Research Report

Rate Dispersion and the Role of Bargaining Power in the German Mortgage Market

THIS STUDY DOCUMENTS THE ROLE OF BARGAINING POWER IN THE DETERMINATION OF MORTGAGE RATES BASED ON A UNIQUE ADMINISTRATIVE DATA SET COMPRISING 20,000 MORTGAGE LOAN CONTRACTS. WE USE VARIATION IN THE COMPETITIVE ENVIRONMENT TO IDENTIFY THE EXTENT TO WHICH DIFFERENTIAL PRICING IS DUE TO RELATIVE BARGAINING POWER. OUR IDENTIFICATION STRATEGY SEPARATES MARKET POWER FROM OTHER SOURCES OF PRICING DIFFERENTIALS, SUCH AS CREDIT RISK, PRODUCT DIFFERENTIATION, OR OTHER COSTS. THE RESULTS INDICATE THAT BARGAINING POWER DETERMINES THE EXTENT OF PRICE DISCRIMINATION ON OBSERVABLE BORROWER CHARACTERISTICS. A REDUCTION IN LENDER BARGAINING POWER REDUCES THE DISADVANTAGE SUFFERED BY BORROWERS WHO REFINANCE THEIR LOAN AND REDUCES THE ADVANTAGE FOR THOSE WHO HAVE THEIR MAIN BANKING RELATIONSHIP AT ANOTHER BANK. SIMULTANEOUSLY, IT INCREASES THE ADVANTAGE FOR BORROWERS FALLING IN THE WEALTHY/HIGH-INCOME SEGMENT. FURTHER ANALYSES POINT TO SEARCH INCENTIVES AS AN IMPORTANT DRIVER OF THE DIRECTION OF THE EFFECT OF BARGAINING POWER.

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Introduction and Data

Mortgage markets comprise an important segment of retail financial markets. For most households, the purchase of real estate is by far the largest financial investment of their lifetime. The decision of how to finance their home, therefore, has enormous financial consequences. However, the vast number of mortgage providers and financing instruments as well as product features that are available in the market make the choice of the optimal product complex and time-consuming. This paper shows that variation in the effective mortgage rate can be significant even within similar mortgage products. We document significant pricing differences as large as 30 basis points on a 10-year standard mortgage loan even among customers of the same bank. These can result in an average difference of EUR 2,100 in present value terms for a EUR 104,000 mortgage (based on the interquartile range of individual interest rate discounts for 10 year fully amortizing standard mortgage loans with a loan-to-mortgage lending value ratio (LTM) below 60% and an average effective interest rate of 3.8% p.a.).

The study introduced here aims at identifying bargaining power as an important source of pricing differences. To establish that, we analyze a unique data set of circa 28,000 newly issued and refinanced mortgage contracts held by a regionally active retail bank drawn from a comprehensive data set of more than 133,000 retail loans of different types and purposes from the years 2007 to 2014. We focus on mortgage contracts and further narrow the data set down to the years 2008 to 2013 because of availability of market competition data. Also excluding non-performing loans, we take 27,815 loans into consideration. Figure 1 shows a breakup by loan type of these contracts. For most of our analyses, we further narrow the sample down by focusing on collateralized loans and on those for which we are able to match pricing information by maturity and loan-to-value ratio (LTV). Last, we discard subsidized and modernization loans as their pricing is highly regulated (subsidized) or the lending procedure as well as the pricing is different from those of standard loans (modernization). The remaining two loan types – standard mortgage and building loan agreement type – yield 19,976 loans amounting to EUR 1.6 billion held by 14,301 households.

We benefit from the fact that borrowers' credit scores do not play a role in mortgage loan pricing at our sample bank. In particular, the lender posts a mortgage rate schedule that depends on the product features of the mortgage, but the borrower may be able to negotiate a discount. Effective mortgage rates are thus determined through a negotiation process between the prospective borrower and the loan officer. The loan officer's business objectives, and therefore her bonus, depend on the overall lending volume, the effective interest rate margin and cross-selling potential, but are not impacted by borrower default. In a separate analysis, we verify that risk considerations do indeed not play a role in loan pricing in our data. However, we observe credit scores only for a small subset of borrowers. Therefore, we have not included it into the main specifications. For this subset, we show that sign and magnitude of the coefficients on personal characteristics do not change significantly after including credit score as an additional explanatory variable. Furthermore, our data allows the observation of both the posted rate schedule and the effective individual interest rate actually paid by the borrower.

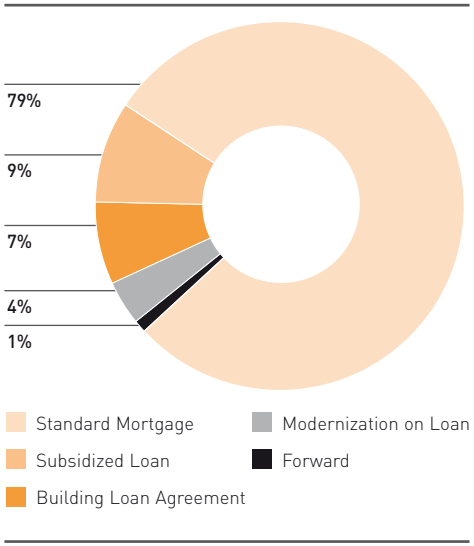

Figure 1: Newly Issued Fixed Rate Loans by Loan Type 2008 to 2013

Ours is not the first study to look at the role of bargaining power in mortgage markets, although it is the first one to assess the phenomenon in the German market. Allen et al. (2014), for example, explain price differentials in the high loan-to-value segment of insured Canadian mortgages. The authors use quantile regression to identify unobserved bargaining ability. Gary-Bobo and Larribeau (2002) used a structural model of price discrimination and find that the price discrimination patterns found in the data best match a structural model where lenders have a significant degree of market power. We employ a more intuitive approach to study a data set that is both rich in number of products and personal characteristics and representative of the population of German mortgage borrowers.

In the mortgage market, lenders generally have an incentive to base their pricing on signals about the customer's type. This is true for markets where the profitability of a customer depends not just on a one-time purchase but also on the customer's behavior during the life of the contract (see for example, Einav et al. (2012) making similar statements about the car loan market in the US). In general, profitability can be determined by both observed and unobserved factors. Knowing that individual credit score is not used for pricing at our sample bank, we show that the bank's pricing depends on observable factors that can be interpreted as the borrower's propensity to switch lenders, cross-selling potential, or effort costs to the loan officer in processing of the loan application. However, consumers may have different unobserved bargaining power, i.e., they may also differ in their ability to negotiate rate discounts (Allen et al., 2014).

Separating the cost-based pricing differentials from rent extraction that is due to unobserved relative bargaining power is the objective of this paper. Stole (2007) states that price discrimination exists whenever price variations between groups of customers cannot be explained by variations in marginal costs. It arises when "(i) firms have shortrun market power, (ii) consumers can be segmented either directly or indirectly, and (iii) arbitrage across differently priced goods is infeasible." Bargaining power is a relative measure that can be higher for specific consumers in some circumstances or higher for the lender in some other circumstances. Cost-based pricing differentials have been distinguished from bargaining power-induced rent extraction by studying differences in the competitive environment. We follow Dafny (2010) in arguing that, as a competitive market would be pricing at marginal cost, any difference in rent extraction across branches characterized by different competitive environments indicates a shift in – and hence the presence of – bargaining power.

Methodology

In a first step, we estimate the extent to which certain factors relate to the effective mortgage interest rate. In particular, we use regression analysis to estimate the impact of observable borrower characteristics on the difference between the effective rate paid by the borrower and the posted rate in the lender's pricing schedule, which we call the rate premium. By controlling the mortgage product features, we find strong evidence of differential pricing along our four variables of interest: higher discounts for borrowers where the annuity payments are made from an account held at another bank, wealthy customers with higher income and borrowers who are born in our sample bank's business district. In contrast, borrowers pay higher rates on loans where the interest rate has been renegotiated after expiry of the previous fixed rate tenor.

In our second step, we distinguish between cost-based differential pricing and price differences that arise from the presence of bargaining power by taking advantage of different competitive environments. To that end, we construct a measure of competition by counting the number of banks who have a branch presence within a 5-km driving distance from each of our sample bank's branch offices. This measure is then interacted with each of the variables of interest in turn. The identifying assumption is that an increase in competition shifts bargaining power from the bank to the customer. Significant coefficients on the interacted variables thus provide evidence for the presence of bargaining power.

Results

Our results show that, in line with standard theory, a reduction in the bank's bargaining power lessens the extent of differential pricing in the dimensions of whether a loan is refinanced or whether the customer has her main banking relationship at another bank. All respective coefficients in the applied regression models are statistically and economically significant. A borrower's premium on the posted rate is on average 9 basis points higher when a loan is refinanced at the end of the fixed rate period. On average, the interest rate is lower by about 6 basis points if the annuity payments are made from an account held at another bank. The customers who were born in the bank's business district do not prove to have a better bargaining power than others. Even though the coefficient is

statistically significant the effect of only two basis points can be neglected from an economic point of view. Interestingly, while the extent of price discrimination along the earlier mentioned dimensions may be reduced by competition, competition actually increases the price advantage for the wealthy/high-income borrowers relative to the standard retail segment even more. These borrowers – who were identified by being a customer in the private banking and wealth sector – enjoy a discount of almost 11 basis points on average. One interpretation may be that the pricing differential between the private/wealth and the retail segment is not the result of bargaining power lying with the bank. Instead, it may be the result of a strong bargaining position of the private/wealth group vis-à-vis the bank, which in turn has a strong bargaining position against the group of retail customers. As a consequence, the bank may be forced to compensate lower mortgage interest rates for the wealthy with higher mortgage interest rates for the segment of "normal" retail customers, who may eventually end up being the ones paying for competition.

We include personal attributes of the borrowers in our regression models and find that more independent customers ("single") receive larger discounts. Moreover, customers who arrange their loan through a broker pay up as well as those borrowers who have other loans outstanding with the sample bank at the beginning of the loan. As we can rule out a role for personal risk considerations in the pricing process, the results are not confounded by the exclusion of credit score from the regressions. We can therefore conclude that personal characteristics do matter in bilateral interest rate negotiations. Loans taken out when the sample bank's advertized interest rate is above the average rate offered by the ten cheapest mortgage lenders in the market tend to receive a higher discount on the posted rate.

To sum these results up, the findings suggest that the bank has to deal with switching costs of potential customers (and more independent customers) and would like to attract and retain high-income and wealthy clients, as their cost-income relationship is more favorable due to scale economies and cross-selling potential. The discount customers receive for taking a mortgage at another bank is consistent with Allen et al. (2014), where borrowers switching financial institutions receive lower rates than do borrowers who stay with their main bank.

We also provide evidence consistent with the hypothesis that differences in bargaining power between customer groups along some dimensions are likely to drive the direction of the effect of competition. We use changes in shopping incentives as potential shifters of bargaining power between customer groups. Shopping incentives are measured by the dispersion of mortgage interest rates offered by other banks in the market, which is based on the assumption that customers may form beliefs about the likely benefits of shopping for better interest rates by researching online, and then act on these beliefs within the competitive environment they face in the offline world. The identifying assumption is that a borrower with a higher unconditional propensity to shop for better alternatives, such as one who takes out a mortgage at a bank that is not her main bank, will be more responsive to changes in the price distribution of the market than her counterpart who takes out a mortgage with her house bank. The results of triple interaction estimates suggest that the higher the mortgage rate dispersion in the market, the more likely is an increase in competition leading to a widening of the pricing differential between groups. The research-online-purchase-offline (ROPO) effect might therefore be one reason for interest rate dispersion between lenders and the way it interacts with the differential pricing within one lender.

Conclusion

Our results indicate that competition may have ambiguous consequences in the mortgage market. While on the one hand, it may reduce a lender's capability of extracting consumer surplus by reining in its ability to discriminate on price, it may, on the other hand, have quite the opposite effect under certain circumstances. The fact that high shopping incentives lead to a widening of price differences between certain factors suggests that an increase in competition may increase cross-subsidization of sophisticated customers by the naïve (Heidhues and Koszegi, 2010). This has important implications for the optimal design of regulation. In the realm of consumer protection in particular, increasing the level of information and product comparability in a market should be addressed along with market power considerations.

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