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Locking in the rate or staying flexible? Mortgage refinancing around an interest rate shock

Philippe Bracke,⁽¹⁾ João F. Cocco,⁽²⁾ Elena Markoska⁽³⁾ and Purnoor Tak⁽⁴⁾

Abstract

This paper examines UK mortgage refinancing around the 23 September 2022 mini-budget interest rate shock, exploiting predetermined expiry dates of discounted two and five year fixed-rate mortgages. We find: (a) a shift toward two-year fixes, even though they priced above five-year mortgages; and (b) deleveraging, with a 200 basis points rate rise linked to a 2–3 percentage points drop in average loan to value ratios. Although the adjustable-rate mortgage share increased, most borrowers still chose the pricier two-year fix, consistent with seeking rate risk protection plus near-term flexibility for equity extraction if rates fall, an interpretation supported by evidence that near-term equity extraction is likelier under two than five-year loans.

Key words: Mortgages, deleveraging, interest rates, flexibility, equity extraction, leverage cycles.

JEL classification: E31, E52, G5, G51.

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1 Introduction

Mortgages play a central role in monetary policy transmission. For many households, mortgage debt is their largest liability and fluctuations in interest rates and required debt servicing can have a large impact on the cash available for non-housing consumption. Fixed-rate mortgages protect borrowers against payment increases when rates rise, but they tend to be more expensive than adjustable-rate loans (Stanton and Wallace, 1998; Campbell and Cocco, 2003).¹ The speed and magnitude of monetary-policy pass-through depend on the mix of mortgage types held across households and on borrowers’ refinancing behavior (Auclert, 2019; Beraja et al., 2019; Eichenbaum et al., 2022; Garriga et al., 2017). We study a central but underexplored trade-off in mortgage choice: interest-rate insurance versus financial flexibility. A longer fixation period insures the household against rate increases for longer, but also locks the household into its contract and makes it costly to refinance, move, repay principal, or extract equity before the fixed-rate period ends.

We provide evidence on the nature of the insurance-flexibility trade-off using data on UK mortgage refinancing around an unexpected interest-rate increase. After the shock, borrowers shift sharply toward 2-year fixed-rate products, even though these offer less rate insurance and carry higher rates than 5-year mortgages. We show that this pattern reflects demand for short-term payment protection combined with near-term financial flexibility, especially the ability to extract equity at lower cost once the fixation period ends. Expectations of future rate declines alone cannot explain the results, since most borrowers choose fixed-rate products rather than substantially cheaper adjustable-rate mortgages.

Our identification strategy exploits the unexpected, large interest rate rise following the UK Chancellor’s Growth Plan announced on 23 September 2022—the ‘mini-budget’ (hereafter, the event). The plan’s unfunded tax cuts were met with market skepticism and triggered a sharp repricing of swap and mortgage rates.² In addition, we exploit the institutional feature that most UK mortgages include an introductory fixed-rate period, typically two or five years, during

¹This is due to the usually upward slope of the term structure and the compensation that lenders require for the option that borrowers have to refinance their fixed-rate loans.

²Although the interest rate shock followed the announcement of unfunded tax cuts, mortgage interest is not tax deductible in the UK and the proposed tax cuts were reversed within a few weeks. Mortgage rates and our estimated refinancing effects remained essentially unchanged 61–120 days after the announcement, well after the fiscal measures had been reversed.

which the interest rate is significantly discounted, after which borrowers commonly refinance. The expiry of the discounted rate period is predetermined by choices made several years before the event, yielding plausibly exogenous variation in refinancing timing. Therefore, what makes our setting unusually powerful is the combination of a large, sudden, and salient increase in mortgage rates with an institutional structure that lets us compare otherwise similar borrowers who happened to refinance just before or just after the shock. Few episodes combine rate increases of this magnitude with plausibly exogenous variation in exposure to the shock.

A first challenge that we need to overcome is that some of the post-event remortgagors had secured their mortgage offers before the event. Because offers typically remain valid for three months (or longer), our administrative data, which record the loan origination date but not the offer date, cannot by itself identify these cases. We overcome this challenge by combining daily time-series information on all products *on offer* in the market with the discrete jump in rates at the event, allowing us to infer which post-event originations were based on pre- versus post-event offers.

A second challenge is selection. Although the event was unanticipated and the timing of refinancing is plausibly exogenous, borrowers can choose whether, and how early, to secure a mortgage offer before their refinancing date. This choice is endogenous and likely correlated with borrower characteristics. Indeed, we show that higher-income borrowers and those with a joint applicant are more likely to have obtained a pre-event offer, indicating a stronger propensity to plan ahead. This selection is also economically informative: it identifies borrowers whose advance planning ended up protecting them from the shock. Studying who these borrowers are, and how their outcomes differ from otherwise similar borrowers who did not secure a pre-event offer, sheds light on heterogeneity in household behavior. In the analysis, we use several strategies to separate this selection margin from the treatment effect of the shock itself.

Our empirical results on the refinancing behavior around the event are threefold. First, there is a large shift towards shorter fixation periods by borrowers exposed to the unanticipated rise in mortgage rates, who are 11 percentage points more likely to select 2-year products instead of 5-year ones. This shift occurs despite 2-year products offering less protection against the risk of future rate rises and, over this period, becoming approximately 10 basis points more expensive than 5-year ones. This shift towards shorter fixation periods implies, going forward, a reduction in the duration of household liabilities.

Second, borrowers are much less likely to switch lenders. The process of remortgaging with

the same lender without equity extraction is much simpler, in that borrowers do not need to go through an affordability assessment. Higher interest rates makes passing the affordability assessment harder, so that borrowers turn to their existing lender. Thus, the interest rate shock has implications for mortgage market competition.

Third, we use the discrete increase in mortgage rates from the event to estimate the elasticity of the loan amount to prices. We find evidence of significant deleveraging. In elasticity terms, our estimates imply that a 1 percentage point increase in mortgage rates reduces loan amounts by 1.9% for 2-year and 4.4% for 5-year products, and lowers loan-to-value (LTV) by 1.2 to 1.4 percentage points. These average effects reflect *both* repayments and reduced equity extraction after the event, and are consistent with the higher incidence of same-lender refinances. They provide a direct measure of the household balance-sheet response to borrowing costs, a key margin in the transmission of monetary policy.

We show that these estimated effects are broadly robust to alternative approaches to dealing with selection, including a matched sample approach. Moreover, for a subset of the data we can link borrowers to their prior loan (i.e. the loan taken 2- or 5-years before the event), and the results persist when we estimate changes using this panel data. The results also remain robust when coefficients are allowed to differ between post-event days 1–60, when uncertainty was elevated, and days 61–120, after uncertainty had subsided.

It is important to recognize that these are equilibrium outcomes, shaped jointly by lenders' supply decisions and borrowers' demand. While separating supply and demand is challenging, we make progress using high-frequency data on all products on offer and their pricing. For each 2- and 5-year loan on offer each day, we compute the difference between the loan's interest rate and the same-maturity interest-rate swap. Because lenders hedge with swaps and price relative to them, this spread is informative about supply conditions. Pre-event, 5-year products carried a larger spread than 2-year products, consistent with higher required compensation for longer fixes. After the event, the pattern inverted: 5-year loans exhibited a lower spread, suggesting a lender tilt toward longer fixes (or, alternatively, imperfect competition that allowed lenders to exploit increased demand for 2-year products). In either case, this evidence suggests that the shift in originations toward shorter fixation periods is demand-driven.

The interest rate shock shifted demand towards the more expensive 2-year products, that offer less protection against future rate rises. In the second part of the paper, we show that 2-year products are more flexible, and that the shift can be explained by an increased borrower

demand for flexibility at higher interest rates. Using market-wide data on all mortgage products on offer, we document that prepayment penalties are significant and widespread during the initial fixed-rate period but largely disappear once it ends.³ Consequently, 2-year products can be refinanced sooner and at lower cost, providing evidence of greater contractual flexibility relative to 5-year products.

There are several reasons why borrowers may value greater flexibility, which we investigate. First, if they expect interest rates to decline, shorter fixed-rate periods allow earlier repricing and the opportunity to benefit from lower rates—albeit with greater exposure to subsequent increases. If such expectations are strong, borrowers might forgo a fixed rate altogether and choose an adjustable-rate mortgage (ARM). Indeed, the ARM share was low and stable at about 5% pre-event but rose steadily to over 15% thereafter. Post-event, ARMs were also significantly cheaper than fixed-rate loans and more flexible. Nevertheless, the vast majority of borrowers continued to choose the more expensive 2-year fixed-rate products—a pattern that cannot be explained solely by expectations of falling rates or by demand for immediate flexibility.

An alternative explanation is that borrowers value flexibility and the ability to extract equity not immediately but in the near future (in 2 years), should interest rates decline. We provide evidence for the exercise of this flexibility using an administrative dataset with loan-level, semiannual information on the mortgage portfolios of *all* lenders from 2015 to 2023. Because we observe the universe of loans, we can link mortgages held by the same borrower on the same property, even when the subsequent loan is with a *different* lender, allowing us to identify equity-extraction events.

A survival analysis shows that borrowers on 2-year fixed-rate mortgages are significantly more likely to extract equity than those on 5-year products, with the gap largest in years 2–5 after origination. This pattern indicates that 2-year borrowers actively use their greater contractual flexibility for equity release, and that the post-event shift toward 2-year fixes is consistent with increased demand for short-term flexibility to extract equity, should interest rates decline.

Related literature. Our analysis contributes to the growing literature on mortgages and the transmission of monetary policy (Auclert, 2019; Beraja et al., 2019; Eichenbaum et al., 2022; Garriga et al., 2017). Most of this literature has focused on the United States (US), where 30-

³For instance, in the first year since origination, their median value is 3% (5%) for 2-year (5-year) mortgages. In the third year, the median values are 0% (3%), respectively.

year fixed rate mortgages are the predominant type of contract, which in the case of a refinance are repaid at face value. This means that in a context of rising interest rates many households prefer not to refinance, creating lock-in (Fonseca and Liu, 2024). The UK products, with an initial period of significantly discounted rates at the end of which most borrowers refinance, allow us to study responses to the higher interest rates. In addition, the co-existence of many types of products allow us to study reactions to the interest rate shock along several dimensions of the mortgage contract.

Some of the effects that we estimate are consistent with the US evidence. For instance, we find that borrowers are more likely to switch to 2-year fixed rate products post-event. This result is consistent with the findings of Koijen et al. (2009) for the US, who show that borrowers are relatively more likely to refinance into an ARM (relative to a 30-year FRM) in a period of rising rates. Our contribution in this dimension is the event that we exploit, which provides identification. In addition, we present within borrower results showing that the switch happens even for borrowers who had previously chosen a 5-year product, so that it is not due to the differences in the characteristics of borrowers who refinance at different interest rate levels.

Our paper is also related to literature on mortgage choice. Particularly relevant among the former are papers that focus on the choice between fixed and adjustable rate mortgages (Campbell and Cocco, 2003; Koijen et al., 2009, among others) and in particular on the role of moving risk in mortgage choice (Brueckner and Follain, 1988; Dhillon et al., 1987; Stanton and Wallace, 1998; Sa-Aadu and Sirmans, 1995, among others). We highlight several dimensions of mortgage flexibility that borrowers may consider when choosing mortgage fixation period.

There are a number of recent papers that have analyzed several features of the UK mortgage market, including intermediaries' incentives and mortgage pricing. They include, among others, Benetton (2021), Benetton et al. (2025), Robles-Garcia (2022), Best et al. (2020), Peydró et al. (2023), and Liu (2023). Particularly relevant for our analysis is Liu (2023) who shows how the choice of a shorter fixation period for more leveraged households may be driven by an expectation of being able to refinance in the near future at a lower loan-to-value and credit spread. While these effects can also be at work in our data, the vast majority of the refinances in our sample are characterized by low LTVs.

Finally, our paper is related to the recent papers that study mortgage choice in different countries in the recent period of rising interest rates (Adelino et al., 2026; Fuster et al., 2026). These papers find that borrowers' actions, including loan repayment, reduce the impact of higher

rates on monthly payments. While we also find evidence of deleveraging, the richness of the mortgage menu allows us to show that, alongside this deleveraging, borrowers simultaneously shifted toward contracts that were more expensive and offered less rate insurance, but provided greater flexibility. This variation enables us to document and quantify the trade-off between interest-rate insurance and financial flexibility. We also exploit a novel shock, the 2022 mini-budget announcement, which generated a substantial and salient rise in mortgage rates.⁴

The rest of the paper proceeds as follows. Section 2 describes the UK mortgage market, summarizes the data, and details our main identification strategy. Section 3 estimates the effects of the interest rate shock on mortgage fixation period, lender switches and deleveraging. Section 4 presents evidence on the trade-off between financial flexibility and interest rate insurance, and on the reasons why flexibility is valuable. Section 5 concludes.

2 Background, data sources and identification

In this section we provide background information on the UK mortgage market, the data sources, and describe our main identification strategy.

2.1 The UK mortgage market

Most UK mortgages have an initial period of interest rate fixation that can vary between two and ten years, with two or five years being the most frequent. During this initial period the interest rate is significantly discounted. After it ends, borrowers who do not remortgage revert to a floating rate (the reversion rate) equal to the prevailing base rate plus a spread. The reversion rate tends to be significantly higher than the initial rate due to the much higher margin. Most borrowers remortgage at the end of the initial discounted-rate period, when early repayment charges no longer apply. Frequent mortgage refinancing is a distinctive feature of the UK market. This means that at each point in time, there are many borrowers whose discounted rate period comes to an end and who refinance their loans.

In the UK mortgage market there are many products on offer, by different lenders. The pricing of these products varies by LTV band, and jumps as the LTV moves to a higher band.

⁴This shock has also been used in [Badarinza et al. \(2024\)](#) to study search and matching within the UK housing market, while we focus on mortgage refinancing.

Therefore, borrowers tend to bunch at the upper threshold of the lower LTV band. The affordability assessment and borrower credit risk determines whether the borrower qualifies for the loan, but conditional on borrowers qualifying, it does not affect loan interest rate (see, among others, [Benetton, 2021](#); [Best et al., 2020](#)).

Refinancers can take the new loan from their existing lender (internal remortgaging) or from a new lender (external remortgaging). Internal remortgaging without a change in loan terms (such as amount outstanding) is a simpler process; it does not require either a full property valuation, an affordability assessment, or proof of income. Lenders still carry out a property valuation, but do so using the property value when the previous loan was originated, updated using the evolution of local house price indices. This means that absent local house price declines, all borrowers (including those whose income has dropped) are able to remortgage with the same lender without equity extraction (this is often called a product transfer). On the other hand, remortgaging with the same lender with equity extraction or remortgaging with a different lender requires a full property valuation and an affordability assessment.⁵

Lenders are required to notify borrowers in advance of the end of the initial period of discounted rates. In particular, the Financial Conduct Authority (FCA) requires lenders to give *reasonable notice* of a change in the loan interest rate and mortgage payments due. The interpretation of reasonable notice varies across lenders, and timings of notification may vary from 4 months to 1 month in advance. The notification is frequently done by post, but not all borrowers may pay sufficient attention to the correspondence they receive.

The process of remortgaging with the same lender without a change in loan terms is straightforward and has few requirements, but borrowers must still actively request an offer from their existing lender, which can often be done easily online. Remortgaging offers typically remain valid for 3 months, and must be accepted by borrowers for the remortgaging to take place.

This mortgage market structure, with large increases in mortgage payments when the initial period of discounted rates ends, has the potential to create instability, particularly if borrowers are unable to refinance at the end of the initial period. Despite rising interest rates, the period of our analysis was characterized by house price increases. This means that most borrowers in

⁵When remortgaging, borrowers can take the loan directly from a lender (direct channel) or through a mortgage broker (intermediated channel) ([Robles-Garcia, 2022](#)). Brokers help borrowers search among the products on offer by different lenders and provide advice. They benefit from the frequent refinancing activity since they receive a fee for their services (paid by the lender) if consumers use them for the refinancing.

our sample, including those whose income has dropped, are able to remortgage with the same lender.⁶

2.2 Data sources

We use data from several sources that we briefly describe here. Internet Appendix A provides additional details on the data and sample construction.

2.2.1 Origination data

Our first main data source is the Product Sales Data (PSD001), an administrative dataset which covers UK residential mortgages *originated* for both home purchase and remortgaging. We focus on the latter since they do not involve a contemporaneous house transaction. PSD001 has been available since 2005 when the Financial Conduct Authority (FCA) introduced the requirement that lenders report all new sales of regulated mortgage contracts, and it has been used by several papers in the literature (Best et al., 2020; Cloyne et al., 2019; Benetton, 2021, among others).

Prior to April 2021, PSD001 covers all new loans for home purchase, external remortgages, and some but not all internal remortgages. Several lenders did not treat remortgages by existing borrowers as a new loan and did not report them. This changed in April 2021 after which date all internal remortgages are also recorded.⁷

The data includes a variety of origination information, such as mortgage type (e.g., 2-year fixed, 5-year fixed, etc), initial interest rate, loan amount, loan term, the identity of the lender and remortgaging type (internal versus external). The data also contains a variety of borrower information, including the date of birth, property postcode, property value, income, whether there is a joint borrower in the loan, number of dependent children, among others. For some of the internal remortgages in our sample borrower income and property value information are missing. Such remortgages do not involve an affordability assessment and some lenders do not collect income information.

⁶In the event of substantial house-price declines, some borrowers could be unable to remortgage. Fixing the mortgage rate for a longer period offers protection against this outcome.

⁷Hence, our analysis benefits from having complete administrative data on the universe of refinancing transactions.

2.2.2 Loan performance data

A second data source is PSD007 which has bi-annual information on the performance of all outstanding mortgages. The data starts in the first semester of 2015 and it has recently been used by [Fisher et al. \(2024\)](#) to study refinancing cross-subsidies in the UK mortgage market. Each semester lenders must report to the regulator loan level information on all the loans in their portfolios, including their status (performing, in arrears, etc), the outstanding amount, property postcode, date of birth of the main borrower, among other items. The information included is less comprehensive than that in the origination data, as detailed borrower demographic data is unavailable. We use the PSD007 data to identify loans that have not been refinanced after the end of the initial period of discounted rates.⁸ We also use these data to study the use of flexibility by borrowers on different interest rate fixation terms.

2.2.3 Moneyfacts data

The Moneyfacts data contains detailed information on all the products *on offer* in the market including the identity of the lender, product type (loan for property acquisition or remortgaging, period of interest rate fixation), interest rates (initial and follow on), maximum LTV, early repayment charges (ERCs), among other. We use the Moneyfacts data for two purposes. First, to identify, among mortgages originated after the mini-budget announcement, the offers that borrowers had received before the event. Second, to provide evidence on how the ERCs vary across products with different interest-rate fixation periods.

2.3 Identification

In this section we describe the event that we use to identify the effects and the empirical methodology.

2.3.1 The interest-rate shock

For identification, we use the announcement of the UK Chancellor’s 2022 Growth Plan, commonly referred to as the mini-budget, on Friday, September 23, 2022, which led to a large

⁸As PSD001 only reports new originations, PSD007 is necessary to identify borrowers who are due to refinance but do not originate a new loan.

unanticipated increase in mortgage rates. Unlike typical monetary tightening cycles, in which policy rates rise gradually and are at least partly anticipated by markets and households, the mini-budget triggered a discrete and unexpected jump in mortgage rates within a few days, providing a rare setting in which to study how households respond to unanticipated increases in borrowing costs. In order to provide the context in which it took place, Figure 1a plots the evolution of several macroeconomic variables since January 2018. After a period of stable inflation and low interest rates, inflation started rising rapidly in January 2021. It was followed, towards the end of the year, by increases in the Bank of England base rate and mortgage rates. While interest rates were already increasing before the event, marked by a vertical line in the figure, the large increase that the event triggered, and the narrow window around it that we use, provide identification.

[Insert Figure 1 here]

Figure 1a also plots the average initial interest rate on 2-year and 5-year fixed interest rate 75% LTV loans. While 5-year mortgage rates were higher than 2-year ones during the initial part of the sample, they converged and became almost identical in late 2021, with 2-year rates becoming higher than 5-year ones towards the end of the sample period. The relation between 2- and 5-year rates observed during the initial part of the sample is the most commonly observed since the term structure is usually upward-sloping and there is a term premium. Consequently, mortgages with longer fixed-rate periods provide insurance against cash-flow risk but are typically more expensive than loans with shorter fixation periods.

Figure 1b focuses on an event window of ± 120 days around the event, again represented by a vertical line. It uses Moneyfacts data to plot the number of different 2- and 5-year products on offer in the market. There was a large reduction as lenders withdrew products. While the number of products on offer began to recover soon after, there was a major repricing, with interest rates shifting up by approximately 2 percentage points on average, effects that were more persistent than those on swap rates. In addition, 5-year products became cheaper than 2-year ones. Products with longer fixation periods provide insurance against cash-flow risk for longer, and after the event they did so at a lower interest rate.

The mini-budget announcement included controversial policies to reduce taxes financed by increasing government debt. For example, it planned a reduction in the basic income tax rate from 20% to 19%, with a complete removal of additional tax rates for top earners including on

dividend income, increase the nil-rate stamp duty tax threshold, reverse the planned increase in the corporate tax rate and national insurance contributions, among other items.⁹ The plans were unanticipated by the market and resulted in large increases in both the level and volatility of gilt yields. On Monday, September 26, the Bank of England reiterated their goal to reduce inflation through increasing interest rates in reference to the mini-budget announcement.¹⁰

Our focus is on identifying the effects of the interest rate shock on mortgage outcomes. However, one might reasonably argue that the estimated effects are driven not by the interest rate shock, but by the proposed tax changes. While this possibility cannot be entirely ruled out, several considerations mitigate this concern. First, the mini-budget proposed a relatively small reduction in the basic rate of income tax – from 20% to 19% – and, in the UK, mortgage interest is not tax deductible so that there are no incentives to adjust borrowing for tax reasons. Second, while the tax announcement generated the shock, the channel through which it reaches household balance sheets is a pricing channel; lenders repriced mortgage products off the swap curve in response to the jump in gilt yields, and it is this discrete change in the rate borrowers face, not the tax proposals, that we exploit for identification. Third, strong market responses and political pressure led to the resignation of Liz Truss as Prime Minister on 25 October 2022, fewer than 50 days after taking office. The most contentious policies of the mini-budget were withdrawn, but gilt yields remained significantly higher than pre-mini-budget levels, and we estimate similar post-event effects for days 61-120 following the announcement.

The mini-budget and its effects were unanticipated, but once the events unfolded they were covered extensively in the news. Figure 1c plots Google searches data for the terms “mini-budget” and “mortgage calculator,” clearly showing the unexpected and salient features of the event. The large spike in searches for mortgage calculator suggests that its impact on mortgage payments was a primary concern for households. Finally, Figure 1d plots the UK daily policy uncertainty index and the average daily values and corresponding confidence intervals for three different periods: pre-mini-budget, the first 60 days after the mini-budget announcement, and the following 60 days (i.e., days 61 to 120 after the announcement). The figure shows that there was a large increase in uncertainty in the 60 days after the mini-budget announcement, but that its average level decreased significantly after that, to levels similar to those pre-event.

⁹The Growth Plan is available at <https://www.gov.uk/government/topical-events/the-growth-plan>.

¹⁰See Bank of England, “Statement from the Governor of the Bank of England,” September 26, 2022, <https://www.bankofengland.co.uk/news/2022/september/statement-from-the-governor-of-the-boe>.

Our approach compares remortgages originated in the 120 days prior to the cutoff date of Monday, September 26, 2022 to those originated in the 120 days after this date.¹¹ Table 1 shows summary statistics for these sub-samples. All continuous variables are winsorized at the 1st and 99th percentile. The average LTV of the remortgaged loan pre-event is around 51%, but there is significant heterogeneity, ranging from 22% for percentile 10 to 75% for percentile 90. These are remortgaged loans originated after a period of house price increases, explaining why we do not observe higher LTVs at the top percentiles. There also is significant heterogeneity in loan-to-income (LTI) ratios, ranging between 1.3 (p10) and 4.3 (p90). The values are generally similar for loans originated post-event.

[Insert Table 1 here]

2.3.2 Identifying pre-offers

A key identification challenge is that some borrowers who remortgaged after the event had already secured pre-event offers, so they completed post-event but faced pre-event interest rates. Offers typically remain valid for 3 months (and possibly longer); the data includes the origination date, but not the date of the offer.¹² We use Moneyfacts data to overcome this challenge and identify pre-offers.

The Moneyfacts data includes information on *all* products on offer by all lenders on each day, including lender identity, product type (2-year fixed, 5-year fixed, etc), initial interest rate, and LTV band for the product (maximum LTV 65, maximum LTV 75, etc). To identify pre-offers, in a first step, we calculate, for the combination of lender, product type and LTV bucket the maximum interest rate among all products on offer in the four weeks prior to the mini-budget announcement.¹³ We focus on this period since interest rates were increasing in the

¹¹The results are not very sensitive to the exact time window chosen, including +/-90 and +/-150 days. Later on we present results where we separate the post-event remortgages in two, 1-60, when uncertainty was higher, and 61-120 days.

¹²Although lenders generally retain the right to withdraw unaccepted offers, they did not do so, likely due to reputational considerations.

¹³There are several different products for each combination of lender, product type and LTV band that differ in the initial product fees and interest rate. The initial product fees typically are between £0 and £999, and information on fees is not always available in the origination data (Benetton et al., 2025).

weeks leading to the event, so that the maximum rates on offer during this period will represent an upper bound for the interest rate on offers received before the mini-budget announcement.

The event triggered very large interest rate rises. This means that for the products on offer after the event, the maximum interest rate pre-event (for the combination of lender, product type and LTV bucket) is almost always lower than the minimum interest rate for products on offer after the event (again for the same combination of lender, product type and LTV bucket). This, together with the interest rate on the loans originated post-event by different lenders, allows us to separate pre- and post-event offers.¹⁴

Figure 2a plots the average weekly origination interest rates on 2- and 5-year products, separating post-event originations into pre- and post-offers. The figure confirms the validity of our strategy for identifying pre-offers and the large quantitative impact of the mini-budget announcement on mortgage rates, an average increase of almost 200 basis points.¹⁵

[Insert Figure 2 here]

Figure 2b plots the share of 2-year and 5-year fixed rate loans originated in each week, separating by pre- and post-offer. Most of those who refinanced in the first few weeks after the mini-budget announcement did so using pre-offers. This is not surprising for two reasons. First, inflation and interest rates were already rising prior to the event, which may have led borrowers to request offers sooner. Second, the event triggered a significant decline in the number of mortgages on offer, which may have led to a delay in the remortgaging by those without an offer. However, as time passes, the share of pre-offers declines. Both of these may give rise to selection, an identification challenge that we try to address in our empirical analysis.

2.3.3 Empirical methodology

We have three groups of borrowers whose loans we compare. First, borrowers with pre-event offers who remortgaged before the event. Second, those with pre-event offers (and interest

¹⁴There are a few exceptions for loans offered by small specialist lenders for whom the maximum interest rate pre-event is higher than the lowest interest rate post-event. For borrowers remortgaging with these lenders post-event, we cannot tell whether their offer is pre- or post-event (roughly 8 thousand 2-year loans and 10 thousand 5-year loans). We remove them from the sample.

¹⁵The average interest rates in Figure 2a are lower than those in Figure 1b since the latter are calculated as an average across all products on offer in the market, including products with high LTVs. The remortgaged loans tend to have lower LTVs.

rates) who accepted the offer only after the event. Finally, those with post-event offers and interest rates.

Just to fix ideas, assume, unrealistically, that borrowers choose how far in advance of their discounted-rate expiry to request a mortgage offer at random, and that this timing is unrelated to their refinancing needs or other borrowing decisions.¹⁶ Under this assumption, borrowers refinancing after the event with pre-event offers would be comparable to those refinancing after the event with post-event offers, except for their exposure to the interest-rate shock. Comparing these groups would therefore identify the treatment effect of the shock on loan outcomes.¹⁷

We say unrealistically because, although the event was unanticipated, borrower selection may be present: borrowers with pre-offers could differ systematically from those without. The process for requesting an offer from the current lender is straightforward and can be done online at the click of a button, provided that there are no changes in loan terms (e.g., increases in loan amount). In spite of this, borrowers must still take action and request the offer, and some may do so earlier than others.¹⁸ Table 2 shows summary statistics separately for 2-year and 5-year products, and for pre-event and post-event borrowers with and without pre-offers. For both fixation periods, higher-income and joint borrowers are more likely to secure pre-offers, indicating a stronger propensity to plan ahead. These patterns hold at the mean, but also throughout the distribution. In the analysis that follows we use several approaches to try to separate treatment from selection effects.

[Insert Table 2 here]

To examine the effects of the event on mortgage refinancing outcomes, we estimate:

$$\text{Outcome}_{it} = \alpha + \beta_{\text{Post, Pre-offer}} \times \text{Post}_{it} \times \text{Pre-offer}_{it} + \beta_{\text{Post, Post-offer}} \times \text{Post}_{it} \times \text{Post-offer}_{it} + \gamma X_{it} + \epsilon_{it} \quad (1)$$

where Outcome_{it} refers to the outcome variable of interest for loan i remortgaged in day t . Post_{it} is a dummy variable equal to one for remortgages that take place after the event and Pre-offer_{it}

¹⁶Recall that the date of expiry of the discounted rate on the previous loan was set several years in advance.

¹⁷A potential confounding effect is if borrowers with pre-offers shop around and secure another offer after the event which they take. We think that this is very unlikely since the post-event offer would be at a much higher interest rate than the existing one.

¹⁸The literature on inaction in household finance shows that inaction is often related meaningfully to borrower characteristics (Andersen et al., 2020; Belgibayeva et al., 2026).

(Post-offer_{it}) is a dummy variable equal to one for pre-event (post-event) offers. The estimated α gives us the average value for those who remortgage prior to the event, $(\alpha + \beta_{\text{Post, Pre-offer}})$ is the value for those who remortgage after the event with a pre-offer, and $(\alpha + \beta_{\text{Post, Post-offer}})$ is the value for those remortgaging post with a post-offer. The vector X_{it} includes controls for borrower and other characteristics (e.g., local area fixed effects), allowing us to control for selection. Finally, ϵ_{it} is the residual.

In our analysis, the event window is +/-120 days, but the results are not sensitive to considering shorter (+/-60 days) or longer (+/-150 days) windows. Below we also consider other approaches to selection, including a matched sample and, for a subset of the mortgages, a panel data approach that measures within-borrower differences and in this way tries to control for selection on unobservables (e.g., preferences).

3 Effects of the interest rate shock

This section studies mortgage refinancing outcomes around the event along several dimensions, including interest rate fixation period, lender switches and leverage.

3.1 Baseline estimates

We estimate Equation (1) for several outcome variables. In the regressions, each loan corresponds to one observation which is the level at which coefficients are estimated; in the background of the figures, we plot weekly averages of the variables of interest for each of the groups. The standard errors are clustered at the daily frequency. We first show regression results without additional controls, whose estimated coefficients show the combined effects of treatment and selection. Afterwards, we use several approaches to separate the two.

3.1.1 Fixation term

The first row of Table 3 shows the results for the dummy variable for 5-year interest rate fixation period. In columns (1), (2) and (5) we report the estimated coefficients without any controls. More precisely, column (1) shows the estimated pre-period level, column (2) the change relative to this pre-period level for the post-period/pre-offer group, and column (5) the change for the post-period/post-offer group, again relative to the pre-period level. Column (8) reports the

number of observations and adjusted R-squared of the regression.

[Insert Table 3 here]

To facilitate visualization, Figure 3 plots the estimates and in the background the weekly averages of the variables of interest for each of the groups. There are several interesting patterns. First, for pre-offer loans, we observe a heightened probability of selecting a 5-year mortgage following the mini-budget announcement, increasing from 64% to 69%. This reflects borrower selection, namely that those borrowers looking to remortgage into a 5-year product are more likely to have secured an early remortgaging offer.

[Insert Figure 3 here]

Second, we find that borrowers with post-mini-budget offers are significantly less likely to select a 5-year fixed rate mortgage compared to the pre-announcement average (the difference is roughly 11 percentage points). Therefore, the large increase in rates triggered a shift towards products with shorter fixation terms.

The estimates without any controls capture treatment and selection. High income and joint borrowers are more likely to have secured a pre-offer. In addition, they are likely to live in areas with higher house prices. To control for these selection effects, we estimate Equation (1) controlling for borrower characteristics (income, joint mortgage status, age, dependent children) and local authority fixed effects (by including these variables in X_{it}).¹⁹ These local authority fixed effects capture, for instance, differences in local house price levels and local employment opportunities. In columns (3), (6) and (9) of Table 3 we report the results when we control for borrower characteristics and local area fixed effects. And in columns (4), (7) and (10) we expand the set of control variables to include lender fixed effects.²⁰ The estimated post-event changes are fairly insensitive to the inclusion of controls, even though the controls help to

¹⁹England and Wales together have approximately 340 local authorities, which represent a geographic area of government through which many local governmental services are managed.

²⁰Lender fixed effects may matter for several reasons, the most important being that lenders differ in the pricing of their products, providing differential incentives for borrowers to switch lenders at the time of remortgaging.

explain outcomes, as measured by the increases in R-squared shown in columns (8) through (10).²¹

Thus, the interest rate shock led to a shift towards 2-year products, in spite of them becoming more expensive than 5-year ones (Figures 1b and 2a) and offering less protection against the risk of future rate rises.²² In light of this evidence, the natural question is why borrowers are opting for products that are both more expensive and offer less protection against interest rate risk. A possible reason, which we investigate in Section 4 below, is that at times of higher interest rates borrowers value the greater flexibility of products with shorter fixation periods.

3.1.2 Lender switches

During the global financial crisis many US borrowers were underwater which prevented them from refinancing and taking advantage of lower interest rates, leading to government interventions (Agarwal et al., 2023). Income shocks such as unemployment may also prevent borrowers from refinancing (DeFusco and Mondragon, 2020). Our setting is different along several important dimensions, but at the same time it can provide valuable evidence on the role of refinancing frictions and how they impact borrowers.

The event took place after a period of rising house prices, so that most borrowers in our sample have accumulated substantial amounts of home equity, meaning that LTV constraints are not binding. Second, the setting is one of an interest rate increase. US borrowers might not want to refinance in such a scenario (Fonseca and Liu, 2024), but UK borrowers revert to a higher variable rate if they do not do so. Refinancing with the same lender without equity extraction does not require an affordability assessment, but switching lenders does. Therefore, the comparison of the extent of lender switching before and after the event may provide a measure of its effects on refinancing frictions, and in particular on borrowers' ability to pass the affordability assessment at the higher interest rates.

Panel B of Table 3 shows estimates of Equation (1) with an indicator for same lender (internal) refinance as the outcome variable, distinguishing between borrowers in 2- and 5-

²¹Appendix B and Table A1 report the estimated coefficients on the control variables, which tell us about the relation between borrower characteristics and remortgaging outcomes. Older borrowers who may be less likely to move tend to choose longer fixation periods.

²²In addition, this shift towards 2-year fixation periods occurs despite a slower recovery in the supply of these products (Figure 1b).

year fixed rate products. As before, columns (1), (2), and (3) show the estimated coefficients without any controls, plotted in Figures 4a and 4b. Following the mini-budget, post-offer holders choosing 2-year fixation terms are 17 percentage points more likely to refinance with the same lender, a significant increase from the pre-event value of 70 percent. The difference is both economically and statistically significant.²³

[Insert Figure 4 here]

The remaining columns of Panel B of Table 3 show that the inclusion of controls impacts the estimates for the probability of a lender switch: the estimated post-event/post-offer changes in probabilities are roughly one third lower when we include all the controls (column (7)) compared to the base estimates (column (5)). The effects are also attenuated when considering 5 year fixation period mortgages, with an increase relative to pre-event level that is economically meaningful but not always statistically significant.

The impact of the controls on the magnitude of the estimated coefficients is due to selection on pre-offers. In Appendix B, we report the estimated coefficients on the control variables, which show that lower income borrowers and those without a joint borrower are more likely to remortgage with the same lender. Switching lenders (external remortgage) requires that borrowers pass an affordability assessment. Those with higher income and a joint borrower are in a better position to do so. Finally, controlling for income and joint borrower, older individuals are less likely to switch lenders when remortgaging.

In spite of selection accounting for roughly one-third of the total effect, we still estimate statistically significant and economically meaningful post-event/post-offer changes for 2-year products. These results have implications for mortgage market competition. At times of interest rate rises it may be more difficult for borrowers to pass affordability assessments as a result of the higher required mortgage payments, meaning that incumbent lenders may have some captive borrowers.

²³Figures 4a and 4b show patterns in the weekly averages of the proportion of same-lender refinances, with higher averages in particular weeks. This is due to the way in which internal refinances take place, with the refinanced products having a certain future year/month end of fixation period date, and groups of borrowers moved to the product at certain dates within the month.

3.1.3 Leverage

The question of how consumers respond to interest rates is central in economics, and several papers in the literature have used different approaches to estimate the coefficient of inter-temporal substitution.²⁴ Relatedly, [DeFusco and Paciorek \(2017\)](#) exploit the degree of bunching in response to a discrete jump in interest rates at the conforming loan limit to estimate the interest rate elasticity of mortgage demand among US borrowers. Our event can be used to estimate the response of mortgage debt to interest rates.

Table 4, Panel A shows estimates for the logarithm of loan amount, in a similar format to the one before. Column (5) shows that for post-offer holders, there are very significant declines of 12% and 27% in average loan size for 2-year and 5-year products, respectively. These are very large estimates, but as the results in columns (6) and (7) show, they are partly the result of borrower selection. Once we control for it, albeit still large, the declines become significantly smaller, and equal to 3.7% and 8.7%, respectively. Given the size of the shock, these estimates imply that a 1 percentage point increase in interest rates reduces mortgage demand by 1.9% (4.4%).

[Insert Table 4 here]

Panel B of Table 4 show results for leverage using LTV as the outcome variable. And Figure 4, panels (c) and (d) plot coefficient estimates and weekly averages of LTV for 2-year and 5-year fixation periods, respectively, for the regressions without controls. In the pre-event period, the average LTV of the remortgaged loans is slightly higher for 2-year than 5-year products, but around 50% for both. For post offer holders, the deleveraging that takes place corresponds to roughly 3.4% (4.3%) of property value for 2-year (5-year) products. Given the interest rate rise of 2 percentage points, it implies a significant LTV reduction of roughly 1.7 (2.1) percentage points per 1 percentage point increase in interest rates. When we add controls to the regressions (column (7)), the deleveraging is still significant and equal to 2.4% (2.8%) of property value, or 1.2 (1.4) percentage points per 1 percentage point rate rise.²⁵ These estimates provide a

²⁴See for example a review in [Attanasio and Weber \(2010\)](#) and references therein. [Best et al. \(2020\)](#) use UK mortgage market data to measure the coefficient of inter-temporal substitution.

²⁵The deleveraging could be due to the higher cost of borrowing or a stronger precautionary savings motive due to the uncertainty triggered by the event. In Section 3.2 we investigate this. It is also interesting to note that, for the explanatory power of the leverage regressions, borrower characteristics and local authority fixed

direct measure of the household balance-sheet response to borrowing costs, a key margin in the transmission of monetary policy.

3.1.4 Robustness to a narrower window

Appendix Table A2 shows that the results in this section are robust to performing the estimation on data for a narrower 60 day window before and after the event, with an exception: the estimated coefficients for fixation term in Δ Post-period, Pre-offer are not significantly different from zero (Panel A, columns (2) to (4)). In other words, the likelihood that borrowers choose a 5-year mortgage is similar for those remortgaging in the pre-period and those remortgaging in the post-period with a pre-offer. This suggests that the estimated positive coefficients in columns (2)-(4) of Panel A of Table 3 are due to differences in the timing of the offers received by borrowers in each of the groups. For a narrower origination window, such differences are likely reduced.

3.2 Uncertainty

The event was characterized by significant economic uncertainty. This raises the question of whether the previously estimated effects were due to the increase in interest rates or to higher uncertainty. With this in mind, we estimate a regression similar to Equation (1) but letting the estimated coefficients on post-offers depend on whether the loan was originated in post-event days 1-60 when uncertainty was high or in post-event days 61-120 when it returned to more normal levels (as shown in Figure 1d):

$$\text{Outcome}_{it} = \alpha + \beta_{\text{Post, Pre-offer}} \times \text{Post}_{it} \times \text{Pre-offer}_{it} + \beta_{\text{Post, Post-offer}}^{1-60} \times \text{Post}_{it}^{1-60} \times \text{Post-offer}_{it} + \beta_{\text{Post, Post-offer}}^{61-120} \times \text{Post}_{it}^{61-120} \times \text{Post-offer}_{it} + \gamma X_{it} + \epsilon_{it} \quad (2)$$

where for instance Post_{it}^{1-60} is a dummy variable that takes the value of one for loans originated in days 1 to 60 after the event. As before the vector X_{it} includes borrower characteristics, local area and lender fixed effects.

Table 5 shows the estimated coefficients for specifications with all the controls. The effects are broadly similar in both post sub-periods, compared to the pre-event remortgages: there is a shift towards 2-year fixed rate products, borrowers are more likely to remortgage with the effects are much more important than lender fixed effects.

same lender, and they are more likely to deleverage. In terms of the magnitudes, the increase in the likelihood of remortgaging with the same lender and the deleveraging that takes place are both larger in the 1-60 days period compared to the 61-120 days period when uncertainty was lower. This is consistent with a stronger precautionary savings motive in the face of heightened uncertainty.

[Insert Table 5 here]

The interest rate shock was the result of the announcement of large unfunded tax cuts. Therefore, one potential identification concern is that the estimated mortgage effects were the result of an expected decline in taxes and not the increase in interest rates. Most of the policies of unfunded tax cuts were reversed within a month of their announcement, which combined with the estimates in this section, alleviates this concern. If households were responding to anticipated tax savings rather than to mortgage rates, we would expect the estimated effects to fade once those policies were withdrawn, whereas we find effects of similar magnitude in the 61-120 day window, after the reversal, as in the first 60 days. This is further evidence that, whatever its fiscal origins, the mini-budget operated on household mortgage decisions through the interest rate channel.

3.3 Other approaches to selection

In this section, we report the results of other approaches to dealing with selection, namely constructing a matched sample and estimating within borrower changes.

3.3.1 Matched sample

Our second method to separate selection from treatment uses a matched sample. We split the data into mortgages *originated* in the pre- and in the post-event period, without distinguishing the post-event originations between pre- and post-offers. For each observation in the post-event data, the script finds the best match from the pre-event data, adds a matched flag, and appends the matched pairs to a new dataset. The match is performed with no replacement, ensuring each row in the pre- or post- data is uniquely matched. The best match is determined by finding the observation with the smallest difference in income among those borrowers who share the

same lender, live in the same location (local authority), who have the same joint borrower status, and are in the same age bracket.

The matching yields for each post-event borrower, both with and without pre-offers, a similar pre-event one. Some of these post-event borrowers, meaning they remortgaged after the event, have pre-offers and others do not. We form two groups: (i) those remortgaging after the event with pre-offers and matched pre-event borrowers (the control group); and (ii) those remortgaging after the event without pre-offers and therefore impacted by the interest rate shock and matched pre-event borrowers (the treated group). We construct a dummy variable, $Treated_{it}$, that takes the value of 1 for borrowers in the treated group (and zero for those in the control group). In addition, we construct a $Post_{it}$ indicator that takes the value of one for mortgages originated after the event date and zero otherwise.

We estimate a regression comparing mortgage outcomes for the treated group relative to the control group:

$$Outcome_{it} = \alpha + \beta^T \times Treated_{it} + \beta_{Post}^T \times Treated_{it} \times Post_{it} + \delta_t + \gamma X_{it} + \epsilon_{it}, \quad (3)$$

where i denotes the loan, t the origination day, and ϵ_{it} the residual. The time fixed effects (δ_t) are dummies for non-overlapping 30-day periods covered by our sample. The vector X_{it} includes controls for log income, joint-borrower status, age group indicators, and local authority and lender fixed effects. The coefficient of interest is β_{Post}^T which captures the average change in the post-period for treated borrowers relative to the control group and relative to the pre-period. The standard errors are clustered at the daily frequency.

We also estimate a corresponding event-study specification:

$$\begin{aligned} Outcome_{it} = & \alpha + \beta^T \times Treated_{it} + \sum_{k \in \{-3, -2, -1, +1, +2, +3, +4\}} \beta_k \times D_k \\ & + \sum_{k \in \{-3, -2, -1, +1, +2, +3, +4\}} \beta_k^T \times Treated_{it} \times D_k + \gamma X_{it} + \epsilon_{it}, \end{aligned} \quad (4)$$

where we estimate separate coefficients for non-overlapping 30-day periods before and after the event, with the 30 days immediately prior to the event as base period ($k = 0$). The indicator variables D_k are dummy variables that take the value of 1 for loans originated in each of these 30-day periods (and zero otherwise). The coefficients of interest are β_k^T which show how mortgage outcomes evolve in event time for borrowers in the treated group relative to those in the control group. As before, we cluster standard errors at the daily frequency.

Table 6 shows the estimated β_{Post}^T coefficients in Equation (3). Column (1) shows that treated borrowers are 15.7 pp less likely to choose a 5-year fixed rate product after the event. Columns (2) and (3) show that treated borrowers become significantly more likely to remortgage with the same lender: the effect is 7.7 pp for 2-year and 12.2 pp for 5-year mortgages. Columns (4) and (5) report LTV results. For 5-year borrowers, the average post-event reduction in LTV is 2.8 pp, revealing significant deleveraging. For 2-year borrowers, the LTV effect is small and not significantly different from zero. The previous estimates, in Figures 4c and 4d, also showed much stronger deleveraging for borrowers in 5-year than in 2-year loans.

[Insert Table 6 here]

Figure 5a plots the estimated β_k^T coefficients and corresponding confidence intervals for the event study specification (Equation 4) and for the indicator for 5-year fixation term as dependent variable. The pre-event estimated coefficients are not different from zero. However, we find, post-event and compared to the control group, a sizable reduction in the likelihood of borrowers in the treated group selecting a 5-year fixed-rate mortgage.

[Insert Figure 5 here]

Figures 5b and 5c show the estimates for LTV as dependent variable, for 2- and 5-year loans, respectively. There are no pre-trends and as before the estimates show significant deleveraging, post-event, for treated borrowers in 5-year loans. Finally, Appendix Figure A1 shows the estimates for same lender refinances as dependent variable, which become more likely for treated borrowers post-event, but when estimated separately for each 30-day period the coefficients are for the most part not significantly different from zero.

Overall, the results in this section confirm the previous results of a significant shift towards products with shorter fixation period, a higher incidence of same lender refinances, and deleveraging in response to the interest rate shock.

3.3.2 Panel data

The previous analysis deals with selection on observables. But unobservable individual characteristics could also play a role, which we try to address using panel data. For those remortgages originated in the event window around the mini-budget announcement, we use the origination

data to try to identify the previous loan (either for property acquisition or remortgage) taken by the same borrower. More precisely, we search in the data for a previous mortgage for the same combination of property postcode and date of birth of the main borrower. In the UK, a typical property postcode comprises only 15 properties which together with a birth date makes our match quite precise, and we are able to identify previous loans taken by the same borrower even if those were from a different lender.

A shortcoming is that we are not always able to identify the previous loan taken by the same borrower. Not all internal remortgages are recorded in the data prior to April 2021, so that the sample of loans for which we can identify the previous loan is a selected one, in which the previous loan typically involved a house purchase, equity extraction, or was an external remortgage. It is also possible that a previous internal remortgage was not recorded in the data and we miss it, but that in our search for the previous loan we are able to match it to an older loan to the same borrower. To minimize the risk of this latter issue, in matching to previous loans of the same borrower, we keep only previous loans for which we are reasonably confident that it is indeed the most recent previous loan. More precisely, we keep previous loans that were taken at most 3 (6) years prior to the event date when that previous loan was a 2-year (5-year) fixed-rate loan.

In Panel A of Table 7, we estimate Equation (1) for borrowers remortgaging pre- and post-event, with the indicator variable for 5-year fixed rate as outcome, distinguishing between cases in which the *same* borrowers previously took a 2-year and 5-year fixed rate loan (first and second rows). Column (1) shows that borrowers remortgaging pre-event were less likely to opt for a 5-year fixed-rate loan if they had previously taken a 2-year loan (0.54) than if they had previously taken a 5-year one (0.79). Column (2) shows that those remortgaging post-period with pre-offers were more likely to choose 5-year fixes, but the probability of such a choice decreased considerably, by roughly 10-12 percentage points, among those remortgaging post-period with post-offers (column 3). The shift to 2-year fixed also occurs among those previously taking a 5-year loan.

[Insert Table 7 here]

Panel B of Table 7 shows the results for the likelihood of remortgaging with the same lender, conditional on a lender switch for the previous loan. We condition on a lender switch for the previous loan due to the data limitation mentioned above, that the previous loans

that we observe are more likely to be external remortgages. Column (1) shows that pre-event the probability of remortgaging with the same lender is higher among those selecting 2-year products (0.744) than among those selecting 5-year products (0.630). For those remortgaging post-event, with post-offers, the probability of staying with the same lender increases by 0.14 and 0.12 for 2-year and 5-year, respectively, as shown in column (3).

Panel C of Table 7 shows the results for LTV, conditional on the borrower having extracted equity in the previous loan. The reason why we condition on previous equity extraction is again the data limitation that we are more likely to observe previous external remortgages and those involving equity extraction. The negative and statistically significant estimated coefficients for the post-period/post-offer group (column 3) show that the post-event deleveraging also takes place among those who have previously extracted equity.

3.4 Loans on offer

The previous sections showed results for mortgage outcomes. It is important to keep in mind that they are equilibrium outcomes, resulting from the decisions of lenders of which loans to offer and at what terms (supply) and borrowers' choices (demand). For instance, the shift that we estimated towards products with shorter fixation could also be due to a lender preference for such loans. While isolating the supply and demand effects is challenging, in this section we use Moneyfacts data to shed some light on this. Recall that it includes information on all loans *on offer* in the market on each day.

Focusing first on number of products on offer, Figure 1b shows that the event triggered a large decline in both 2-year and 5-year loans. However, as the figure shows, after the initial shock, the number of 5-year loans recovered faster than the number of 2-year ones, possibly indicating a lenders' preference for the former. Stronger evidence can be obtained from their pricing. For each 2-year and 5-year loan on offer on each day, we calculate the difference between the loan interest rate and swap rate for the corresponding maturity (2- or 5-year). Lenders use swaps to hedge interest rate risk, and price loans with reference to swaps. We then regress this premium on weekly dummies, maximum product LTV dummies and lender fixed effects.

Figure 6 plots the estimated coefficients on the weekly dummies showing how loan premia changed over time, and the corresponding confidence intervals (which are narrow and barely visible). Prior to the event, the premium on 5-year products was higher than that on 2-year ones, showing that lenders required greater compensation to lend at rates that are fixed for

longer.

[Insert Figure 6 here]

The event triggered large increases in swap rates, and corresponding decreases in premia in the week after. Subsequently, as lenders repriced the mortgages, their premia increased. But interestingly, while prior to the event 5-year loans carried a higher premium, this changed in the weeks after the event, with 2-year loans having a higher premium. The lower premium of 5-year products indicates a lender preference for loans with a longer period of interest rate fixation, but it could also be due to imperfect competition and lenders' ability to exploit the increased demand for 2-year products. In either case, the evidence on loans on offer and on premia suggests that the shift towards shorter fixation is more likely to be driven by borrowers' choices than lender preferences.

4 Flexibility

Longer fixed-rate periods provide greater protection against interest-rate increases but, because the term structure is typically upward-sloping, they are usually more expensive. By contrast, shorter fixed-rate terms reduce initial payments—valuable for borrowers facing binding liquidity constraints—even though they entail higher interest-rate risk.²⁶ However, in our event window two-year rates were higher than five-year rates. Thus, products with shorter fixed-rate periods offered not only less protection against rising rates but were also more expensive. This poses a question: why did borrowers shift toward the more expensive, shorter fixes? A natural alternative would be to refinance into an adjustable-rate mortgage, which was typically cheaper. The fact that most borrowers instead chose the more expensive 2-year fix suggests the mechanism is not simply rate-cut expectations, but a bundle of near-term flexibility plus insulation from immediate rate risk. In this section, we first show that two-year products are more flexible—because terms can be adjusted or refinanced sooner and at lower cost—and then examine the determinants of the demand for flexibility.

Borrowers may value product flexibility for several reasons. First, if they expect interest rates to fall, a shorter fixed-rate period allows them to refinance sooner and benefit from lower rates, albeit with greater exposure to subsequent rate increases. Second, borrowers who

²⁶See, for instance, [Cocco \(2013\)](#); [Ehrmann and Ziegelmeyer \(2017\)](#); [Piskorski and Tchistyi \(2010\)](#).

anticipate moving home in the near term may prefer flexibility, since the loan may need to be redeemed (terminated) at that point.²⁷ Third, borrowers who expect to release equity or reduce principal in the near term may prefer shorter fixed-rate periods, which typically allow such changes at lower cost. We evaluate the importance of these reasons, and frame our findings in the context of the trade-off between interest rate insurance and loan flexibility. Before doing so, we quantify prepayment penalties.

4.1 Prepayment penalties

In the UK, most fixed-rate mortgages carry prepayment penalties (commonly known as early repayment charges, or ERCs) during the initial fixed-rate period, but not thereafter. ERCs measure the cost to borrowers of refinancing or otherwise changing loan terms.²⁸ Table 8, using Moneyfacts data, quantifies these costs as a percentage of the outstanding loan balance. Panel A (Panel B) presents results for two-year (five-year) fixed-rate products, where the different columns refer to the age of the loan measured in years since origination.

[Insert Table 8 here]

Prepayment penalties are substantial during the fixed-rate period. For five-year products, charges are particularly high in the first two years since origination, with median values of 5% and 4%, respectively—well above typical U.S. refinancing costs for fixed-rate mortgages (Berger et al., 2021; Chen et al., 2020). Five-year products are also less flexible because these charges apply for a longer duration. (We return to Panel C of Table 8 below.)

²⁷We use may because, if mortgages are portable—that is, transferable to a new property—choosing a longer fixed-rate period does not necessarily entail significant charges when moving home. Although UK mortgages are portable in principle, porting is often difficult in practice: applications require a new property valuation and full re-underwriting, and borrowers must re-qualify under current affordability and credit criteria. Although detailed data on porting is not available, the responses to the 2017 and 2020 FCA Financial Lives Survey suggest that among home movers, only approximately 20% bring their previous mortgage contracts to their new homes (Financial Conduct Authority, 2017, 2020).

²⁸Loans also carry up-front (“product”) fees, but these are smaller than in the United States—typically between £0 and £1,000.

4.2 Interest rate expectations

Borrowers’ expectations about future mortgage rates likely influence product choice.²⁹ Following the event—and the sharp interest-rate rise it precipitated—some borrowers may expect rates to fall. Those anticipating declines will prefer shorter fixed-rate terms, which enable earlier repricing to capture lower rates.³⁰ Importantly, for this channel to operate, borrower expectations must deviate from market-implied expectations, since lenders price fixed-rate mortgages off the swap curve.

Figure 7a plots the market-implied expectations (yellow) and actual (black) Bank of England base rate over time. Each of the yellow lines corresponds to a different quarter, when the expectations were calculated.³¹ The event took place at the end of 2022Q3. Prior to the event, markets anticipated a further increase in the policy rate followed by a gradual decline. After the event, the realized path rose substantially above prior expectations, underscoring the event’s magnitude and unexpected nature. In 2022Q4, markets expected a near term increase in interest rates to roughly 5%, and a subsequent moderate decline. These expectations were revised down in 2023Q1, as indicated by a downward shift of the 2023Q1 curve relative to the preceding quarter. Market expectations of an interest rate decline partly explain why 5-year products priced below 2-year ones.

[Insert Figure 7 here]

Unfortunately, household-level interest-rate expectations for the UK are unavailable, so we cannot compare them directly with market expectations. Instead, we observe two- and five-year-ahead inflation expectations from the Bank of England’s Household Survey. Figure 7b plots quarterly means with confidence intervals. In 2022Q4—the quarter after the event—the two-year-ahead average is slightly higher than the five-year-ahead average, but the difference is not statistically significant. Both measures decline significantly in 2023Q1 relative to the

²⁹See, for instance, the evidence in Devine et al. (2023), obtained from a survey.

³⁰This argument is about the base rate. Liu (2023) shows that shorter contracts enable borrowers to refinance into lower credit spreads as amortization and house-price growth reduce LTV ratios. This channel is most relevant for high-LTV borrowers. In our refinancing sample, the average remortgage LTV is around 50% (percentile 90 is around 75%), a range in which credit spreads do not differ materially across LTV buckets.

³¹The expectations are calculated daily, using financial markets (derivatives) data, and then averaged over the quarter. Source: <https://obr.uk/frs/fiscal-risks-and-sustainability-july-2023/>.

previous quarter, a shift that could influence mortgage choices, if lower inflation expectations imply lower expected interest rates. This decline in inflation expectations is consistent with the contemporaneous reduction in market-implied interest rate expectations.

In the absence of household level data on interest rate expectations, we examine the likelihood that borrowers refinance into an adjustable-rate mortgage (ARM) around the announcement, as this choice is informative about expectations of future interest rates. If borrowers anticipate declines, they may avoid fixed-rate loans to prevent locking in elevated rates.³²

4.2.1 Adjustable-rate loans

Panel (a) of Figure 8 plots the weekly count and share of ARMs in total refinancing. The ARM share was fairly stable at about 5% before the event, then rose steadily to over 15% by the end of the sample—a pattern consistent with borrowers expecting rates to fall. Panel (a) further shows that the post-event increase is driven almost entirely by tracker mortgages—products that track the Bank of England base rate—which were also the predominant ARM type prior to the event.³³

[Insert Figure 8 here]

Panel (b) plots weekly average initial rates for 2-year fixed, 5-year fixed, and 2-year tracker mortgages. We use Moneyfacts data to calculate the averages, so that they reflect the interest rate on the loans on offer, not necessarily those taken by borrowers. The Bank of England base rate is shown in the same figure. Following the event, five-year fixes became, on average, cheaper than two-year fixes, while trackers were the cheapest products overall. The choices of borrowers who opt for tracker mortgages are consistent with the expectation that interest rates will either fall or not rise to the levels of the fixed rate loans, and borrowers being willing to accept the cash-flow risk that comes with such loans.

To shed light on who these borrowers are, Table 9 reports summary statistics for ARM borrowers, separately for the pre- and post-event periods. Relative to the results in Table 1, ARM borrowers take out larger loans but also purchase more expensive homes and report higher

³²Our earlier analysis focused exclusively on 2- and 5-year fixed-rate loans, which accounted for well over 90% of originations prior to the mini-budget announcement.

³³Tracker mortgages include an introductory period—typically two years—during which the margin over the reference rate is lower than in the subsequent period.

incomes. Consequently, their LTV and LTI ratios are lower than those of fixed-rate borrowers, suggesting they may be better positioned to bear the cash-flow risk associated with ARMs.

Borrowers who expect rates to fall should prefer floating-rate loans. Moreover, as Panel (c) of Table 8 shows, tracker mortgages carry lower prepayment penalties than fixed-rate loans, implying greater flexibility. Nevertheless, despite the growing prominence of trackers, more than four-fifths of borrowers still choose the more expensive fixed-rate products. This suggests that, while interest-rate expectations matter, other forces—such as aversion to rate risk—also shape choices. And because ARMs offer the greatest immediate flexibility at the lowest cost, the strong preference for two-year fixes indicates a preference for rate protection combined with *near-term flexibility* rather than immediate flexibility.

4.3 Borrowers’ use of contractual flexibility

In this section, we analyze refinancing outcomes to study heterogeneity in borrowers’ use of contractual flexibility under 2-year versus 5-year fixed-rate mortgages, and to identify its underlying drivers. We conduct the analysis across multiple borrower cohorts, including loans originated before the event window, which allows us to observe outcomes over a longer post-origination horizon. Our primary dataset is the Mortgage Performance Sales Data (PSD007), available from January 2015 through June 30, 2023. We focus on 2- and 5-year fixed-rate loans, which accounted for roughly 90% of originations.

4.3.1 Methodology

Twice yearly—on 30 June and 31 December—all lenders must submit loan-level data on the mortgages in their books to the regulator. The reporting includes the account-opening date, current outstanding loan amount, product type (e.g., 2-year fixed), the end date of the initial discounted-rate period, property postcode, the main borrower’s date of birth, among others. The account-opening date refers to the borrower’s initial loan with the lender. For borrowers who subsequently refinance with the same lender (internal remortgage), the account-opening date remains unchanged, while the record is updated to reflect the revised loan terms.

We define cohorts of borrowers based on “new accounts” (new borrowers in a newly acquired property) of 2-year and 5-year fixed-rate loans in each semester. We identify new accounts using the combination of the main borrower’s date of birth and property postcode. Because

a typical UK postcode covers roughly 15 addresses, this pairing provides a precise identifier in our data.³⁴ Our first cohort comprises 315,653 new accounts originated in 2015 H1; the second cohort consists of accounts opened in 2015 H2, and so on for subsequent cohorts. We track all cohorts through 30 June 2023. We study whether borrowers in 2-year loans make use of loan flexibility differently than those in 5-year loans, and the reasons for the use of the flexibility. We conduct a survival analysis using Kaplan-Meier estimation (Kaplan and Meier, 1958), considering different outcomes as termination events.

4.3.2 House move

Borrowers may prefer more flexible loans, with lower prepayment penalties, because they are more likely to move houses in the near future. Accordingly, the first reason for loan termination that we evaluate is a house move. For each cohort and each half-year after origination, we classify accounts as still open if, in the combined portfolios of *all* lenders, we still observe a mortgage linked to the same main borrower’s date of birth and property postcode. Under this definition, a remortgage—whether a product transfer with the original lender or a switch to a different lender—without a house move is not treated as a termination event.³⁵ Note that, although we initially restrict the sample to 2- and 5-year loans, we subsequently search across *all* mortgage types in the portfolios of *all* lenders for the postcode–date-of-birth combination.

Figure 9a shows the cumulative estimated probabilities of termination (account closure) for the 2015H1 cohort. In addition to point estimates, the figure shows confidence intervals at each reporting date, but these are narrow and not clearly visible. 2-year loans are much more likely to be terminated than 5-year ones, with the gap widening around five semesters after origination—coinciding with the end of the two-year fixed-rate period, after which prepayment penalties no longer apply for the 2-year loans. At this time, the estimated cumulative probabilities of loan termination are 0.176 (0.055) for 2-year (5-year) products. This provides direct evidence that borrowers choosing shorter fixes are more likely to move home (or fully redeem) sooner after origination.

³⁴PSD007 excludes buy-to-let mortgages; investor purchases are therefore outside our analysis.

³⁵In this analysis, the most likely reason for the account to be closed is a house move (the property postcode changes). However, the account will also be closed (without a house move) if the loan is fully repaid (the loan disappears from the portfolio of *all* lenders) or the main borrower changes (the date of birth changes). Although the latter do not imply a house move, they still reflect reasons why borrowers may value flexibility.

[Insert Figure 9 here]

Interestingly, the difference in the probabilities of a house move narrows 10 semesters after origination, when prepayment penalties no longer apply to the 5-year products. Our findings show the importance of future moving probability as a determinant of the fixed-rate period choice households make. They are consistent with the US literature on the role of moving risk in mortgage choice (see [Brueckner and Follain, 1988](#), and [Stanton and Wallace, 1998](#), among others).

4.3.3 Equity extraction

The event triggered a rise in interest rates and deleveraging. Borrowers may value the flexibility of two-year fixes for future equity extraction if conditions change and rates decline. We extend the analysis by broadening the definition of a termination event: in addition to house moves, we classify as terminations those cases in which the same postcode–date-of-birth pair remains in the data but the outstanding balance increases relative to the previous reporting date (previous semester), either in a loan with the same or a different lender. This captures borrowers who do not move but refinance to extract equity. The fact that we observe the universe of loans across all lenders, combined with the fine granularity of UK postcodes, permits a level of precision for this analysis that is often not achievable.

Figure 9b reports estimated loan-termination probabilities. The gap between 2- and 5-year loans widens markedly five semesters after origination. Relative to the baseline that excludes equity extraction as termination event, the differences are substantial: by the sixth semester, 20% of two-year fixes terminate due to a move (or full redemption or a change in the main borrower), but this rises to roughly 54% when terminations also include increases in loan balances. This underscores the importance of contractual flexibility for equity extraction.

Figures 9c and 9d show the estimates for the 2020H1 cohort, meaning new mortgage borrowers in a newly acquired property that first appear in the data on June 30, 2020. There are fewer post-origination observations, but the patterns are consistent with those for the earlier cohort, indicating a greater use of contractual flexibility by borrowers in 2-year loans.

In Appendix Figure A2 we show that the patterns are similar for other cohorts of borrowers, and we further extend the analysis and treat as termination event a reduction of more than 20% of the loan amount that was outstanding at the end of the previous reporting period. The

differences relative to the case when only house moves and equity extraction are small. There are several potential reasons for this. First, the full repayment of outstanding loans is captured in the house move case. Second, most UK mortgages allow for additional annual repayments of up to 10% of outstanding loan balance, so that there already is some repayment flexibility embedded in most contracts.

4.3.4 Loans originated around the event

In this section, we study loan terminations for the sample of loans originated around the mini-budget announcement, i.e., in the ± 120 days of the event date. To measure loan terminations we rely, as before, on the bi-annual lender submissions of loan-level data in their books, with June 30, 2025 as the latest submission. Also as before, we compare 2- and 5-year loans along two sets of termination outcomes: account closure and account closure combined with equity extraction.³⁶

Figure 10, Panels (a) and (b) stratify borrowers by the initial fixed-rate term. Consistent with the previous analysis, loan terminations either due to a house move or equity extraction are much more likely for 2- than 5-year loans, with a gap that widens significantly 4 semesters after origination. It is important to emphasize that this result is not mechanical: in our analysis, a remortgage to a different loan either with the same or a different lender but without a house move or equity extraction is *not* classified as a termination.

[Insert Figure 10 here]

In Panels (c) and (d), borrowers are further stratified by the timing of loan origination (pre- versus post-event) and loan offer (pre- versus post-event offer). All groups of borrowers in 2-year loans make use of contractual flexibility to a greater extent than those in 5-year loans.

When comparing the different 2-year groups, it is important to remember that, at each point in time, loans originated in the pre-period have been outstanding for longer than those originated in the post-period. This difference in exposure time likely generates variation in the incidence of loan terminations across the 2-year groups. Since we only observe outcomes at discrete points in time, in June and December of each year, we cannot adjust the analysis for differences in exposure at a frequency higher than six months.

³⁶Recall that an account is closed when the combination of property postcode and borrower date of birth disappear from the loan portfolios of *all* lenders, reflecting either a house move or full repayment of the loan.

5 Conclusion

This paper examines mortgage outcomes following the unexpected rise in mortgage rates triggered by the September 2022 mini-budget announcement. We uncover three main findings. First, borrowers shift toward shorter fixed-rate terms: the likelihood of selecting 2-year products over 5-year ones increases by 11 percentage points post-event. This shift occurs despite higher interest rates on 2-year products than 5-year ones, and it leads to a reduction in the duration of household liabilities. It reflects demand for short-term payment protection combined with near-term financial flexibility (an insurance-flexibility trade-off). Second, borrowers are less likely to switch lenders at refinancing, consistent with affordability constraints binding at higher rates, as lender switches require a full affordability assessment. Third, borrowers deleverage, as evidenced by declines in average loan amounts of 1.9% to 4.4% and in LTVs of 1.2% to 1.4% per 1 percentage point rate rise.

In the second part of the paper, we link the shift toward the more expensive 2-year fixed-rate products to increased demand for product flexibility at the higher interest rates. We frame borrowers' choices as a trade-off between protection against future interest rate rises and product flexibility, which we show is greater with shorter fixation periods. We then present evidence on motives for flexibility—specifically, interest-rate expectations, mobility, and opportunities for equity extraction and prepayment. Expected declines in interest rates cannot fully explain the results since most borrowers still select fixed-rate mortgages instead of the much cheaper adjustable-rate products. The analysis highlights the quantitative importance of contractual flexibility for near-term equity extraction under 2-year fixed-rate loans.

Our findings have important implications for credit cycles and for monetary policy transmission. In particular, borrower responses along the fixed-rate term and loan-size dimensions imply current reductions in the duration of household liabilities and leverage. Our results indicate borrowers are willing to pay a premium, in both price and reduced protection, for the option to adjust their debt in the near future. These shifts increase the likelihood of near-term equity extraction, generating credit cycles and altering the composition of indebted households through which subsequent monetary policy is transmitted.

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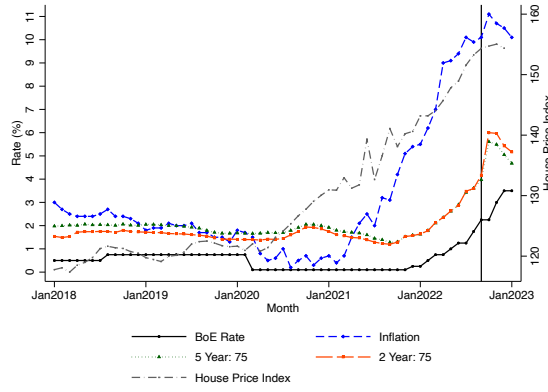
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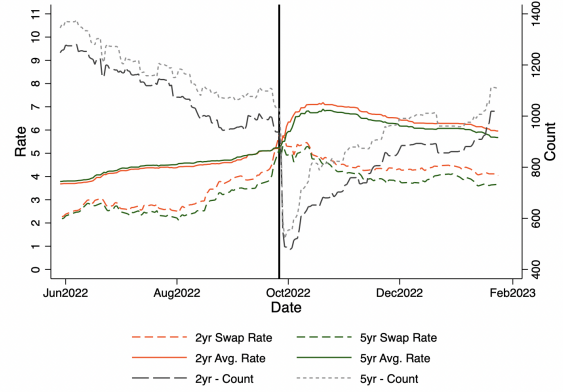
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Figure 1: UK Macroeconomic Context and the Mini-Budget

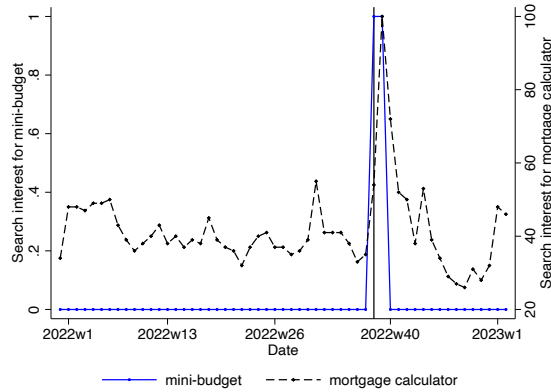
Panel (a) plots the monthly time series of several macroeconomic variables from January 2018 to January 2023. The following series are plotted in Panel (a): the Bank of England base rate (black), the year-over-year consumer price inflation (CPI) change (blue), the 5-year fixed rate for 75% LTV mortgages (green), the 2-year fixed rate for 75% LTV mortgages (orange) and the UK National House Price Index (gray) which is plotted on the right vertical axis. The vertical black line at September 2022 represents the month of the mini-budget announcement. Panel (b) plots the daily average interest rate for 2 and 5 year mortgage products on offer, as well as the count of 2 and 5 year products on offer, around the mini-budget date. The vertical black line indicates the event date, which refers to Monday, September 26, 2022, the Monday after the mini-budget announcement on Friday, September 23, 2022. Data for Panel (b) are from MoneyFacts. Panel (c) plots Google Trends search interest in the terms “mini-budget” and “mortgage calculator” across the UK. Panel (d) plots the daily UK policy uncertainty index, with mean and 95% confidence intervals for the pre-mini-budget period, the first 60 days after, and the following 60 days after. Data are taken from https://www.policyuncertainty.com/uk_daily.html.



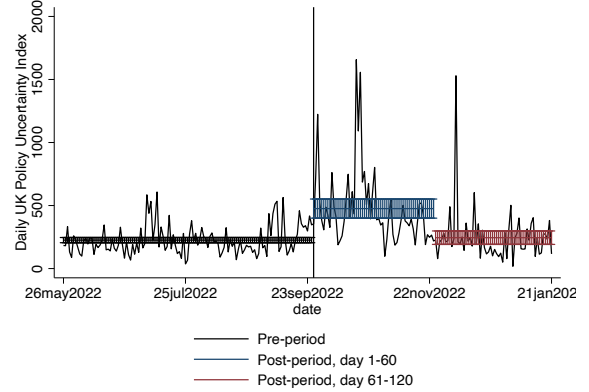
(a) UK macroeconomic activity



(b) Mini-budget announcement



(c) Google trends



(d) UK daily policy uncertainty index

Figure 2: Mortgage Interest Rates

Panel (a) plots the weekly average origination interest rate for 2- and 5-year fixed-rate mortgages, grouped by pre-offer or post-offer. Panel (b) plots the weekly share of 2- and 5-year fixed rate mortgage originations, grouped by pre-offer or post-offer holders.

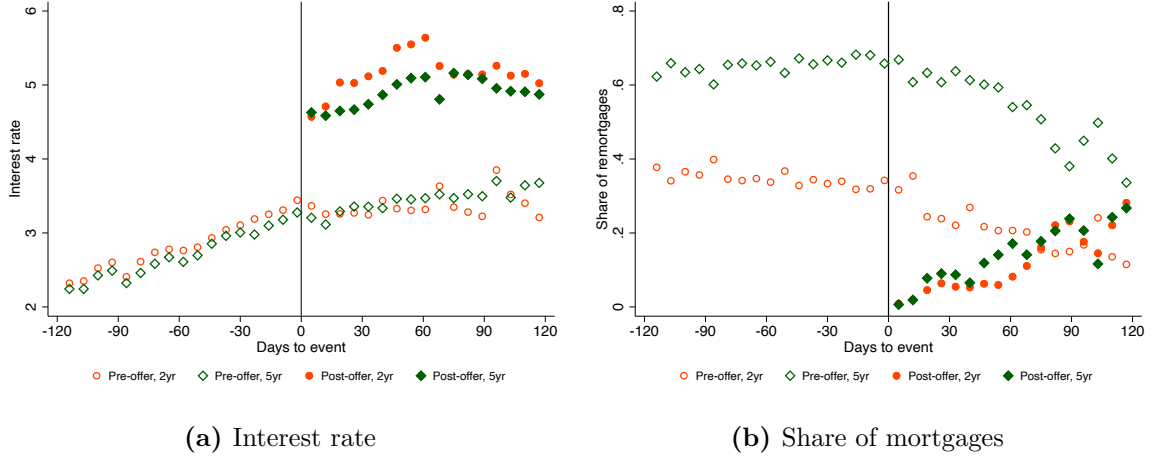


Figure 3: Fixation Term

This figure plots regression coefficients of our main specification, Equation (1), with fixation period (5-year fixed-rate mortgage indicator) as the outcome. Weekly data averages of the outcome variable are plotted behind the coefficients. 90% confidence intervals shown in gray are calculated using robust standard errors clustered at the origination-day level.

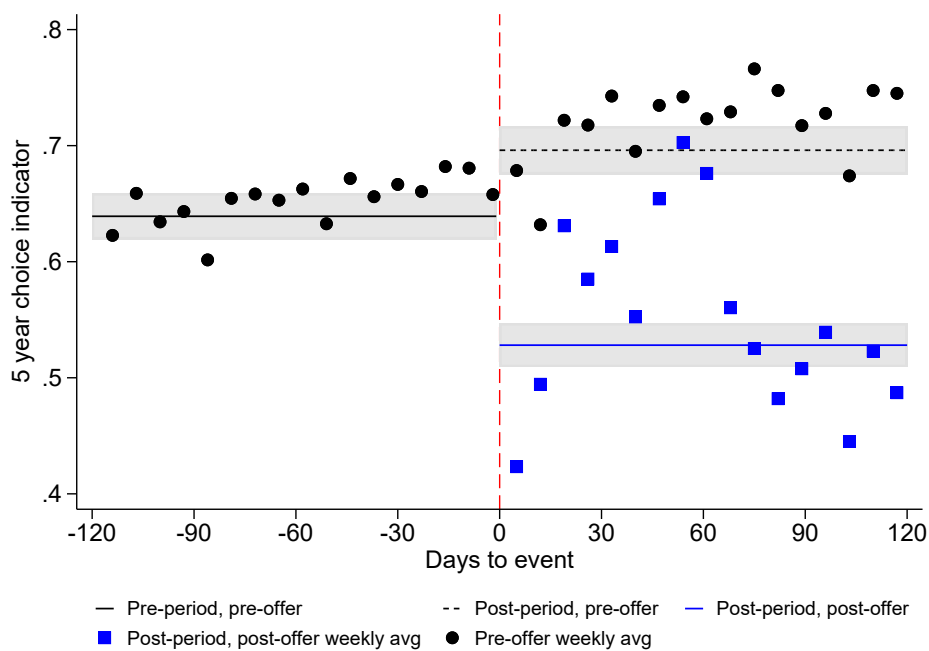


Figure 4: Lender Switches and Leverage

This figure plots regression coefficients of our main specification, Equation (1), with internal indicator (Panels (a) and (b)) and loan-to-value (Panels (c) and (d)) as the outcomes. The internal indicator variable takes the value of one when a borrower refinances with the same lender, and zero otherwise. Weekly data averages of the outcome variable are plotted behind the coefficients. 90% confidence intervals shown in gray are calculated using robust standard errors clustered at the origination-day level.

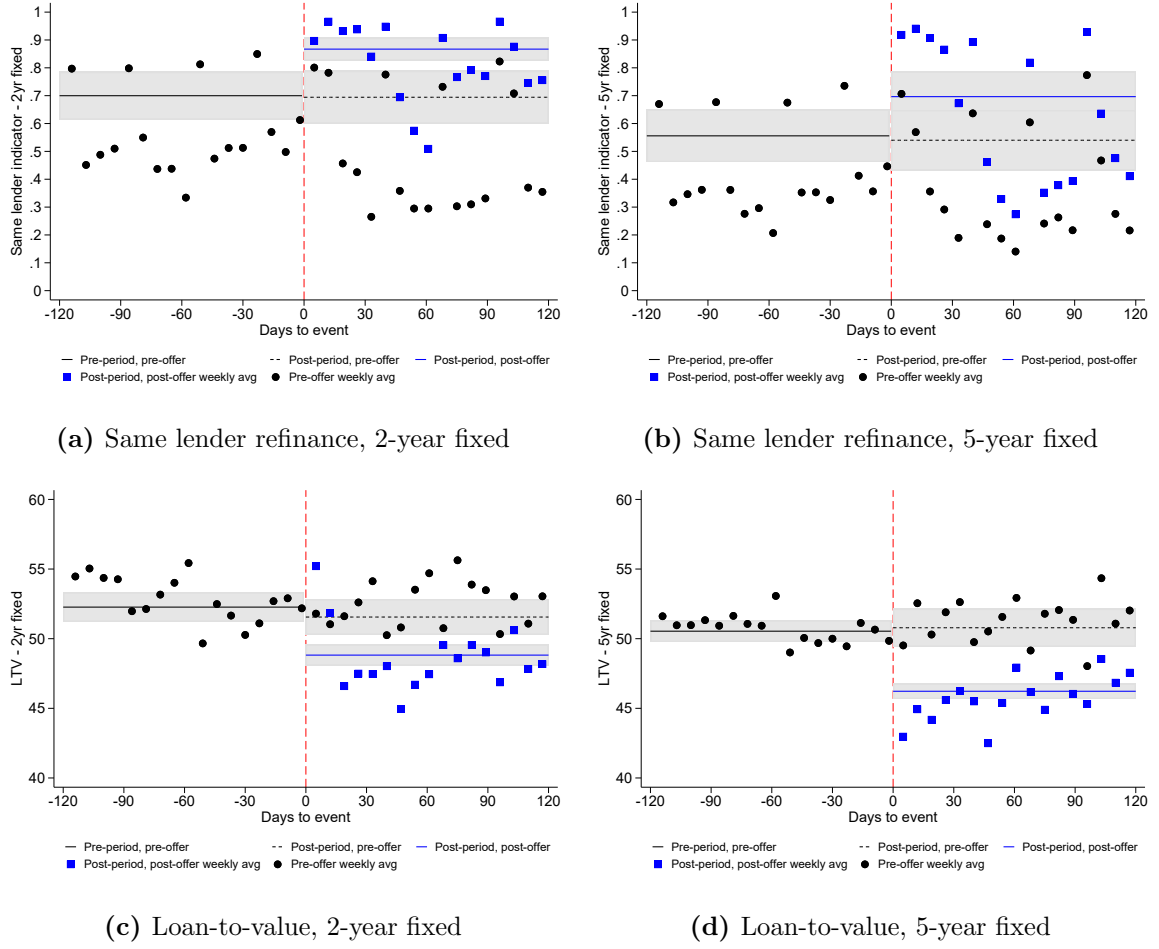


Figure 5: Matched Sample

The figure plots the estimated coefficients on the interaction between the treated and time dummies (the β_k^T coefficients) in equation (4). The treated group are post-event borrowers without a pre-offer and matched pre-event borrowers. The control group are post-event borrowers with a pre-offer and matched pre-event borrowers. The best match is determined by finding, for each post-event borrower, the pre-event borrower with the smallest difference in income among those borrowers who share the same lender, live in the same location (local authority), who have the same joint borrower status, and are in the same age bracket. The match is performed with no replacement. The standard errors are clustered at the daily frequency. The figure plots the estimated coefficients and corresponding 90% confidence intervals. Panel (a) shows results for the indicator for 5-year fixed as the outcome variable, and panels (b) and (c) for loan to value for borrowers in 2- and 5-year fixed rate mortgages.

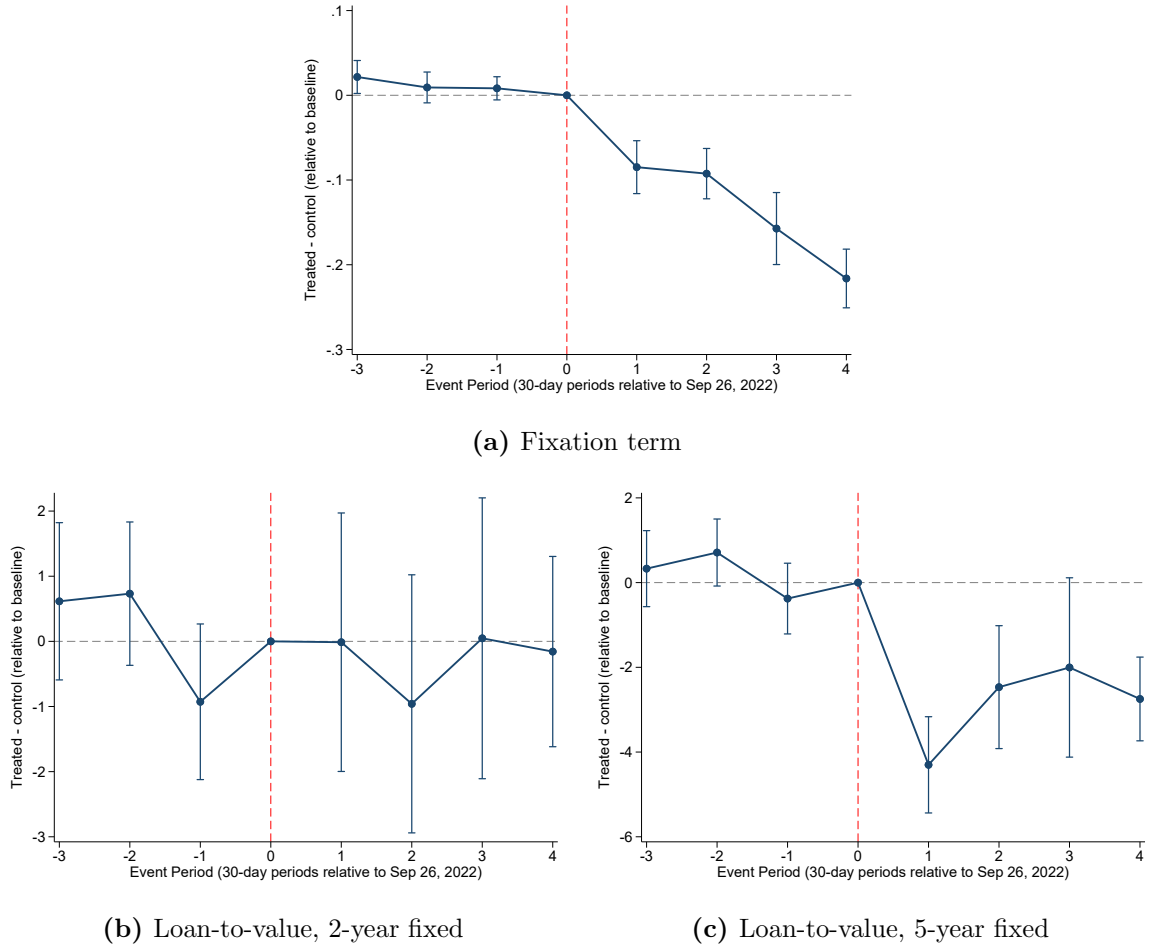


Figure 6: Mortgage Premia over Swap Rates

The figure plots estimated coefficients on weekly dummies of regressions of the difference between mortgage interest rates and swap rates on indicators for weeks, controlling for LTV-band and lender fixed effects. We estimate separate regressions for 2-year and 5-year fixed-rate products. The mortgage premia are calculated over the same maturity swap rate. The mortgage data are from Moneyfacts and includes daily information on all products on offer in the market on each day. The figure also plots 95% confidence intervals, but these are narrow and not clearly visible.

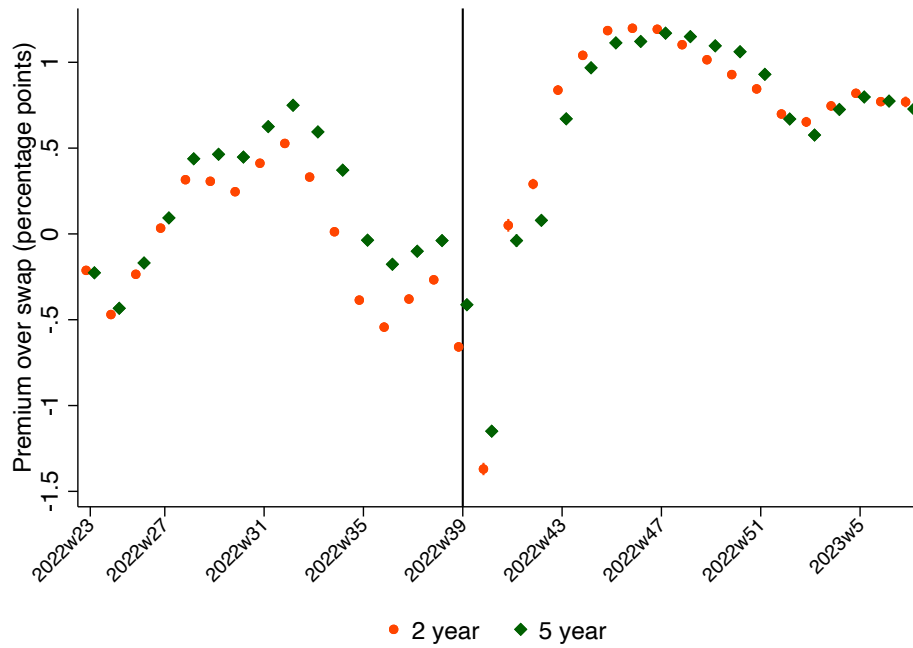


Figure 7: Interest Rate and Inflation Expectations

Panel (a) plots the market-implied expectation of the Bank of England base rate (yellow) at each time horizon from Q1 2021 to Q1 2023 and the actual path (black). Panel (b) plots the mean 2 and 5 year ahead household inflation expectations, along with 95% confidence intervals. Data for Panel (a) are from the Office of Budget Responsibility's Fiscal Risks and Sustainability report, while data for Panel (b) are from the Bank of England/Ipsos Inflation Attitudes Survey.

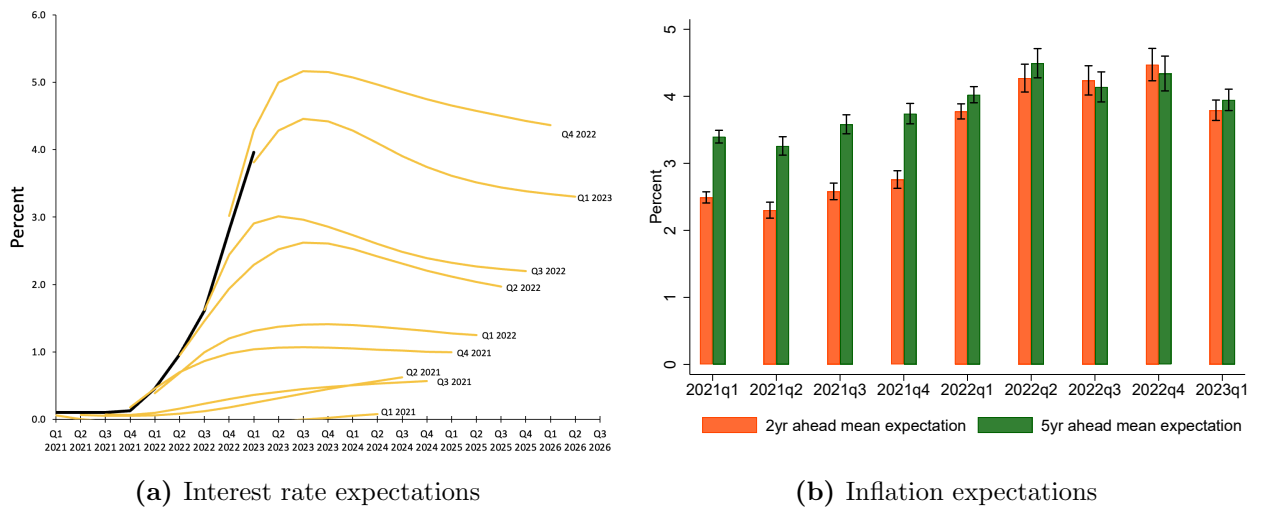
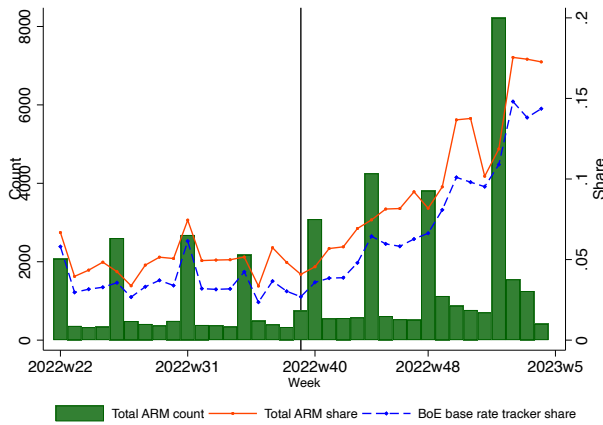
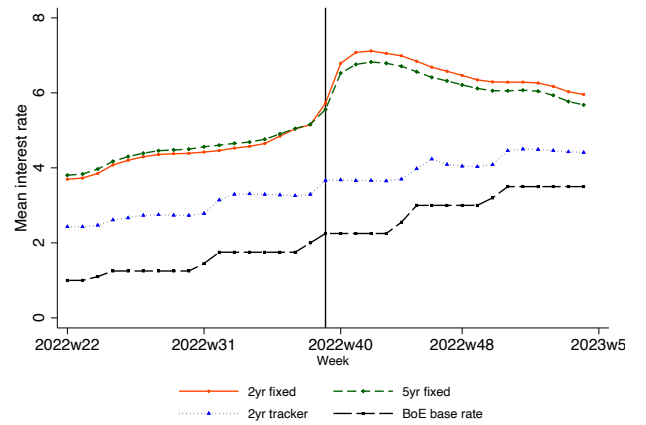


Figure 8: Trends in Adjustable-Rate Mortgages (ARMs) Around the Event

Panel (a) shows the weekly count of ARM originations (left y-axis) and the share of ARM among all remortgages (right y-axis, orange). It also reports the share of Bank of England base-rate tracker ARM—the predominant ARM type—among all remortgages (right y-axis, blue). Panel (b) plots weekly average advertised rates from Moneyfacts for 2- and 5-year fixed-rate mortgages, 2-year tracker ARMs, and the Bank of England base rate. The event week is marked by a vertical black line. The data sources are PSD for Panel (a) and Moneyfacts for Panel (b).



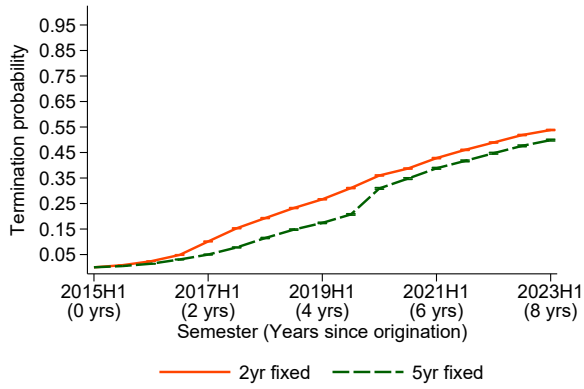
(a) ARM Trend



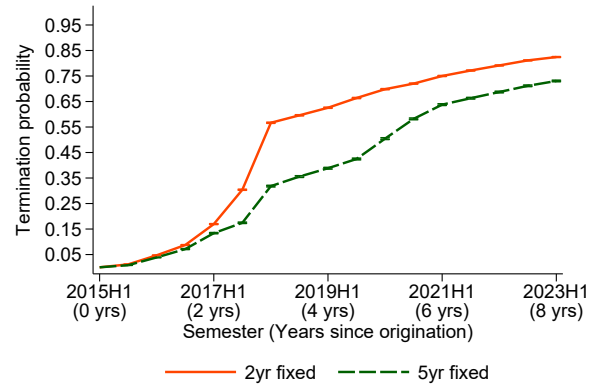
(b) Mean Interest Rates on Offer on FRMs and ARMs and Bank of England base rate

Figure 9: Loan Terminations by Initial Fixed-Rate Term

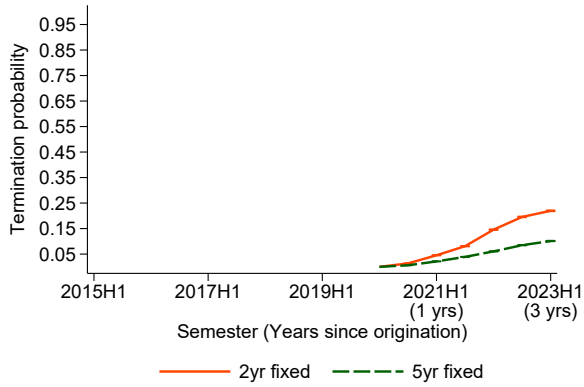
This figure plots probabilities of loan terminations for borrowers who bought a house and took a new loan in the first semester of 2015 (Panels (a) and (b)) and in the first semester of 2020 (Panels (c) and (d)). Borrowers are stratified by the initial fixed-rate mortgage term (2- and 5-years). Panels (a) and (c) treat account closures as terminations. Account closure is when the combination of property postcode and borrower date of birth disappears from the loan portfolios of *all* lenders, reflecting either a house move or full repayment of the loan. Panels (b) and (d) additionally treat equity extractions as terminations. 95% confidence intervals are shown.



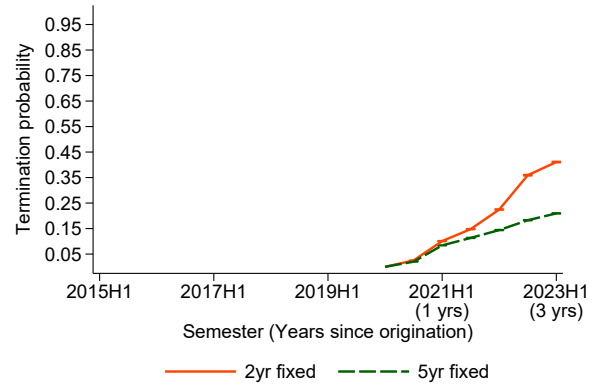
(a) House moves, 2015H1 cohort



(b) House moves and equity extraction, 2015H1 cohort



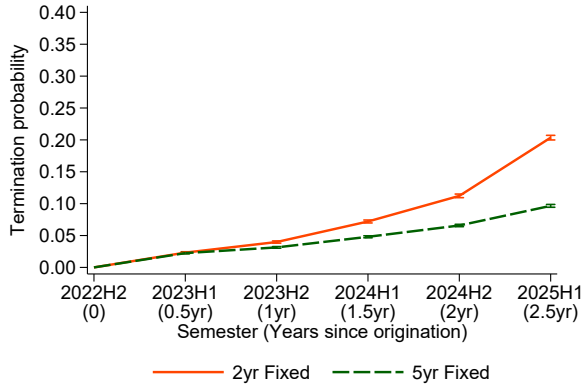
(c) House moves, 2020H1 cohort



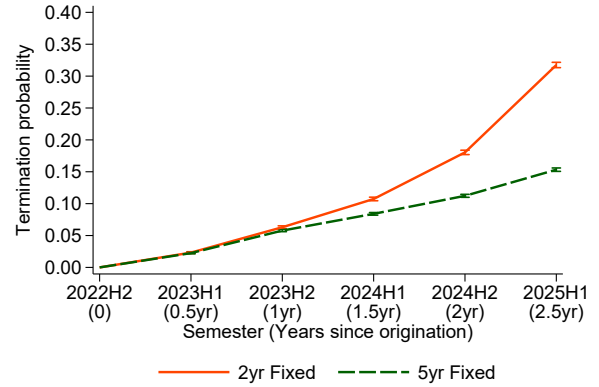
(d) House moves and equity extraction, 2020H1 cohort

Figure 10: Loan Terminations For Remortgages Originated Around the Event

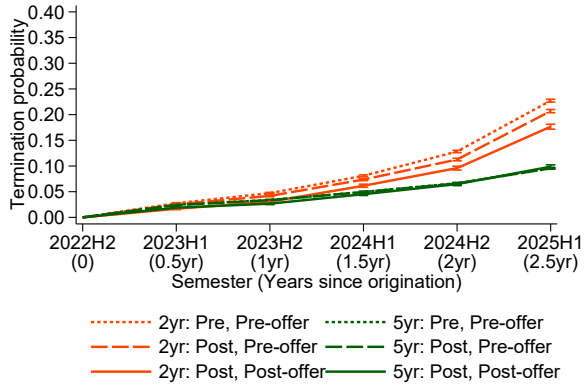
This figure plots loan termination probabilities for borrowers who remortgaged their loans in the 120 days before and after the event date of September 26, 2022 for the universe of 2-year and 5-year fixed rate remortgages. In Panels (a) and (b) borrowers are stratified by the initial fixed-rate mortgage term (2- and 5-years). In Panels (c) and (d), in addition, borrowers are stratified by the timing of their remortgage (pre- and post-period) and of their remortgage offer (pre- and post-event). Panels (a) and (c) treat account closures as terminations. Account closure is when the combination of property postcode and borrower date of birth disappears from the loan portfolios of *all* lenders, reflecting either a house move or full repayment of the loan. Panels (b) and (d) additionally treat equity extractions as terminations. 95% confidence intervals are shown.



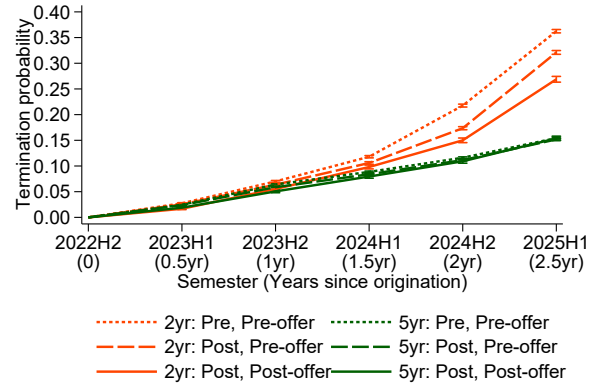
(a) House moves, baseline cohort



(b) House moves and equity extraction, baseline cohort



(c) House moves, baseline cohort



(d) House moves and equity extraction, baseline cohort

Table 1: Summary Statistics

This table presents summary statistics on mortgage refinancing covering the 120 days before and after the event date of September 26, 2022 for the universe of 2-year and 5-year fixed-rate remortgages. The data are from PSD001. All continuous variables and age are winsorized at 99 percent. The indicator for joint mortgage takes the value of one if there is a second borrower in the loan, and zero otherwise.

	Mean (1)	Sd (2)	p10 (3)	p25 (4)	p50 (5)	p75 (6)	p90 (7)
Panel A: Pre Mini-Budget Announcement (N = 230,473)							
Loan amount (£)	190,033	133,698	61,629	99,818	156,211	242,205	355,787
Property value (£)	395,363	270,588	160,000	221,000	325,000	475,000	700,000
Loan-to-value (%)	51.16	19.89	21.55	36.97	54.14	66.76	75.00
Loan-to-income	2.89	1.10	1.33	2.09	2.98	3.76	4.27
Income (£)	69,319	48,894	28,413	39,416	56,032	81,792	122,171
1(Joint mortgage)	0.58	0.49	0.00	0.00	1.00	1.00	1.00
Main borrower age (years)	41.73	9.39	30.00	34.00	41.00	48.00	55.00
Panel B: Post Mini-Budget Announcement (N = 275,975)							
Loan amount (£)	194,557	136,563	62,704	100,552	160,024	248,904	367,210
Property value (£)	410,113	274,185	166,481	230,537	340,000	498,000	725,000
Loan-to-value (%)	50.13	19.34	21.43	36.36	53.08	65.40	73.15
Loan-to-income	2.86	1.09	1.31	2.07	2.95	3.73	4.24
Income (£)	71,434	49,779	28,966	40,185	57,979	85,000	127,000
1(Joint mortgage)	0.59	0.49	0.00	0.00	1.00	1.00	1.00
Main borrower age (years)	41.30	9.21	30.00	34.00	40.00	48.00	54.00

Table 2: Summary Statistics by Offer Type, 2- and 5-Year Fixed

This table presents summary statistics on borrower characteristics for mortgage refinances covering the 120 days before and after the event date of September 26, 2022, by groups of offer types (pre- and post-event offer), and for borrowers in 2-year (Panel A) and 5-year (Panel B) fixed-rate mortgages. Pre-period (post-period) refers to mortgages originated before (after) the event date. The data are from PSD001. All continuous variables and age are winsorized at 99 percent.

	Mean (1)	Sd (2)	p10 (3)	p25 (4)	p50 (5)	p75 (6)	p90 (7)
Panel A.1: 2yr, Pre-period, Pre-offer (N = 83,163)							
Property value (£)	372,321	251,384	155,000	211,453	308,492	448,709	650,000
Income (£)	66,187	46,641	27,905	38,000	53,655	77,804	115,168
1(Joint mortgage)	0.53	0.50	0.00	0.00	1.00	1.00	1.00
Main borrower age (years)	40.69	9.59	29	33	39	47	55
Panel A.2: 2yr, Post-period, Pre-offer (N = 62,680)							
Property value (£)	404,414	272,843	166,040	228,251	334,195	487,084	703,121
Income (£)	72,213	51,347	29,500	40,284	57,801	85,218	129,462
1(Joint mortgage)	0.56	0.50	0.00	0.00	1.00	1.00	1.00
Main borrower age (years)	40.24	9.4	29	33	39	47	54
Panel A.3: 2yr, Post-period, Post-offer (N = 24,132)							
Property value (£)	348,319	215,989	150,000	204,599	298,458	426,828	597,352
Income (£)	60,052	39,621	26,000	35,445	50,022	71,531	102,030
1(Joint mortgage)	0.51	0.50	0.00	0.00	1.00	1.00	1.00
Main borrower age (years)	40.64	9.45	29.00	33.00	39.00	47.00	54.00
Panel B.1: 5yr, Pre-period, Pre-offer (N = 147,310)							
Property value (£)	408,372	280,015	164,640	227,880	333,671	493,300	728,318
Income (£)	71,093	50,038	28,785	40,180	57,562	84,047	126,200
1(Joint mortgage)	0.62	0.49	0.00	0.00	1.00	1.00	1.00
Main borrower age (years)	42.31	9.23	31.00	35.00	42.00	49.00	55.00
Panel B.2: 5yr, Post-period, Pre-offer (N = 143,558)							
Property value (£)	430,775	285,540	175,000	244,368	355,000	521,000	763,650
Income (£)	75,899	52,161	30,615	42,831	61,818	90,302	135,758
1(Joint mortgage)	0.64	0.48	0.00	0.00	1.00	1.00	1.00
Main borrower age (years)	41.36	8.79	30.00	35.00	41.00	47.00	54.00
Panel B.3: 5yr, Post-period, Post-offer (N = 27,008)							
Property value (£)	338,454	214,583	145,000	197,221	285,651	412,988	581,445
Income (£)	58,069	37,632	25,121	34,910	48,810	69,732	98,378
1(Joint mortgage)	0.55	0.50	0.00	0.00	1.00	1.00	1.00
Main borrower age (years)	42.25	9.67	30.00	34.00	42.00	49.25	56.00

Table 3: Fixation Term and Lender Switches

This table presents regression coefficients of our main specification, Equation 1, estimated on the 120 days before and after the event date, with the outcomes of fixation period choice and same lender refinancing indicator in the rows. Columns 1 refers to the pre-period, pre-offer average of the outcomes, without any controls. Columns 2-4 refers to marginal difference between the pre-period, pre-offer group and the post-period, pre-offer group, while Columns 5-8 refers to the marginal difference between the pre-period, pre-offer group and the post-period, post-offer group. Columns 3-4 and 6-7 include controls for log income, joint status, age groups, as well as local authority fixed effects. Columns 4 and 7 additionally include lender fixed effects. Age group controls are $1(30 < \text{Age} \leq 40)$, $1(40 < \text{Age} \leq 50)$, and $1(\text{Age} > 50)$, with the omitted category being $1(30 \leq \text{Age})$. Robust standard errors are in parentheses and are clustered at the origination-day level. Columns 8-10 report the number of observations and adjusted R^2 in square brackets for each of the three corresponding specifications for each outcome. *, **, and *** represent statistical significance at the 10%, 5%, and 1% confidence levels, respectively.

	Pre-period level	Δ Post-period, Pre-offer			Δ Post-period Post-offer			No. Obs. & Adj. R^2		
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Panel A: Fixation term										
1(5 year choice)	0.639*** (0.012)	0.057*** (0.017)	0.057*** (0.016)	0.052*** (0.015)	-0.111*** (0.017)	-0.103*** (0.016)	-0.114*** (0.014)	487,851 [0.011]	485,344 [0.031]	485,344 [0.063]
Panel B: Lender switches										
1(Same lender), 2 yr	0.700*** (0.052)	-0.006 (0.078)	0.000 (0.067)	-0.002 (0.067)	0.167*** (0.058)	0.142*** (0.050)	0.104** (0.044)	169,975 [0.017]	169,289 [0.133]	169,289 [0.222]
1(Same lender), 5 yr	0.556*** (0.057)	-0.016 (0.087)	-0.011 (0.078)	-0.024 (0.074)	0.141* (0.079)	0.108 (0.070)	0.096 (0.062)	317,876 [0.007]	316,055 [0.116]	316,055 [0.151]
Ln(Income)	No	No	Yes	Yes	No	Yes	Yes	No	Yes	Yes
1(Joint mortgage)	No	No	Yes	Yes	No	Yes	Yes	No	Yes	Yes
Age	No	No	Yes	Yes	No	Yes	Yes	No	Yes	Yes
Local Authority FE	No	No	Yes	Yes	No	Yes	Yes	No	Yes	Yes
Lender FE	No	No	No	Yes	No	No	Yes	No	No	Yes

Table 4: Leverage

This table presents regression coefficients of our main specification, Equation 1, with the outcomes of log loan amount and LTV in the rows. Columns 1 refers to the pre-period, pre-offer average of the outcomes, without any controls. Columns 2-4 refers to marginal difference between the pre-period, pre-offer group and the post-period, pre-offer group, while Columns 5-8 refer to the marginal difference between the pre-period, pre-offer group and the post-period, post-offer group. Columns 3-4 and 6-7 include controls for log income, joint status, age groups, as well as local authority fixed effects. Columns 4 and 7 additionally include lender fixed effects. Age group controls are $\mathbb{1}(30 < \text{Age} \leq 40)$, $\mathbb{1}(40 < \text{Age} \leq 50)$, and $\mathbb{1}(\text{Age} > 50)$, with the omitted category being $\mathbb{1}(30 \leq \text{Age})$. Robust standard errors are in parentheses and are clustered at the origination-day level. Columns 8-10 report the number of observations and adjusted R^2 in square brackets for each of the three corresponding specifications for each outcome. *, **, and *** represent statistical significance at the 10%, 5%, and 1% confidence levels, respectively.

	Pre-period level	Δ Post-period, Pre-offer			Δ Post-period Post-offer			No. Obs. & Adj. R ²		
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Panel A: Logarithm of loan amount										
Ln(Loan amount), 2 yr	11.887*** (0.016)	0.063** (0.032)	-0.016 (0.017)	0.025*** (0.009)	-0.118*** (0.034)	-0.047** (0.021)	-0.037*** (0.007)	169,975 [0.006]	169,289 [0.548]	169,289 [0.576]
Ln(Loan amount), 5 yr	11.944*** (0.015)	0.072** (0.033)	-0.006 (0.014)	0.023*** (0.007)	-0.266*** (0.021)	-0.102*** (0.013)	-0.087*** (0.010)	317,876 [0.017]	316,055 [0.588]	316,055 [0.613]
Panel B: Loan-to-value (%)										
LTV, 2 yr	52.260*** (0.639)	-0.689 (1.003)	-1.516** (0.763)	-0.226 (0.639)	-3.443*** (0.790)	-2.915*** (0.702)	-2.388*** (0.400)	169,975 [0.003]	169,289 [0.289]	169,289 [0.329]
LTV, 5 yr	50.542*** (0.464)	0.245 (0.952)	-0.936 (0.727)	0.195 (0.599)	-4.301*** (0.571)	-3.441*** (0.512)	-2.800*** (0.464)	317,876 [0.004]	316,055 [0.267]	316,055 [0.311]
Ln(Income)	No	No	Yes	Yes	No	Yes	Yes	No	Yes	Yes
1(Joint mortgage)	No	No	Yes	Yes	No	Yes	Yes	No	Yes	Yes
Age	No	No	Yes	Yes	No	Yes	Yes	No	Yes	Yes
Local Authority FE	No	No	Yes	Yes	No	Yes	Yes	No	Yes	Yes
Lender FE	No	No	No	Yes	No	No	Yes	No	No	Yes

Table 5: Uncertainty, Splitting Post-Period, Post-Offer

This table presents regression coefficients of our main specification, Equation 1, with an additional indicator variable estimated to split the post-period, post-offer sample in mortgages originated in the the first 60 days, when uncertainty was high, and in the subsequent 60 days after the event. The outcome variables shown in column are the same as before: an indicator for a 5-year fixed rate choice, indicators for same lender refinances, and loan-to-value. All regressions control for log income, joint status, age groups, as well as local authority and lender fixed effects. *, **, and *** represent statistical significance at the 10%, 5%, and 1% confidence levels, respectively.

	1(5 year choice)	1(Same lender), 2 yr	1(Same lender), 5 yr	LTV, 2yr	LTV, 5yr
	(1)	(2)	(3)	(4)	(5)
Constant	0.337*** (0.057)	1.279*** (0.086)	1.559*** (0.106)	-18.830*** (3.313)	-21.842*** (2.814)
Δ Post-period, Pre-offer	0.052*** (0.015)	-0.002 (0.067)	-0.024 (0.074)	-0.225 (0.640)	0.196 (0.599)
Δ Post-period, Post-offer (1-60 days after)	-0.056*** (0.019)	0.131*** (0.047)	0.141** (0.062)	-2.711*** (0.446)	-3.367*** (0.410)
Δ Post-period, Post-offer (61-120 days after)	-0.132*** (0.014)	0.098** (0.047)	0.081 (0.072)	-2.306*** (0.419)	-2.606*** (0.524)
Controls					
Ln(Income)	Yes	Yes	Yes	Yes	Yes
1(Joint mortgage)	Yes	Yes	Yes	Yes	Yes
Age	Yes	Yes	Yes	Yes	Yes
Local Authority FE	Yes	Yes	Yes	Yes	Yes
Lender FE	Yes	Yes	Yes	Yes	Yes
Observations	485,344	169,289	316,055	169,289	316,055
R^2	0.064	0.222	0.151	0.329	0.311

Table 6: Matched Sample

This table presents pooled difference-in-differences regression coefficients estimated on the matched sample using equation (3). The treated group are post-event borrowers without a pre-offer and matched pre-event borrowers. The control group are post-event borrowers with a pre-offer and matched pre-event borrowers. The best match is determined by finding, for each post-event borrower, the pre-event borrower with the smallest difference in income among those borrowers who share the same lender, live in the same location (local authority), who have the same joint borrower status, and are in the same age bracket. The match is performed with no replacement. The dependent variable is shown in the column header: an indicator for a 5-year fixed rate choice, indicators for same lender refinances (for the 2-year and 5-year subsamples), and loan-to-value (for the 2-year and 5-year subsamples). The table shows the estimated coefficients on the interaction $Treated \times Post$ which capture the average change in the post-period for treated borrowers relative to the control and the pre-period. The regressions include 30-day event-time fixed effects and controls for log income, joint-borrower status, age indicators, local authority and lender fixed effects. Standard errors, clustered at the daily level, are reported in parentheses. *, **, and *** represent statistical significance at the 10%, 5%, and 1% confidence levels, respectively.

	1(5 year choice)	1(Same lender), 2 yr	1(Same lender), 5 yr	LTV, 2yr	LTV, 5yr
	(1)	(2)	(3)	(4)	(5)
Treated $\times$ Post	-0.157*** (0.013)	0.077* (0.042)	0.122*** (0.043)	-0.434 (0.556)	-2.847*** (0.611)
Controls					
Event-time FE	Yes	Yes	Yes	Yes	Yes
Ln(Income)	Yes	Yes	Yes	Yes	Yes
1(Joint mortgage)	Yes	Yes	Yes	Yes	Yes
Age	Yes	Yes	Yes	Yes	Yes
Local Authority FE	Yes	Yes	Yes	Yes	Yes
Lender FE	Yes	Yes	Yes	Yes	Yes
Observations	375,484	132,049	243,435	132,049	243,435
Adj. R^2	0.056	0.193	0.147	0.323	0.305

Table 7: Panel Data

This table presents regression coefficients of our main specification, Equation 1, estimated on the sample of remortgages for which we are able to identify the previous mortgage taken by the *same* borrower. This allows us to condition on the previous choice of that same borrower. Robust standard errors are in parentheses and are clustered at the origination-day level, while the adjusted R^2 is reported in square brackets. *, **, and *** represent statistical significance at the 10%, 5%, and 1% confidence levels, respectively.

	Pre-period level	Δ Post-period, Pre-offer	Δ Post-period Post-offer	No. Obs. & Adj. R^2
	(1)	(2)	(3)	(4)
Panel A: Fixation term				
1(5 year choice Lag 2 year)	0.538*** (0.006)	0.080*** (0.013)	-0.123*** (0.013)	251,582 [0.016]
1(5 year choice Lag 5 year)	0.785*** (0.007)	0.034*** (0.010)	-0.104*** (0.013)	111,700 [0.010]
Panel B: Lender switches				
1(Same lender Lag diff. lender), 2 yr	0.744*** (0.046)	-0.018 (0.073)	0.144*** (0.051)	47,380 [0.014]
1(Same lender Lag diff. lender), 5 yr	0.630*** (0.049)	-0.049 (0.082)	0.121* (0.068)	81,575 [0.009]
Panel C: Loan-to-value (%)				
LTV Lag equity extr., 2 yr	46.787*** (0.937)	-2.223 (1.629)	-4.669*** (1.542)	25,027 [0.006]
LTV Lag equity extr., 5 yr	45.845*** (0.807)	-1.203 (1.636)	-5.625*** (1.196)	44,317 [0.006]

Table 8: Prepayment Penalties

This table summarizes prepayment penalties (early repayment charges) as a percentage of the outstanding loan amount for 2-year (Panel A) and 5-year (Panel B) fixed-rate loans, and 2-year tracker mortgages (Panel C). Data are from Moneyfacts, covering the loans on offer from May 29, 2022 to January 24, 2023. Columns correspond to loan age, measured in years since origination.

	Year 1	Year 2	Year 3	Year 4	Year 5
	(1)	(2)	(3)	(4)	(5)
Panel A: 2-Year Fixed					
Mean	2.61	1.69	0.00	0.00	0.00
Sd	0.63	0.64	0.00	0.00	0.00
p25	2.00	1.00	0.00	0.00	0.00
p50	3.00	2.00	0.00	0.00	0.00
p75	3.00	2.00	0.00	0.00	0.00
Panel B: 5-Year Fixed					
Mean	4.61	4.01	3.06	2.32	1.50
Sd	0.57	0.62	0.66	0.67	0.76
p25	4.00	4.00	3.00	2.00	1.00
p50	5.00	4.00	3.00	2.00	1.00
p75	5.00	4.00	3.00	3.00	2.00
Panel C: 2-Year Tracker					
Mean	0.72	0.55	0.00	0.00	0.00
Sd	0.52	0.62	0.00	0.00	0.00
p25	0.50	0.25	0.00	0.00	0.00
p50	0.50	0.25	0.00	0.00	0.00
p75	0.50	1.00	0.00	0.00	0.00

Table 9: Summary Statistics for Adjustable-Rate Mortgages

This table presents summary statistics on mortgage refinancing covering the 120 days before and after the event date of September 26, 2022 for the universe of ARM remortgages. The data are from PSD001. All continuous variables and age are winsorized at 99 percent. The indicator for joint mortgage takes the value of one if there is a second borrower in the loan, and zero otherwise.

	Mean (1)	Sd (2)	p10 (3)	p25 (4)	p50 (5)	p75 (6)	p90 (7)
ARMs, Pre-period (N = 14,688)							
Loan amount (£)	215,203	164,362	58,988	101,203	171,145	275,433	426,058
Property value (£)	511,759	371,885	187,959	267,752	400,000	609,118	982,885
LTV (%)	45.92	20.60	15.11	30.00	48.77	62.43	71.00
LTI	2.67	1.18	0.98	1.78	2.74	3.62	4.19
Income (£)	87,265	68,572	31,672	44,308	65,000	101,647	171,618
1(Joint mortgage)	0.53	0.50	0.00	0.00	1.00	1.00	1.00
Main borrower age (years)	43.60	10.71	31.00	35.00	42.00	51.00	59.00
ARMs, Post-period (N = 30,156)							
Loan amount (£)	206,078	149,936	64,849	104,664	166,784	260,999	395,000
Property value (£)	481,583	343,555	182,946	258,338	381,060	575,000	900,000
LTV (%)	46.84	19.69	17.10	32.21	49.94	62.56	70.22
LTI	2.74	1.16	1.07	1.87	2.83	3.68	4.20
Income (£)	82,652	63,560	31,040	42,995	62,893	96,802	157,602
1(Joint mortgage)	0.53	0.50	0.00	0.00	1.00	1.00	1.00
Main borrower age (years)	42.90	10.04	31.00	35.00	42.00	50.00	57.00

Internet Appendix for
“Locking in the rate or staying flexible?
Mortgage refinancing around an interest rate shock”

A Data description and sample construction

Our dataset on refinancing activity covers the 120 days preceding and following our event date for the mini-budget, September 26, 2022, and restrict the sample to observations with more than 2 year remaining on the mortgage term. All presented variables are winsorized at 1% and 99%.

The data includes, among other details, information on the loan amount, interest rate, type (variable rate, 2-year fixed, 5-year fixed, etc.), lender, property postcode, and whether the loan is intermediated or direct. External remortgages include information on property value and borrower income, but such information is missing for the vast majority of internal remortgages. This happens because a full property valuation and an affordability assessment are not carried out at the time of remortgaging. We partially overcome this data limitation by estimating property value, in a similar way to what lenders do.

We take the sample of remortgages that took place after May 29, 2022 and look for the previous loan taken by the same borrower. We do so using two variables in the origination data, the combination of property postcode and date of birth of the main borrower. A typical UK postcode contains only 15 addresses so that together with the borrower birth date it is a fairly accurate way to match mortgages originated at different times, even if those were originated by different lenders. Recall that we focus on remortgages (excluding loans for property acquisition). Given that the maximum fixed length period is typically 5 years and our sample starts in April 2021, we use 2015 as a cut-off for matching borrowers to their previous mortgage choice.

For the majority of remortgages, we are able to identify the previous loan. There may be several reasons why we may not be able to find a previous loan. The most likely reason is that the previous loan was an internal remortgage which prior to April 2021 were not always recorded in the origination data. But it is also possible that the main borrower in the loan has changed, in which case we do not match the two observations. Out of the previous loans, roughly 95% have information on property value. We use the information on the date and property value of the previous loan and the subsequent evolution of local authority house prices indices to estimate property values at the point of remortgaging. This is similar to the calculations that lenders carry out and it allows us to estimate the loan-to-value (LTV) ratio of the remortgaged loan.

Most internal remortgages have missing information for borrower income. Therefore, we rely

on the information in the previous loan. Most of the loans that we identify have information on previous borrower income (roughly 95%). We use this previous income measure to calculate the loan to income (LTI) for the loans that are remortgaged internally. But naturally, these LTI measures should be interpreted with caution. The origination data includes several other household characteristics that we use in the analysis.

Panel analysis. The ability to identify previous loans taken out by the same borrower allows us to build a panel of mortgage choices and measure within-borrower changes over time, for instance those who previously took a 2-year fixed rate mortgage and now changed to a 5-year fixed. We impose the condition that the previous mortgage choice was made after 2015. This is because complete mortgage data on internal re-mortgages has only been available since April 2021. By imposing this restriction, we are limiting cases of missing internal refinancing observations. Second, we impose the condition that, if the previous loan we identify was a 2 year (5 year) fixation period loan, the current loan for that borrower cannot start more than 3 years (6 years) after the end of the fixation period of the previous loan. Again, this helps limit the possibility of missing internally refinanced intermediate loans.

B Selection on observables

In the main text we have estimated our specification controlling for borrower characteristics, local area and lender fixed effects. The estimated coefficients on these control variables tell us about the relation between borrower characteristics and remortgaging outcomes, which we study in this appendix.

Several papers in the literature have emphasized the role of moving risk in mortgage decisions ([Brueckner and Follain \(1988\)](#), [Dhillon et al. \(1987\)](#), [Stanton and Wallace \(1998\)](#), [Sa-Aadu and Sirmans \(1995\)](#), among others). Loans with a fixed rate (or an interest rate that is fixed for longer) tend to have larger prepayment penalties. Therefore, borrowers who are more likely to move may prefer shorter fixation periods. The first row of [Table A1](#) shows the estimated coefficients on the borrower controls in the previous estimation of the choice of 5-year fixation period, for the specification that includes lender fixed effects.

Those who choose 5-year fixed rate products tend to have higher income, a joint applicant in their mortgage, and be older (less than 30 years old is the omitted category). These variables

are likely to be correlated with how settled the household is, in terms of location and the house in which they live in, meaning a lower likelihood of moving. It is important to note that although the literature has focused on the role of moving risk, the argument extends beyond moving risk. Joint borrowers and older individuals may be more settled in their finances and be less likely to wish to refinance the mortgage for reasons other than a house move, namely for equity extraction.

The second and third rows of Table A1 show that higher income borrowers and those with a joint borrower are less likely to remortgage with the same lender. Switching lenders (external remortgage) requires that borrowers pass an affordability assessment. Those with higher income and a joint borrower may be in a better position to do so. Controlling for income and joint borrower, older individuals are less likely to switch lenders when remortgaging.

Panels C and D Table A1 shows the estimated coefficients on the borrower controls for the leverage variables. The results are as expected. Higher income and joint borrowers tend to have larger loan amounts. Loan amounts and LTV tend to be significantly smaller for older borrowers.

C Inaction

Borrowers who do not remortgage at the end of the initial period of discounted rates and remain inactive move to the reversion rate. While on the reversion rate, they do not face early repayment charges, providing flexibility. But this flexibility is costly due to the much higher mortgage spread and exposes borrowers to interest rate risk.³⁷

The Kaplan-Meier survival framework can be used to study the likelihood that borrowers remain inactive at the end of the initial period of discounted rates and move to the reversion rate. We take the termination event to be the first time (as reported in the PSD007 data) that the borrower does not take action and moves to the reversion rate. Of particular interest are the past loans for which the initial period of discounted fixed rate ends around the event date, namely loans originated in 2017/H1 and 2020/H1.³⁸ These are the cohorts for which the initial period of discounted rates ends just before the mini-budget announcement, for 5-year (for the 2017/H1 cohort) and 2-year products (for the 2020/H1 cohort).

³⁷There is a growing literature on inertia in mortgage refinancing and potential cross-subsidies that may emerge from this. See, for example, Fisher et al. (2024) for UK evidence and Zhang (2024) for US evidence.

³⁸See Figure A4 for results for all other cohorts from 2015/H1 to 2023/H1.

Figure A3 show that there are indeed borrowers who move to the reversion rate when their fixation period ends, both for the 2-year and 5-year products. In terms of magnitudes, the likelihood of a move to reversion is higher for 2-year products, consistent with these borrowers valuing the flexibility that comes with being on the reversion rate more (albeit at a cost in the form of a higher loan rate).

The right hand side charts of A3 show that the moves to reversion happen disproportionately in 2022/H2 for the 5-year 2017/H1 and 2-year 2020/H1 cohorts. However, in the left-hand charts we plot the estimates for cohorts of borrowers whose initial period of discounted rates ends one-year earlier. The proportions of borrowers who move to the reversion rate at the end of their respective initial periods are similar. This shows that, at least for these cohorts, the mini-budget announcement did not translate into unusual levels of inaction.

A similar conclusion holds when we instead consider data from all cohorts to study the changes in the likelihood of inaction around the event. Remaining inactive and moving to the reversion rate means more flexibility going forward (borrowers could adopt a “wait and see” approach to the remortgaging decision), but at the same time it exposes borrowers to interest rate risk and it is a costly alternative (due to the higher interest rate spread relative to the base rate).

D Appendix Figures and Tables

Figure A1: Matched Sample, Same Lender Refinances

The figure plots the estimated coefficients on the interaction between the treated and time dummies (the β_k^T coefficients) in equation (4). The treated group are post-event borrowers without a pre-offer and matched pre-event borrowers. The control group are post-event borrowers with a pre-offer and matched pre-event borrowers. The best match is determined by finding, for each post-event borrower, the pre-event borrower with the smallest difference in income among those borrowers who share the same lender, live in the same location (local authority), who have the same joint borrower status, and are in the same age bracket. The match is performed with no replacement. The standard errors are clustered at the daily frequency. The figure plots the estimated coefficients and corresponding 90% confidence intervals. Panel (a) and (b) plot the estimates for borrowers in 2- and 5-year fixed rate mortgages, respectively.

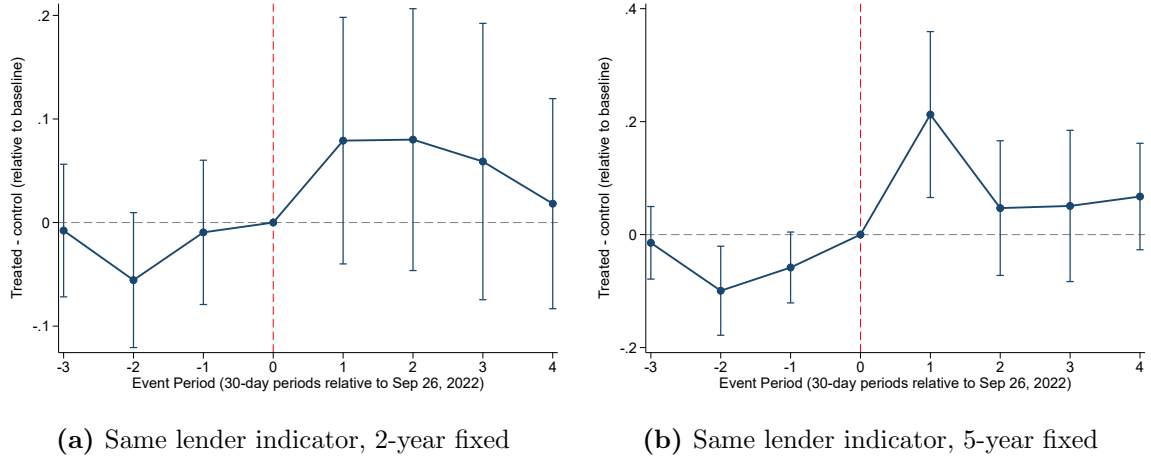
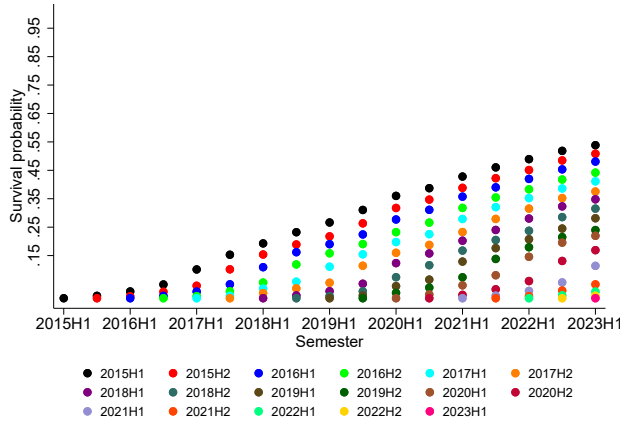
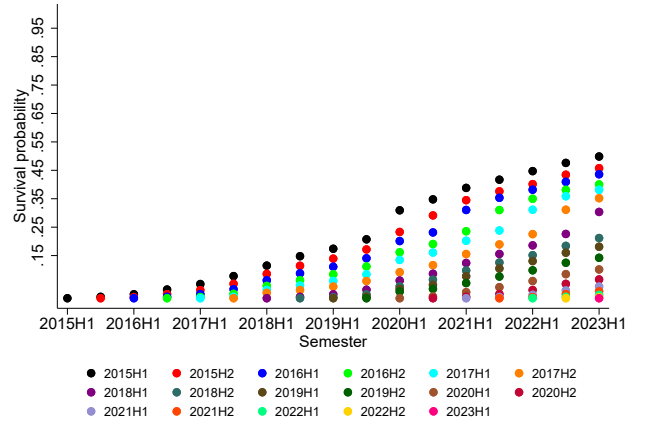


Figure A2: Loan Terminations by Initial Fixed-Rate Term, All Cohorts

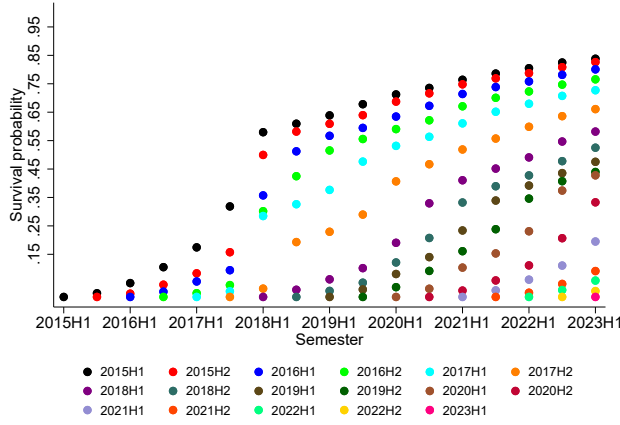
This figure plots Kaplan-Meier survival curves for all cohorts, which are indicated by a particular color. Panels (a) and (c) plot 2-year fixed mortgages, while Panels (b) and (d) plot 5-year fixed mortgages. Panels (a) and (b) refer to account closures only as terminations, while Panels (c) and (d) additionally refer to equity extraction and loan repayment as terminations



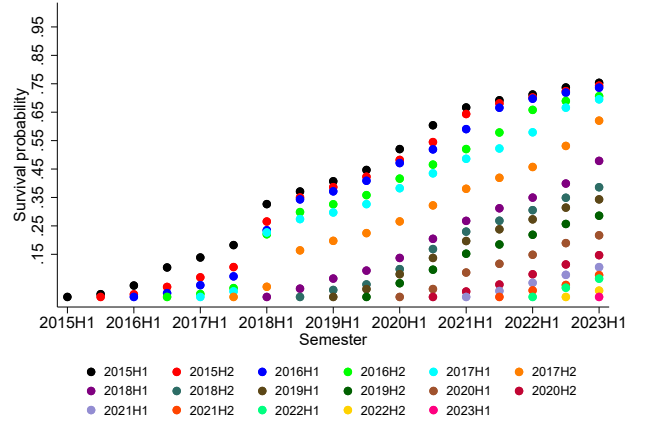
(a) 2 year fixed - House move



(b) 5 year fixed - House move



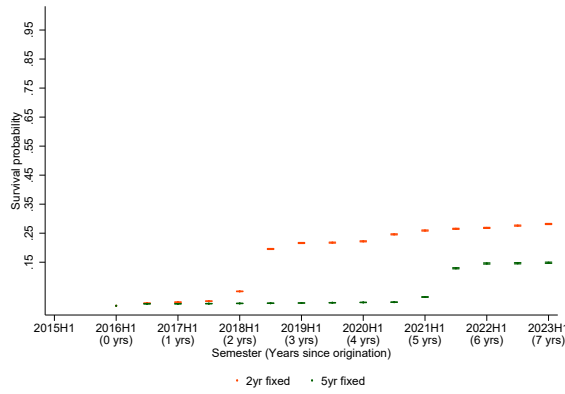
(c) 2 year fixed - House move, equity extraction, and



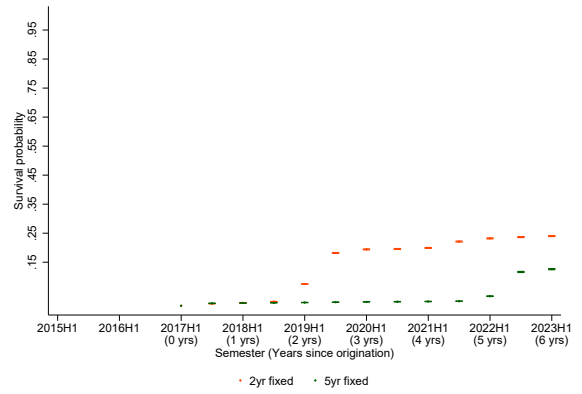
(d) 5 year fixed - House move, equity extraction, and repayment

Figure A3: Inactive Borrowers (First Time on Reversion)

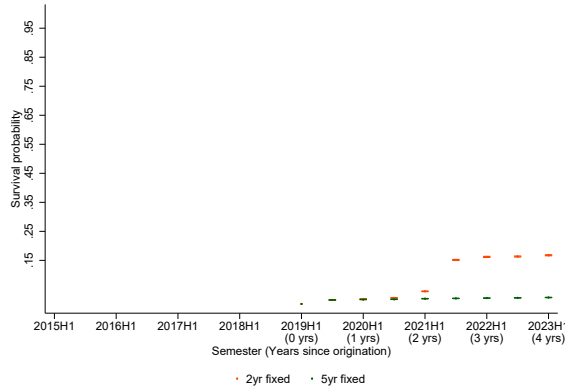
This figure plots Kaplan-Meier survival curves for borrowers who originated a mortgage in the first semester of 2016, 2017, 2019 and 2021 by the fixation period. The outcome variable is the first time that borrowers are on the reversion rate, meaning that they remain inactive at the end of the period of discounted rates and do not remortgage, as reported on PSD007. 95% confidence intervals are plotted.



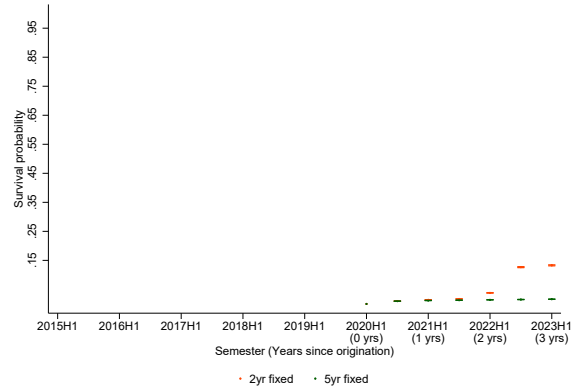
(a) 2016 H1



(b) 2017 H1



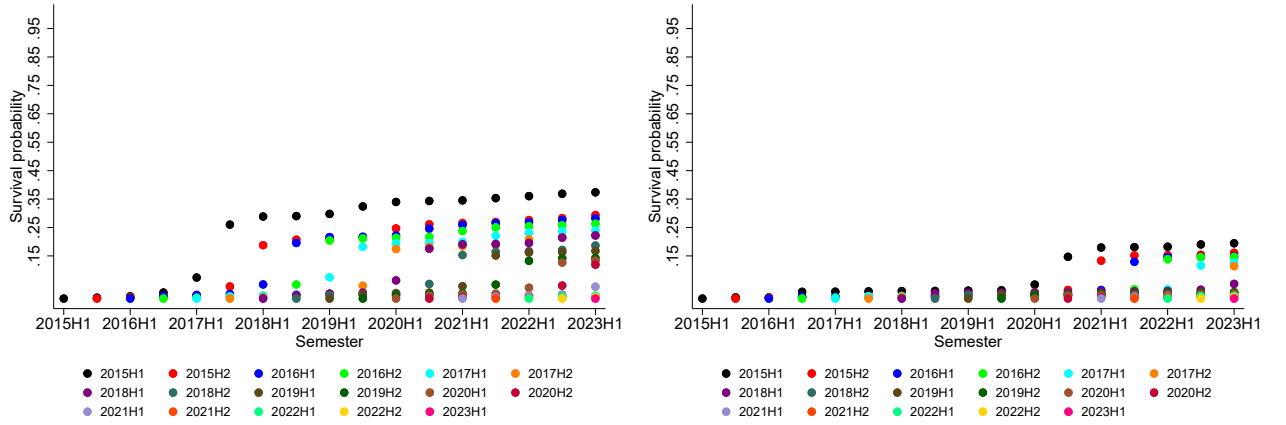
(c) 2019 H1



(d) 2020 H1

Figure A4: Inactive Borrowers (First Time on Reversion) for All Cohorts

This figure plots Kaplan-Meier survival curves for all cohorts, which are indicated by a particular color. We define a termination event as the borrower's first transition onto the lender's reversion (follow-on) rate. Panel (a) plots the curves for 2-year fixed-rate mortgages, while Panel (b) plots the curves for 5-year fixed-rate mortgages.



(a) 2 year fixed

(b) 5 year fixed

Table A1: Estimated Coefficients on Borrower Characteristics

This table presents the estimated regression coefficients for the borrower control variables (columns) in our main specification, Equation (1). The outcomes of fixation period choice, same lender refinances, and leverage are in the rows. All columns include local authority and lender fixed effects. Robust standard errors are in parentheses and are clustered at the origination-day level. *, **, and *** represent statistical significance at the 10%, 5%, and 1% confidence levels, respectively.

	Ln(Income)	1(Joint mortgage)	1(30 < Age ≤ 40)	1(40 < Age ≤ 50)	1(Age > 50)
	(1)	(2)	(3)	(4)	(5)
Panel A: Fixation term					
1(5 year choice)	0.016*** (0.006)	0.069*** (0.003)	0.062*** (0.003)	0.129*** (0.005)	0.106*** (0.005)
Panel B: Lender switches					
1(Same lender), 2 yr	-0.120*** (0.009)	-0.039*** (0.007)	0.027*** (0.005)	0.036*** (0.007)	0.061*** (0.010)
1(Same lender), 5 yr	-0.143*** (0.009)	-0.073*** (0.011)	0.015*** (0.005)	0.002 (0.009)	0.004 (0.013)
Panel C: Logarithm of loan amount					
Ln(Loan amount), 2 yr	0.773*** (0.008)	-0.030*** (0.004)	-0.061*** (0.007)	-0.209*** (0.012)	-0.600 (0.019)
Ln(Loan amount), 5 yr	0.790*** (0.005)	-0.028*** (0.003)	-0.057*** (0.006)	-0.217*** (0.010)	-0.484*** (0.011)
Panel D: Loan-to-value (%)					
LTV, 2 yr	9.105*** (0.311)	-0.725*** (0.129)	-5.599*** (0.273)	-14.824*** (0.406)	-30.048*** (0.428)
LTV, 5 yr	9.172*** (0.274)	-0.686*** (0.119)	-6.133*** (0.181)	-15.848*** (0.284)	-27.326*** (0.241)
Local Authority FE	Yes	Yes	Yes	Yes	Yes
Lender FE	Yes	Yes	Yes	Yes	Yes

Table A2: 60 Day Window

This table presents regression coefficients of our main specification, Equation 1, with the outcomes of fixation period choice (Panel A), an indicator for same lender refinances (Panel B), and loan-to-value (Panel C). The sample is restricted to 60 days before and after our event date of September 26, 2022. Columns 1 refers to the pre-period, pre-offer average of the outcomes, without any controls. Columns 2-4 refers to marginal difference between the pre-period, pre-offer group and the post-period, pre-offer group, while Columns 5-8 refers to the marginal difference between the pre-period, pre-offer group and the post-period, post-offer group. Columns 3-4 and 6-7 include controls for log income, joint status, age groups, as well as local authority fixed effects. Columns 4 and 7 additionally include lender fixed effects. Age group controls are $\mathbb{1}(30 < \text{Age} \leq 40)$, $\mathbb{1}(40 < \text{Age} \leq 50)$, and $\mathbb{1}(\text{Age} > 50)$, with the omitted category being $\mathbb{1}(30 \leq \text{Age})$. Robust standard errors are in parentheses and are clustered at the origination-day level. Columns 8-10 report the number of observations and adjusted R^2 in square brackets for each of the three corresponding specifications for each outcome. *, **, and *** represent statistical significance at the 10%, 5%, and 1% confidence levels, respectively.

	Pre-period level	Δ Post-period, Pre-offer			Δ Post-period Post-offer			No. Obs. & Adj. R^2		
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Panel A: Fixation term										
$\mathbb{1}(\text{5 year choice})$	0.658*** (0.010)	0.026 (0.019)	0.025 (0.017)	0.017 (0.015)	-0.072*** (0.026)	-0.063*** (0.023)	-0.072*** (0.018)	243,425 [0.002]	242,149 [0.023]	242,149 [0.058]
Panel B: Lender switches										
$\mathbb{1}(\text{Same lender}), 2 \text{ yr}$	0.708*** (0.064)	-0.004 (0.102)	0.001 (0.087)	0.011 (0.077)	0.162** (0.074)	0.128** (0.063)	0.107*** (0.052)	80,926 [0.008]	80,592 [0.126]	80,592 [0.221]
$\mathbb{1}(\text{Same lender}), 5 \text{ yr}$	0.568*** (0.073)	-0.021 (0.116)	-0.013 (0.102)	-0.021 (0.090)	0.159* (0.095)	0.129 (0.083)	0.114 (0.070)	162,499 [0.005]	161,557 [0.116]	161,557 [0.159]
Panel C: Loan-to-value (%)										
LTV, 2 yr	51.324*** (0.864)	0.054 (1.262)	-0.678 (0.970)	0.518 (0.792)	-2.862*** (1.034)	-2.233** (0.887)	-1.592*** (0.498)	80,926 [0.001]	80,592 [0.299]	80,592 [0.342]
LTV, 5 yr	49.869*** (0.708)	0.849 (1.208)	-0.446 (0.952)	0.929 (0.686)	-4.591*** (0.778)	-3.554*** (0.636)	-2.520*** (0.511)	162,499 [0.003]	161,557 [0.270]	161,557 [0.318]
Ln(Income)	No	No	Yes	Yes	No	Yes	Yes	No	Yes	Yes
$\mathbb{1}(\text{Joint mortgage})$	No	No	Yes	Yes	No	Yes	Yes	No	Yes	Yes
Age	No	No	Yes	Yes	No	Yes	Yes	No	Yes	Yes
Local Authority FE	No	No	Yes	Yes	No	Yes	Yes	No	Yes	Yes
Lender FE	No	No	No	Yes	No	No	Yes	No	No	Yes