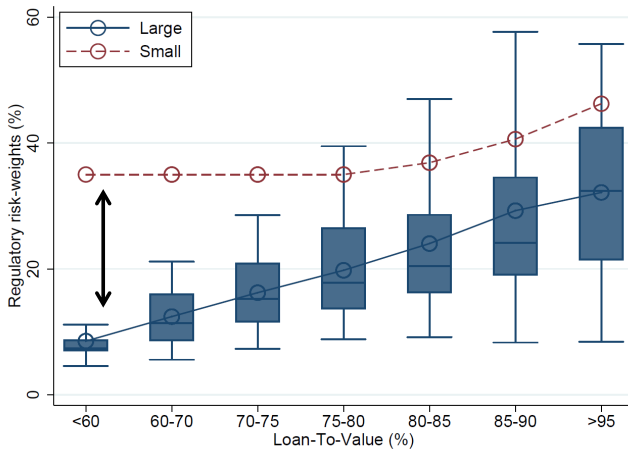
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## Mechanism: Cost

*“The most important competitive edge that banks bring to bear for many types of transactions is the ability to fund themselves cheaply. Thus, if Bank A is forced to adopt a capital structure that raises its **cost** of funding relative to other intermediaries by 20 basis points, it may lose most of its business...”*

— Hanson, Kashyap and Stein, JEP 2011

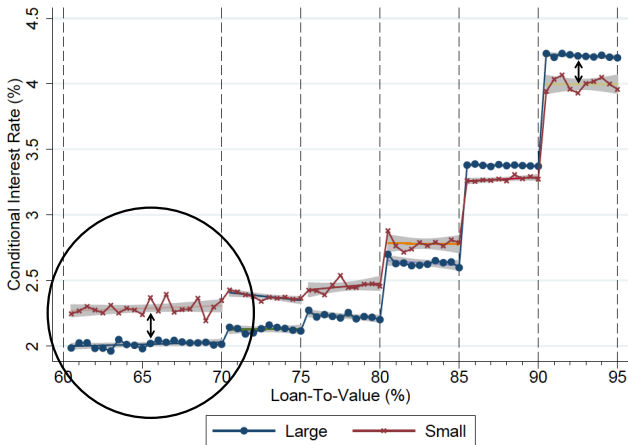
# Mechanism: Cost



- ▶ Large lenders **absolute** advantage across all loan-to-values
- ▶ Large lenders **relative** advantage at low loan-to-values

Mechanism: Cost  $\rightarrow$  Price

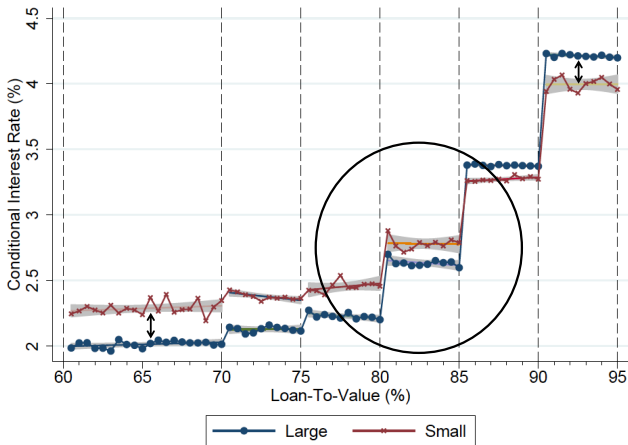
## Mechanism: Cost $\rightarrow$ Price



- ▶ Small lender relative lower rate at high loan-to-value
- ▶ 30bp difference move from 1st to > 10th position “best buy” tables

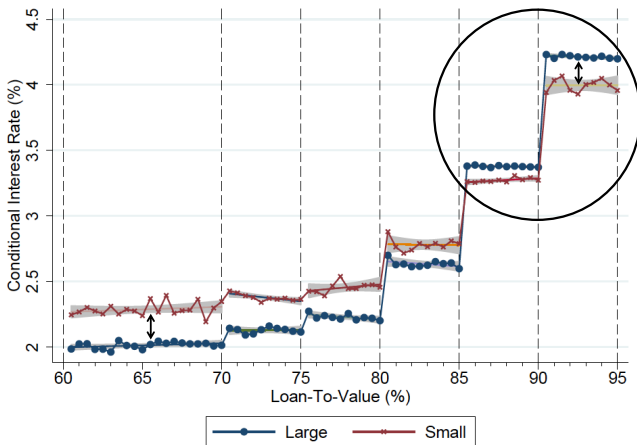


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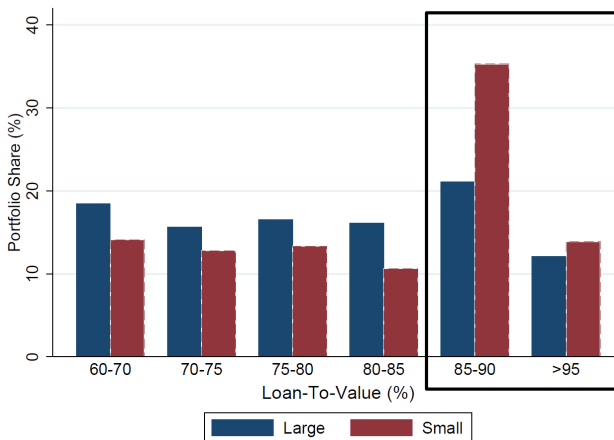
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Mechanism: Cost  $\rightarrow$  Price  $\rightarrow$  Quantity

# Mechanism: Cost $\rightarrow$ Price $\rightarrow$ Quantity



► Small lender specializes in high loan-to-value mortgages

► Is it driven by regulation? [► Ex-ante characteristics](#) [► Ex-post performances](#)

## ► **Shadow Cost of Capital Regulation**

- +1-percentage-point risk weighted capital requirements → +10% mortgage rates
- Upper bound on cost (only one margin of adjustment)

## ► **Counterfactual Leverage Regulations**

1. Policy-driven cost advantage account for  $\approx 20\%$  of concentration in the mortgage market
2. Interaction lender-based (risk-weighted capital requirements) and borrower-based (LTV limits) regulations may lead to unintended consequences

# Related Literature

## ► Consumer choice in mortgage markets:

- Campbell and Cocco (2003), Campbell et al (2011), Agarwal et al (2014), Fuster and Zafar (2015), Best et al (2015), Corbae and Quintin (2015), De Fusco and Paciorek (2016), Badarinza et al (2017)

→ New modelling approach & supply side responses to demand side

## ► Structural analysis of financial markets:

- Kojien and Yogo (2016), Crawford et al. (2017), Hastings et al. (2017), Egan et al. (2017), Xiao (2017), Gambacorta et al. (2017), Buchak et al. (2017, 2020)

→ Mortgage market, discrete-continuous choice & new identification strategy

## ► Competition, financial stability and macro-prudential policy:

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→ Structural model with new micro data, imperfect competition & interaction leverage regulation-market structure

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# Outline

A FACTS-DRIVEN STRUCTURAL MODEL

RESULTS AND COUNTERFACTUALS

CONCLUSIONS

# A FACTS-DRIVEN STRUCTURAL MODEL

# Facts in the UK Mortgage Market

1. Interest jumps at maximum loan-to-value ▶ Rates schedule  
→ Model: pricing by maximum loan-to-value
2. Borrowers bunching at maximum loan-to-value ▶ Bunching  
→ Model: discrete leverage choice
3. Borrowers buy “Dominated” Products ▶ Lender  
→ Model: brand fixed effects
4. Branches affect choice of lender ▶ Branches  
→ Model: branches enters utility

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# Roadmap for the Model

- ▶ **Goal:** recover primitive parameters to study equilibrium effects of alternative leverage regulations
  1. Borrowers' demand elasticities
  2. Lenders' unobservable costs of originating mortgages

- ▶ **Ingredients:** static partial-equilibrium model

- ▶ Demand:  $I_m$  consumers choosing

- Which mortgage to take from their choice set (downside risk)

- How much to borrow (downside risk)

- ▶ Supply:  $L_m$  lenders

- Offering differentiated mortgage products

- Competing on interest rates to maximize expected profits

- Paying for the cost of originating mortgages

- Regulation

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  - ▶ Demand:  $I_m$  consumers choosing
    - ▶ Which mortgage to take from their choice set (discrete choice)
    - ▶ How much to borrow (continuous choice)
  - ▶ Supply:  $L_m$  lenders
    - ▶ Offering differentiated mortgage products
    - ▶ Competing on interest rates to maximize expected profits
    - ▶ Pricing accounting for: default and refinancing risk, competition, leverage regulation

# Demand

- ▶ **Indirect utility** for borrower  $i$  in market  $m$  to take product  $j$ :

$$V_{ijm} = \bar{V}_{ijm}(r_{jm}, X_j, \xi_{jm}, Y_i, D_i, \zeta_i, A_{ij(l)}) + \varepsilon_{ijm}$$

- ▶ Mortgage:
  - ▶  $r_{jm}$ : initial interest rate
  - ▶  $X_j$ : other characteristics (e.g. rate type, lender, max LTV)
  - ▶  $\xi_{jm}$ : unobservable characteristics (e.g. cash back, advertising, screening)
  - ▶  $A_{ij(l)}$ : application costs (lenders' branch network)
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  - ▶  $Y_i$ : income
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- ▶  $\varepsilon_{ijm}$ : taste shock iid across mortgages and borrowers
- ▶ Borrower chooses **mortgage**  $j$  if  $V_{ijm} > V_{ikm} \forall k \in J_i$
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# Supply

- Competition on **interest rate**:

$$\max_{r_{jm}} \Pi_{lm}(r_{jm}) = \sum_{j \in J_{lm}} \sum_{i \in I_m} s_{ijm}(r_{jm}, r_{-jm}) \times \\ q_{ijm}(r_{jm}) \times [t_j r_{jm}(1 - d_{ijm}) - t_j c_{jm}]$$

- $s_{ijm}, q_{ijm}$ : product and loan demands
- $t_j$ : fix period remortgage
- $d_{ijm}$ : default risk
- $c_{jm}$ : lender marginal cost (policy rate + spread + others)

- Regulatory **risk-weighted capital constraint**:

$$s.t. \quad \underline{K}_{lm} \sum_{j \in J_{lm}} S_{jm} Q_{jm} \rho_{jm} \leq K_{lm}$$

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# Supply: Optimal Interest Rate

- Discrete choice + Continuous choice + Default risk + Regulation

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- Lagrangian multiplier  $\lambda$  = shadow cost of leverage regulation

# Identification and Estimation

## ► Demand:

- Selection for quantity choice → Joint simulated maximum likelihood
- Correlation interest - unobservable product characteristics → IV:  
risk-weighted capital requirements as product-level supply-side shifters

## ► Supply:

- Given equilibrium pricing obtain product-level marginal costs from:
  - Observed interest rates
  - Markups from demand estimates
  - Default estimates from linear probability model
- Variation in risk-weighted capital requirements both across-lender and within-lender across products

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# RESULTS AND COUNTERFACTUALS

# The Shadow Cost of Capital Regulation

	MAIN			HETEROGENEITY		IV
	(1)	(2)	(3)	(4)	(5)	(6)
RW CAPITAL REQ (%)	0.220*** (0.042)	0.268*** (0.035)	0.308*** (0.045)	0.332*** (0.056)	0.245*** (0.033)	0.283*** (0.036)
HIGH LTV		1.056*** (0.084)	1.006*** (0.090)	1.051*** (0.083)	1.041*** (0.082)	1.038*** (0.081)
FIX 5		0.599*** (0.073)	0.592*** (0.072)	0.604*** (0.071)	0.598*** (0.072)	0.599*** (0.073)
SWAP RATES		0.279* (0.159)	0.296** (0.147)	0.277* (0.161)	0.280* (0.157)	0.278* (0.160)
FUNDING SPREADS		0.118 (0.214)		0.152 (0.222)	0.109 (0.209)	0.124 (0.217)
RW CAPITAL REQ (%) x HIGH BUFFER				-0.098* (0.058)		
x HIGH FUNDING SPREAD					0.136** (0.053)	
MARKET F.E.	No	Yes	No	Yes	Yes	Yes
LENDER F.E.	No	Yes	No	Yes	Yes	Yes
MARKET-LENDER F.E.	No	No	Yes	No	No	No
MARGINAL COST (MEAN)	2.42	2.42	2.42	2.42	2.42	2.42
R <sup>2</sup>	0.13	0.82	0.84	0.82	0.82	0.82
OBSERVATIONS	1046	1046	1046	1046	1046	1046

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HIGH LTV		1.056*** (0.084)	1.006*** (0.090)	1.051*** (0.083)	1.041*** (0.082)	1.038*** (0.081)
FIX 5		0.599*** (0.073)	0.592*** (0.072)	0.604*** (0.071)	0.598*** (0.072)	0.599*** (0.073)
SWAP RATES		0.279* (0.159)	0.296** (0.147)	0.277* (0.161)	0.280* (0.157)	0.278* (0.160)
FUNDING SPREADS		0.118 (0.214)		0.152 (0.222)	0.109 (0.209)	0.124 (0.217)
RW CAPITAL REQ (%) x HIGH BUFFER				-0.098* (0.058)		
x HIGH FUNDING SPREAD					0.136** (0.053)	
MARKET F.E.	No	Yes	No	Yes	Yes	Yes
LENDER F.E.	No	Yes	No	Yes	Yes	Yes
MARKET-LENDER F.E.	No	No	Yes	No	No	No
MARGINAL COST (MEAN)	2.42	2.42	2.42	2.42	2.42	2.42
R <sup>2</sup>	0.13	0.82	0.84	0.82	0.82	0.82
OBSERVATIONS	1046	1046	1046	1046	1046	1046

# The Shadow Cost of Capital Regulation

	MAIN			HETEROGENEITY		IV
	(1)	(2)	(3)	(4)	(5)	(6)
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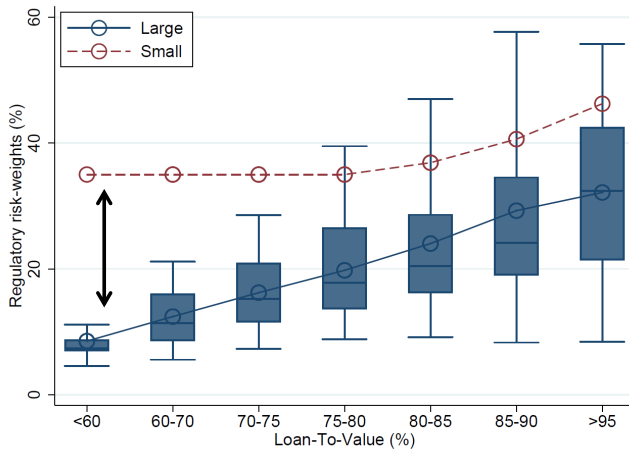
# #1: Equilibrium Effects of Risk Weights

**Leverage Regulation:  
Risk-weighted Capital Requirements**

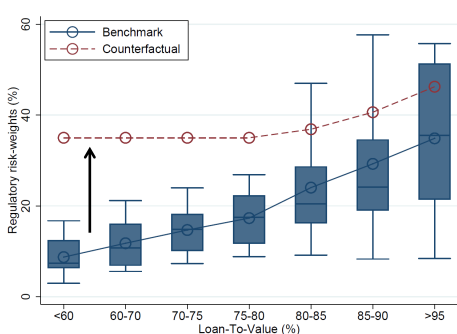


**Market Structure**

# Actual Regulation



# Counterfactual Regulation



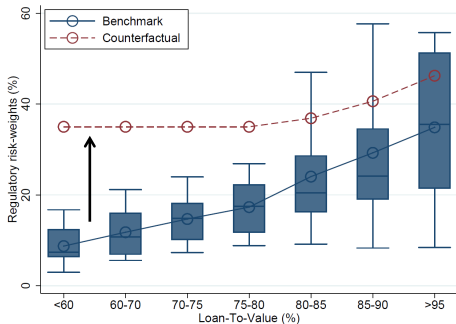
Counterfactual II: All internal  
Lower regulatory risk-weights  
for small lenders

## Counterfactual I: All standard

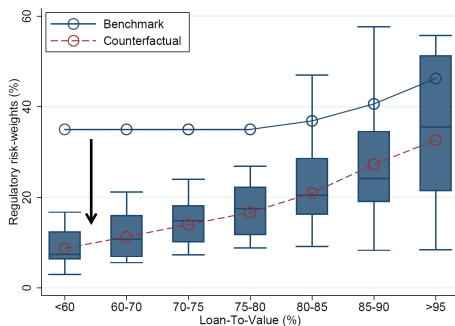
Abolition of internal models  
for large lenders (“floors”)



# Counterfactual Regulation



**Counterfactual I: All standard**  
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Lower regulatory risk-weights  
for small lenders

# Leverage Regulation Shapes Market Structure

	BASELINE	COUNTERFACTUALS	
		ALL STANDARD	ALL INTERNAL
	VALUE	$\Delta$	$\Delta$
PASS-THROUGH:			
COST	2.14	0.53	-0.15
PRICE	2.62	0.53	-0.15
LERNER INDEX	19.50	-3.15	1.65
MARKET STRUCTURE:			
HERFINDAHL INDEX	16.01	-3.80	-3.40
SHARE TOP SIX	85.52	-18.11	-13.98

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# Effects on Borrowers and Risk

	BASELINE	COUNTERFACTUALS	
		ALL STANDARD	ALL INTERNAL
	VALUE	$\Delta$	$\Delta$
BORROWERS AND LENDERS:			
PRODUCT DEMAND	5,638	-792	86
LOAN AMOUNT	135	-1.57	0.52
CONSUMER SURPLUS	7,250	-2,570	581
LENDER PROFITS	10,404	-1,507	127
RISK:			
DEFAULT:	1.34	0.11	-0.04
BUFFER:			
ALL	2.18	2.12	-0.09
TOP SIX	1.88	2.27	-0.01
OTHERS	4.02	0.57	-1.40

- Equity buffer: £Equity - £Expected losses

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# CONCLUSIONS

# Conclusions and Policy Implications

- ▶ **Shadow cost of risk-weighted capital requirements**
  - ▶ +1-percentage-point risk weighted capital requirements  $\rightarrow$  +10% mortgage rates
- ▶ Leverage regulation shapes market structure
  - ▶ Favors large banks and increases concentration by  $\approx 20\%$
- ▶ Caveats on design of multiple leverage regulation
  - ▶ Limit 90+ LTV mortgages decrease defaults, but also consumer surplus, profits & risk-weighted equity buffer

## What's Next?

...The most important slide of my talk...



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# Limitations and Open Questions

## 1. What are the relevant dimensions of competition?

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- ▶ Non-price characteristics (e.g., advertising) - Gurun, Matvos and Seru (2016)

## 2. Unintended consequences outside the mortgage market?

- ▶ Household regulation → reallocation to corporate credit - Acharya et al. (2020)
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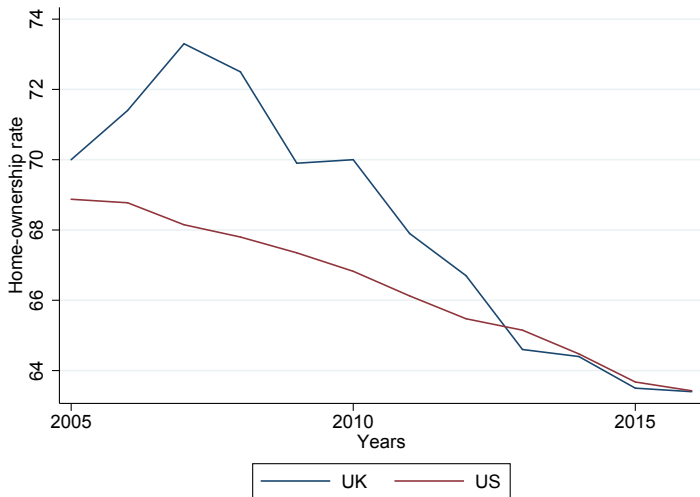
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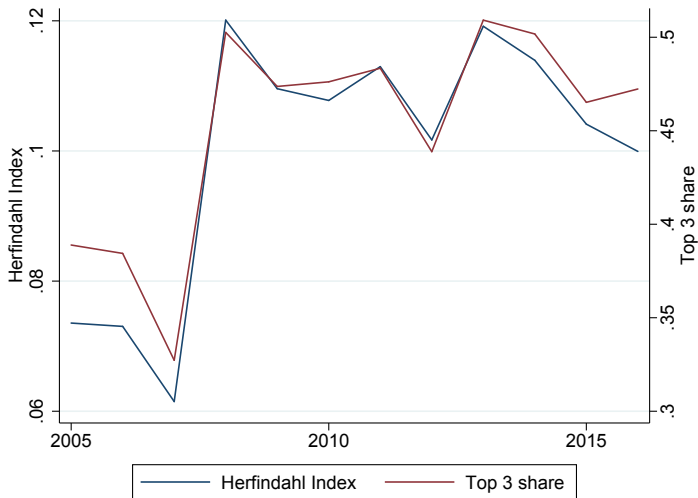
# APPENDIX

# Home Ownership in UK and US



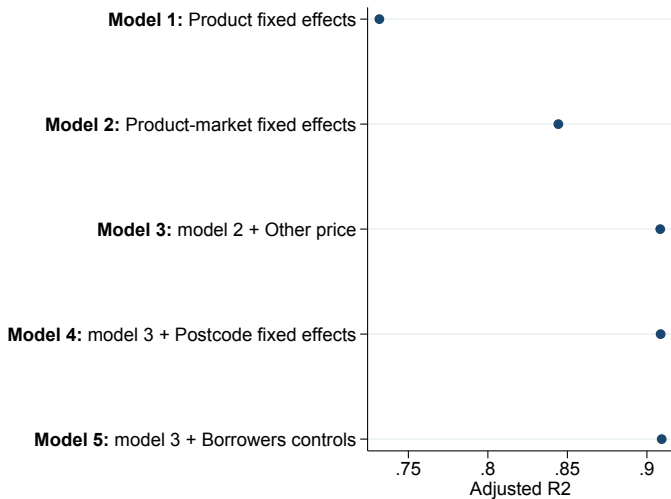
▶ back

# Concentration in the UK Mortgage Market



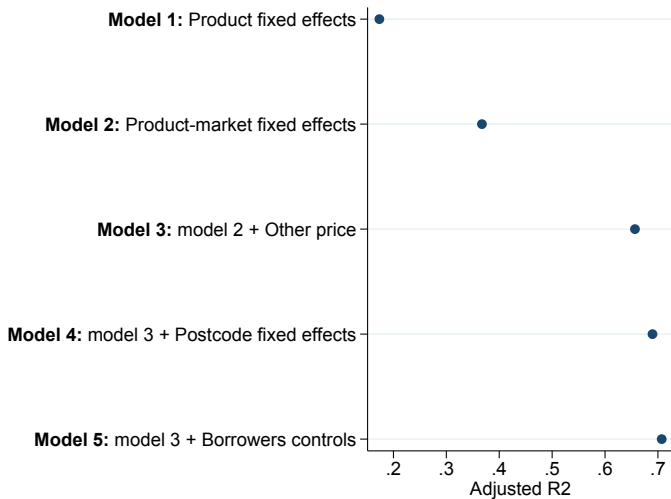
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# Variation Mortgage Rates



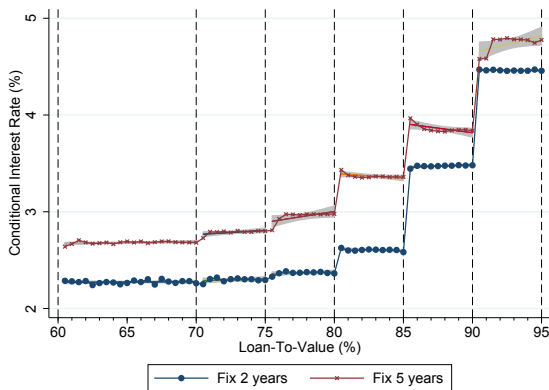
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# Variation Mortgage Fees



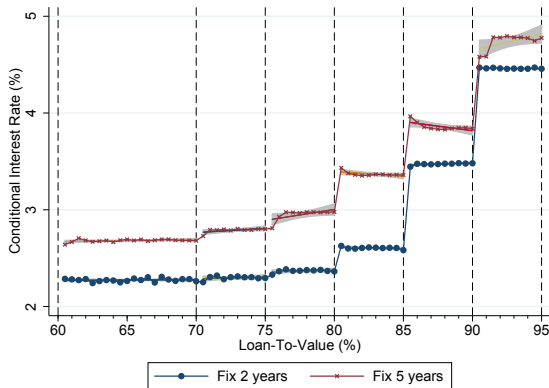
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# 1) Interest Jumps at Maximum Loan-To-Value



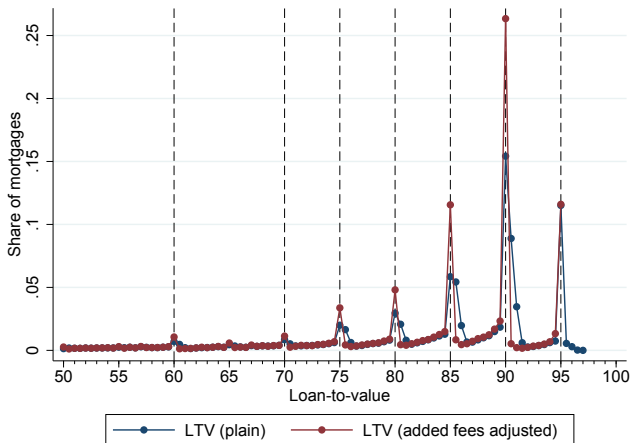
- ▶ Differences across rate types (and across lenders)
  - ▶ No pricing based on borrowers characteristics ▶ Variation Rates
- **Model:** pricing by lender, rate type, maximum LTV

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## 2) Borrowers Bunching at Maximum Loan-To-Value

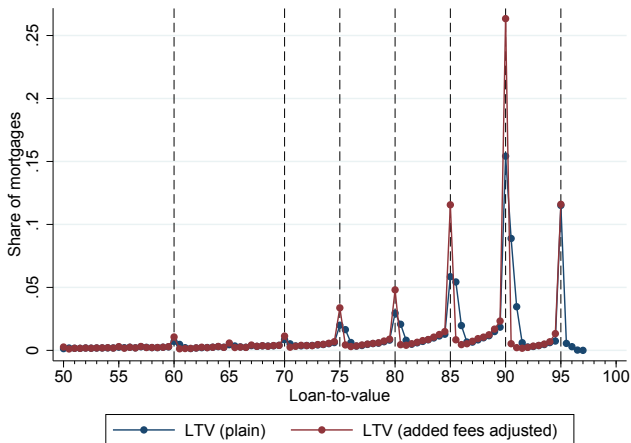


→ **Model:** discrete leverage choice

▶ back



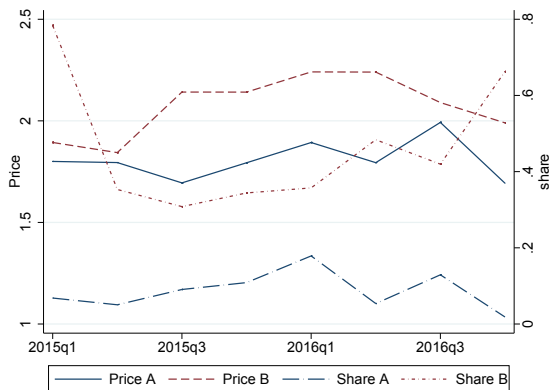
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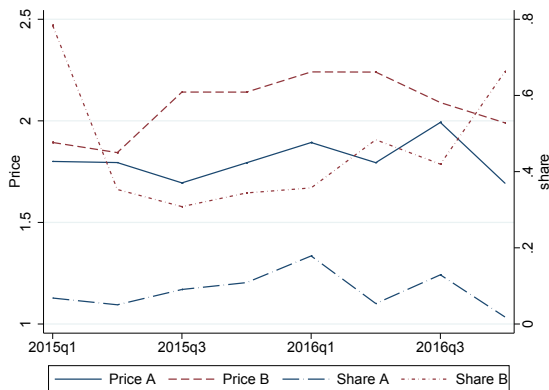
### 3) Borrowers Buy “Dominated” Products



- ▶ Same max LTV (70), fix period (2 years), quantity (140-160K)
- ▶ Lender A lower price and market share than lender B [▶ Default](#)

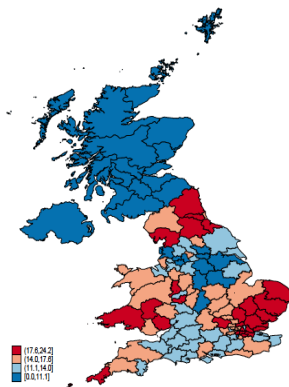
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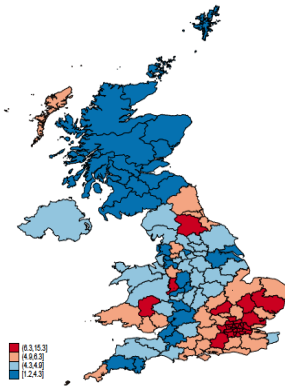


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## 4) Branches Affect Choice of Lender



Branches

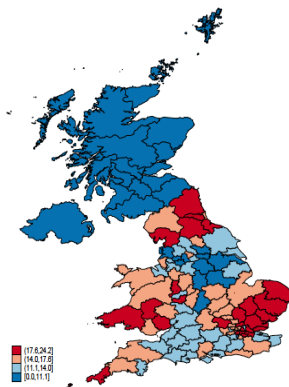


Mortgages

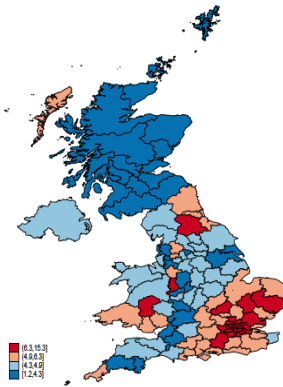
[▶ back](#)

→ **Model:** local branch network enters indirect utility

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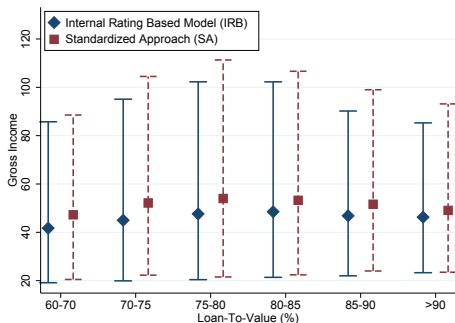


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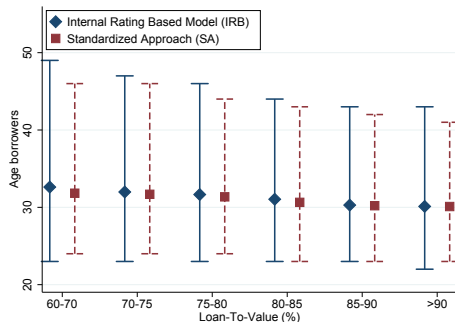
▶ back

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# Selection: Ex-ante Borrower Characteristics



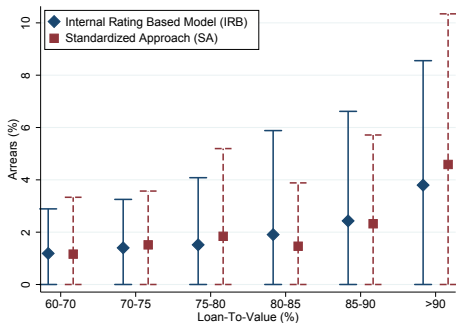
Income



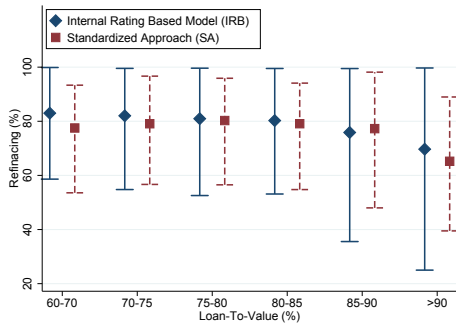
Age

▶ back

# Selection: Ex-post Borrower Performances



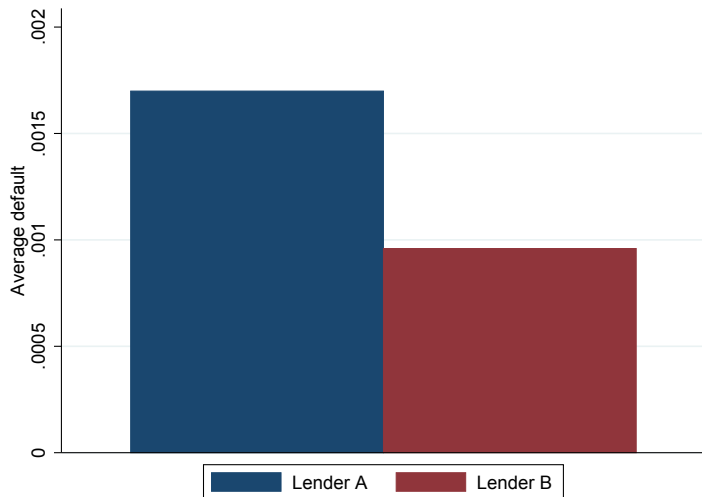
Arrears



Refinancing

[▶ back](#)

# No Cherry Picking



▶ back



# Remortgaging

FIGURE A.1: REMORTGAGES HAPPEN WHEN THE RESET RATE KICKS IN



Source: Best, Cloyne, Ilzetzki and Kleven, 2015

▶ back

# Magnitude Elasticities

- ▶ Interest rate  $\uparrow$  10bp
  - ▶  $\rightarrow$  Continuous choice:  $\downarrow$  0.25%  
~ Best et al. (2015); De Fusco and Paciorek (2017); Fuster and Zafar (2015)
  - ▶  $\rightarrow$  Discrete choice: own-product demand  $\downarrow$  22%, other product  $\uparrow$  0.2%

▶ back

# Demand - Fit

	IN SAMPLE					OUT OF SAMPLE				
	MEAN	SD	P10	P50	P90	MEAN	SD	P10	P50	P90
LOAN VALUE										
DATA	136.4	64.6	75.0	121.7	212.2	140.9	66.2	76.5	126.0	220.0
MODEL	135.3	64.5	76.3	119.7	213.8	141.4	66.4	79.2	125.5	221.8
LTI										
DATA	3.5	0.8	2.3	3.6	4.6	3.6	0.8	2.4	3.6	4.6
MODEL	3.5	0.9	2.4	3.5	4.6	3.6	0.9	2.4	3.5	4.8
SHARES										
DATA	1.2	2.1	0.1	0.4	3.0	1.2	2.4	0.1	0.5	2.8
MODEL	1.2	2.4	0.1	0.4	2.9	1.2	3.0	0.0	0.3	2.6
LTV										
DATA	80.7	11.2	62.5	84.8	90.0	81.4	11.2	63.1	85.0	90.7
MODEL	83.4	5.4	74.8	85.1	88.8	84.9	4.6	76.9	86.5	90.0

▶ back

# Results: Mark-ups

	OBS	ONLY DISC		DISC-CONT		FULL	
		(PP)	(%)	(PP)	(%)	(PP)	(%)
ALL	1,070	0.525	19.3	0.496	18.3	0.493	18.1
LENDER TYPE							
BIG 6	662	0.510	18.9	0.482	17.9	0.480	17.8
CHALLENGERS	168	0.550	19.2	0.519	18.1	0.517	18.0
BUILDING SOCIETIES	240	0.549	20.5	0.517	19.4	0.515	19.3
LTV BAND							
LTV $\leq$ 70	224	0.477	22.0	0.451	21.0	0.449	20.7
70 < LTV $\leq$ 80	512	0.525	21.1	0.495	19.9	0.492	19.8
LTV > 85	334	0.558	14.8	0.527	14.0	0.525	13.9
DEAL TYPE							
2 YEARS	576	0.522	21.6	0.492	20.3	0.489	20.2
5 YEARS	494	0.529	16.7	0.501	15.8	0.498	15.7

► back

## Default Parameters

	FULL SAMPLE	PRE-CRISIS	POST-CRISIS	
	OLS	OLS	OLS	IV
	(1)	(2)	(3)	(4)
INTEREST (%)	0.0015*** (0.0001)	0.0114*** (0.0006)	0.0012*** (0.0001)	0.0012*** (0.0004)
HIGH LTI	0.0007*** (0.0002)	0.0025*** (0.0006)	0.0003* (0.0001)	0.0003** (0.0001)
HIGH LTV	0.0013*** (0.0002)	0.0127*** (0.0008)	-0.0010*** (0.0002)	-0.0009** (0.0004)
TIME F.E.	Yes	Yes	Yes	Yes
LENDER F.E.	Yes	Yes	Yes	Yes
RATE TYPE F.E.	Yes	Yes	Yes	Yes
POSTCODE DISTRICT F.E.	Yes	Yes	Yes	Yes
INDIVIDUAL CONTROLS	Yes	Yes	Yes	Yes
OBSERVATIONS	2708046	551840	2156171	2082421

## Marginal Costs

	OBS	MARGINAL COST (NO DEFAULT)		EFFECTIVE MARGINAL COST (WITH DEFAULT)	
		NO ADD-ON	WITH ADD-ON	NO ADD-ON	WITH ADD-ON
ALL	1,070	2.411	4.780	2.431	4.828
LENDER TYPE					
BIG 6	662	2.420	4.995	2.434	5.036
CHALLENGERS	168	2.525	4.576	2.543	4.615
BUILDING SOCIETIES	240	2.306	4.330	2.341	4.402
LTV BAND					
LTV $\leq 70$	224	1.783	4.362	1.793	4.396
70 < LTV $\leq 80$	512	2.095	4.070	2.104	4.092
LTV > 85	334	3.316	6.148	3.358	6.245
DEAL TYPE					
2 YEARS	576	2.117	5.605	2.098	5.543
5 YEARS	494	2.775	3.890	2.796	3.921

▶ back

# Common Increase in Capital Requirements

	VALUE	$\Delta$	$\Delta$ (%)
COST	2.23	0.60	28.51
PRICE	2.71	0.63	23.89
DEMAND	5,364.60	-812.04	-15.14
QUANTITY	134.91	-2.43	-1.80
MONTHLY PAYMENT	662.59	60.79	9.21
PTI	20.28	1.86	9.21
CONSUMER SURPLUS	1.10	-0.47	-53.73
LENDER PROFITS	798.64	-121.95	-39.40
DEFAULT	1.08	0.11	10.27
BUFFER	3.03	2.68	88.44
HI	16.71	7.19	43.03
BIG SIX	86.27	6.73	7.80

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# Counterfactual Choice Set

- ▶ **Large number of products** (18K in 2015) → Characteristics approach
  - ▶ Focus on “big six” (>75% of the market), largest challengers and building societies
  - ▶ Outside option: other lenders and not borrowing (Goeree, 2008; Egan et al, 2016)
- ▶ **Leverage choice** → Matching and affordability criteria
  - ▶ Build borrower groups based on observable demographics (borrower type, income, age, region and quarter)
  - ▶ Counterfactual choice set: products by borrowers in the same group
  - ▶ Additional restriction on leverage choice: LTV bands adjacent to one chosen in equilibrium (“local” shopping decision)
- ▶ **Lender choice** → Application based on location and branch presence
  - ▶ Proxy for local pre-existing relations with “home bank”



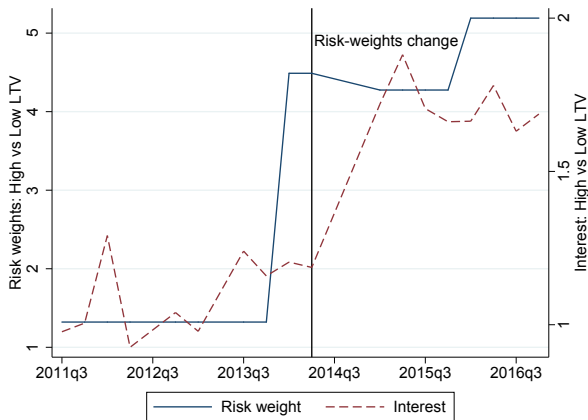
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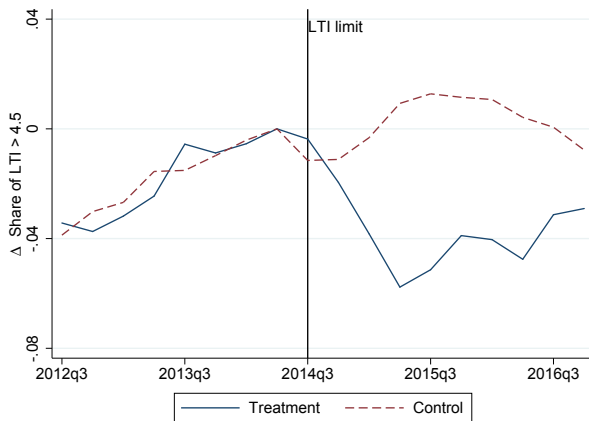
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# 1a) Reduced Form: Model Switch - One Lender



- **Policy change:** switch from standard to internal model
- **Variation:** within lender across leverage and over time

## 2) Reduced Form: Loan-To-Income Limits



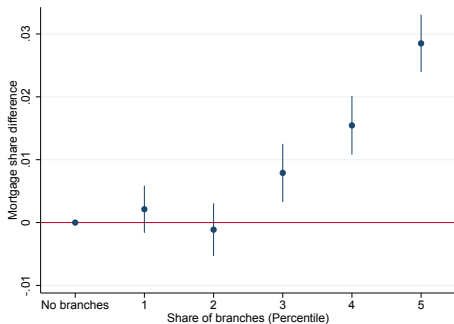
- **Policy change:** limit to originations with high LTI [► Policy](#)
- **Variation:** treated if above median mortgage share LTI > 4.5 before

## LTI policy

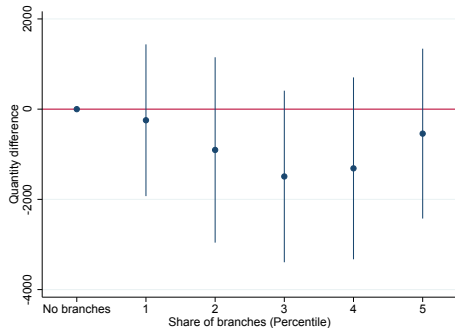
*The Prudential Regulation Authority (PRA) and the Financial Conduct Authority (FCA) should ensure that mortgage lenders do not extend more than **15%** of their total number of new residential mortgages at **loan to income** ratios at or greater than **4.5**. This recommendation applies to all lenders which extend residential mortgage lending in excess of **£100 million** per annum. The recommendation should be implemented as soon as is practicable.*

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# Branches and Discrete-Continuous Choice



Discrete lender choice



Continuous quantity choice

▶ back

## #2: Interactions Between Borrower- and Lender-based Leverage Regulations

## Leverage Limits:



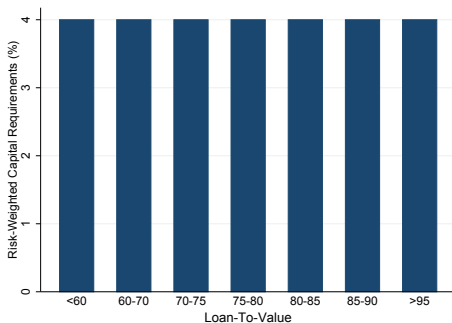
## Loan-To-Income      Loan-To-Value

( ▶ Reduced Form )



## Interaction with Risk-weighted Capital Requirements

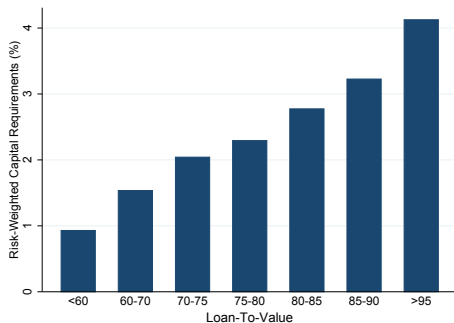
# Counterfactual Loan-To-Value Limits



## Counterfactual I: Pre-Crisis

homogenous capital requirements

+ 90% Loan-To-Value limit



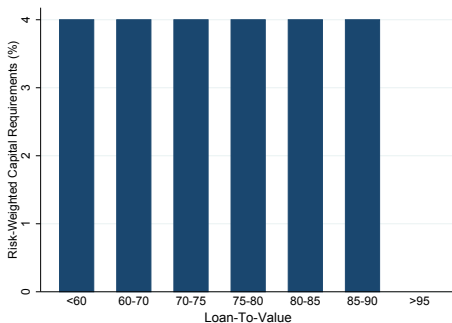
## Counterfactual II: Post-Crisis

Risk-weighted capital requirements

+ 90% Loan-To-Value limit



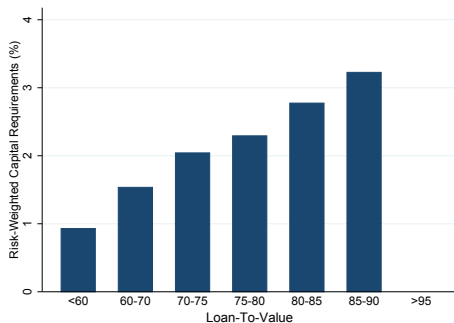
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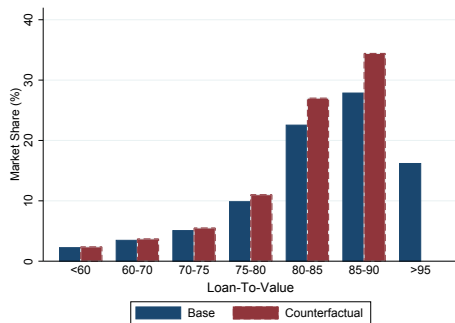
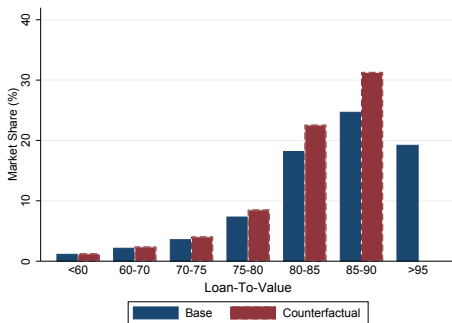


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# Intended and Unintended Consequences

	PRE-CRISIS	POST-CRISIS
	$\Delta$ (%)	$\Delta$ (%)
PASS-THROUGH:		
COST	-4.23	-7.62
PRICE	-3.56	-6.62
CREDIT ACCESS:		
DEMAND	-7.62	-3.65
CONSUMER SURPLUS	-20.00	-8.26
LENDER PROFITS	-12.74	-7.04
RISK:		
DEFAULT	-10.87	-8.97
EQUITY BUFFER:		
ALL	0.01	-10.23
TOP SIX	0.01	-13.18
OTHERS	0.01	-4.78

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