UK housing & mortgage markets: a first look to the data

Juan Castellanos

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Contents

1. Mortgage Market

1.1. Contract Type

Total mortgage debt is depicted in Figure 1 in black. There are two series: one that spans from 2004-m1 to 2023-m2, which is plotted with a dashed line, and corresponds to loans to *Households & Individual Trusts*, and another series that spans from 2016-m1 to 2023-m2, plotted with a solid line, and that captures the loans to *Individuals & Individual Trusts*. According to the Classification of Accounts, Households & Individual Trusts are subdivided into: i) *Individuals & Individual Trusts* and ii) *Unincorporated Businesses* (resident in the UK) *other than Unlimited Liability Partnerships*. Given that the importance of the latter for mortgage debt is rather limitted, as shown by the two series overlapping quite well for the common sample, I will use these two definitions interchangably. In any case, Figure 1 shows that the stock of UK mortgage debt has (almost) monotonically increased over the last 20 years, with a marked increase around 2010.

Total mortgage debt is splitted into floating and fixed. Total floating mortgage debt is depicted in red while fixed mortgage debt is plotted in blue. As for total debt, the difference between dashed and solid lines capture the stock of debt corresponding to unincorporated business, which again is very small for both types of contracts. Nonetheless, these two debt categories have experienced very different dynamics with respect to the total stock. On the one hand, fixed mortgage debt was more or less stable

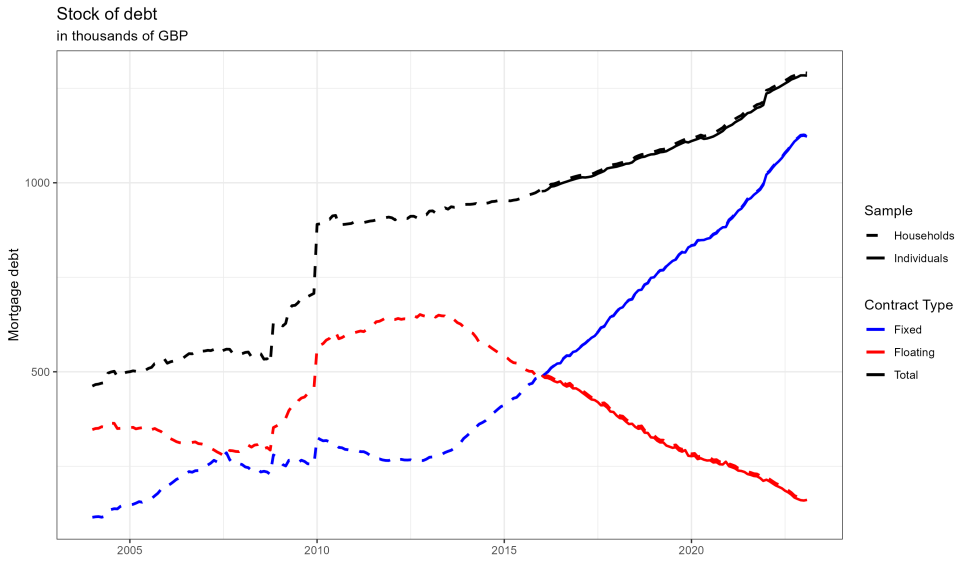


FIGURE 1. Mortgage debt has an upward trend

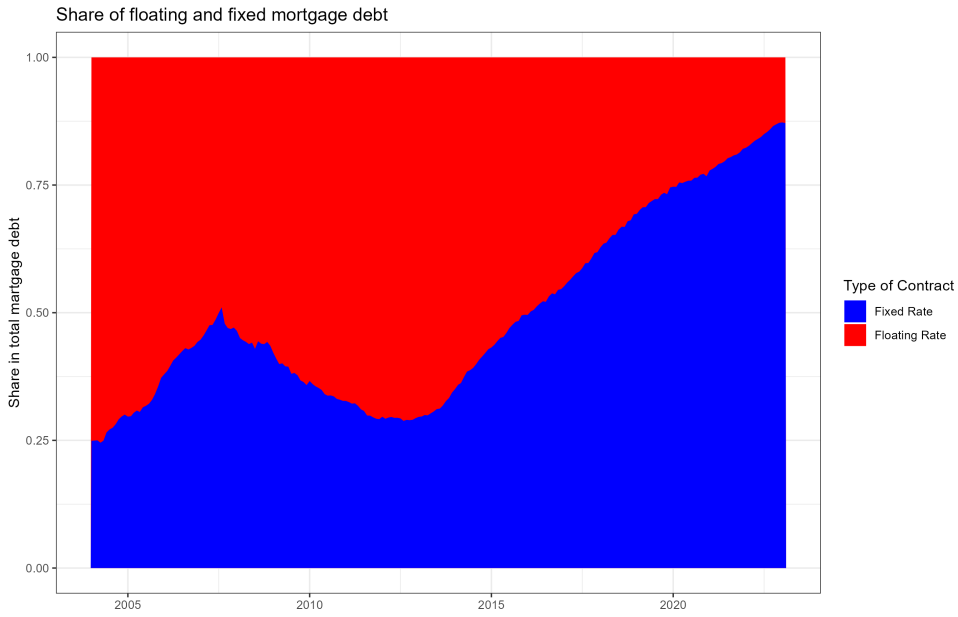


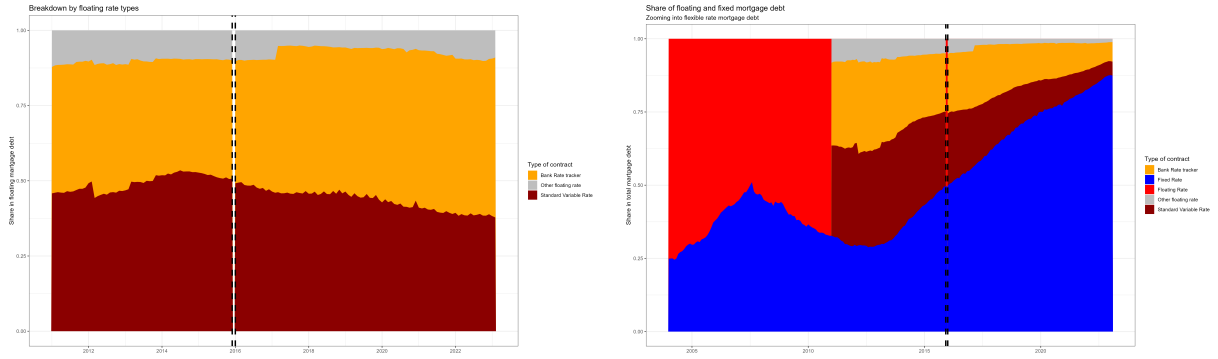
FIGURE 2. The split between fixed and floating debt changed after 2014.

until 2014, and then started to grow rapidly overtaking the stock of floating debt around 2016. On the other hand, floating mortgage debt increased only until 2014 when it peaked. After that, it has slowly decreased.

As a result of these dynamics, the split between these two types of debt has clearly changed after 2014. As shown in Figure 2, the importance of fixed rate debt has steadily increased since then, going from 35% of total debt in 2014 to more than 75% in 2023. Not quite sure whether this is a supply or demand driven story, however, it is interesting to see that the pattern coincides with the introduction in October, 2014 of borrower-based macro-prudential limits. In particular, the FPC of the Bank of England introduced two macro-prudential measures in 2014:

a. Mortgage lenders cannot extend more than 15% of their total number of new residential mortgages at loan to income ratios at or greater than 4.5
b. An affordability test that ensures that borrowers could still afford their mortgages if, at any point over the first five years of the loan, the Bank Rate were to be 3 percentage points higher than the prevailing rate at origination.

Floating debt mortgage breakdown. In the UK, the most common flexible rate mortgage contracts either follow the Bank of England rate (Bank Rate tracker mortgages) or have a Standard Variable Rate (SVR). The SVR is set by the lender and typically, but not always,



A. Fifty-fifty split between SRV and BOE Bank Rate.

B. The relative importance of these two types of contracts has been srinking over time.

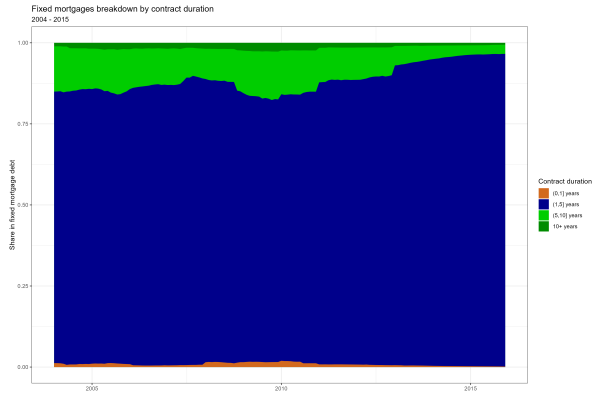
FIGURE 3

changes with the Bank of England rate.

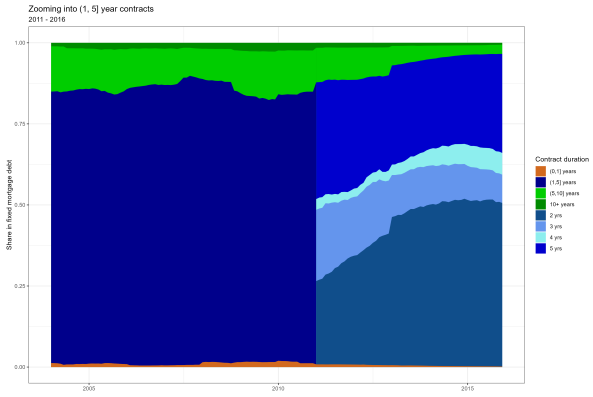
We have data on these two types of contracts from 2011-m1 to 2023-m2, although since 2016-m1 these data are available for *Individuals & Individual Trusts* only. As shown in the left panel of Figure 3, the split between these two types of floating rate mortages has been very stable over time, with each of them taking approximately half of the variable rate market. Overall, both SVR and Bank rate tracker mortgages have a much lower representation in the cross section of mortgages today than a decade ago, going form 30% and 28% of total morgage debt in 2011-m1 to 6% and 1% in 2023-m2, respectively.

Fixed debt mortgage breakdown, by contract duration. The data are a bit inconsistent in this regard as the criteria seems to have changed over time. We have a breakdown between fixed rate mortgages that have a duration of less than 1 year, between 1 and 5 years, between 5 and 10 years, and more than 10 years. It is available between 2004-m1 to 2015-m12. As one can see in the top left panel in the Figure 4, the vast majority of fixed contracts have a duration between 1 and 5 years, representing between 83% and 97% of the total fixed mortgagte debt. Nonetheless, this corresponds to a share of 20% of total debt in 2004, while these contracts amount to 50% of total debt in 2015. Recall that the share of fixed rate contracts has increased over that time window.

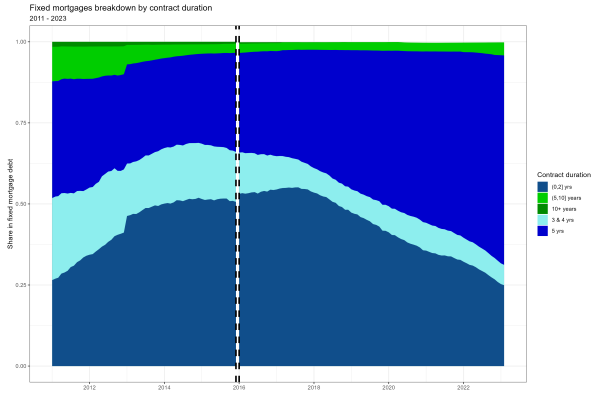
Moreover, I can futher decompose this split for the period between 2011-m1 to 2015-m12 into 2, 3, 4, 5 year fixed rate mortgages as shown in the top right panel of the Figure 4. There one sees that the two most predominant contracts correspond to 2 or 5 year fixed contracts, with 2 year contracts gaining relevance. In fact, at the beginning of the sample (2011-m1), 2 year contracts represent 26% of all fixed mortgage debt, while towards the end of this sample (2015-m12) this number is 50%. On the other hand, 5 year



A. Mortgages between 1 and 5 years predominate with very little time variation.



B. 2 and 5 year contracts dominate, with 2-year gaining more relevance from 2011 to 2015.



C. Starting from 2016 more five year contracts are being signed.

FIGURE 4. Inconsistent classifications over time, but 2 and 5 year contracts are the most common in the UK mortgage market

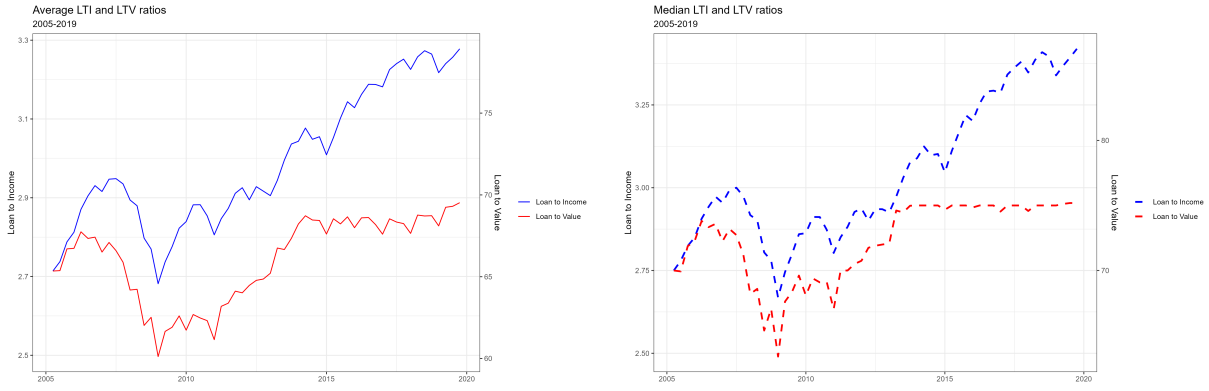
contracts represent between 30% to 35% of all fixed mortgage debt during this period, implying that the increase in the share of 2 year contracts comes from the reduction of mortgage debt contracts with a fixed duration between 3 & 4 years.

Finally, I use the data from *Individuals & Individual Trusts* to look at this decomposition between 2 and 5 year mortgages beyond 2015-m12. From this point onwards, the data accumulates 3 & 4 year mortgages into a single bin, as well as pulls (0, 1] year mortgages with those that are 2 years. This split is shown in the bottom panel of Figure 4. The key message from this figure is that there has been a reversal in the growth of 2 year contracts in favor of 5 year ones, which have become the most common type beyond 2016. In fact, they represent 65% of total debt by the beginning of 2023.

1.2. Loan to Value & Loan to Income Ratios

Averages. We plot in Figure 5 the average (left panel) and the median (right panel) LTV and LTI ratios over the period between 2005-q1 and 2019-q4. The left y-axis corresponds to the values of the average Loan to Income ratio, while the values of the Loan to Value ratio are captured on the right y-axis. This dual axis plot allow us to visualize the correlation between these two measures. I normalize the axes such that each of the series starts at the same point in the graph. As shown graphically, these measures follow similiar cyclical patterns and are correlated. In fact, the correlation coefficient betweeen the two is 0.87. Nonetheless, there seems to be a decoupling after 2014. The average LTV ratio, which was not regulated by the Bank of England, stabilized around 68% with its median value being around 75%. On the other hand, the LTI ratio, which had a cap of 4.5, kept increasing on average over this period. This may reflect the fact that more mortgagors are being constrained by this limit since the average house price to income ratio has slightly increased over the last decade, as we shall see in Section 2.1.

Distribution. The evolution of the distribution of Loan to Income and Loan to Value ratios is plotted below for the period between 2005-q1 and 2019-q1. In particular, LTI ratios are binned into 6 different buckets: i) below 3, ii) between 3 and 3.5, iii) between 3.5 and 4, iv) between 4 and 4.5, v) between 4.5 and 5, and vi) above 5. These are plotted in the left pannel of Figure 6, which shows how the amount of LTI-constrained mortgagors has increased over time: more than 60% had LTIs below 3 in 2005, but only 36.6% were



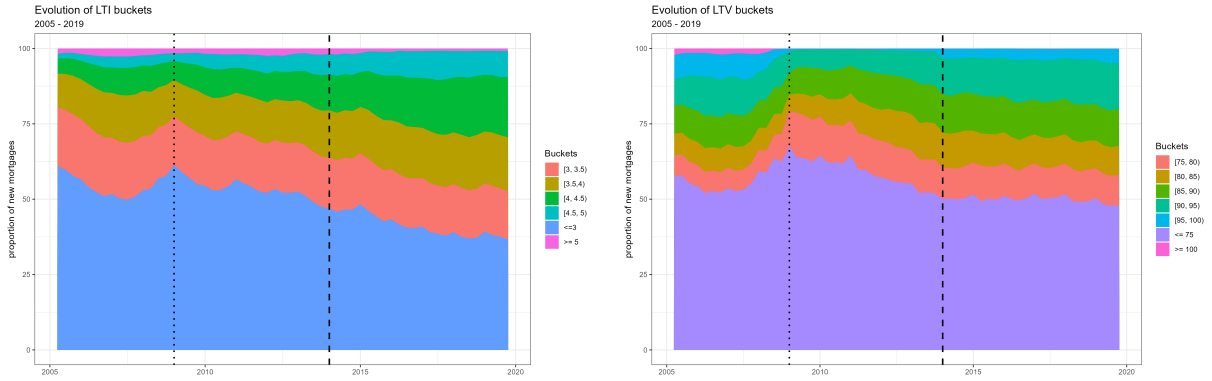
A. Average LTVs and LTIs are highly correlated before 2014, but LTV stabilized while LTI continnue growing after 2014

B. Same applies for median LTVs and LTIs

FIGURE 5. Decoupling of LTV and LTI ratios after macro-prudential reform

in this bin in 2019. Moreover, we also see how these constrained households bunch into the bin between 4 and 4.5, which is consistent with the new macroprudential meassures that the Bank of England put in place in 2014 (dashed black line).

The evolution of the distribution of LTV ratios is depicted in the left panel of Figure 6. LTV ratios are binned into the follwing buckets: i) below 75%, ii) between 75% and 80%, iii) between 80% and 85%, iv) between 85% and 90%, v) between 90% and 95%, vi) between 95% and 100%, and vii) above 100%. The most relevant take-away from this plot is that mortgage loans above 100% LTV ratios disapeared from the market after the Great Recession (dotted black line).



A. After the 2014 reform, there are more constrained households between 4 and 4.5 LTI ratios.

B. After the Great Recession, mortgage above 100 LTV limits were taken out of the market.

FIGURE 6. LTI ratios affected by the reform, while LTVs by the Great Recession

1.3. Prices

Morgage Rates. As seen above, the two most common fixed mortgage contracts have a two or five year duration before switching to floating rates. Hence, we plot in Figure 7 the (average) mortgage rates prevailing in these type of contracts for 75% LTV mortgages during the period spanned from 1995-03-31 unitl 2023-08-31. The solid lines correspond to the raw data in monthly frequency, while the dashed lines capture the quarterly average of the monthly rates.

It is evident that there is a clear downward trend in the morgage rates until the aftermath of Covid-19, where we see an spike in rates that brought them back to the preveailing levels of the Great Recession. The spike in rates is probably associated to the uncertaincy surounding the recovery of the Covid-19 pandemic and the increase in Bank rates to tame the inflationary pressures.

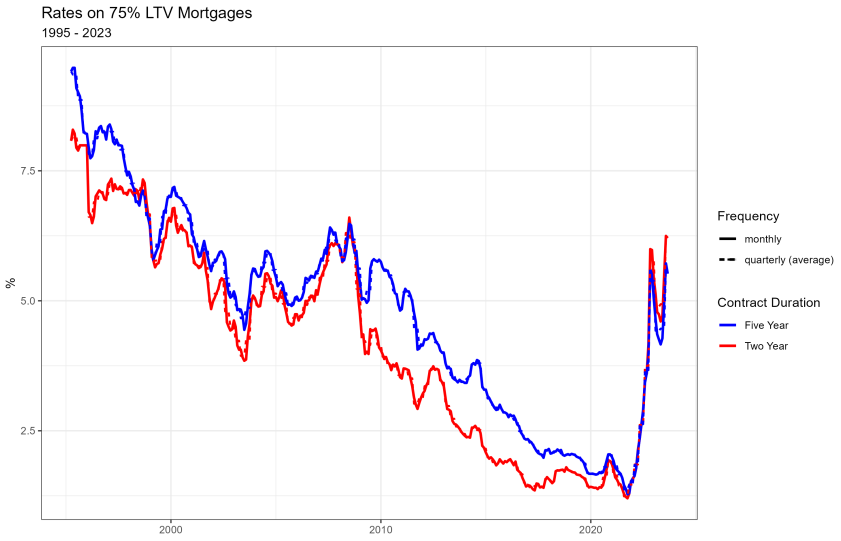


FIGURE 7. Downward trend in mortgage rates, followed by a spike after Covid-19

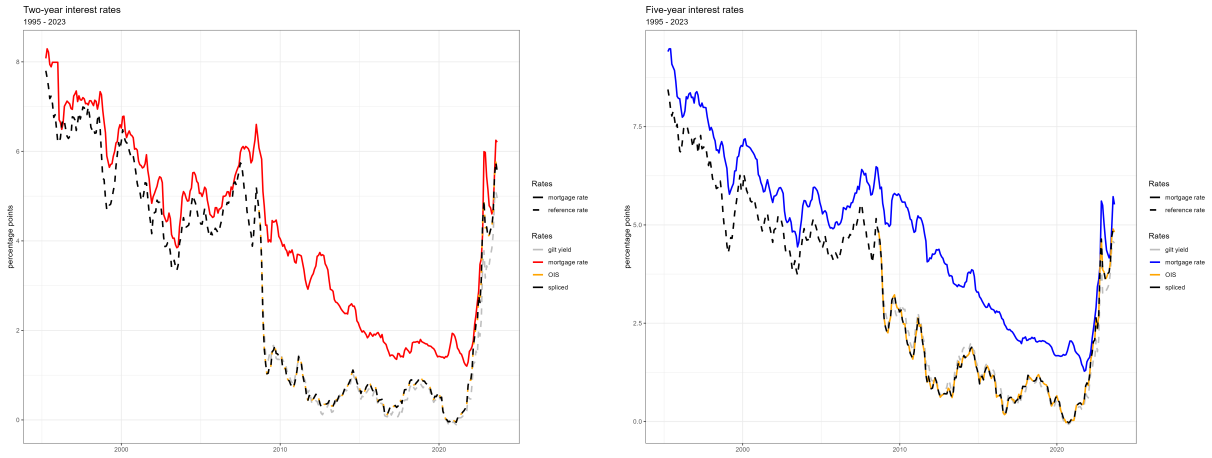
The two year and the five rate mortgage rates comove almost perfectly with a correlation coefficient of 0.97. Nontheless, the five year mortgage rate is almost always above the five year rate, which probably reflects the fact that banks are capable of insure against rate risk by charging a higher premium to the longer maturity contracts.

Reference rates & spreads. We use the gilt yield and the Overnight Index Swap (OIS) rate to compute the spread between risk-free rates and the mortgage rate. The gilt yield caputres the yields on UK government bonds while the OIS rates are instruments that settle on overnight unsecured interest rates such as SONIA for the UK or EONIA for the European Union.

The OIS rate is only availble starting in 2008-08-31. Therefore, prior to that date we use the gilt yield as a refernce rate. The spliced series is therefore the gilt yield until the date when the OIS rates start to become available.

As shown in Figure 8, reference rates have also had a downward trend and plummetted in the aftermath of the Great Recession, where the difference with the mortgage rate increased substantially. Similarly, there has also been a recent spike in the gilt yields and OIS rates closing the gap between the mortgage and reference rates.

The spread on mortgage rates was around 1 percent during almost 15 years (1995 to 2008). Then, as a result of the Great Recesion and the fall in the government bond returns, it increased to almost 3 percent and has slowly recoverd and is now back to its initial level of around 1 percent. Similar to mortgage rates, five-year mortgage spreads



A. Downward trend, large fall around the Great Recession and recent spike.

B. Similar trends for Two and Five Year Rates.

FIGURE 8

are also above the two year counterpart for most part of the sample.

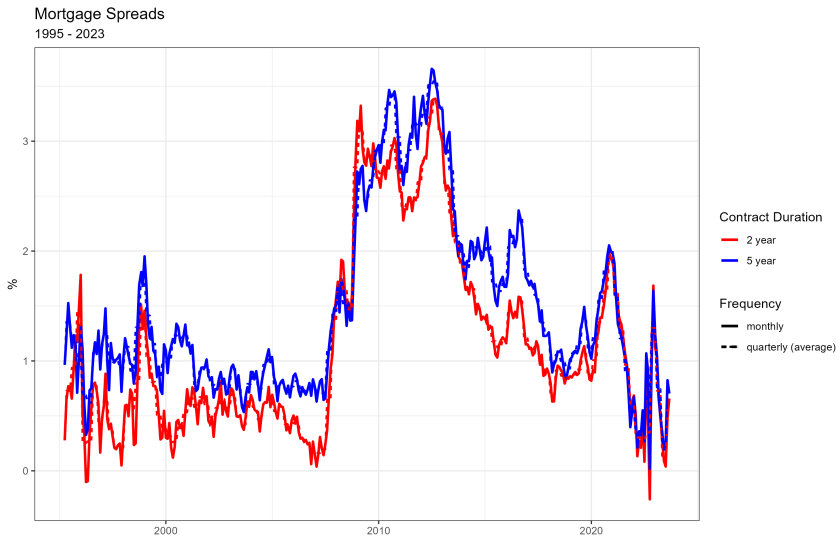


FIGURE 9. Stable around 1%, before jumping to 3% during the Great Recesion. In its aftermath, they have become more volatile and fluctuate between 0.5% and 2%.

Other mortgage rates. We have looked at rates on 75% LTV mortgages used to purchase owner occupied properties as a basis to analyze how mortgage spreads evolve over time. This choice is partly motivated by data constraints. There are other series available at the Bank, however, they are not available for the whole sample.

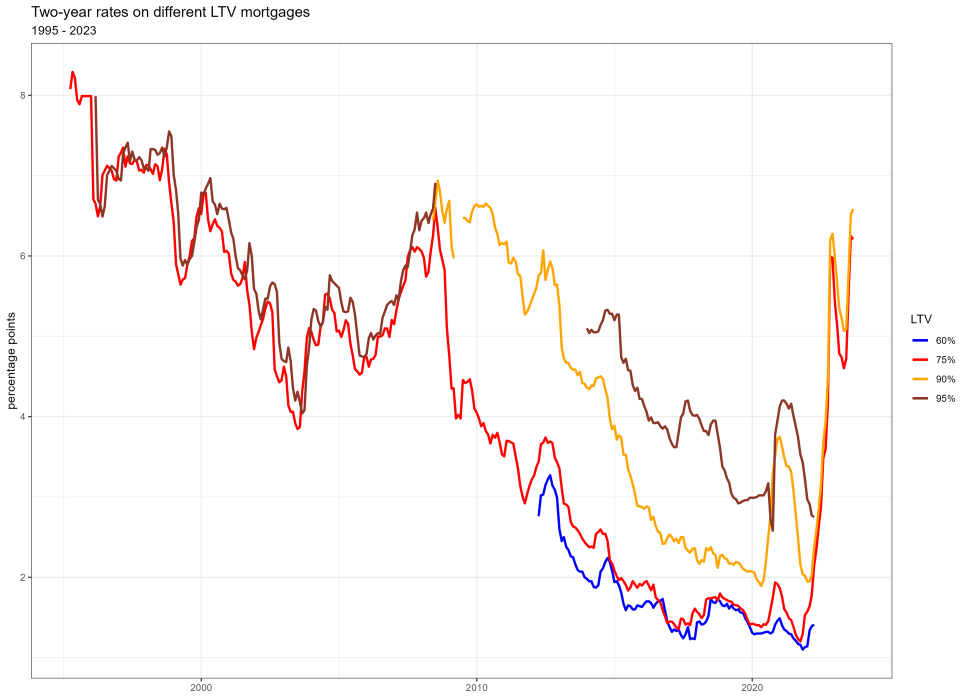


FIGURE 10. Before the Great Recession mortgage rates on different LTV loans were very similar.

In any case, we still look at these shorter series and compare them to the rates on 75% LTV mortgages. There are data available on rates on 60%, 90% and 95% LTV loans. These series are plotted in Figure 10. There are a few things to learn from this figure. First, all these rates have been decreasing at a reasonable pace until 2020. After 2020, the hikes in the Bank rate as well as the increase in uncertainty has pushed these rates up and they were back to the levels observed prior the Great Reccession in the span of a few months. Second, there is a premium on mortgage rates with higher LTV ratios as these are more risky. And third, the spread between these rates was tiny prior the Great Recession, then it increased during the period between 2008 and 2022, and it has closed out again after 2022. For example, during the 1990s and 2000s the difference between the rates on 95% and 75% LTV loans was almost nil (0.25 p.p. on average), while the spread between these two rates was slightly below 2 percentage points during the period between 2008 and 2020.

1.4. Constrained Mortgagors

In our DSGE model we assume that all borrowers are credit constrained. Therefore, in order to identify the share of borrowers that are constrained in the data we look at the

fraction of mortgagors that have a house and a mortgage but also have less than two years of earnings in liquid assets. We define liquid assets as money market, checking, savings and call accounts, as well as corporate and government bonds and treasury bills net of credit card debt.

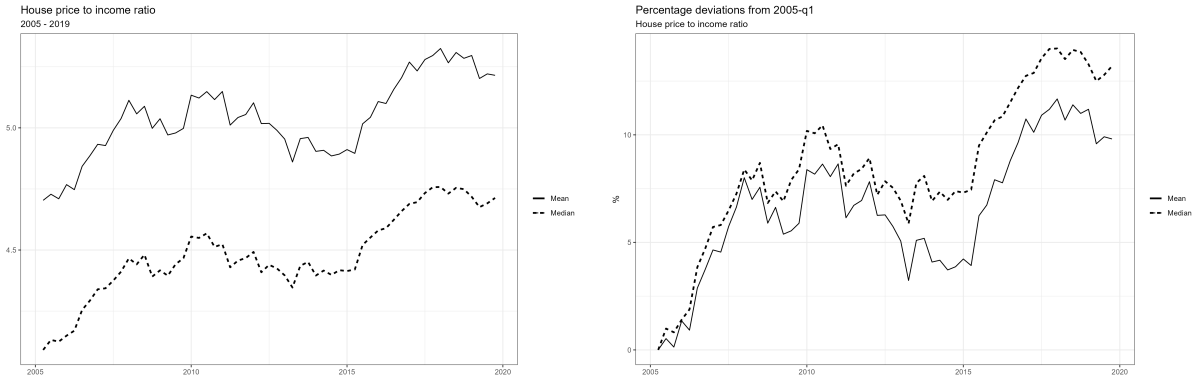
Waiting on Marek's input to further develp this section.

2. Housing Market

2.1. House Price to Income Ratio

The average house price to income ratio, depicted by the black solid line in Figure 11 (left panel), has remained relatively stable around 5. Its median value (dashed black line) is slighlty below and around 4.5. This indicates that the HPI is skewed to the right. Note that this national average masks the vast heterogeneity in the UK and particularly the differnces between the London area and the rest of the UK.

Moreover, as show in the right panel of the same figure, there has been an upward trend in both the mean and the meadian HPI. Here we compute the percentage deviation from the first observation in the sample (2005-q1). This shows that in the last 15 years, there has been an increase of 15% in the house price to income ratio. The overall increase in this metric has been specially prominent in the last 5 years.



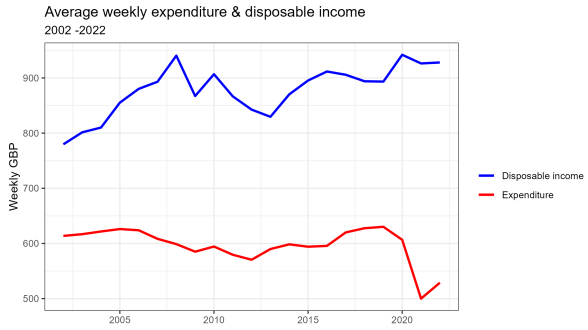
A. Mean HPI value around 5, while the median around 4.5.

B. The house price to income ratio has increased over time.

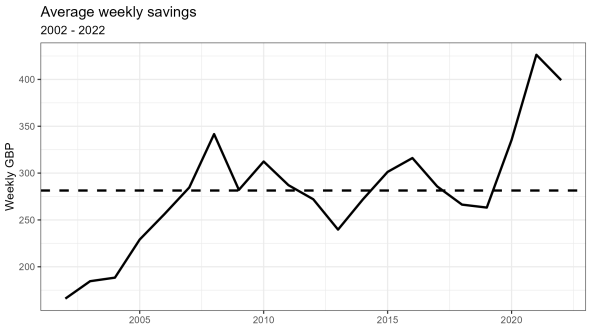
FIGURE 11

2.2. Household Expenditure Shares

These data are publicly available in the Office for National Statistics (ONS). They provide information on household expenditure shares for several years. The most recent data is for 2022, however, this is not a great year to look at expenditure shares. As shown in the left panel of Figure 12, household expenditure has remained relatively stable over time except from the Covid period when it plummeted. This lead to a big increase in savings during that time around 400 GBP/week relatively to the mean of the series (289 GBP/week). After 2020, average weekly expenditure started to increase again but



A. Expenditures are stable over time, while disposable income follows the business cycle.



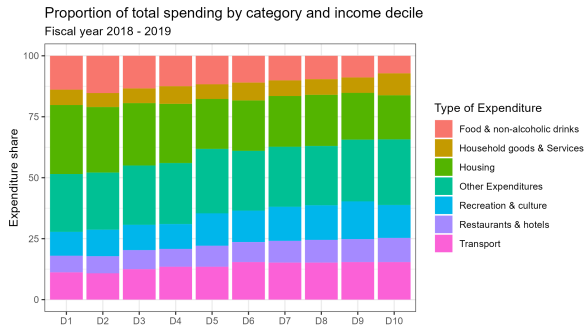
B. Weekly savings increased during Covid, but they haven't return to its previous level yet

FIGURE 12

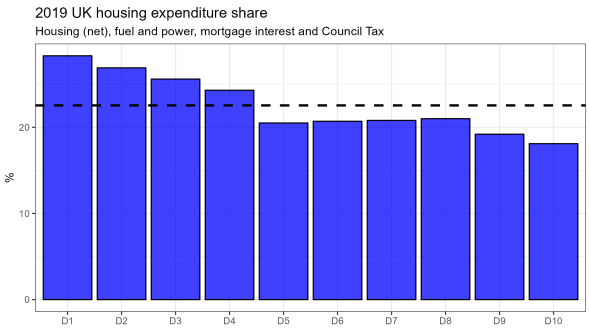
it hasn't reached the pre-Covid levels yet. Taking all this into account, any year prior Covid-19 would be a more reasonable choice when calibrating the housing expenditure share. For simplicity, I will look at fiscal year between April 2018 and March 2019.

These data classifies households into different deciles based on the disposable income. Expenditures are categorized in different bins that are self-explanatory by the legend in the bar chart in the right panel of Figure 13. Other Expenditures includes: i) alcoholic drinks, tobacco and narcotics, ii) clothing and footwear, iii) health, iv) communication, v) education, vi) miscellaneous goods and services, and vii) other expenditure items.

Housing is the largest spending category independently of household's income. It is followed by food & non-alcoholic drinks for the bottom half, while for the top half the second most important item is transportation. Going back to the housing



A. Housing is the biggest component of household's expenditures.



B. Housing expenditure share is around 20%.

FIGURE 13

expenditure share, which is the relevant one for our purposes, it goes without saying that is clearly decreasing in household's disposble income, nonetheless, it is around 20% for all income deciles. Since we don't have the proportion of total spending by category for all households, we would take the mean value across deciles as a proxy. Note, however, that the mean of the decile's expenditure share doesn't have to coincide with the housing expenditure share of all households.

3. Miscellanea

3.1. Long term interest rates

In our DSGE model, savers have access to long term bonds. Consequently, it is reasonable to use the 10 year gilt yield to match the saver's discount factor. The challenge is to pick the averaging window to get our target rate. Similar to other rates, the 10-year gilt yield exhibits a downward trend until 2020, and then fastly increases as the Bank rised their interest rate. Nonethless, it seems that during the period between 1998 and 2008 it is somewhat stable. Hence, we take the 10 year average during this preriod and use the 4.83% average as our target.

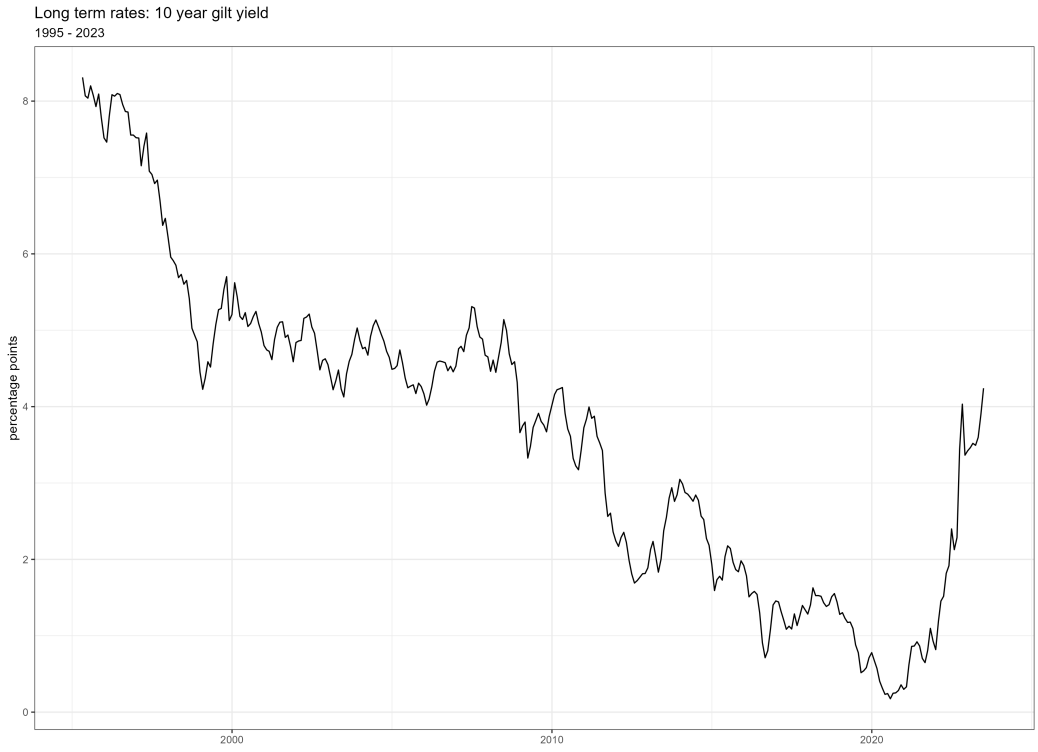


FIGURE 14. Downward trend, spike after 2020. However, more or less stable and around 4.83 percentage points during the 2000s.

3.2. Inflation expectations

- Bank of England/Ipsos Inflation Attitudes Survey: 2 year ahead inflation expectations for households.

- Deloitte CFO Survey: professionals' inflation expectations at the 2 year ahead time-frame.
- Market Participants Survey