Bank of England

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Staff Working Paper No. 1,158
November 2025

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Aniruddha Rajan,[1] Francesc Rodriguez-Tous[2] and
Mauricio Salgado-Moreno[3]

Abstract

We study how monetary policy affects the fixation structure of mortgage contracts, a feature that is crucial for how household consumption adjusts following changes in policy rates. Using loan-level data covering the universe of residential mortgages in the UK, we show that lenders do not adjust the relative supply of mortgages with different fixation lengths in response to changes in the level of interest rates, but they do so following changes in the term spread. Monetary policy-induced increases in the slope of the yield curve cause lenders to increase the supply of longer-fixation mortgages. This effect is particularly strong for lenders with a greater share of fixed-rate mortgages in their existing portfolios – consistent with an interest rate risk management motive – as well as during expansionary monetary policy episodes. When monetary policy is contractionary, however, increases in the term spread lead banks to increase the supply of shorter as compared to longer-fixation mortgages. Finally, we find that the choice of monetary policy instrument has material – and directionally opposing – implications for the supply of mortgages at different fixation lengths.

Key words: Monetary policy, bank lending, household finance, mortgages, local projections.

JEL classification: E43, E52, G21, G51.

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(1) Bank of England. Email: aniruddha.rajan@bankofengland.co.uk
(2) Bayes Business School, City St. George's, University of London. Email: francesc.rodriguez-tous@city.ac.uk
(3) Bank of England. Email: mauricio.salgadomoreno@bankofengland.co.uk

We are thankful to Hans Degryse, Angela Gallo, Malte Heissel (discussant), José-Luis Peydró (discussant), and Francisco Urzua. We are also grateful to conference participants in the 31st Finance Forum 2024, the EEA-ESEM 2024 in Rotterdam, as well as seminar participants at the Bank of England and Bayes Business School.

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Bank of England, Threadneedle Street, London, EC2R 8AH
Email: enquiries@bankofengland.co.uk

ISSN 1749-9135 (on-line)

1 Introduction

The initial fixed interest rate period of mortgages (hereafter "fixation") is central to the transmission of monetary policy. Adjustable-rate mortgages transmit changes in the policy stance swiftly to households, impacting their cash-flows and thereby influencing consumption (Cloyne, Ferreira, and Surico (2020), Flodén et al. (2021), Agarwal et al. (2022), Garriga, Kydland, and Šustek (2017), Foulis et al. (2025)). In contrast, mortgages with longer fixation periods temporarily insulate borrowers from such effects. This motivates the main questions of our paper: does monetary policy directly influence the fixation structure of the mortgage market? And do lenders adjust the fixation structure of their mortgage portfolios as a strategy to manage interest rate risk?

Addressing these questions presents several empirical challenges. First, granular information on mortgage transactions are required to isolate differences in fixation periods and strip away variation attributable to other factors. Second, analysing mortgage prices *and* quantities is crucial to understand whether observed effects are driven by supply-side or demand-side dynamics. Third, identifying the date at which a mortgage was offered—rather than when it was executed—is critical to accurately trace the timing of responses to unexpected monetary policy shocks. Finally, credible measures of unexpected monetary policy shocks are needed to serve as exogenous variation.

We address these challenges using the universe of residential mortgage transactions in the U.K. from the Financial Conduct Authority "Product Sales Database", which provides rich information on loan amounts, rates, maturities, locations, and—crucially—the fixation period. The U.K. mortgage market offers a particularly clean empirical setting: the dominant products are 2-year and 5-year fixed-rate mortgages that are otherwise nearly identical across borrowers and loan characteristics, allowing us to isolate the role of fixation length. Unlike the U.S., where the overall mortgage term and fixation period are typically equivalent (Chiang and Dueholm (2024)), the U.K. market enables a more precise identification strategy. To overcome the limitation that mortgage registers record execution rather than offer dates, we match each transaction to the full menu of products offered by lenders each month. This allows us to recover the timing of mortgage offers and accurately measure the monthly response of mortgage rates and lending volumes. To identify causal effects, we exploit high-frequency movements in gilt yields around monetary policy announcements and estimate dynamic responses using local projections over a long sample spanning both low- and high-interest rate environments.

Our analysis yields four main findings.

First, lenders do not significantly alter the fixation-structure of their mortgage portfolios in response to changes in the *level* of interest rates. Although lenders initially increase the supply of longer-fixation mortgages—thereby increasing portfolio duration—this effect is transitory and dissipates within four months.

The same is not true, however, when monetary policy affects the *slope* of the yield curve (i.e. the term spread). An increase in the term spread induces lenders to shift towards longer-fixation mortgages, lowering their relative price and increasing their quantity. The combination of lower prices and higher quantities point to a supply-side mechanism. To our knowledge, this is the first study to document how changes in the term spread affect the bank lending channel of monetary policy. One interpretation is that banks are well-hedged against changes in the level of interest rates (Drechsler, Savov, and Schnabl (2021)) but less so against changes in the term spread.

This result is robust to a battery of tests. We find that our results remain when we use a highly disaggregated set of fixed effects (lender-location-LTV band-month FE); alternative instruments (using factors as per Swanson (2021) and computed by Braun, Miranda-Agrippino, and Saha (2023) for the U.K.); and when we exclude "information effects" (Nakamura and Steinsson (2018), Jarocinski and Karadi (2020)).

Second, we investigate the mechanism underlying the observed adjustment in mortgage fixation structure. We find that the response is concentrated among lenders with a higher ex-ante share of fixed-rate mortgages in their portfolios. This heterogeneity is consistent with a duration risk management motive: following a monetary policy shock that increases the term spread, lenders with greater exposure to fixed-rate assets experience greater crystallisation of duration risk, even though these exposures are not marked-to-market. In response, they rebalance their portfolios by increasing the issuance of longer-fixation mortgages, thereby restoring interest rate risk exposure.

We also investigate further sources of lender heterogeneity as potential drivers for our baseline results. While effects appear to be somewhat stronger for banks compared to building societies, and for lenders with higher capital and reserve ratios, the differences are generally not significant. These findings suggest that the exposure to interest rate risk in the mortgage portfolio is the key mechanism through which lenders re-adjust the supply of mortgages with different fixation lengths following a change in the term spread.

Third, we find that the effects of monetary policy on mortgage fixation depend on the overall policy stance. Changes in the term spread happen in episodes of expansionary as well as contractionary monetary policy shocks. The shift towards longer mortgage fixations following an increase in the term spread is observed only during expansionary monetary policy episodes.[1] In contrast, during contractionary episodes, lenders seek to reduce, rather than increase, the length of their mortgage fixation in response to an increase in the term spread. Additionally, we find no significant heterogeneity in responses based on whether the term spread increases or decreases, or when the policy rate is at, or away from, the effective lower bound.

Fourth, we find that the effects of monetary policy on mortgage fixation depend on the policy instrument deployed. Contractionary policy rate surprises—proxied by the "Target" factor—flatten the yield curve and raise the relative cost of longer-fixation mortgages, while contractionary quantitative easing surprises—proxied by the "QE" factor—steepen the curve and have the opposite effect. Forward guidance surprises—proxied by the "Path" factor—have limited impact. We also uncover asymmetries between the quantitative easing and quantitative tightening periods: contractionary "QE" shocks increase the supply of longer-fixation mortgages during the QE period but reduce them during the QT period, with stronger effects. These findings underscore the importance of instrument choice in shaping the transmission of monetary policy through the mortgage market.

Taken together, these results deepen our understanding of monetary policy transmission to the real economy via mortgage lending. They highlight the role of fixation structure as a margin of adjustment for lenders and suggest that monetary policy interventions that compress long-term yields

[1] Similar to Di Tella and Kurlat (2021), which show a model where banks take on higher interest risk exposure when rates are lower.

relative to short-term yields—such as QE—tilt mortgage supply towards shorter fixation lengths, thereby increasing the sensitivity of household consumption to future interest rate fluctuations.

Literature Review. Our main contribution is to the literature analysing the transmission of monetary policy to the real economy through the bank lending channel. Seminal work shows how monetary policy influences the supply of credit via bank balance sheet constraints (Bernanke and Gertler (1995); Kashyap and Stein (2000); Jimenez et al. (2012)). While this literature has largely focused on credit to non-financial firms, driven by the availability of corporate credit registers in many countries, more recent work studies the role of household credit: Benetton, Gavazza, and Surico (2021), Garriga, Kydland, and Šustek (2017), Cloyne, Ferreira, and Surico (2020), and Foulis et al. (2025) show that mortgage markets play a central role in the transmission of monetary policy via consumption impacts. We contribute to this literature by showing that monetary policy not only affects the level of mortgage lending but also the *composition* of mortgage contracts by fixation periods. This margin of adjustment matters because it determines the sensitivity of future cash flows to interest rate changes, and thus shapes the persistence of monetary policy transmission over time.

We also build on the literature on bank interest rate risk management. Prior work has examined how banks manage their exposures through derivatives and how their equity values respond to changes in interest rates, including changes in the term spread (Hoffmann et al. (2019), Vuillemey (2019), Paul (2023) English, Van den Heuvel, and Zakrajšek (2018)). This literature shows that bank stock prices fall after monetary policy-induced increases in the term spread, and that most banks hedge very little of their interest rate exposures via derivatives. Our contribution is to show that mortgage supply itself is a key tool for managing interest rate risk. Specifically, we identify how lenders rebalance the duration of their mortgage portfolios in response to monetary policy. By focusing on mortgages with very similar characteristics except for their fixation length, our empirical setup isolates duration exposure from other confounding sources of risk, allowing us to highlight a clean interest rate risk management channel operating through mortgage supply.

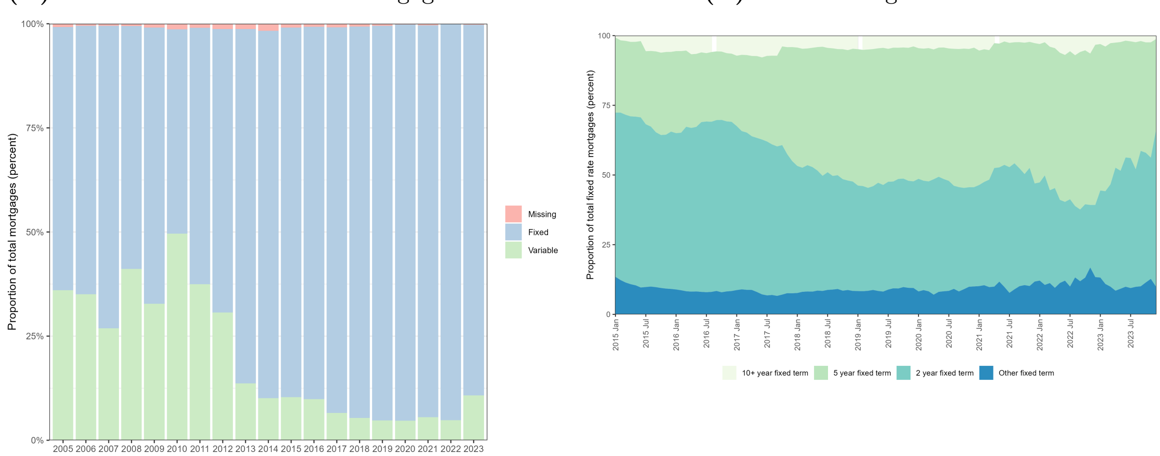
We also add to a growing literature studying the determinants of mortgage choice, mostly between adjustable-rate mortgages and fixed-rate mortgages (Campbell and Cocco (2003), Badarinza, Campbell, and Ramadorai (2018), Liu (2023)). Our paper departs from the literature by focusing on the supply-side of the mortgage market by highlighting the importance of monetary policy. As this literature emphasizes, the adjustability of mortgage contracts plays a crucial role in the transmission of monetary policy via households.

2 Institutional background

The U.K. residential mortgage market is primarily composed of two fixed-rate mortgage (FRM) products with initial fixation periods of two or five years. During the fixation period, the interest rate remains fixed; thereafter, the loan typically reverts to a variable rate. At that point, borrowers generally have the option to refinance without incurring penalties, and most choose to transition into a new fixed-rate product. Importantly for the research question of our paper, both new originations and refinancing occur at prevailing market rates. Prior research documents that these rates are, at least in part, influenced by changes in short-term interest rates induced by monetary policy decisions (see, for example, Hofmann and Mizen (2004); Becker, Osborn, and Yildirim (2012)).

Figure 1: Evolution of mortgages over time in the United Kingdom

(A) Fixed versus variable rate mortgages over time   **(B)** Fixation lengths over time



This figure shows the evolution of the composition of new mortgages in the U.K. Panel (A) shows the composition of fixed- versus adjustable-rate new residential mortgages from 2005 to 2023. Panel (B) shows, within fixed-rate mortgages, the relative shares of mortgages with different fixation periods from 2015 to 2023.

The dominance of these two contract types—2-year and 5-year FRMs—has become particularly pronounced since the 2008 financial crisis. Panel (A) of Figure 1 illustrates the evolution of FRM and adjustable-rate mortgage (ARM) shares in new mortgage lending flows in the U.K. since 2005. Prior to 2010, FRMs accounted for roughly 50–75% of new lending, implying that ARMs represented between 25%–50% of the market. Since 2013, however, FRMs have consistently comprised more than 90% of new lending on average.

Within the FRM segment, market share has shifted toward longer fixation periods—primarily 5-year products—as shown in Panel (B) of Figure 1. Breakdowns by fixation length are substantively complete from 2015 onward. Over this period, the share of two-year FRMs within total FRM originations declined from approximately 60% in Q1 2015 to about 25% by Q4 2022, while the share of five-year FRMs more than doubled from roughly 26% to 56%. Since then, the two-year share has partially rebounded, reaching 49% by Q4 2023.[2] This rebound coincides with the second half of the recent U.K. monetary-policy tightening cycle. Taken together, the evidence points to a structural shift toward FRMs and, within FRMs, toward longer fixation terms for most of the sample period.

3 Data

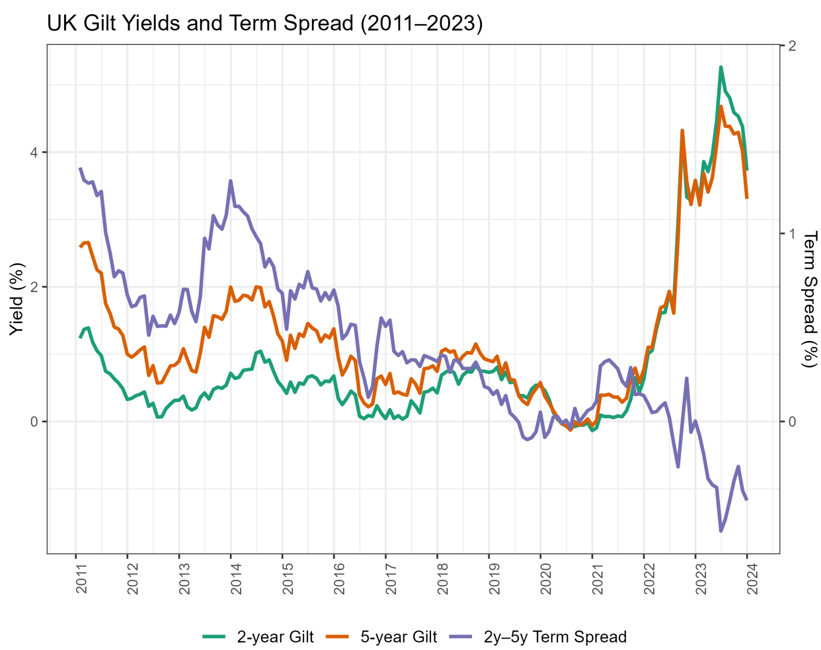
We combine several data sources to address the empirical challenges outlined earlier. Monthly data on gilt yields are obtained from Bloomberg. To capture high-frequency monetary policy shocks, we use the dataset constructed by Braun, Miranda-Agrippino, and Saha (2023) which leverages minute-by-minute gilt yield movements from Refinitiv Tick around monetary policy announcements. We also use a mortgage register maintained by the Financial Conduct Authority, Product Sales Database 001 (PSD001), which contains the universe of newly issued residential mortgages in the United Kingdom. We complement this with data from MoneyFacts, which provides detailed information on mortgage products offered by lenders, and with data from the Product Sales Database 007 (PSD007) which provides information on lenders' existing mortgage portfolios. Finally, we use bank balance sheet data gathered through confidential regulatory reporting to the Bank of England.

[2] Appendix Figure A.1 shows a similar pattern in both unweighted and lending-volume-weighted average fixation lengths over time.

3.1 Yield curve data and monetary policy surprises

We collect monthly data on gilt yields at various maturities from Bloomberg. For our main analysis we focus on 2-year and 5-year gilt yields, as well as the term spread—defined as the 5-year yield minus the 2-year yield—which captures changes in the slope of the yield curve. Figure 2 plots the evolution of these yields over our sample period. Notably, 2-year and 5-year gilt yields exhibit a high degree of co-movement (correlation = 94%). However, the term spread has generally declined over time, falling below zero in the final years of the sample.

Figure 2: Gilt yields and term spread



Source: Bloomberg Finance L.P.. This figure shows evolution the the level of 2-year and 5-year gilt yields as well as the term spread, measured at a monthly frequency. The final data point is December 2023.

We also incorporate high-frequency data on changes in gilt and other asset yields around U.K. monetary policy announcements. Specifically, for our main analysis we use the dataset published by Braun, Miranda-Agrippino, and Saha (2023), which captures monetary policy surprises in gilt (and other asset) yields within a 30-minute window surrounding policy announcements—defined as the interval from 10 minutes before to 20 minutes after the announcement. From this dataset we use monetary policy surprises based on changes in yields at the 6-month, 2-year, and 5-year maturities around monetary policy announcements, as the basis of our main analysis. In robustness checks, we extend our analysis to include a broader set of surprises, encompassing longer-maturity yields, equity market reactions, and monetary policy factors derived using the methodology of Swanson (2021). These additional measures allow us to test the sensitivity of our results to alternative characterisations of monetary policy shocks.

Figure 3 shows the main monetary policy surprises that we use across our sample. We focus on four yield curve movements: changes in the 6-month, 2-year, and 5-year yields, as well as the term spread between the 2-year and 5-year maturities. Positive and negative surprises across these series are relatively evenly distributed across the sample period, including during episodes when the Bank Rate was near the effective lower bound. Surprises become more pronounced during the recent U.K. monetary policy tightening cycle, yet remain bi-directional, reflecting both easing and tightening shocks even within a broadly contractionary environment.[3]

3.2 Bank balance sheet data

We incorporate balance sheet information from U.K. commercial banks and building societies into our sample from confidential mandatory statistical reporting submitted to the Bank of England at quarterly frequency.[4] Concretely, we draw bank-level data from balance sheet returns (BT and BE) on central bank reserve holdings, total loans, capital as well as total and sight deposits. Given that our primary dataset is available at a monthly frequency we align each mortgage observation with the corresponding lender balance sheet values from the previous quarter.

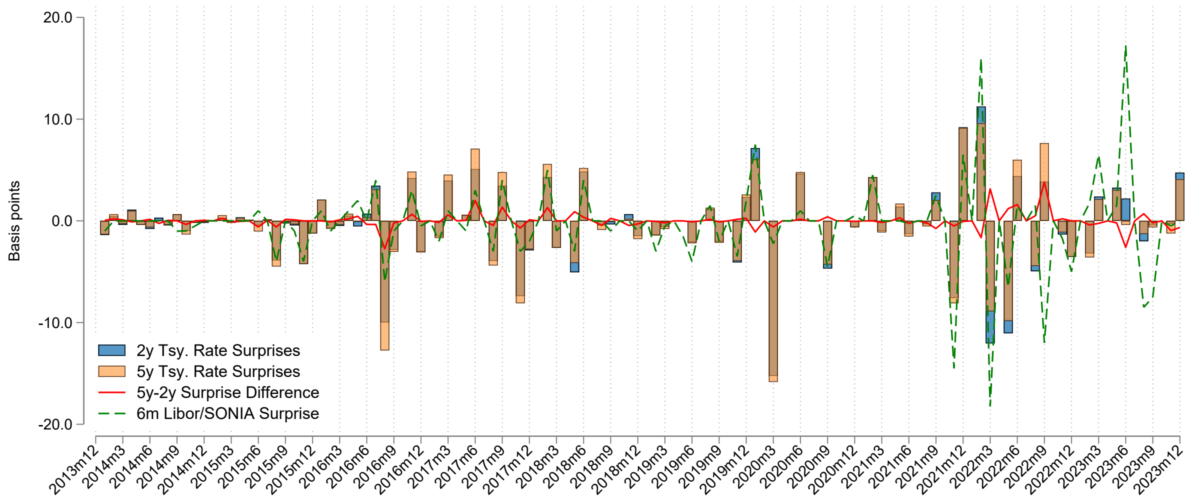
3.3 Mortgage transactions data

Our primary data on executed mortgage transactions comes from PSD001, a comprehensive dataset maintained by the Financial Conduct Authority that covers the universe of newly issued residential

[3]The 6-month surprise is calculated using the second-quarter Short Sterling Futures contract. In the initial portion of our sample, this is based on the 3-month Libor rate as historically these futures have been considered as the most liquid measures of interest rate expectations in the U.K., and are available since 1997 (Joyce, Relleen, and Sorensen (2008)). In 2021, Libor-based futures were phased out. As a result, from that point on we switch to futures that are based on the 3-month SONIA rate instead, at equivalent maturities.

[4]For more information on the statistical reports see `https://www.bankofengland.co.uk/statistics/data-collection/statistical-reporting`.

Figure 3: Monetary policy surprises



This figure shows the high-frequency changes around monetary policy announcements for several yields. The blue column shows the changes in 2-year Gilt yields; the orange column shows the changes in 5-year Gilt yields; the red line shows the differences between these two changes; and the dashed green line shows the changes in the 6-month Libor (until 2021) and SONIA (after 2021). The vertical axis is in basis points. These changes are computed using Refinitiv Tick data and are taken from Braun, Miranda-Agrippino, and Saha (2023).

mortgages in the United Kingdom. PSD001 includes rich information on both transaction and borrower characteristics. We undertake a number of cleaning steps on this dataset, detailed in Appendix Table A.1, which involve excluding non-standard residential mortgage products—such as second-charge, commercial and business loans—and removing obvious data errors.

Importantly, until 2021, PSD001 included only external remortgages (i.e., refinancing involving a change of lender), excluding internal remortgages (refinancing with the same lender and property). These two types of remortgages may differ systematically in terms of borrower and lender characteristics—for example, lenders may possess superior soft information about borrower quality in internal remortgage cases. Similar to Benetton, Gavazza, and Surico (2021) we exclude remortgages from our baseline analysis. However, we confirm in robustness checks that our results are not sensitive to their inclusion.

Our sample focuses on the period from 2015 to 2023, during which complete data on fixation lengths are available and U.K. monetary policy underwent substantial variation. PSD001 provides detailed information on mortgage characteristics, including fixation length, interest rate, loan amount, loan-to-value ratio, mortgage term, and property location. It also includes borrower attributes such as gross income, age, employment status, and first-time buyer status.

To complement PSD001, we use PSD007—also maintained by the FCA—which contains half-yearly data on lenders' outstanding mortgage portfolios. This dataset allows us to measure lenders' pre-existing exposure to fixed-rate and adjustable-rate mortgages, which we use to capture heterogeneity in balance sheet duration risk.

3.4 MoneyFacts product data

The execution date recorded in PSD001 reflects the point at which a borrower draws down funds, typically after securing a property. However, mortgage offers are generally made earlier, at a fixed interest rate valid until a specified expiration date. PSD001 does not record the offer date, which introduces a timing mismatch between observed mortgage pricing and monetary policy events.

To address this, we incorporate data from MoneyFacts, a separate dataset that tracks mortgage products offered by U.K. lenders. This enables us to infer the timing of mortgage offers and improve temporal alignment with monetary policy shocks. In the earlier part of our sample, MoneyFacts provides monthly snapshots of product offerings; from August 2018 onward, the data are available at daily frequency. The dataset includes product-level details such as interest rate, fixation length, maximum loan-to-value ratio, and associated fees.

3.5 Matching PSD001 mortgages with MoneyFacts data

As discussed earlier, a key empirical challenge is that we do not directly observe when mortgage offers are agreed in principle between lenders and borrowers from the transactions data. The challenge to identification is the following: because borrowers may execute a mortgage several months after setting terms with a lender, transactions whose terms were set *prior* to a monetary policy event may be mistakenly attributed as *responses* to that event.

This is a widespread problem in the literature. A simple solution would be to lag the timing of mortgage transactions in the PSD001 by an arbitrary amount (e.g. one quarter). However, given our interest is on the dynamic response of mortgage rates following a monetary policy surprise that happens at a precise moment in time, obtaining the exact—monthly—timing of mortgage offers is particularly important for this analysis. We therefore perform a matching exercise to assign each mortgage transaction in PSD001 to the expected date (month) when the mortgage was agreed in principle. To do so, we run the following algorithm:

- Select a time window over which MoneyFacts products could potentially be matched with a particular PSD001 transaction. We choose 0-12 months. This means a January 2020 PSD001 transaction can be matched with products in the MoneyFacts data anywhere between January 2019 and January 2020.
- For the daily sample (from August 2018 onward), we perform exact matching on (i) lender name; (ii) product type; (iii) fixation length; and (iv) interest rate. Then we apply nearest-neighbour matching on (v) product LTV; and (vi) product fee.[5]
- For the monthly sample (before August 2018), we perform exact matching on (i)-(iii). Given product interest rates may unobservably change within the month, we continue to match on interest rate but allow for the match to be within a range of MoneyFacts monthly rate ± 0.5 standard deviations.[6] Nearest-neighbour matching is again applied on (v)-(vi).
- This process generates a set of unique matches (one PSD001 transaction matched to one MoneyFacts product) as well as non-unique matches (one PSD001 transaction matched to multiple MoneyFacts products). To generate unique matches we first construct a distribution of the differences in timing between PSD001 transactions and matched MoneyFacts products from the unique set of matches. We then use this distribution to assign selection probabilities to matches within the non-unique cases.
- Using these empirical probabilities, we then randomly draw a unique match in the cases where multiple MoneyFacts products have matched with a PSD001 transaction.[7]

This procedure yields matches for approximately 70% of cleaned PSD001 transactions, resulting

[5]A distinction between the PSD001 and MoneyFacts data is that PSD001 reports actual LTV ratios at the time of transaction, while MoneyFacts reports maximum permissible LTVs for product eligibility.

[6]The interest rate standard deviation is computed at the lender-LTV band-fixation-year level.

[7]Our results are robust to the randomisation introduced in this step.

in a matched sample of around 3.25 million observations (Table A.1). Most mortgage offers are executed within four months, though a non-trivial share exhibit longer lags.[8] While the average lag aligns with market intelligence and internally produced Bank of England estimates, the tail of the distribution underscores the importance of accounting for delayed execution.

Following the matching, we aggregate the data into a panel, constructed at the lender-location-LTV-fixation-month level to track dynamics through our local projection empirical specifications. The final panel comprises approximately 1.4 million observations, of which around 1.15 million observations pertain to either 2-year or 5-year FRMs. The panel includes 86 lenders across 179 U.K. locations, 14 LTV categories and 7 fixation lengths, with each panel unit observed an average of 11 times.

Summary statistics for the final dataset are presented in Table 1, including the breakdown across two-year and five-year FRMs.[9]

[8] Appendix Figure A.2 illustrates the distribution of offer to execution lags.

[9] More detailed summary tables are provided in the Appendix Tables A.2, A.3 and A.4.

Table 1: Summary statistics of matched panel dataset

Variable	Full sample Mean	Full sample SD	2-year FRMs Mean	2-year FRMs SD	5-year FRMs Mean	5-year FRMs SD	Norm. diff.
Interest Rate (%)	2.71	1.12	2.63	1.20	2.82	1.05	-0.119
Number of loans	2.36	3.21	2.60	3.74	2.48	3.11	0.025
Total value of loans (£)	478,125	747,306	523,053	836,174	499,628	758,502	0.021
Average loan value (£)	203,404	151,664	203,449	138,477	198,399	150,496	0.025
Lender fees (£)	720.08	3,441	699.16	4,348	739.06	2,748	-0.008
Mortgage term (months)	319.55	80.10	327.12	76.89	319.56	78.71	0.069
LTV ratio	71.65	19.28	74.20	18.52	70.96	18.97	0.122
LTI ratio	3.33	0.91	3.37	0.89	3.37	0.89	0.00
First-time buyers (%)	0.47	0.44	0.48	0.44	0.49	0.44	-0.016
Verified income (%)	1.00	0.01	1.00	0.01	1.00	0.00	0.00
Self-employed (%)	0.11	0.27	0.12	0.28	0.10	0.26	0.052
Interest only (%)	0.01	0.11	0.01	0.10	0.01	0.10	0.00
Borrower age (years)	36.33	8.37	35.82	7.98	36.33	8.29	-0.044
Gross income (£)	65,084	86,877	64,132	64,506	62,264	92,821	0.017
Property value (£)	300,808	245,290	288,729	214,071	295,098	238,060	-0.020
Observations	1,372,725		569,180		581,173		

Note: This table shows summary statistics of variables from the final matched panel dataset, as well as broken down across 2-year and 5-year FRMs. For indicator variables (i.e. first-time buyers, verified income, self-employed and interest-only), the values in the matched panel dataset measure the proportion of underlying loan-level observations within each panel unit for which the indicator flag is equal to 1, where the value 1 is aligned with the naming convention of these variables. The last column presents the normalised differences for each variable between 2-year and 5-year FRM; these are calculated as $\Delta_x = \frac{\bar{X}_{2y} - \bar{X}_{5y}}{\sqrt{S^2_{2y} + S^2_{5y}}}$ as in Imbens and Wooldridge (2009).

The breakdown across 2-year and 5-year FRMs suggests that borrower characteristics are broadly similar across these two product types. We examine these similarities more formally in the last column of Table 1, where we compute the normalised differences following Imbens and Wooldridge (2009). None of the values is above 0.25 in absolute terms, reinforcing the notion that the borrower pools for 2-year and 5-year FRMs are observationally similar.

4 Empirical approach

We estimate the **dynamic average cumulative response** of mortgage outcomes to monetary policy shocks using a panel local projection framework. Our dependent variable, $Y_{i,b,p,L,t}$, at horizon h. $Y_{i,b,p,L,t}$ denotes either the average interest rate (price) or the logarithm of the total value in pounds (quantity) of mortgages with fixation length $i \in \{2, 5\}$ years offered by lender b in location p with LTV-eligibility band L at month t. As described in Section 3, the data are aggregated into an unbalanced panel at the lender-location-LTV-fixation-month level.

We define the left-hand-side variable as the cumulative change over horizon h, given by:

$$\Delta_h Y_{i,b,p,L,t} \equiv Y_{i,b,p,L,t+h} - Y_{i,b,p,L,t-1}$$

and estimate this using panel regressions to trace out cumulative responses.

In Specification 1 we employ high-frequency monetary policy surprises as our main explanatory variables. We use four distinct measures, consistent with those described in Section 3.1, each normalised by its standard deviations. Three of these capture surprise changes in the *level* of the yield curve at different maturities (6-month, 2-year and 5-year), while the fourth captures changes in the *slope* of the yield curve—specifically, the term spread between the 2-year and 5-year maturities. This slope measure is particularly relevant to the fixation lengths for the mortgages we study.[10]

$$\Delta_h Y_{i,b,p,L,t} = \beta_h \left(\Delta \mathrm{MP}_t \times \mathbb{1}_i^{5y} \right) + X'_{i,b,p,L,t-1}\phi + u_{i,b,p,L,t} \tag{1}$$

for $h = 0, 1, 2, ..., 6$, where $\Delta\mathrm{MP}_t$ are the monetary policy surprises and $\mathbb{1}_i^{5y}$ is an indicator variable equal to one if the fixation length is five years and to zero if the fixation length is two years.

As controls, we include a vector of loan and borrower risk characteristics, denoted $(X_{i,b,p,L,t})$.[11] In addition, we incorporate a granular suite of fixed-effects including location-time, location-bank, bank-time, LTV band-time, LTV band-bank, LTV band-fixation, bank-fixation and location-fixation fixed effects. This rich set of fixed effects allows us to isolate within-lender, within-location and within-LTV band variation in mortgage pricing and quantity across fixation lengths, thereby identifying the differential response of longer (5-year) versus shorter (2-year) fixed-rate mortgages to monetary policy shocks. The coefficient sequence $\{\beta_h\}_{h=0}^{H=6}$ traces out the cumulative response of the dependent variable to a +1 unit monetary policy shock over horizon h.

[10] Maturity-matched risk-free rates are commonly used as pricing benchmarks for mortgage interest rates (Harimohan, McLeay, and Young (2016), Fisher et al. (2024)) and are actively employed by lenders as hedging instruments when issuing fixed-rate mortgages with 2-year and 5-year terms. (Benetton (2021)).

[11] In our baseline specification we control for the following loan and borrower characteristics by incorporating one lag of each of the following: the dependent variable, transaction LTV ratio, LTI ratio, lender fees, proportion of self-employed borrowers, proportion of first-time buyers, proportion of interest-only mortgages, and average mortgage term within the lender-location-LTV-fixation-month unit.

Following Stock and Watson (2018), we supplement this with an instrumental variables (IV) approach, in which monthly changes in the term spread (ΔYC_t) are instrumented using high-frequency monetary policy surprise measures, as formalised in Specification 2. This strategy enables us to estimate the effect of exogenous, but persistent, monetary policy-driven changes in the yield curve on mortgage pricing and provision, mitigating concerns about endogeneity in yield curve dynamics.

$$\Delta_h Y_{i,b,p,L,t} = \beta_h^{IV} \left(\Delta \text{YC}_t \times \mathbb{1}_i^{5y} \right) + X'_{i,b,p,L,t-1}\phi + u_{i,b,p,L,t} \tag{2}$$

We further allow the effect of monetary policy shocks on mortgage pricing and quantities to vary across different states and across lender characteristics. Specifically, we estimate a state-dependent model, as formalised in Specification 3, which interacts our primary explanatory variable with variables either documenting the prevailing economic environment or lender-level balance sheet heterogeneity. This approach enables us to examine heterogeneity in the transmission of monetary policy to mortgage lending.

$$\begin{aligned} \Delta_h Y_{i,b,p,L,t} = \mathbb{1}_t^{S1} \left[\beta_h^{IV,S1} \left(\Delta \text{YC}_t \times \mathbb{1}_t^{5y} \right) + X'_{i,b,p,L,t-1}\phi^{S1} \right] + \dots \\ \dots + \mathbb{1}_t^{S2} \left[\beta_h^{IV,S2} \left(\Delta \text{YC}_t \times \mathbb{1}_t^{5y} \right) + X'_{i,b,p,L,t-1}\phi^{S2} \right] + u_{i,b,p,L,t} \end{aligned} \tag{3}$$

where the dependent and main control variables are as before and $\mathbb{1}_t^{S1}$ and $\mathbb{1}_t^{S2}$ are dummy variables representing the particular state-dependency or bank balance sheet dimension being captured.[12]

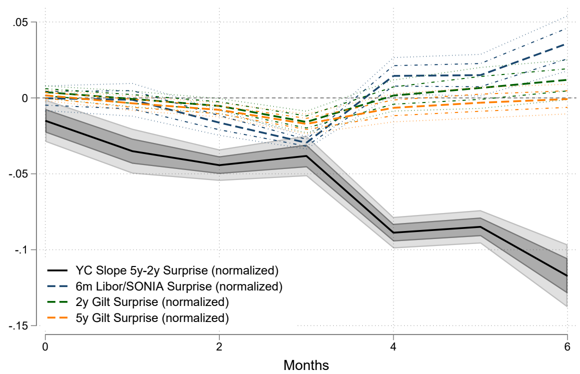
5 Results

Figure 4 (A) presents the results for interest rates from Specification 1. Given the high degree of collinearity among the monetary policy surprise series—for instance, the correlation between high-frequency surprises in the 2-year and 5-year gilt yields is approximately 96%—we estimate separate regressions for each series and plot the resulting coefficients jointly. Two findings emerge.

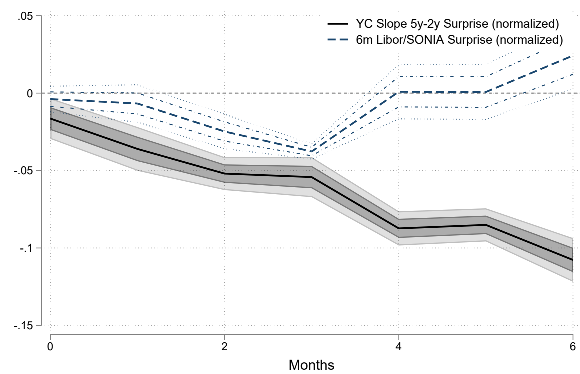
[12]Where feasible, Specification 3 includes fixation-time fixed effects as additional controls.

Figure 4: Effect of monetary policy surprises on mortgage rates

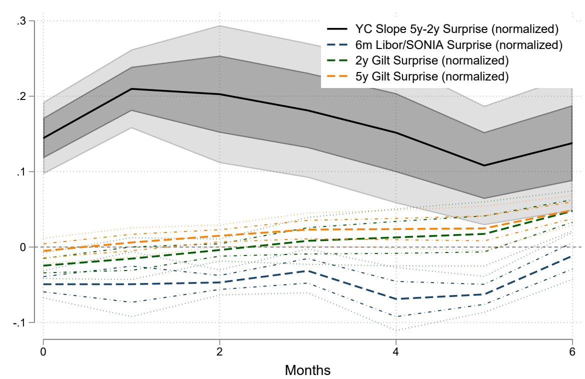
(A) Changes along the yield curve: Interest rates (%)



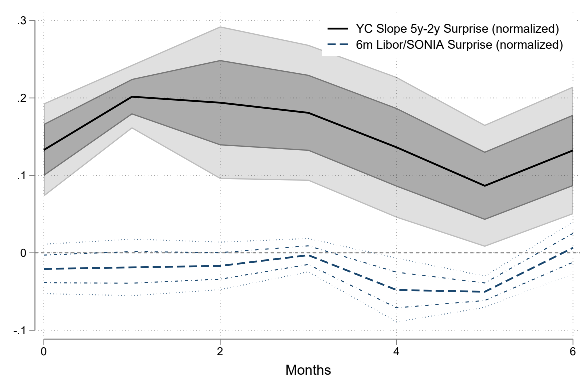
(B) Changes in level and slope: Interest rates (%)



(C) Changes along the yield curve: Total lending (log)



(D) Changes in level and slope: Total lending (log)



This figure shows the cumulative response of interest rates (Panel (A) and Panel (B)) and total lending (Panel (C) and Panel (D)) to high-frequency surprises in the yield curve around monetary policy announcements. In Panel (A) and Panel (C), these changes are: the 6-month Libor/Sonia futures (dark blue), the 2-year gilt yield (green), the 5-year gilt yield (orange), and the spread between the 5- and the 2-year gilt yields (black). These results come from separate regressions for each change. In Panel (B) and Panel (D), we use both the change in the 6-month Libor/Sonia futures (dark blue) and the change in the term spread (black). The changes are all standardised by their standard deviation. These are the results from running Specification 1. The shaded areas around the lines correspond to the 65% and 90% confidence bands.

First, high-frequency surprises in the 6-month, 2-year, and 5-year yields around monetary policy announcements appear to have limited impact on the relative pricing of newly issued longer-fixation mortgages versus shorter-fixation mortgages. This null effect is particularly pronounced for surprises in the 2-year and 5-year gilt yields.

Second, and in contrast, we find that unexpected changes in the term spread between the 2-year and 5-year maturities exert a stronger and more persistent influence. A one standard deviation increase in the term spread around monetary policy announcements leads to a reduction in the relative price of 5-year FRMs by over 10 basis points compared to 2-year FRMs. This result suggests that slope-based monetary policy shocks—those that steepen the yield curve—induce lenders to adjust pricing in favour of longer-fixation products.

One potential concern is that our specification examines the impact of changes in the term spread without explicitly controlling for concurrent changes in the level of the yield curve. As shown in Figure 4 (A), surprises in short-term yields—particularly the 6-month Libor/SONIA—appear to exert the strongest level effects across maturities. To address this, we estimate a specification that includes both the high-frequency surprise in the 6-month yield and the term spread simultaneously. Given their modest correlation (-21%), this allows us to cleanly disentangle level and slope effects.

Figure 4 (B) presents the interest rate results from this joint specification. The findings are qualitatively similar to those obtained when the surprise series are introduced individually. Crucially, the term spread continues to exert a substantially larger effect on the relative pricing of longer-versus shorter-fixation mortgages. A similar pattern emerges for lending quantities (Panel (C) and Panel (D)): changes in the term spread have a more pronounced impact than in the level of yields.

The key takeaway from these results is that changes in the *level* of the yield curve have limited influence on the relative pricing and quantity of mortgages across fixation lengths—potentially reflecting lenders' hedging strategies. This interpretation is consistent with the view that bank deposits serve as natural hedges against interest rate risk (Drechsler, Savov, and Schnabl (2021)). In contrast, changes in the *slope* of the yield curve appear to have much stronger effects.

We next turn to the results from Specification 2, which implements an instrumental variables (IV) approach using the high-frequency surprise in the term spread as an instrument for the month-on-month change in the term spread (measured in percentage points). This specification isolates exogenous variation in the slope of the yield curve induced by monetary policy announcements, allowing us to estimate its causal impact on the relative pricing and provision of longer- versus shorter-fixation mortgages. This is our baseline regression.

Table 2 reports the first-stage results from the IV specification.[13] Column (1) shows that the

[13]For brevity, we report first-stage results for horizon zero of the local projection specification. Results at other

surprise change in the term spread around monetary policy announcements is a highly relevant instrument for longer-term (monthly) changes in the slope of the yield curve. A one-standard deviation increase in the high-frequency surprise raises the month-on-month change in the term spread by approximately 5 basis points.[14]

While the IV first-stage leverages the full dataset, including controls and fixed effects, we note that the high-frequency surprises in the term-spread are also strongly correlated with monthly changes in the slope of the yield curve in a simple time-series sense. Column (2) confirms this, showing that a one-standard deviation increase in the high-frequency surprise is associated with a 6 basis point increase in the month-on-month change in the term spread—very similar to Column (1).

Table 2: Time-Series and First Stage Regressions

	First Stage Regression (h=0) $\Delta 2s5s_t \times \mathbb{1}_i^{5y}$	Time Series Regression $\Delta 2s5s_t$
ΔMP_t	0.0545***	0.0624***
	(0.0015)	(0.0186)
Observations	594792	120
F-stat	1342	11.87
Kleinbergen-Paap P-value (Underidentification test)	0.005	
Cragg-Donald Wald F-stat	48400	

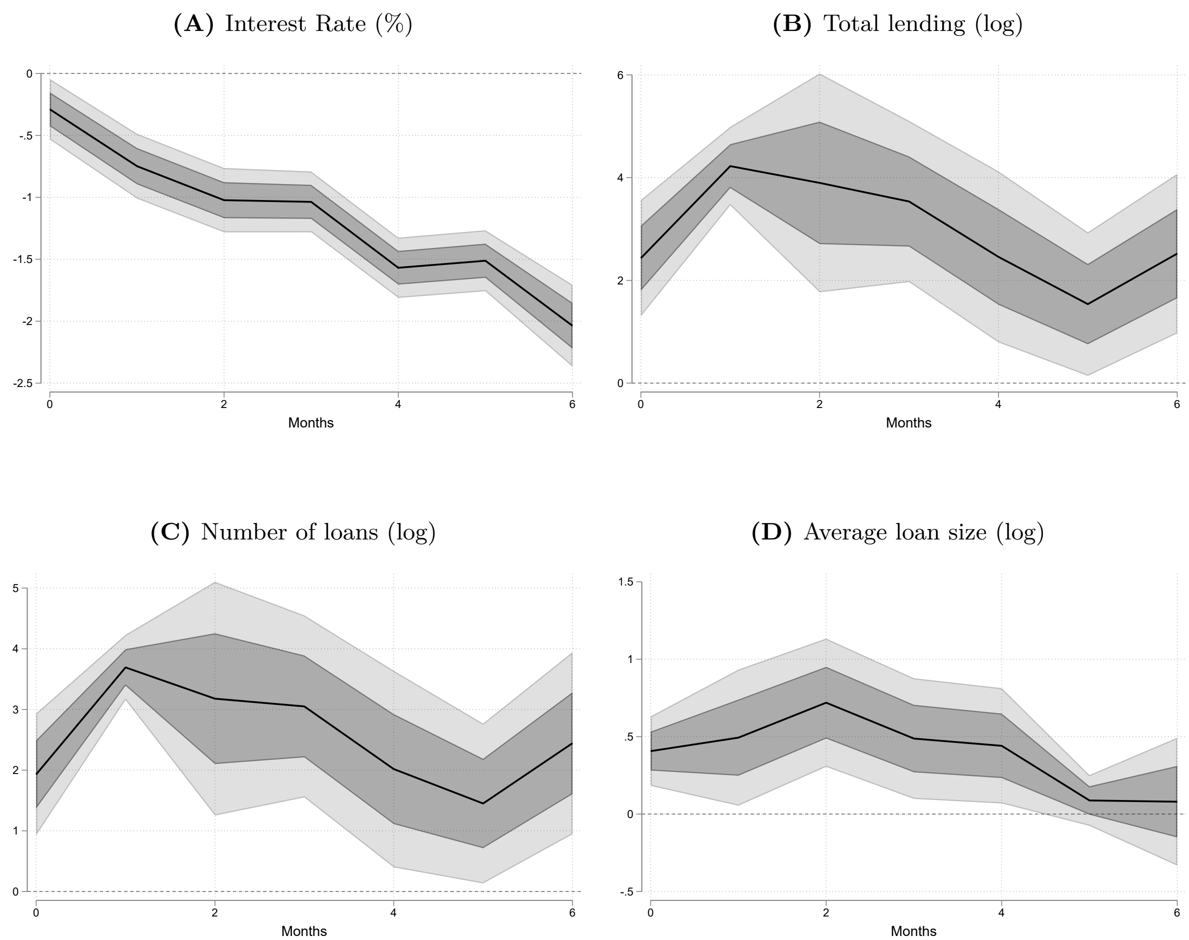
Column (1) shows the results of the first-stage regression at horizon zero, with clustered standard errors provided in brackets. In this column, the coefficient is shown for the monetary policy surprise ΔMP_t interacted with the fixation dummy $\mathbb{1}_i^{5y}$. Column (2) shows the results of the simple time-series regression, with Newey-West standard errors (5 lags) In this column the monetary policy surprise is not interacted with the fixation dummy.

Figure 5 (A) presents the second-stage results using interest rates as the dependent variable. Consistent with the findings in Figure 4, we find that an *increase* in the slope of the yield curve, leads to a *decline* in the relative pricing of longer-fixation mortgages. Specifically, 5-year FRM mortgages become cheaper (in relative terms) compared to 2-year FRM mortgages following a steepening of the yield curve. The magnitude is economically meaningful: the standard deviation of the instrumented term-spread change is just under 0.10, implying that a one-standard deviation increase in the slope of the yield curve over a month reduces the pricing spread between 5-year and 2-year mortgage rates by 20 basis points (looking at the cumulative effect at horizon 6).

horizons are qualitatively similar.

[14]The Kleinbergen-Paap statistic enables us reject the null hypothesis of model under-identification, while the Cragg-Donald Wald F-statistic indicates that the surprise change in the term spread is sufficiently correlated with the endogenous month-on-month change.

Figure 5: Effect of a yield curve slope change (IV) on the mortgage market



This figure shows the cumulative response of interest rates (Panel (A)), total lending (Panel (B)), number of loans (Panel (C)), and average loan size (Panel (D)) to a 1pp month-on-month increase in the term spread (difference between 5-year and 2-year Gilt yields) instrumented by the high-frequency term spread surprise. The black solid lines depict point estimates of the relative effect between the 5-year and 2-year fixed rate mortgages, while the shaded areas around the lines correspond to the 65% and 90% confidence bands. These are the results from running Specification 2.

Figure 5 (B) presents the second-stage results using lending volumes (in total value terms) as the dependent variable. Following a one-standard deviation increase in the slope of the yield curve, the quantity of 5-year FRM lending rises significantly relative to 2-year FRM lending. The peak effect, observed at horizon 1, corresponds to an increase of approximately 40 percent in the relative volume of 5-year FRMs. The cumulative effect at horizon 6 remains substantial, at around 25 percent. While these magnitudes may appear large, it is important to note that the panel units over which these effects are estimated are highly granular.

Breaking the quantity results down into their constituent components, we find consistent results when looking at the number of loans provided rather than the total value of lending (Figure 5 (C)) and when looking at the average loan size provided (Figure 5 (D)). These results, together with the pricing results in (A), point to effects being credit supply driven rather than driven by credit demand effects: i.e. after an increase in the slope of the yield curve, lenders expand the supply of 5-year FRMs—offering lower prices and extending greater quantities—relative to 2-year FRMs.

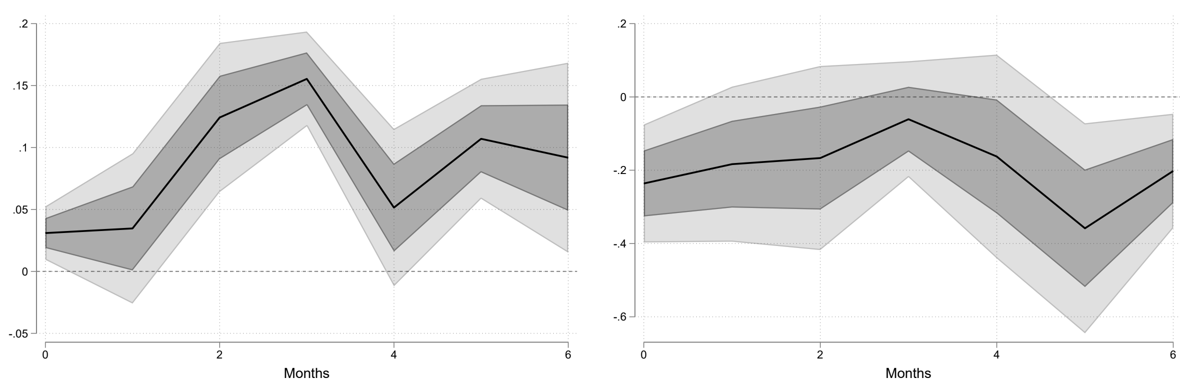
5.1 Overall impact of term spread changes

The main results rely on surprises around monetary policy announcements to instrument monthly changes in the slope of the yield curve. Before turning to robustness checks, we also examine how mortgage pricing and quantities respond to *uninstrumented* changes in the term spread. This comparison allows us to assess whether the effects observed in our baseline IV specification are driven by monetary policy-induced variation or reflect broader yield curve dynamics.

To do so, we re-estimate Specification 1, replacing the instrumented change in the slope of the yield curve with the raw month-on-month change as the explanatory variable. The results are presented in Figure 6.

Figure 6: Effect of a yield curve slope change (endogenous)

(A) Interest Rate (%) **(B)** Total lending (log)



This figure shows the cumulative response of interest rates (Panel (A)) and total lending (Panel (B)) to a 1pp month-on-month increase in the term spread (difference between 5-year and 2-year Gilt yields) without using instrumental variables. The black solid lines depict the relative effect between the 5-year and 2-year fixed rate mortgages, while the shaded areas around the lines correspond to the 65% and 90% confidence bands.

We observe markedly different responses when using raw month-on-month changes in the term spread, relative to our baseline IV specification. In particular, following an increase in the slope of the yield curve, longer-fixation mortgages become *more expensive* and their quantity declines relative to shorter-fixation products. These results are still consistent with a mortgage supply explanation, but in this case imply that lenders *decrease* (rather than increase) the supply of longer-fixation mortgages in response to a steepening of the yield curve.

Importantly, these reduced-form estimates must be interpreted with caution. Monthly changes in the term spread may reflect endogenous market responses to macroeconomic news, fiscal developments, or other external shocks. As such, they conflate monetary policy effects with broader economic dynamics. This underscores the value of our instrumental variable strategy, which isolates exogenous variation in the term spread induced by monetary policy announcements, allowing for a cleaner identification of causal effects on mortgage pricing and provision.

5.2 Robustness

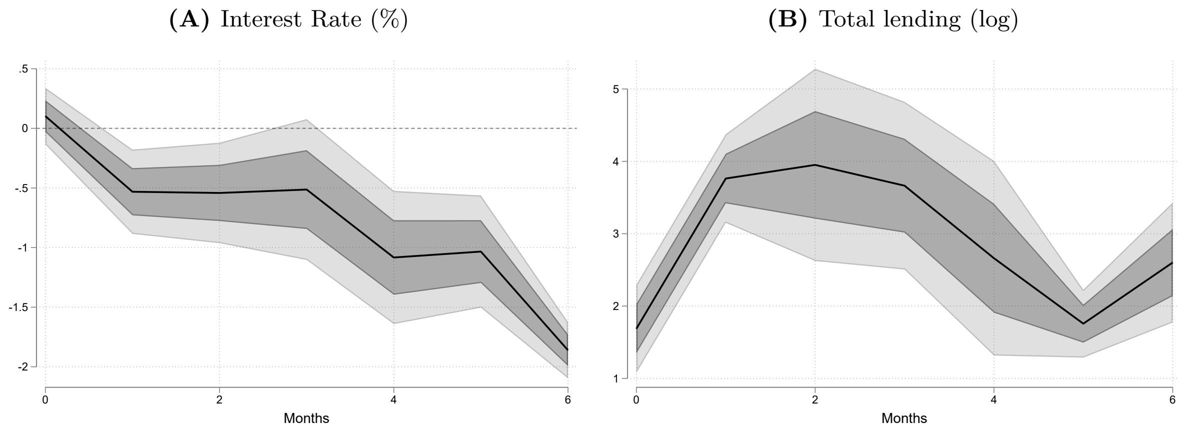
We subject our baseline results to a battery of robustness exercises. In this section we highlight several key checks, while remaining robustness exercises are set out in the Appendix.

Our baseline specification, shown in Figure 5, uses the high-frequency monetary policy surprise in the term spread as an instrument for monthly changes in the slope of the yield curve. A natural question is whether our results are sensitive to the choice of instrument. To address this, we re-estimate Specification 2 using an alternative set of instruments: the three structural monetary policy factors–"Target", "Path", and "QE"—derived from the methodology in Swanson (2021) and adapted to U.K. data by Braun, Miranda-Agrippino, and Saha (2023). These factors capture distinct components of monetary policy shocks across the yield curve and are orthogonal by construction.[15]

[15] As described in Braun, Miranda-Agrippino, and Saha (2023), U.K.-specific monetary policy factors are estimated by applying the Swanson (2021) model to monetary surprises in the first four short sterling futures, and in the 2, 5 and 10-year gilt yields. The estimation proceeds in two steps. First, principal components summarise the common variation in the seven asset prices. Second, identifying restrictions are imposed to pin down the structural factors and facilitate their interpretation. Out of the three estimated factors, only the first one ("Target") is allowed to load on the first short sterling futures. To distinguish between the second ("Path") and third ("QE") factors, the variance of the latter is minimised over the pre-2009 sample.

Figure 7 presents the results using these alternative instruments. The estimates are broadly consistent with our baseline IV specification, reinforcing the conclusion that monetary policy-induced changes in the slope of the yield curve have a significant impact on the relative pricing and provision of longer- versus shorter-fixation mortgages.

Figure 7: Effect of a yield curve slope change (IV 3 factors) on the mortgage market



This figure shows the cumulative response of interest rates (Panel (A)) and total lending (Panel (B)) to a 1pp increase in the term spread (difference between 5-year and 2-year Gilt yields) instrumented by the three high-frequency monetary surprise factors identified in Braun, Miranda-Agrippino, and Saha (2023). The black solid lines depict point estimates of the relative effect between the 5-year and 2-year fixed rate mortgages, while the shaded areas around the lines correspond to the 65% and 90% confidence bands.

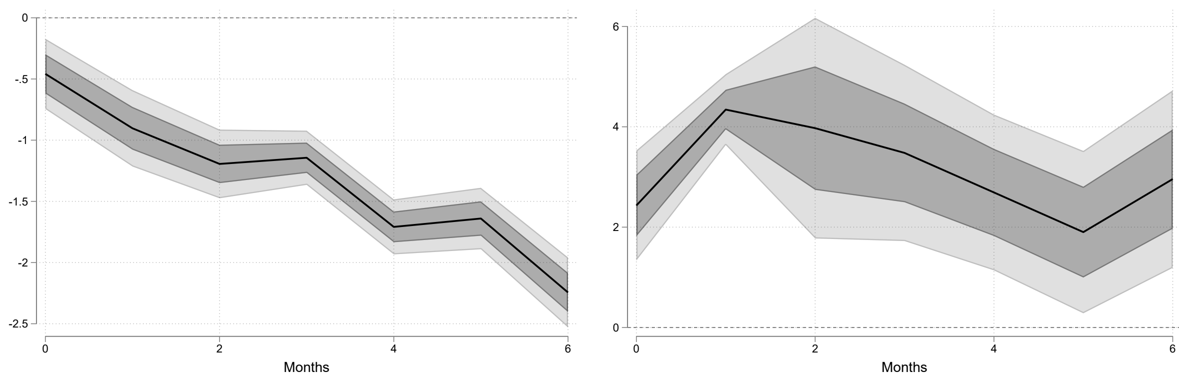
Another important concern is whether the effects we identify are truly attributable to monetary policy, or whether they are instead driven by "information effects" (Nakamura and Steinsson (2018)). As noted by Jarocinski and Karadi (2020), high-frequency asset price movements around monetary policy announcements may reflect the release of new information about the state of the economy rather than a pure response to unexpected policy changes. To address this, we adopt their approach to distinguish between events dominated by monetary policy news and those dominated by "information effects".

Specifically, we compare yield reactions around monetary policy announcements with contemporaneous stock market reactions. When monetary policy effects dominate, we expect gilt yields and equity prices to move in opposite directions. Conversely, when information effects dominate, both asset classes should respond in the same direction. We classify events accordingly and set the surprise series to zero for information-dominated events, retaining only monetary policy-dominated events in the analysis.

Figure 8 presents the results using this filtered sample. The dynamic responses closely mirror those in our baseline specification, confirming that the main effects are driven by monetary policy shocks rather than information effects. In contrast, when we re-estimate the specification using only information-dominated events, the responses—particularly for pricing—are substantially weaker (Appendix Figure A.4).

Figure 8: Effect of a yield curve slope change (IV no information effects)

(A) Interest Rate (%) **(B)** Total lending (log)

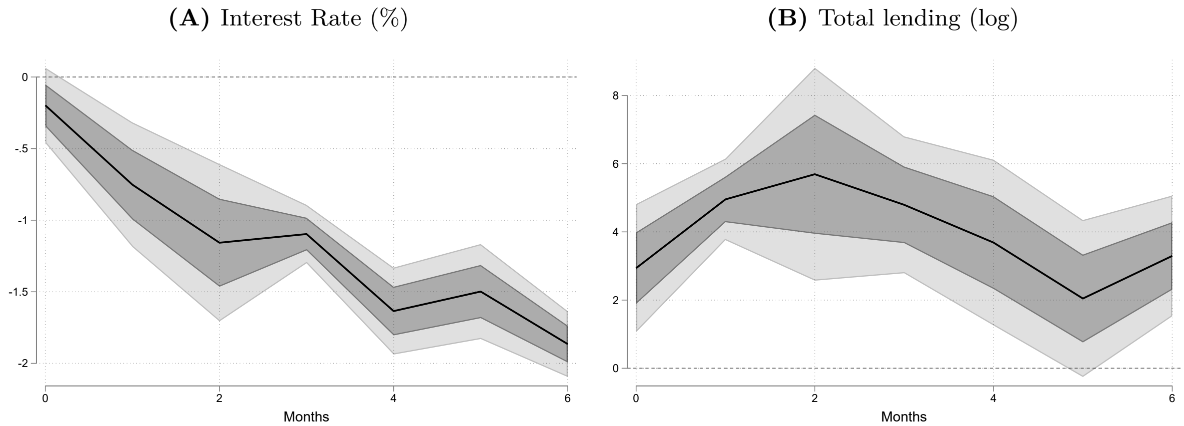


This figure shows the cumulative response of interest rates (Panel (A)) and total lending (Panel (B)) to a 1pp increase in the term spread (difference between 5-year and 2-year Gilt yields) instrumented by the high-frequency term spread surprise, cleaned of information dominated events as per Jarocinski and Karadi (2020). The black solid lines depict point estimates of the relative effect between the 5-year and 2-year fixed rate mortgages, while the shaded areas around the lines correspond to the 65% and 90% confidence bands. These are the results from running Specification 2.

Next, we study the role of fixed effects in shaping our results. The baseline specification includes a comprehensive set of fixed effects—location-time, location-lender, lender-time, LTV-time, LTV-lender, LTV-fixation, lender-fixation, and location-fixation—designed to absorb variation across geography, lender identity, borrower risk and product characteristics. Given the structure of the data (aggregated at the lender-location-LTV-fixation-month level), we further saturate the specification by including lender-location-LTV-month fixed effects.

Figure 9 presents the results from this fully saturated specification. The estimates remain very similar to those in our baseline regression, confirming that our findings are not sensitive to the choice or granularity of fixed effects. This reinforces the interpretation that the observed responses are driven by monetary policy-induced variation in the slope of the yield curve, rather than residual confounding from unobserved heterogeneity across lenders, locations, or borrower risk profiles.

Figure 9: Effect of a yield curve slope change (IV full FEs)



This figure shows the cumulative response of interest rates (Panel (A)) and total lending (Panel (B)) to a 1pp increase in the term spread (difference between 5-year and 2-year Gilt yields) instrumented by the high-frequency term spread surprise. The black solid lines depict point estimates of the relative effect between the 5-year and 2-year fixed rate mortgages, while the shaded areas around the lines correspond to the 65% and 90% confidence bands. These are the results from running Specification 2 with saturated fixed effects.

A remaining question is the extent to which our results depend on the inclusion of different fixed effects. In Figure A.5 and Figure A.6, we systematically relax the fixed effects structure to assess their importance. Panel (A) presents the results when only time (year-month) fixed effects are included. The estimated effect remains quantitatively similar: monetary policy-induced increases in the slope of the yield curve reduce the relative price, and increase the relative quantity, of longer-fixation mortgages compared to shorter-fixation ones. Adding location, lender, and LTV fixed effects (Panel (B)) has a minimal impact on the results. Introducing interactions between each of these dimensions and time—location-time (Panel (C)), lender-time (Panel (D)), and LTV-time (Panel (E))—also leaves the estimates largely unchanged. Even when all of these fixed effects are included simultaneously (Panel (F)), the results remain stable.[16] These findings suggest that the channel we identify is orthogonal to location-specific or LTV-specific responses to monetary

[16]Note that the specification in Panel (F) also differs from the baseline specification, which includes additional fixed effects.

policy shocks.

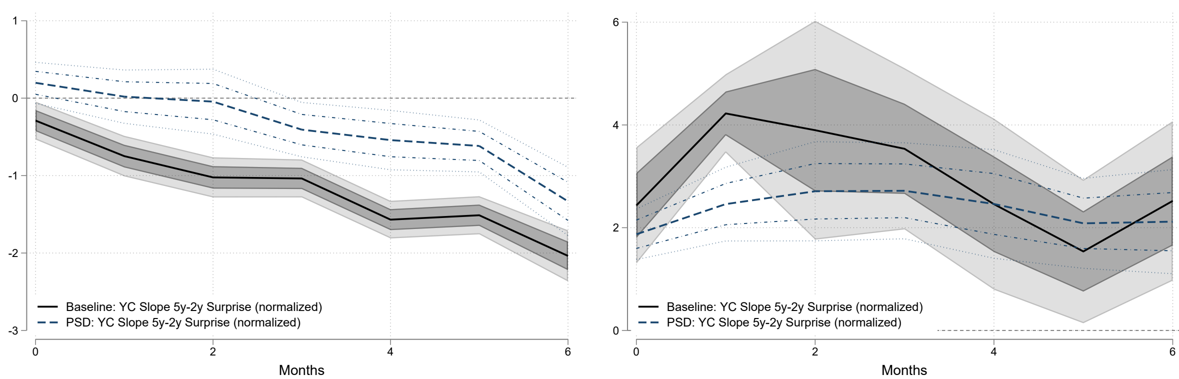
We conduct further robustness tests, reported in Appendix Figure A.7 and Appendix Figure A.8. Our results are robust to including data on remortgages (Panel (A)), including additional lags of the dependent variable and controls (Panel (B)), including a fixation-specific time-trend (Panel (C)), weighting the baseline specification using lenders' total assets (Panel (D)), extending our data sample back to 2011 where information on fixation length is more sparse (Panel (E)), and comparing 2-year FRMs with 10-year FRMs (Panel (F)).

5.3 Comparison with unmatched PSD001 transactions

As discussed in Section 3.5, our baseline analysis relies on matching mortgage transactions from PSD001 with product-level data from MoneyFacts to better align the timing of mortgage offers with monetary policy announcements. Figure 10 compares the dynamic response of mortgage pricing and quantities using the unmatched PSD001 dataset to our baseline specification.[17]

Figure 10: Effect of a yield curve slope change—Comparison of different samples

(A) Interest rate (%) **(B)** Total lending (log)



This figure shows the cumulative response of interest rates (Panel (A)) and total lending (Panel (B)) to a 1pp increase in the term spread (difference between 5-year and 2-year Gilt yields) instrumented by the high-frequency term spread surprise. The black solid lines depict the baseline point estimates of the relative effect between the 5-year and 2-year fixed rate mortgages, while the blue lines show the results using the raw data without our matching procedure (described in Section 3.5). The shaded areas around the lines correspond to the 65% and 90% confidence bands. These are the results from running Specification 2.

Relative to the baseline, the unmatched sample shows a delayed response: interest rates initially

[17] While the econometric specification is similar across both specifications, LTV-band fixed effects in the baseline specification are constructed using LTV eligibility thresholds from MoneyFacts, whereas in the unmatched PSD001 sample they are based on actual transaction LTVs.

rise following an increase in the slope of the yield curve, and only turn negative after horizon 2—becoming statistically significant by horizon 6. Interestingly, the dynamic response in the unmatched mortgage register from months 4 to 6 closely resembles the response in the matched sample between months 1 and 3. This pattern is consistent with an average delay of approximately three months between mortgage offer and execution.

We interpret this result as validation of our matching procedure. By correcting for the timing mismatch between mortgage origination and monetary policy announcements, the matched dataset enables more accurate identification of lenders' responses. This alignment is crucial for understanding the transmission of monetary policy through the mortgage market.

5.4 State-dependent models

This section investigates heterogeneity by augmenting our baseline specification to incorporate a state-dependent framework as formalised in Specification 3.

Bank heterogeneity

We hypothesise that lenders' responses to changes in the slope of the yield curve are mediated by the interest rate risk embedded in their existing mortgage portfolios. While banks employ strategies to hedge against general interest rate fluctuations, shifts in the slope of the yield curve crystallise duration risk in a manner that may prompt a re-optimisation of portfolio composition.

Figure 11 present results conditional on two lender sub-groups, segmented by whether their portfolios contain an above- or below- median share of adjustable-rate mortgages. The black line denotes lenders with a high ARM share (low FRM share), while the blue dashed line represents lenders with a low ARM share (high FRM share). The dynamic response is markedly stronger for lenders with higher FRM exposure. In contrast, pricing responses from lenders with predominantly ARMs are statistically insignificant across most horizons and initially positive.

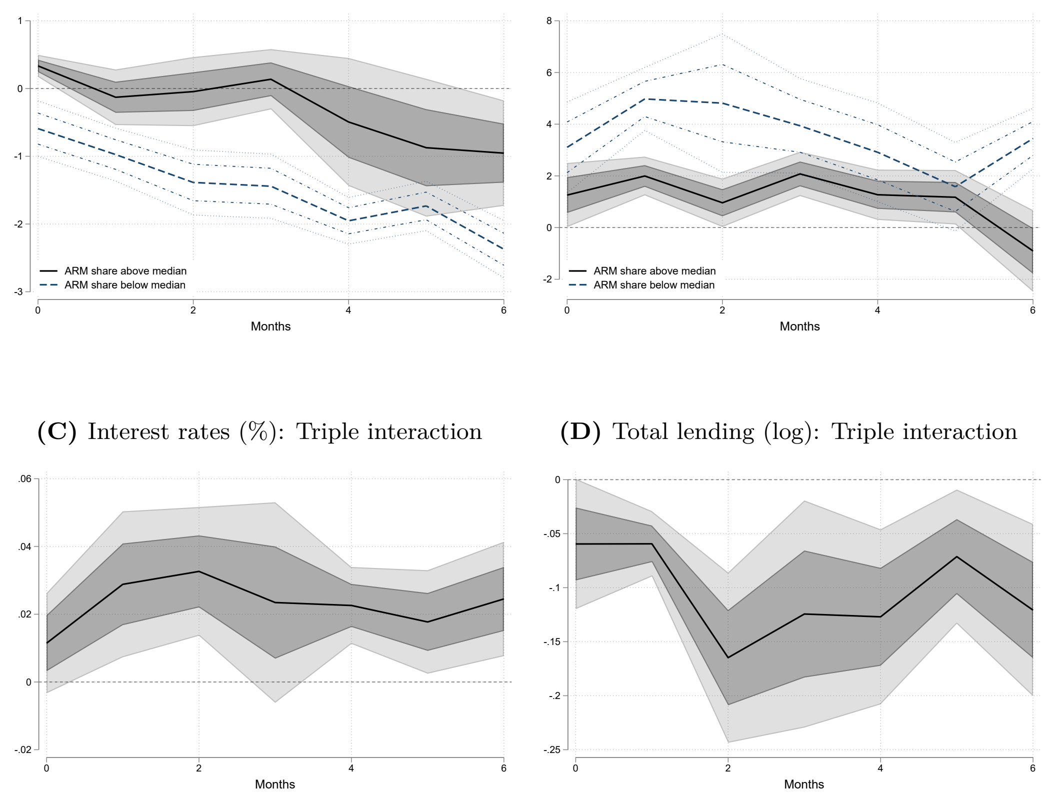
These findings are corroborated by a more stringent triple-interaction specification (Figure 11 Panel (C) and Panel (D)). In this specification, the ARM share enters as a continuous variable and is interacted with all variables as per Specification 3. This specification additionally incorporates fixation-time fixed effects, enhancing identification.

Taken together, the evidence suggests that lenders with greater FRM exposure are the principal contributors to our baseline results. Following an increase in the yield curve slope, these lenders disproportionately expand the supply of 5-year FRMs relative to 2-year FRMs. This behaviour is consistent with these lenders experiencing a larger crystallisation of duration risk within their mortgage portfolios in response to increases in the term spread. Consequently, these lenders undertake a more substantial rebalancing—rebuilding their interest rate risk exposure when unexpected steepening of the yield curve materialises.

Figure 11: Effect of a yield curve slope change—Lender heterogeneity on % of ARM

(A) Interest rates (%) **(B)** Total lending (log)

(C) Interest rates (%): Triple interaction **(D)** Total lending (log): Triple interaction



This figure shows the cumulative response of interest rates (Panel (A) and (C)) and total lending (Panel (B) and (D)) to a 1pp increase in the term spread (difference between 5-year and 2-year Gilt yields) instrumented by the high-frequency term spread surprise. The black solid lines depict point estimates of the relative effect between the 5-year and 2-year fixed rate mortgages, while the shaded areas around the lines correspond to the 65% and 90% confidence bands. The results in Panel (A) and (B) are from running Specification 3, while the results in Panel (C) and (D) are from using a triple-interaction specification incorporating a continuous version of the lender heterogeneity variable as well as fixation-time fixed effects.

We examine other dimensions of bank heterogeneity in Appendix Figures A.9 and A.10. Panel (A) shows that the responses of commercial banks and building societies are broadly similar. Panel (B) indicates that lenders with relatively high deposit funding behave comparably to those with lower deposit reliance. In Panel (C), we observe that lenders with higher capital ratios exhibit somewhat stronger responses, although the confidence intervals overlap substantially with those of lower-capital lenders. Finally, Panel (D) reveals that banks with greater reserve holdings respond more strongly in terms of pricing, but their quantity responses are comparatively muted.

Taken together, these suggest that the key source of heterogeneity lies in the interest rate risk embedded in lenders' mortgage portfolios, as illustrated in Figure 11. This dimension appears to be the primary driver of the differential supply responses to changes in the yield curve slope.

We also explore borrower-side heterogeneity—specifically, high LTV borrowers, high LTI borrowers and first-time buyers. The dynamic response across these groups are largely similar, consistent with the interpretation that our results reflect supply-side adjustments rather than demand-side shifts. The results can be found in Appendix Figure A.11.

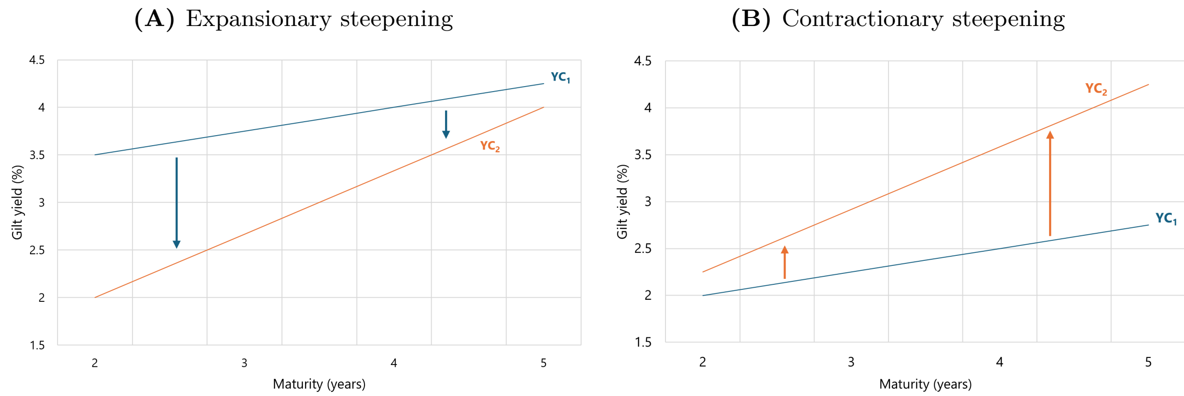
Monetary policy stance

We next extend Specification 3 to allow for the effect of yield curve slope changes to vary with the prevailing stance of monetary policy. Specifically, we examine whether the mortgage supply response differs depending on whether monetary policy surprises are expansionary in nature—defined as an unexpected decline in short-term interest rates (proxied by the 6-month yield surprise)—or contractionary—defined as an unexpected increase in short-term interest rates.[18]

Stylised illustrations of these scenarios are presented in Figure 12. Importantly, in all cases our coefficient of interest continues to capture the effect of an increase in the term spread on mortgage pricing and provision.

[18] We find near-identical results when we define expansions (contractions) using simultaneous decreases (increases) in 2-year and 5-year yields. There are only five months within our sample when the 2-year and 5-year high-frequency surprises move in opposite directions around monetary policy announcements. In these cases, we assign the stance based on the yield with the largest absolute surprise.

Figure 12: Expansionary and contractionary yield curve steepening illustrations



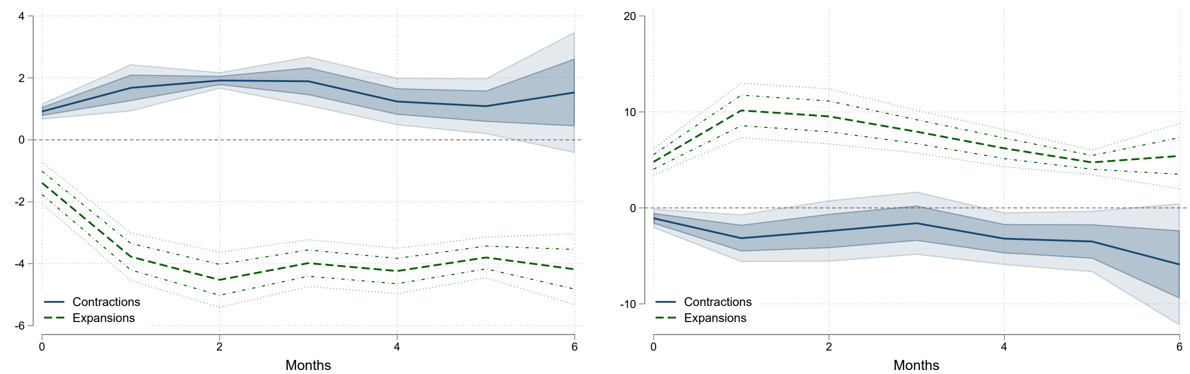
This figure provides stylised examples of instances where an increase in the slope of the yield curve occurs during an expansionary monetary policy episode (Panel (A)) or contractionary monetary policy episode (Panel (B)).

To implement this, we augment the baseline model to incorporate state-dependency, as outlined in Specification 3. The results are presented in Figure 13, where blue lines correspond to the contractionary monetary policy surprises and green lines to expansionary ones. A stark contrast emerges between the two regimes: the primary effect is concentrated in periods of expansionary surprises, both for interest rates (Panel (A)) and total lending (Panel (B)). By contrast, the response under contractionary surprises resembles the endogenous reaction documented in Figure 6.

These findings underscore a meaningful state-dependency in lenders' responses to changes in the slope of the yield curve. Specifically, the supply-side reaction is amplified when monetary policy surprises are expansionary, suggesting that lenders are more responsive to term spread movements when yields fall unexpectedly. Conversely, this effect reverses under contractionary surprises, with lenders exhibiting more muted responses when yields rise.

Figure 13: Effect of a yield curve slope change—Expansion vs. Contraction

(A) Interest rate (%) **(B)** Total lending (log)



This figure shows the cumulative response of interest rates (Panel (A)) and total lending (Panel (B)) to a 1pp increase in the term spread (difference between 5-year and 2-year Gilt yields) instrumented by the high-frequency term spread surprise. The blue solid lines depict the point estimates of the relative effect between the 5-year and 2-year fixed rate mortgages when the monetary policy stance is contractionary and the green dashed lines depict the point estimates when the monetary policy stance is expansionary. The shaded areas around the lines correspond to the 65% and 90% confidence bands. These are the results from running Specification 3.

We further examine whether the effect of changes in the term spread varies depending on the direction of the change—specifically, whether the spread is increasing ("steepening") or decreasing ("flattening"). Results are presented in Appendix Figure A.12, Panels (A) and (B). While the effects appear stronger in steepening episodes, the contrast is less pronounced than in the expansionary versus contractionary monetary policy case.

Finally, we assess whether the response differs depending on whether monetary policy is constrained by the effective lower bound. We define the effective lower bound as periods in which Bank Rate is at, or below, 0.5%. Results are shown in Appendix Figure A.12, Panels (C) and (D). The estimated effects exhibit substantial overlap across regimes, suggesting that the observed responses are not confined to periods of low interest rates, but also manifest when rates are higher.

Taken together, these findings reinforce the asymmetric nature of lenders' responses to monetary policy surprises, conditional on the broader stance of monetary policy.

5.5 Other exogenous changes to the term spread

Our baseline results suggest that changes in the slope of the yield curve—primarily those induced by U.K. monetary policy—affect the relative supply of mortgages with different fixation lengths. This raises a natural question: are these effects specific to domestic monetary policy, or do they generalise to other exogenous shifts in the term spread?

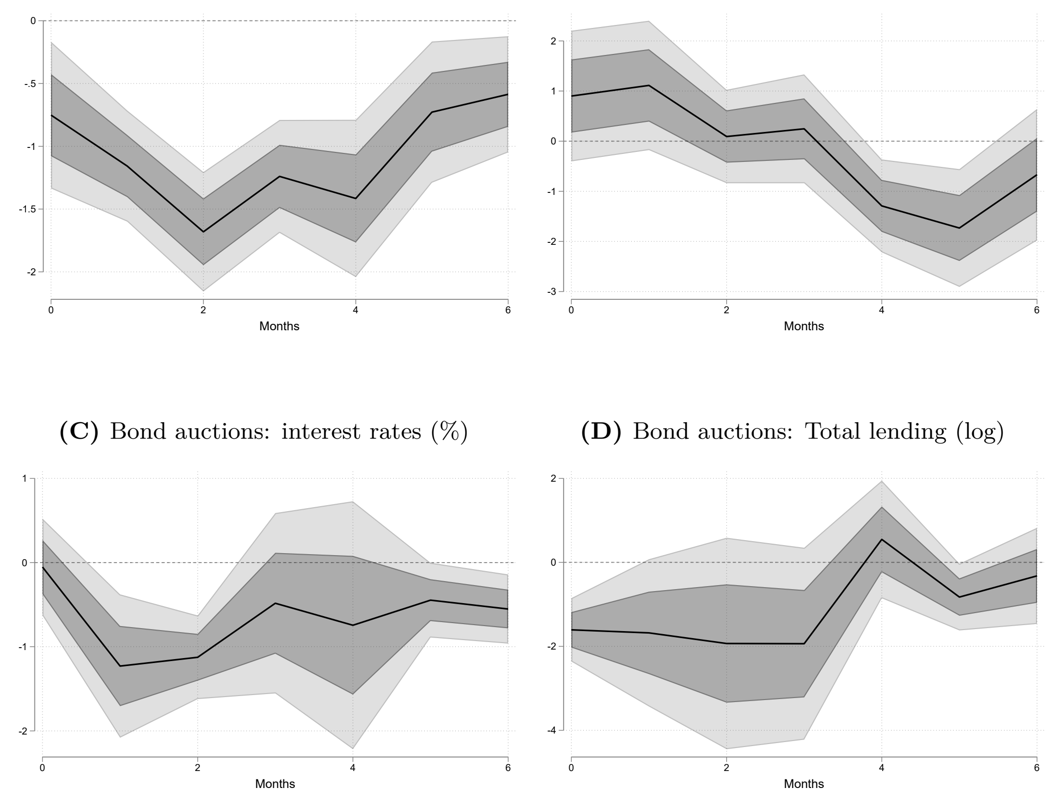
Figure 14: Other exogenous changes to the yield curve slope

(A) US MP: interest rates (%)

(B) US MP: Total lending (log)

(C) Bond auctions: interest rates (%)

(D) Bond auctions: Total lending (log)



This figure shows the cumulative response of interest rates (Panel (A) and (C)) and total lending (Panel (B) and (D)) to a 1pp increase in the term spread (difference between 5-year and 2-year Gilt yields) instrumented by alternative instruments. The black solid lines depict point estimates of the relative effect between the 5-year and 2-year fixed rate mortgages, while the shaded areas around the lines correspond to the 65% and 90% confidence bands. The results in Panel (A) and (B) are from running Specification 2 using the U.S. monetary policy term spread surprise from Swanson (2021), while the results in Panel (C) and (D) are from using the term spread surprise around U.K. government debt auction announcements from Joyce and Lengyel (2024).

To investigate this, we retain the identification strategy from Specification 2, but instrument changes in the U.K. gilt term spread using shocks not directly tied to U.K. monetary policy. First, we employ high-frequency surprises in U.S. yields around Federal Reserve announcements. Second, we use high-frequency surprises around U.K. government bond auction announcements, as documented in Joyce and Lengyel (2024).

Figure 14 presents the results. The top panels report estimates using U.S. monetary policy surprises as instruments, while the bottom panels use U.K. bond auction surprises. Two findings emerge. First, the pricing effects are consistently negative, in line with our baseline specification. Second, the quantity effects are less stable, with the coefficients exhibiting sign reversals across specifications.

Taken together, these results suggest that exogenous changes in the term spread—regardless of their origin—can influence mortgage pricing in a manner consistent with our main findings. While the quantity responses are more ambiguous, the robustness of the pricing effects reinforces the interpretation that term spread movements, even when externally driven, shape lenders' pricing decisions across mortgage products.

5.6 Implications for monetary policy tools

Thus far, we have shown that monetary policy-induced changes in the term spread lead to adjustments in the fixation structure of mortgage supply. But what does this imply for the broader set of tools available to monetary policy makers? Since the 2008 Global Financial Crisis, central banks have expanded their policy toolkit beyond conventional instruments targeting short-term interest rates, deploying measures such as large-scale asset purchases (Quantitative Easing) and forward guidance to support economic activity and meet inflation targets (Bernanke (2020)).

These unconventional tools have primarily been used to ease financial conditions and the monetary policy stance when short-term policy rates approach the effective lower bound. Crucially, commentators have noted that such tools operate on different segments of the yield curve than conventional rate policy. For instance, contractionary short-term policy rate hikes may flatten the yield curve (Lane (2019)) whereas contractionary asset purchase policy actions may steepen it (Mann (2025)). This divergence implies that the slope of the yield curve—and hence mortgage market dynamics—may respond differently depending on the policy instrument employed.

Our robustness analysis using the three structural monetary policy factors derived from high-frequency surprises provides empirical support for this view. The structural factors summarise variation in monetary policy surprises across the short, medium, and long ends of the yield curve. The "Target" factor is intended to capture the immediate policy rate decision, while the "Path" factor is intended to reflect expectations about the future policy trajectory, incorporating both implicit and explicit forward guidance. The "QE" factor, developed by Swanson (2021), loads most heavily on long-maturity yields and is intended to capture the effects of asset purchase policy announcements. Figure 7 presents the results, and the first-stage estimates are documented in Column 1 of Table 3.

Table 3: First Stage Regressions (3 Monetary Policy Factors as Instruments)

	First Stage Regression (h=0) $\Delta 2s5s_t \times \mathbb{1}_i^{5y}$	Time Series Regression $\Delta 2s5s_t$
Target_t	-0.0529***	-0.0406***
	(0.0134)	(0.0086)
Path_t	-0.0100**	0.0049
	(0.0050)	(0.0094)
QE_t	0.0091***	0.0114*
	(0.0019)	(0.0068)
Observations	594792	120
F-stat	349	11.25
Kleinbergen-Paap P-value (Underidentification test)	0.042	
Cragg-Donald Wald F-stat	12869	

Column (1) shows the results of the first-stage regression at horizon zero, with clustered standard errors provided in brackets. In this column, coefficients are shown for each of the monetary policy structural factors interacted with the fixation dummy $\mathbb{1}_i^{5y}$. Column (2) shows the results of the simple time-series regression, with Newey-West standard errors (5 lags). In this column the monetary policy structural factors are not interacted with the fixation dummy.

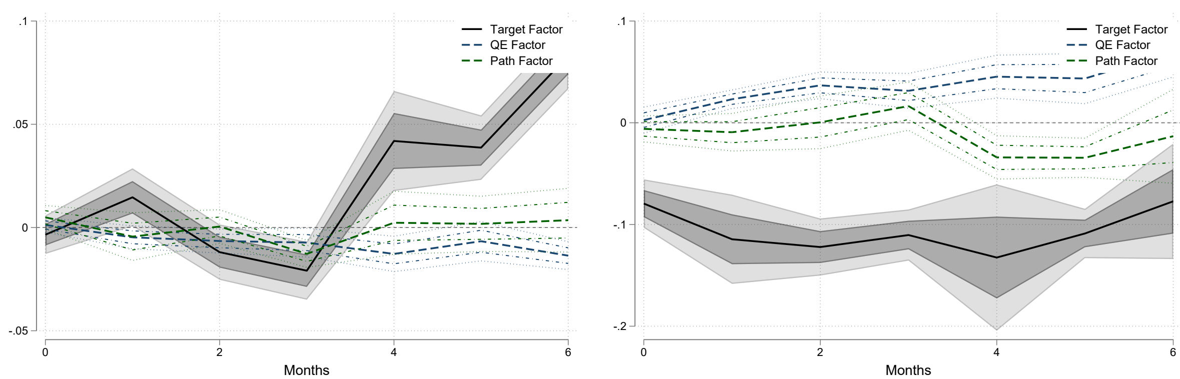
We find that contractionary surprises to the "Target" factor tend to reduce the slope of the yield curve (flattening), while contractionary surprises to the "QE" factor tend to increase the slope (steepening). This pattern is confirmed in a simple time-series regression (Column 2), which yields coefficients of similar sign and magnitude for these two factors, albeit with a lower level of statistical significance for the "QE" factor. By contrast, the "Path" factor is less precisely estimated in the first-stage regression and is entirely insignificant in the time-series specification, with the coefficient switching sign.[19]

[19] Importantly, these results are not mechanically implied by the construction of the structural factors, despite their emphasis on different maturity segments of the yield curve. It is not known ex-ante whether these high-frequency identified factors would generate persistent month-on-month effects on the slope of the yield curve, nor whether such effects would manifest specifically between the 2-year and 5-year maturity points relevant for our mortgage market analysis.

Building on our baseline results, we hypothesise that different monetary policy tools exert materially distinct—yet *directionally divergent*—effects on the fixation structure of the mortgage market. To test this, we estimate a version of Specification 1 in which the raw high-frequency monetary policy surprise variables (as used in Figure 4) are replaced with the three structural monetary policy factors.

Figure 15: Effect of monetary policy factors on the mortgage market

(A) Interest rate (%) **(B)** Total lending (log)



This figure shows the cumulative response of interest rates (Panel (A)) and total lending (Panel (B)) to the three high-frequency monetary policy factors identified in Braun, Miranda-Agrippino, and Saha (2023). The factors are all standardised by their standard deviation. These are results from running a model similar to Specification 1 that includes the three factors simultaneously, with the black solid line showing the responses to the "Target" factor, the blue dashed line the responses to the "QE" factor, and the green dashed lines the responses to the "Path" factor. The shaded areas around the lines correspond to the 65% and 90% confidence bands.

Our results in Figure 15 reveal distinct effects of the three monetary policy factors on the pricing and provision of 2-year FRMs relative to 5-year FRMs. A contractionary surprise to the "Target" factor leads to a statistically significant increase in the pricing of 5-year FRMs relative to 2-year FRMs. In contrast, a contractionary surprise to the "QE" factor generates a persistent decline in the relative pricing of 5-year FRMs. Lending quantities exhibit the opposite pattern, consistent with supply-side adjustments: contractionary "Target" shocks reduce lending volumes for longer-fixation products, while contractionary "QE" shocks increase them. The "Path" factor, by comparison, has negligible effects on both pricing and quantities.

These findings are directionally consistent with our baseline IV specification (Figure 5). Specifically, contractionary "Target" shocks flatten the yield curve, thereby increasing the relative pricing of longer-fixation mortgages, while contractionary "QE" shocks steepen the curve and produce the opposite effect.

Taken together, these results suggest that the choice of monetary policy instrument has material and differentiated implications for structural adjustment in mortgage lending. Policymakers selecting between multiple tools to generate a desired adjustment to the monetary stance should therefore remain cognisant of the consequences for the strength and composition of future monetary transmission via the mortgage market.

5.6.1 Differences between the QE and QT periods

We next examine whether differences in the implementation of asset purchases (Quantitative Easing - QE) and asset sales (Quantitative Tightening - QT) have resulted in asymmetric transmission of this policy tool to mortgage lending. As shown in Appendix Figure A.13, the Bank of England initiated gilt purchases for monetary policy purposes via its Asset Purchase Facility in April 2009, with subsequent rounds over the following decade—approximately half of which occurred during the Covid-19 crisis. The unwinding of these purchases began in February 2022, initially through the cessation of reinvestments of maturing securities ("passive unwind"), followed by active gilt sales commencing in November 2022.

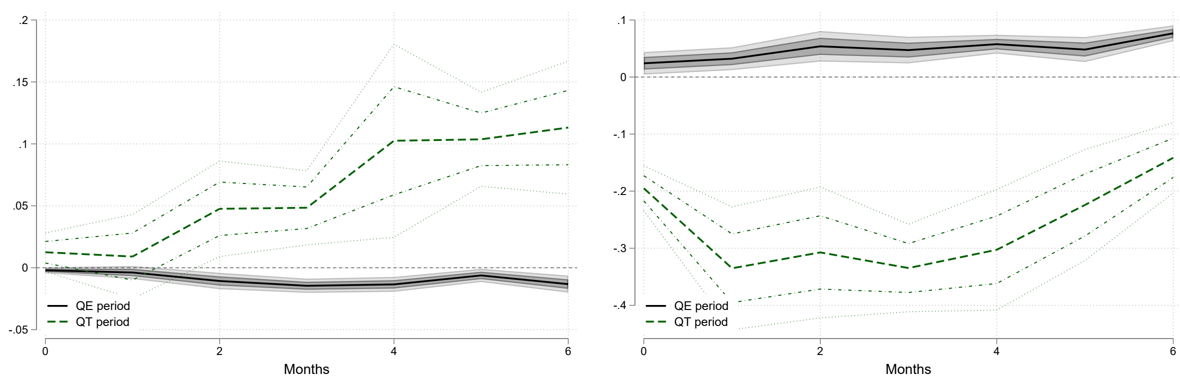
There are several reasons to suspect asymmetries in bank lending effects between the QE and QT episodes. For example, recent research has suggested that QT may be exerting stronger effects on bank lending than QE. Acharya et al. (2023) argue that the banking sector has become more reliant on central bank liquidity since the Global Financial Crisis, while Kumhof and Salgado-Moreno (2024) has also highlighted the potential for QT to constrain lending through liquidity drainage mechanisms. While these studies focus on implications for the aggregate quantity of bank credit, our contribution is instead to examine whether such asymmetries manifest in the *composition* of bank lending, with implications for future monetary policy transmission.

To test for potential asymmetries between the QE and QT episodes, we estimate a version of Specification 1, as in Figure 15, focusing on the "QE" factor. We augment the specification by interacting all variables with a dummy variable equal to one for observations occurring on or after

February 2022 (i.e. the QT period). The results are presented in Figure 16.

Figure 16: Effect of the "QE" factor over the QE and QT periods

(A) Interest rate (%) **(B)** Total lending (log)



This figure shows the cumulative response of interest rates (Panel (A)) and total lending (Panel (B)) to the high-frequency "QE" monetary policy factor across QE and QT periods. The factor is standardised by its standard deviation. These are results from running a model including a state-dependency indicator as per Specification 3. The black solid line depicts the responses to the "QE" factor during the QE period (pre-February 2022), while the green dashed lines present the results during the QT period (post-February 2022). All specifications include loan and borrower controls. The lines depict point estimates of the relative effect between the 5-year and 2-year fixed rate mortgages, while the shaded areas around the lines correspond to the 65% and 90% confidence bands.

During the QE period (i.e. prior February 2022), contractionary surprises to the "QE" factor yield pricing and lending responses consistent with those documented in Figure 15. However, during the QT period these effects reverse in both pricing and quantities and become materially stronger.[20]

We therefore conclude that QE and QT exert materially distinct and directionally opposing effects on the pricing and provision of mortgages across fixation lengths. These findings underscore the importance of recognising asymmetries in the transmission of asset-based monetary policy tools, particularly as central banks transition from accommodative to tightening regimes.

6 Conclusions

This paper examines how monetary policy affects the supply of mortgages with varying initial fixed-rate periods—specifically, mortgages with different fixation lengths—in the United Kingdom during the post-global financial crisis period.

[20] A similar pattern of asymmetry is not observed for the "Target" factor (Appendix Figure A.14) suggesting that these results are not merely driven by differences in the time periods during which QE and QT were implemented.

Using a high-frequency identified instrumental variables approach, we show that monetary policy-induced changes in the *slope* of the yield curve, rather than its *level*, significantly influence the relative supply of mortgages across fixation lengths. A monetary policy-induced steepening of the yield curve lowers the relative price and increases the relative quantity of 5-year FRMs compared to 2-year FRMs. This result is robust to inclusion of granular fixed effects, alternative instruments, and the removal of "information effects". These findings suggest that lenders expand the supply of longer-fixation mortgages in response to a steeper yield curve induced by monetary policy.

The response is concentrated among lenders with a higher share of fixed-rate mortgages in their existing portfolios. This heterogeneity is consistent with a duration risk management motive: following a monetary policy shock that increases the term spread, lenders with greater exposure to fixed-rate products experience greater crystallisation of duration risk and respond by rebalancing their portfolios—issuing longer-fixation mortgages to rebuild interest rate risk exposure.

While the aggregate share of longer-fixation mortgages has increased over the sample period, the term spread has generally declined. Our findings, therefore imply that lender balance sheet frictions have partially offset this structural trend, limiting the extent of observed adjustment in mortgage market composition.

We also document important asymmetries in the transmission mechanism. The effect of yield curve slope changes are concentrated in expansionary monetary policy episodes and reverse during contractionary shocks. Disaggregating by monetary policy instruments—proxied by the structural factors defined by Swanson (2021)—we find that the "Target" and "QE" factors exert the strongest influence, albeit in directionally distinct ways. Notably, the impact of the "QE" factor differs depending on whether the economy is in a quantitative easing (QE) or quantitative tightening (QT) regime.

Taken together, these results show that the composition of mortgage contracts—the share of loans with short- versus long- fixation periods—is an important but often overlooked margin of monetary policy transmission. By influencing how lenders manage their exposure to interest-rate risk, monetary policy shapes the composition of mortgage supply and affects household exposure to interest rate risk. Policies that compress long-term yields relative to short-term yields—such as QE—tilt mortgage supply towards shorter fixation lengths, thereby increasing the sensitivity of household consumption to future interest rate fluctuations. These dynamics may help to explain why the strength and persistence of monetary transmission is state-contingent and can vary across the policy cycle.

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APPENDIX

The following tables and figures comprise the Appendix for the paper '*Monetary policy and mortgage fixation lengths*'.

Table A.1: Data cleaning and matching process

Criterion	*Dropped observations*	*Percentage dropped*	*Remaining observations*
Initial data			**7,792,240**
Exclude LTI <0.1 or LTI >15	34,516	0.4%	7,757,724
Exclude LTV <1 or LTV >150	625	0.0%	7,757,099
Exclude interest rate <0.1	589,150	7.6%	7,167,949
Exclude if missing mortgage type (FRM / ARM)	23,234	0.3%	7,144,715
Exclude if missing employment status or retired	133,694	1.7%	7,011,021
Exclude if missing income verification information	907,781	11.6%	6,103,240
Exclude if missing debt consolidation information	105,340	1.4%	5,997,900
Exclude if borrower has impaired credit history	23,276	0.3%	5,974,624
Exclude buy-to-let mortgages	917	0.0%	5,973,707
Exclude bridging loan mortgages	32,761	0.4%	5,940,946
Exclude business loan mortgages	34	0.0%	5,940,912
Exclude if missing repayment type information	104,683	1.3%	5,836,229
Exclude if missing location information	182,258	2.3%	5,653,971
Exclude data before 2015	956,455	12.3%	4,697,516
Cleaned data			**4,697,516**
Exclude unmatched PSD transactions	1,452,241	30.9%	3,245,275
Matched data			**3,245,275**
Aggregate across transactions into repeated panel units	1,872,550	57.7%	1,372,725
Final panel dataset			**1,372,725**
Memo: of which 2Y or 5Y fixation			*1,150,353*

Note: This table sets out the number of observations remaining in the dataset after each step of the cleaning and dataset matching process. The final number of observations at the aggregated panel data level is the set we use in our regression specifications.

Table A.2: Summary statistics of matched panel dataset

	Observations	Mean	SD	p25	p75
Interest Rate (%)	1372725	2.71	1.12	1.89	3.28
Number of loans	1372725	2.36	3.21	1.00	2.00
Total value of loans (£)	1372725	478125	74730	147900	508199
Average loan value (£)	1372725	203404	151664	118000	249750
Lender fees (£)	1372329	720.08	3441	131.00	1029
Mortgage term (months)	1372687	319.55	80.10	276.00	372.00
LTV ratio	1372725	71.65	19.28	60.00	86.64
LTI ratio	1372725	3.33	0.91	2.78	4.00
First-time buyers (%)	1372725	0.47	0.44	0.00	1.00
Verified income (%)	1372725	1.00	0.01	1.00	1.00
Self-employed (%)	1372725	0.11	0.27	0.00	0.00
Interest only (%)	1372725	0.01	0.11	0.00	0.00
Borrower age (years)	1372725	36.33	8.37	30.00	41.00
Gross income (£)	1372725	65084	86877	38750	73565
Property value (£)	1372725	300808	245290	168500	362475

Note: This table shows summary statistics of variables from the final matched panel dataset. For indicator variables (i.e. first-time buyers, verified income, self-employed and interest-only), the values in the matched panel dataset measure the proportion of underlying loan-level observations within each panel unit for which the indicator flag is equal to 1, where the value 1 is aligned with the naming convention of these variables.

Table A.3: Summary statistics of matched panel dataset - 2 year FRMs

	Observations	Mean	SD	p25	p75
Interest Rate (%)	569180	2.63	1.20	1.75	3.29
Number of loans	569180	2.60	3.74	1.00	3.00
Total value of loans (£)	569180	523053	836174	154800	557995
Average loan value (£)	569180	203449	138477	120000	250000
Lender fees (£)	568890	699.16	4348	76.00	1025
Mortgage term (months)	569180	327.12	76.89	290.50	380.00
LTV ratio	569180	74.20	18.52	65.27	89.34
LTI ratio	569180	3.37	0.89	2.85	4.00
First-time buyers (%)	569180	0.48	0.44	0.00	1.00
Verified income (%)	569180	1.00	0.01	1.00	1.00
Self-employed (%)	569180	0.12	0.28	0.00	0.00
Interest only (%)	569180	0.01	0.10	0.00	0.00
Borrower age (years)	569180	35.82	7.98	30.00	40.00
Gross income (£)	569180	64132	64506	38979	72863
Property value (£)	569180	288729	214071	165000	350000

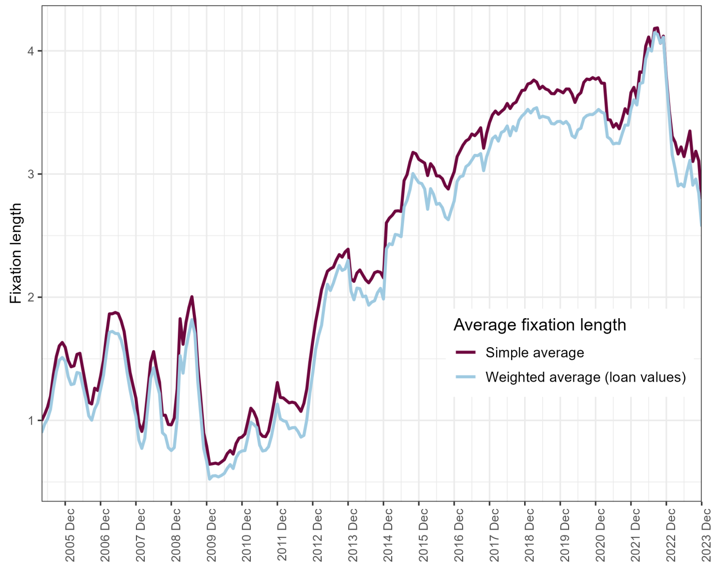
Note: This table shows summary statistics of variables from the final matched panel dataset. This table zooms in on the subset of data pertaining to two-year FRMs. For indicator variables (i.e. first-time buyers, verified income, self-employed and interest-only), the values in the matched panel dataset measure the proportion of underlying loan-level observations within each panel unit for which the indicator flag is equal to 1, where the value 1 is aligned with the naming convention of these variables.

Table A.4: Summary statistics of matched panel dataset - 5 year FRMs

	Observations	Mean	SD	p25	p75
Interest Rate (%)	581173	2.82	1.05	2.09	3.33
Number of loans	581173	2.48	3.11	1.00	3.00
Total value of loans (£)	581173	499628	758502	148500	539485
Average loan value (£)	581173	198399	150496	116010	243650
Lender fees (£)	581088	739.06	2748	199.00	1071
Mortgage term (months)	581136	319.56	78.71	276.00	372.00
LTV ratio	581173	70.96	18.97	59.21	85.38
LTI ratio	581173	3.37	0.89	2.82	4.01
First-time buyers (%)	581173	0.49	0.44	0.00	1.00
Verified income (%)	581173	1.00	0.00	1.00	1.00
Self-employed (%)	581173	0.10	0.26	0.00	0.00
Interest only (%)	581173	0.01	0.10	0.00	0.00
Borrower age (years)	581173	36.33	8.29	30.00	41.00
Gross income (£)	581173	62264	92821	37975	71070
Property value (£)	581173	295098	238060	167750	357500

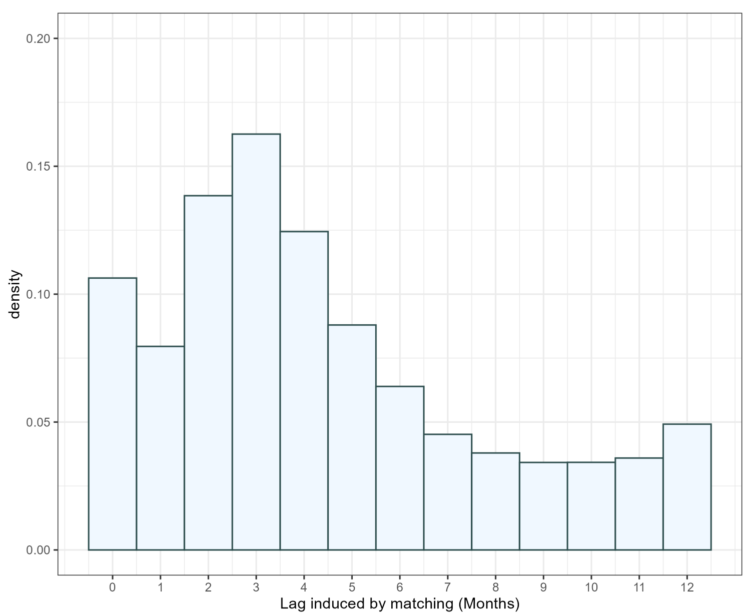
Note: This table shows summary statistics of variables from the final matched panel dataset. This table zooms in on the subset of data pertaining to five-year FRMs. For indicator variables (i.e. first-time buyers, verified income, self-employed and interest-only), the values in the matched panel dataset measure the proportion of underlying loan-level observations within each panel unit for which the indicator flag is equal to 1, where the value 1 is aligned with the naming convention of these variables.

Figure A.1: Average fixation periods for new mortgages in the United Kingdom.



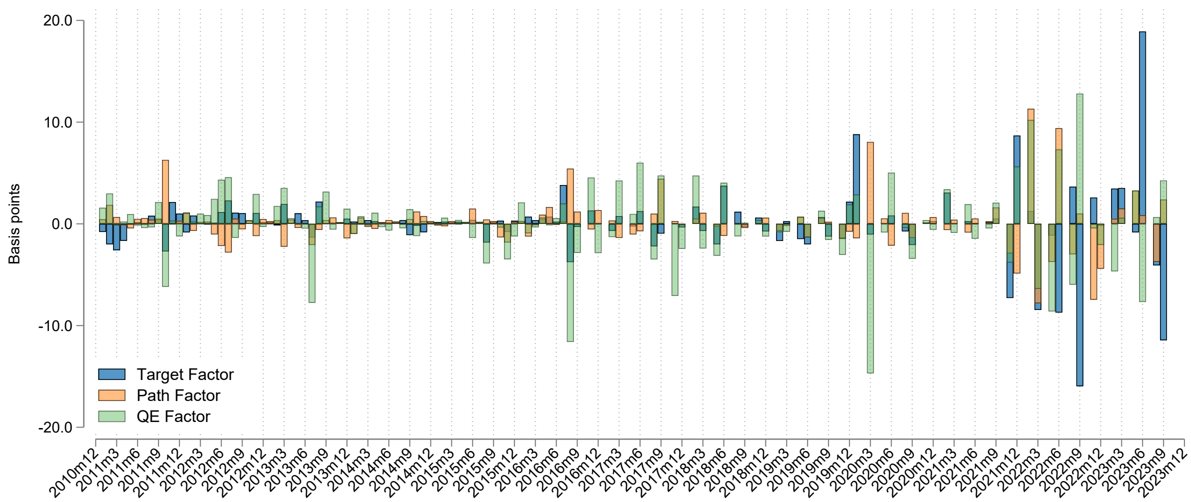
This figure shows the average fixation length of mortgages in the United Kingdom from 2005 to 2023. The vertical axis shows the years of length. The red line shows a simple average, while thee blue line shows a weighted average, where the weights are the loan amounts. The fixation length of adjustable-rate mortgages is set at 0. The full data for the fixation length is only available from 2015; before 2015, there is only information for a subset of FRMs, as the reporting of this variable was voluntary. Importantly, we do not observe any sudden jump at the beginning of 2015, when the full reporting becomes available.

Figure A.2: Months between mortgage offer and execution



This figure shows a histogram of the months between a mortgage being agreed in principle and its execution. The delay between agreement and execution has been estimated using the procedure detailed in Section 3.5.

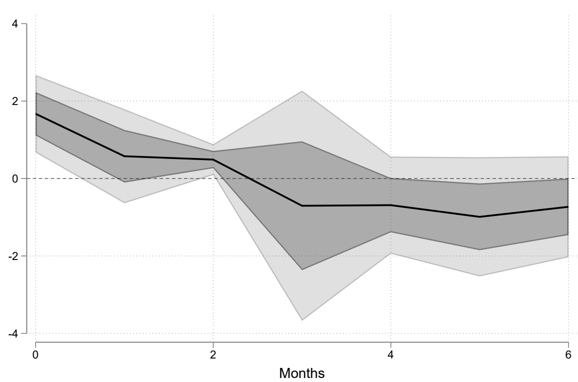
Figure A.3: U.K. Monetary Policy factors



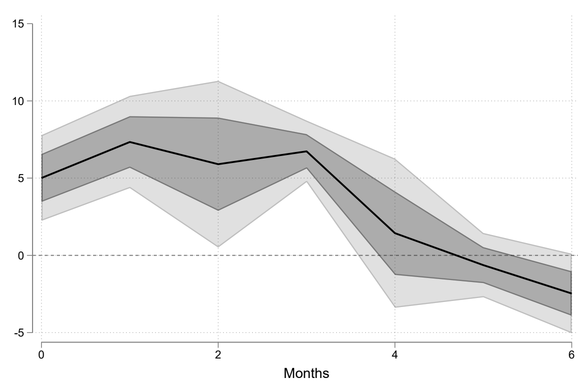
This figure shows the size of each of the three factors (Target, Path, and QE) as computed by Braun, Miranda-Agrippino, and Saha (2023) for the U.K following the approach of Swanson (2021).

Figure A.4: Mortgage pricing and volumes: Specification 2—Information effects

(A) Interest Rate (%)



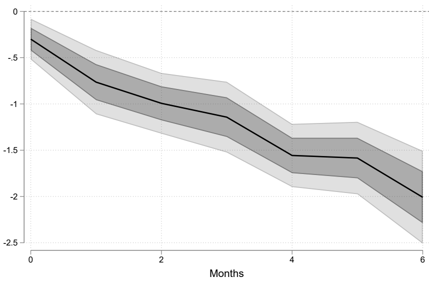
(B) Total lending (log)



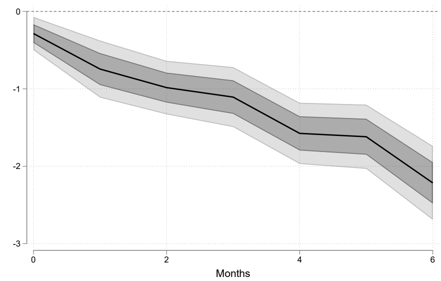
This figure shows the cumulative response of interest rates (Panel (A)) and total lending (Panel (B)) to a 1pp increase in the term spread (difference between 5-year and 2-year Gilt yields) instrumented by the high-frequency term spread surprise, cleaned of monetary policy dominated events as per Jarocinski and Karadi (2020). The black solid lines depict point estimates of the relative effect between the 5-year and 2-year fixed rate mortgages, while the shaded areas around the lines correspond to the 65% and 90% confidence bands.

Figure A.5: Mortgage pricing: Specification 2—Different FEs

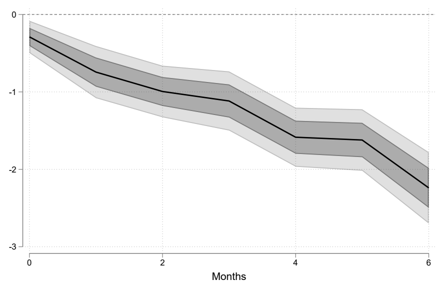
(A) Month



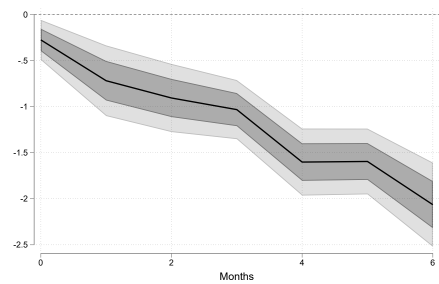
(B) Month, location, lender, LTV



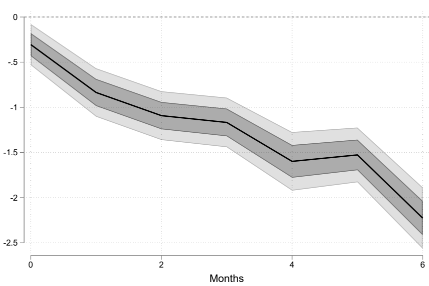
(C) Lender, LTV, Location-Month



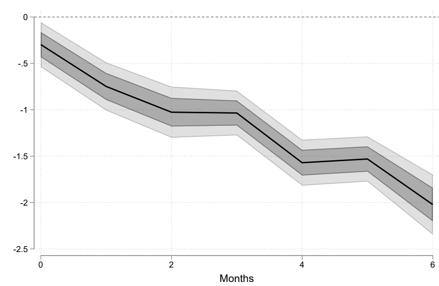
(D) Location, LTV, Lender-Month



(E) Location, Lender, LTV-Month



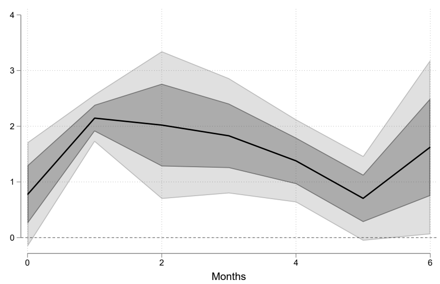
(F) All pairwise FE



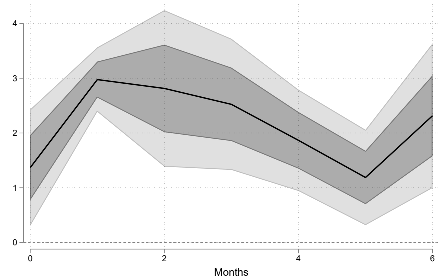
This figure shows the cumulative response of interest rates to a 1pp increase in the term spread (difference between 5-year and 2-year Gilt yields) instrumented by the high-frequency term spread surprise, using different sets of fixed effects. Panel (A) includes month FE. Panel (B) includes month, location, lender, and LTV-band FE. Panel (C) adds location-time FE. Panel (D) adds lender-month FE with respect to (B). Panel (E) adds LTV-band-month FE with respect to (B). Finally, Panel (F) includes location-month, lender-month, and LTV-band-month FE. All specifications include loan and borrower controls. The black solid lines depict point estimates of the relative effect between the 5-year and 2-year fixed rate mortgages, while the shaded areas around the lines correspond to the 65% and 90% confidence bands.

Figure A.6: Mortgage volumes: Specification 2—Different FEs

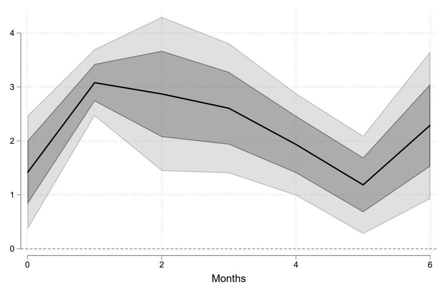
(A) Month



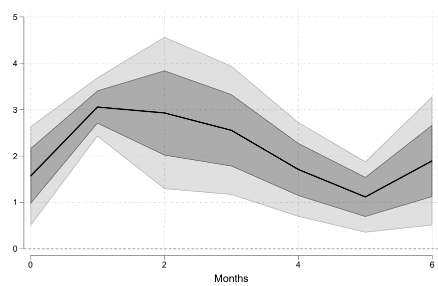
(B) Month, location, lender, LTV



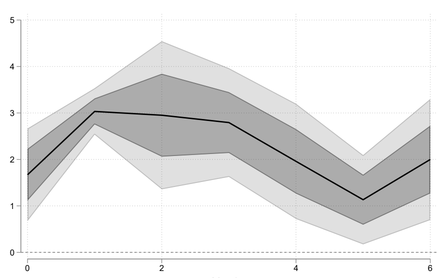
(C) Lender, LTV, Location-Month



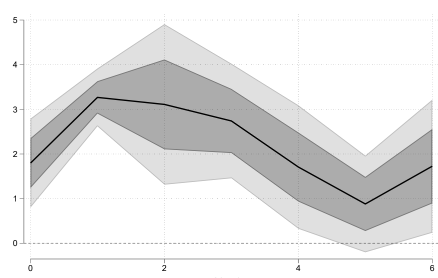
(D) Location, LTV, Lender-Month



(E) Location, Lender, LTV-Month

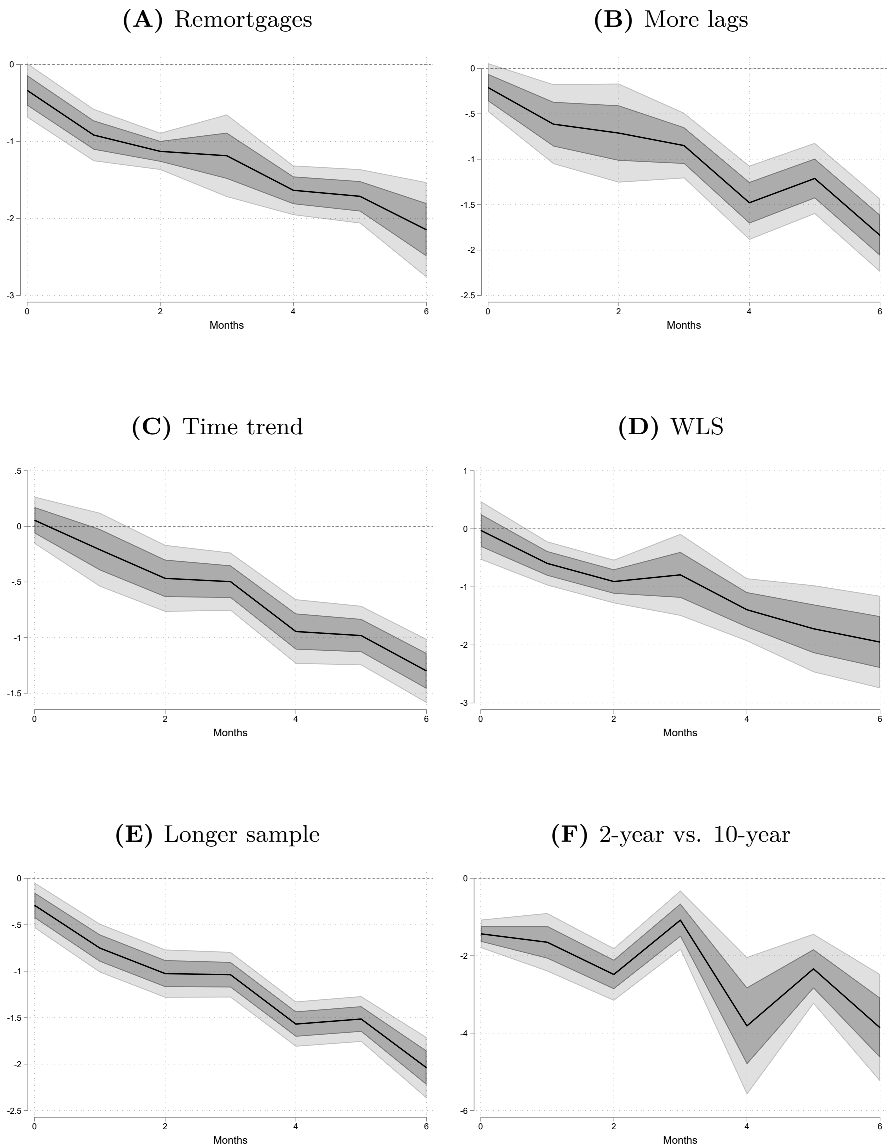


(F) All pairwise FE



This figure shows the cumulative response of total lending to a 1pp increase in the term spread (difference between 5-year and 2-year Gilt yields) instrumented by the high-frequency term spread surprise, using different sets of fixed effects. Panel (A) includes month FE. Panel (B) includes month, location, lender, and LTV-band FE. Panel (C) adds location-time FE. Panel (D) adds lender-month FE with respect to (B). Panel (E) adds LTV-band-month FE with respect to (B). Finally, Panel (F) includes location-month, lender-month, and LTV-band-month FE. All specifications include loan and borrower controls. The black solid lines depict point estimates of the relative effect between the 5-year and 2-year fixed rate mortgages, while the shaded areas around the lines correspond to the 65% and 90% confidence bands.

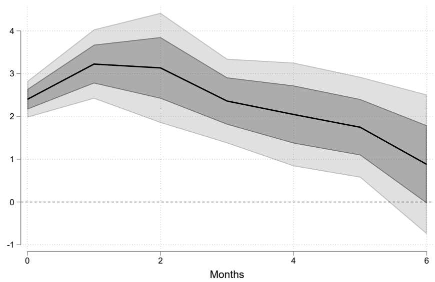
Figure A.7: Mortgage pricing: Specification 2—Additional robustness



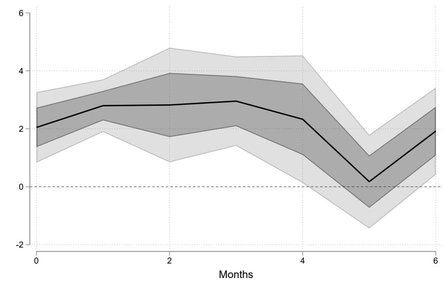
This figure shows the cumulative response of interest rates to a 1pp increase in the term spread (difference between 5-year and 2-year Gilt yields) instrumented by the high-frequency term spread surprise. These results are from running Specification 2. Panel (A) includes remortgages; Panel (B) adds four lags of the dependent variable. Panel (C) adds a fixation-specific time trend. Panel (D) uses weighted least squares with observations weighted by lenders' total assets. Panel (E) starts the sample in 2011. Panel (F) compares 2-year vs. 10-year FRMs. All specifications include loan and borrower controls. The black solid lines depict point estimates of the relative effect between the 5-year and 2-year fixed rate mortgages, while the shaded areas around the lines correspond to the 65% and 90% confidence bands.

Figure A.8: Mortgage volumes: Specification 2—Additional robustness

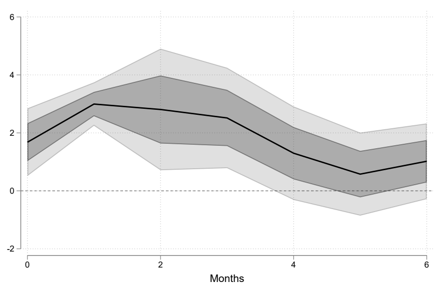
(A) Remortgages



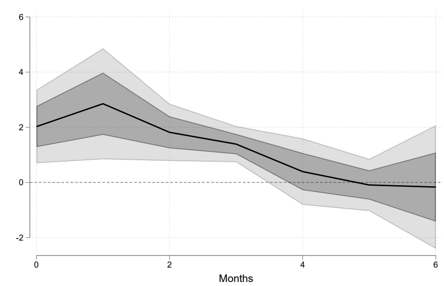
(B) More lags



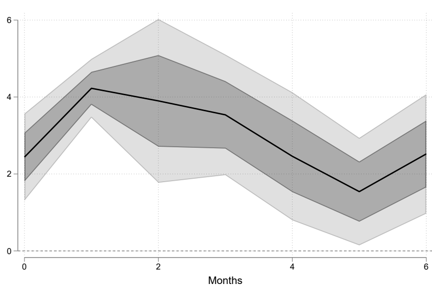
(C) Time trend



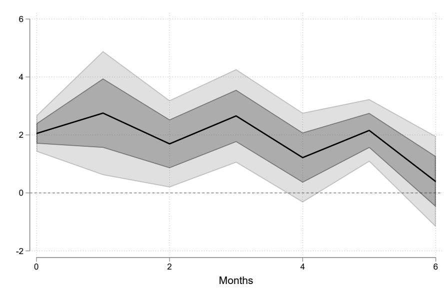
(D) WLS



(E) Longer sample

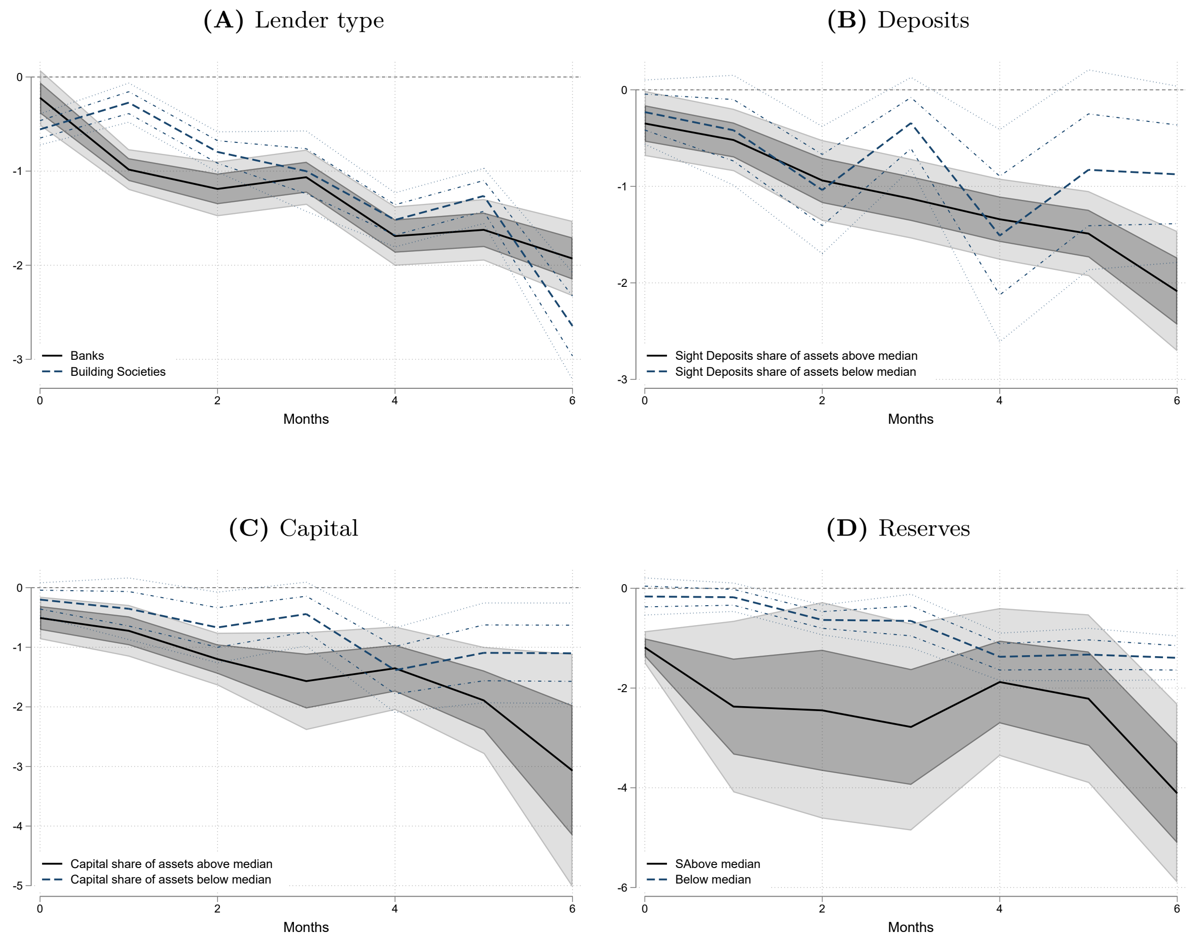


(F) 2-year vs. 10-year



This figure shows the cumulative response of total lending to a 1pp increase in the term spread (difference between 5-year and 2-year Gilt yields) instrumented by the high-frequency term spread surprise. These results are from running Specification 2. Panel (A) includes remortgages; Panel (B) adds four lags of the dependent variable. Panel (C) adds a fixation-specific time trend. Panel (D) uses weighted least squares with observations weighted by lenders' total assets. Panel (E) starts the sample in 2011. Panel (F) compares 2-year vs. 10-year FRMs. All specifications include loan and borrower controls. The black solid lines depict point estimates of the relative effect between the 5-year and 2-year fixed rate mortgages, while the shaded areas around the lines correspond to the 65% and 90% confidence bands

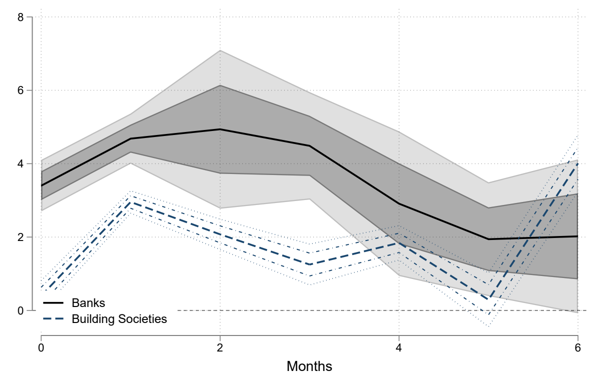
Figure A.9: Mortgage pricing: Specification 3—Lender heterogeneity



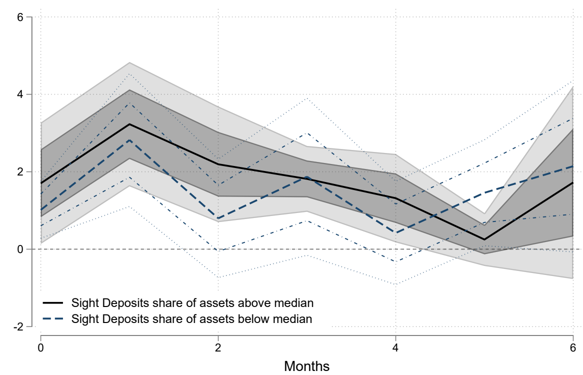
This figure shows the cumulative response of interest rates to a 1pp increase in the term spread (difference between 5-year and 2-year Gilt yields) instrumented by the high-frequency term spread surprise. These results are from running Specification 3 where each "state" refers to a different lender characteristic. In Panel (A), we compare commercial banks vs. building societies. In Panel (B), we compare lenders with deposits over total assets above vs. below the median. In Panel (C), we compare lenders with capital ratios above vs. below the median. In Panel (D), we compare lenders with reserves over total assets above vs. below the median. Except for Panel (A), the different categories are time-varying, meaning that a lender can be in the "above the median" category in on period and then "below the median" in another. All specifications include loan and borrower controls interacted with the "state" variable. The lines depict point estimates of the relative effect between the 5-year and 2-year fixed rate mortgages, while the shaded areas around the lines correspond to the 65% and 90% confidence bands.

Figure A.10: Mortgage volumes: Specification 3—Lender heterogeneity

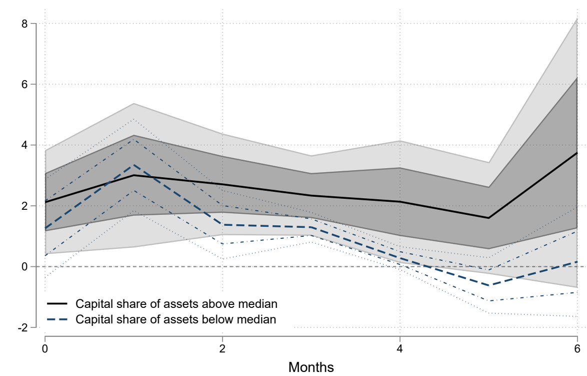
(A) Lender type



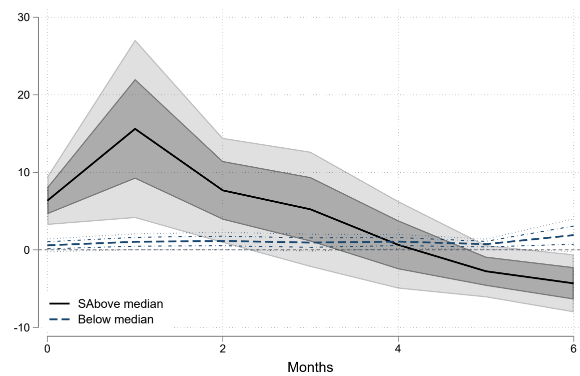
(B) Deposits



(C) Capital



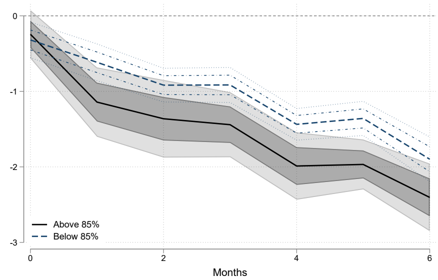
(D) Reserves



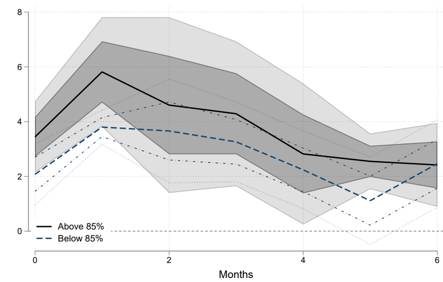
This figure shows the cumulative response of total lending to a 1pp increase in the term spread (difference between 5-year and 2-year Gilt yields) instrumented by the high-frequency term spread surprise. These results are from running Specification 3 where each "state" refers to a different lender characteristic. In Panel (A), we compare commercial banks vs. building societies. In Panel (B), we compare lenders with deposits over total assets above vs. below the median. In Panel (C), we compare lenders with capital ratios above vs. below the median. In Panel (D), we compare lenders with reserves over total assets above vs. below the median. Except for Panel (A), the different categories are time-varying, meaning that a lender can be in the "above the median" category in on period and then "below the median" in another.All specifications include loan and borrower controls interacted with the "state" variable. The lines depict point estimates of the relative effect between the 5-year and 2-year fixed rate mortgages, while the shaded areas around the lines correspond to the 65% and 90% confidence bands.

Figure A.11: Mortgage pricing and volumes: Specification 3—Borrower heterogeneity

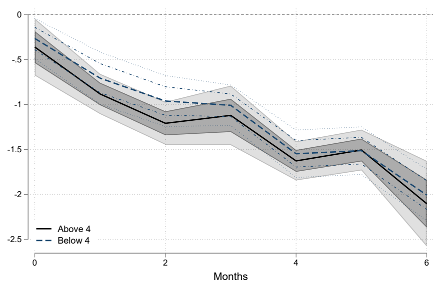
(A) LTV



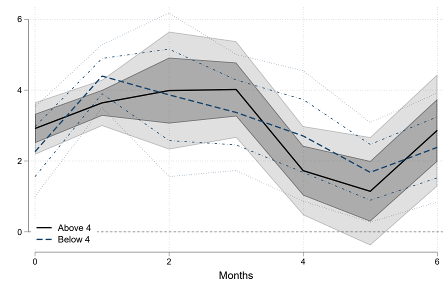
(B) LTV



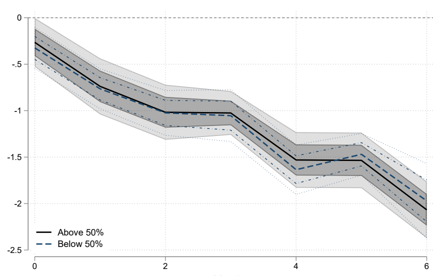
(C) LTI



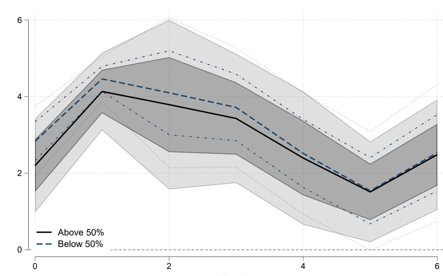
(D) LTI



(E) FTB



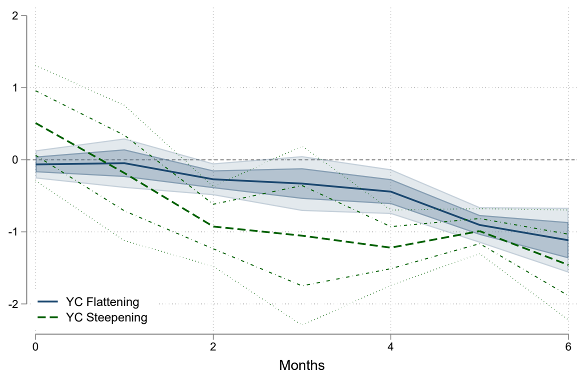
(F) FTB



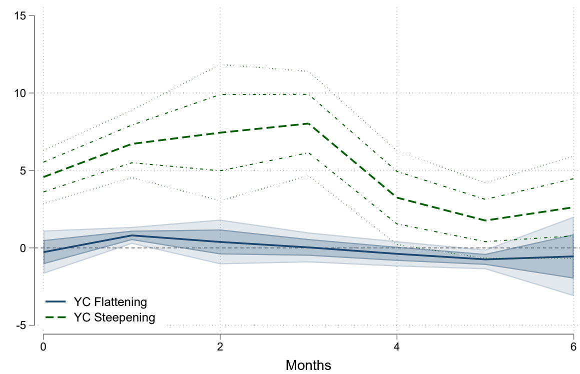
This figure shows the cumulative response of interest rates (Panel (A), Panel (C) and Panel (E)) and total lending (Panel (B), Panel (D) and Panel (F)) to a 1pp increase in the term spread (difference between 5-year and 2-year Gilt yields) instrumented by the high-frequency term spread surprise. These results are from running Specification 3 where each "state" refers to a different borrower characteristic. In Panel (A) and Panel (B), we compare panel units with an average LTV above 85% with panel units with an average LTV below 85%. In Panel (C) and Panel (D), we compare panel units with an average LTI above 4 with panel units with an average LTI below 4. In Panel (E) and Panel (F), we compare panel units with an average proportion of first-time buyers above 50% with panel units with an average proportion of first-time buyers below 50%. All specifications include loan and borrower controls interacted with the "state" variable. The lines depict point estimates of the relative effect between the 5-year and 2-year fixed rate mortgages, while the shaded areas around the lines correspond to the 65% and 90% confidence bands.

Figure A.12: Mortgage pricing and volumes: Specification 3—Monetary policy states

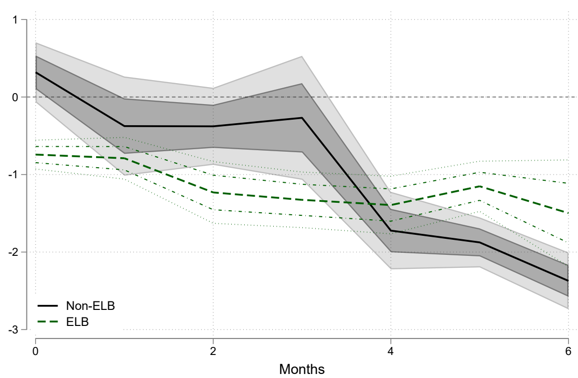
(A) Int. rates: Steepening vs. flattening.



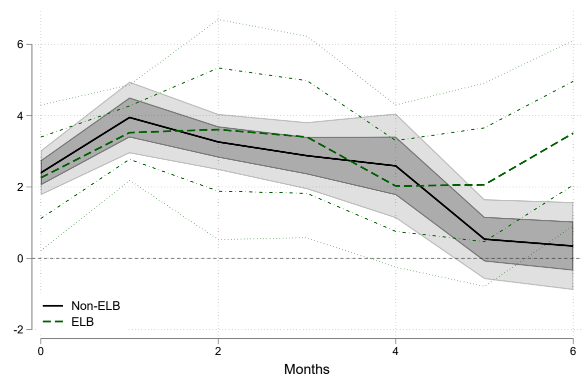
(B) Total lending: Steepening vs. flattening



(C) Interest rates: ELB

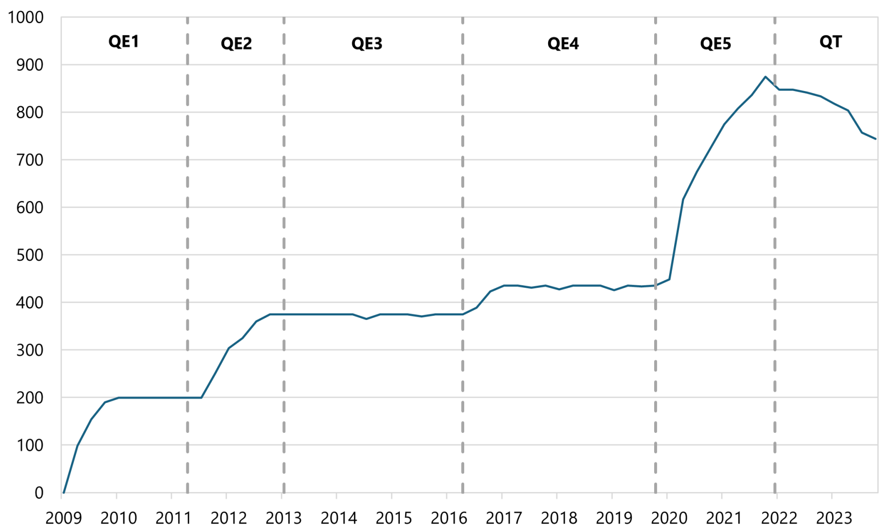


(D) Total lending: ELB



This figure shows the cumulative response of interest rates and total lending to a 1pp increase in the term spread (difference between 5-year and 2-year Gilt yields) instrumented by the high-frequency term spread surprise. These results are from running Specification 3. In Panel (A) and Panel (B), we compare cases of steepening surprises with flattening surprises (i.e. term spread increases versus term spread declines). In Panel (C) and Panel (D), we compare cases where Bank Rate (the policy rate) is close to the effective lower bound (less than or equal to 0.5%) with cases where Bank Rate is above 0.5%. All specifications include loan and borrower controls interacted with the “state” variable. The lines depict point estimates of the relative effect between the 5-year and 2-year fixed rate mortgages, while the shaded areas around the lines correspond to the 65% and 90% confidence bands.

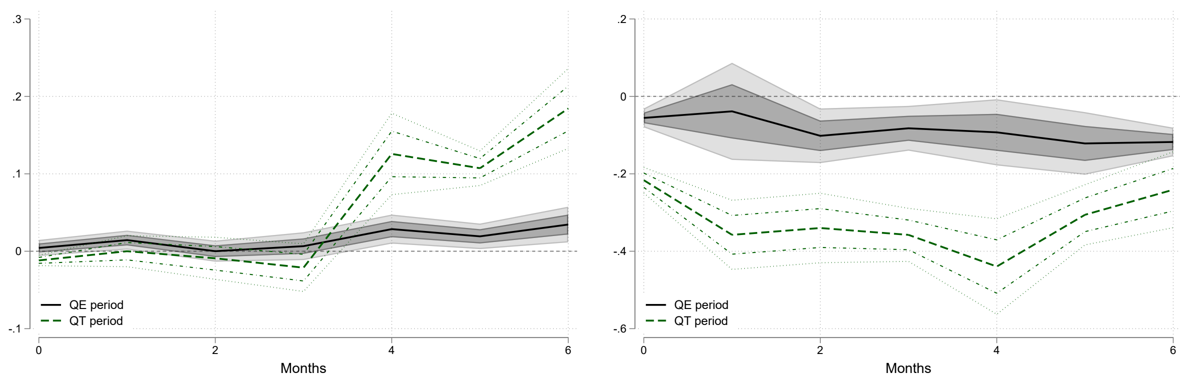
Figure A.13: Stock of gilts held for monetary policy purposes in the Bank of England's Asset Purchase Facility (£bn)



Source: ONS (Series CPNSA). This figure shows the stock of gilts held for monetary policy purposes in the Bank of England's Asset Purchase Facility, measured in £ billions. The date range covers distinct Quantitative Easing episodes (QE1-QE5) as well as the Quantitative Tightening (QT) period beginning in February 2022. The final datapoint is in December 2023.

Figure A.14: Effect of the "Target" factor over the QE and QT periods

(A) Interest Rate (%) **(B)** Total lending (log)



This figure shows the cumulative response of interest rates (Panel (A)) and total lending (Panel (B)) to the high-frequency "Target" monetary policy factor across QE and QT periods. The factor is standardised by its standard deviation. These are results from running a model including a state-dependency indicator as per Specification 3. The black solid line depicts the responses to the "Target" factor during the QE period (pre-February 2022), while the green dashed lines present the results during the QT period (post-February 2022). All specifications include loan and borrower controls. The lines depict point estimates of the relative effect between the 5-year and 2-year fixed rate mortgages, while the shaded areas around the lines correspond to the 65% and 90% confidence bands.