OPENING THE GATES TO THE SWEDISH MORTGAGE MARKET

A STUDY ON HOW THE RECENT EMERGENCE OF MORTGAGE CREDIT COMPANIES AFFECTS REAL INTEREST RATES IN SWEDEN

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Abstract:

This paper examines the impact of the emergence of mortgage credit companies (MCCs) on real mortgage interest rates in Sweden. Our results reveal that MCCs exert downward pressure on average mortgage interest rates for the whole market and monetary financial institutions (MFIs), with statistical significance for most interest rate fixation periods. Additionally, the paper investigates the influence of policy rates on mortgage credit companies' ability to affect mortgage pricing. We conclude that higher policy rates limit MCCs' ability to influence pricing, primarily for fixed-rate mortgages. Our findings highlight the role that mortgage credit companies play in enhancing mortgage market competition and provide insights into their sensitivity to changes in policy rates. In a broader context, our study and its results contribute to the current debate on mortgage market competition in Sweden.

Keywords:

Mortgage credit companies, "Lag 2016:1024", average mortgage interest rate, policy rate transmission

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1. Introduction

1.1 Background and Motivation

The global mortgage market is predicted to reach a valuation of USD 1,615.97 billion in 2027, growing at a compounded annual growth rate of 12.1 percent (Mortgage Lender Global Market Report, 2023). Alongside this high growth rate, the United States, Australia, and the United Kingdom report increasing competition in their respective mortgage markets (Rees, 2019; Sanglap & Ramos, 2023; Consumer Financial Protection Bureau, 2023). Simultaneously, there is a global trend of tightening monetary policy, leading to increasing mortgage interest rates (Council on Foreign Relations, 2023). The interplay between the growing number of mortgage institutions and the tightening of monetary policy brings to the forefront a discussion about effective competition in mortgage markets. Specifically, it raises the question of how increased competition influences mortgage pricing. According to neoclassical economic theory, increased competition results in lower prices. Marshall (1920) argues that more intense competition benefits consumers by reducing prices and improving product quality. However, critics argue that neoclassical theories do not accurately represent the dynamics of real-world competition. According to J. McNulty (1968), competition should be recognised not only by the number of competitors but rather the degree of rivalry amongst them, departing from the idea of perfect competition. In addition, the work of Gabaix, Laibson, D. Li, H. Li, Resnick and de Vries (2016) contests the view that heightened competition results in significantly lower prices. They conclude that high markups still exist in fragmented markets because of market characteristics and customers' individual preferences. While opinions vary on the correlation between price and competition, there is a general agreement amongst the literature that this relationship is not strictly linear.

Examining the price-competition relationship in the mortgage market, Allen, Clark and Houde (2014) investigate the link between market concentration and variation in mortgage prices in the Canadian market. The study reveals a significant correlation between bank mergers and decreasing price dispersion, as well as an increase in average mortgage interest rates. In addition, van Leuvensteijn, Kok Sørensen, Bikker and van Rixtel (2008) examine the influence of market competition on the pass-through of policy rates in the Euro Area. They discover that increased competition leads to lower interest rate spreads across several loan products, with mortgages showing statistically significant results. Moreover, Treur and Boonstra (2014) examine the impact of Dutch market conditions on mortgage funding and interest rates following the financial crisis. The paper discovers a correlation between higher market concentration and rising mortgage interest rates. However, the authors add that the correlation can result from changes in funding costs.

Building on the cited research, our study aims to provide a broader understanding of how increased competition influences mortgage interest rates. Specifically, our research investigates how "Lag 2016:1024", a legislation implemented in Sweden in 2017 that introduced a new type of mortgage institution, impacts mortgage market competition. To

understand the effect of the legislative change, we analyse the effects of these new players, known as mortgage credit companies (MCCs), on average mortgage interest rates.[1]

By focusing on the Swedish market, whose competitive landscape is characterised by a growing number of competitors rather than consolidation, we add to previous literature on mortgage market competition. Furthermore, our research contributes with additional perspectives on how monetary policy influences the mortgage market's competitive landscape. Examining the effect of monetary policy allows us to analyse mortgage credit companies' ability to survive and grow in the long run. To determine monetary policy's impact, we compare the effect of mortgage credit companies on interest rates during periods with high versus low repo rates. Additionally, instead of focusing on interest rate dispersions, spreads, or margins as related literature does, our study directs attention to average mortgage interest rates, which directly reflects real customer prices. Moreover, we examine how monetary financial institutions (MFIs), which hold most of the market power, are impacted by mortgage credit companies.[2] We intend for the study's results to contribute to the discussion on efficient mortgage markets through the insights gained from the Swedish market. Further, we aim to understand if allowing MCCs or similar mortgage institutes to operate is an effective tool for government-controlled market regulation.

Our study analyses data from 2012 to 2023, providing an opportunity to examine the price-competition relationship in the mortgage market without including the atypical dynamics of the 2008 financial crisis (Crotty, 2009). Additionally, using newer data offers a perspective that aligns with current market structures, which is essential given the banking sector's digital transformation in recent years (European Central Bank, 2023). The emergence of Swedish mortgage credit companies is part of this transformation. They use a fully digital business model that has the potential to reshape the mortgage market's competitive landscape. According to J. Ferreira, Fernandes and F. Ferreira (2019), digitalisation alters market structures by removing barriers to entry, paving the way for new competitors and substitutes to emerge. To understand how this development in the Swedish mortgage market has impacted prices, our research questions are as follows:

How has the recent emergence of mortgage credit companies affected real mortgage interest rates in Sweden? And have changes to monetary policy with respect to repo rates affected mortgage credit companies' ability to influence real mortgage interest rates?

To answer the research questions, we use a multiple linear regression model. We want to assess the effect of mortgage credit companies' presence, represented by their market share (independent variable), on average mortgage interest rates (dependent variable). The regressions are run using average mortgage interest rates for the whole market and monetary financial institutions separately, capturing both market and competitor effects. Additionally, we account for year fixed effects by including a dummy variable for each year, and the regressions are conducted for various interest rate fixation periods.[3] To determine how

[1] Mortgage credit companies and their abbreviation MCCs are used interchangeably.
[2] The abbreviation MFIs will be used interchangeably with monetary financial institutions.
[3] Interest fixation periods are separated by ≤ 3 months (Variable) and > 3 months (Fixed), and Total.

monetary policy influences mortgage credit companies' effect on rates, we split and compare the data across two periods: pre- and post-policy rate shock. We determine the cut-off date based on the Swedish Central Bank's policy rate change on May 4th, 2022.

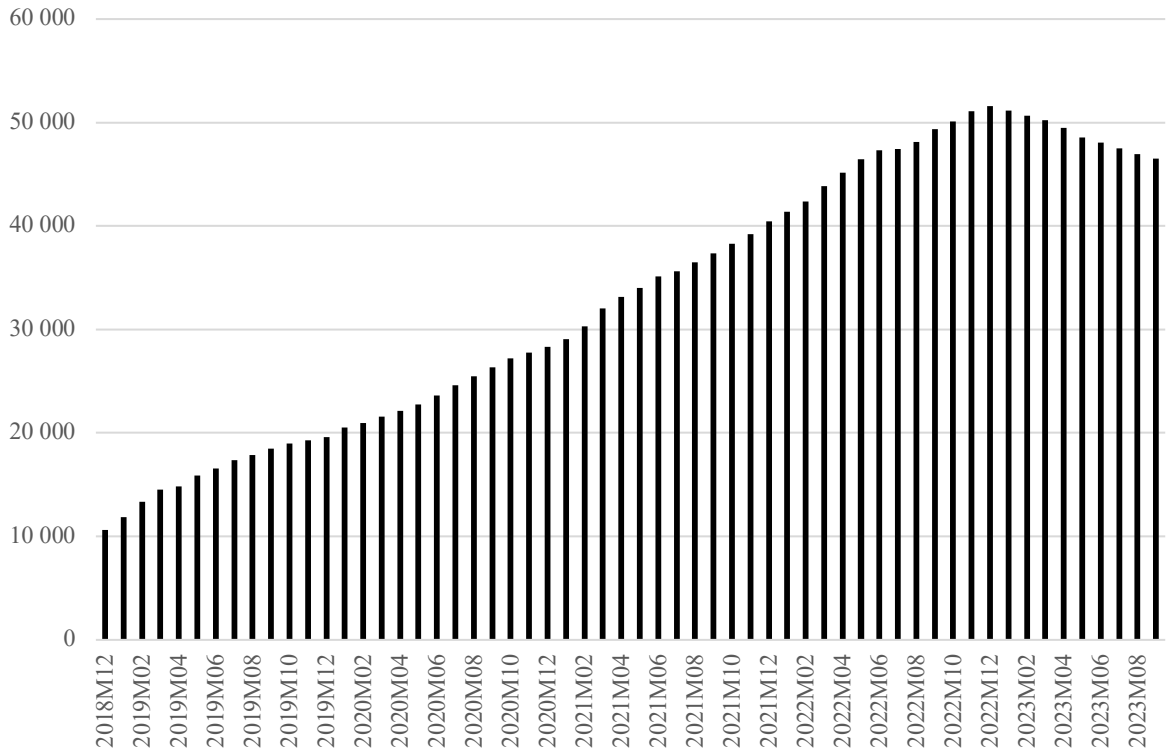
Our results offer two unique perspectives. First, we find that the growing market share of mortgage credit companies exerts downward pressure on average mortgage interest rates. This finding is true for both the whole market and MFIs, as well as for all interest fixation periods, which is discussed to be the result of increased competition and operational efficiencies of MCCs. Second, we observe that mortgage credit companies' effect on rates diminishes as monetary policy tightens. Several factors can account for this reduced impact, with the inability of mortgage credit companies to hold deposits being a major contributor.

1.2 Characteristics of the Swedish Mortgage Market

To provide background for our study, we describe the characteristics of the Swedish mortgage market and outline the legislation that allowed MCCs to enter the market. In Sweden, outstanding household mortgages have increased by an average of 7.9 percent annually in the past 20 years (Swedish Financial Supervisory Authority, 2022). These mortgages currently account for 83 percent of total household debt (Swedish Financial Supervisory Authority, 2023). Historically characterised by high concentration, the Swedish mortgage market is experiencing a rise in new entrants. Still, 60 percent of the market share is held by Sweden's four largest banks: Nordea, Swedbank, SEB, and Handelsbanken (Swedish Bankers' Association, 2023).[4] In 2015, a Swedish government official report concluded that only allowing traditional banks to issue mortgages would *"restrict the market for mortgages in a way that would not be compatible with consumers' interests"* (Government Offices, 2016). Following the report, "Lag 2016:1024" was passed into law, making it possible for a new type of competitor to enter the market: mortgage credit companies.[5] According to Statistics Sweden (2020), mortgage credit companies are institutions authorised by the Swedish Financial Supervisory Authority to issue mortgages. Since 2017, several companies have applied for a permit; however, many have never supplied any mortgages and have since returned their permits (Dagens Industri, 2023). As of 2023, mortgage credit companies hold an approximate market share of 1 percent, with Stabelo and Hypoteket being the largest participants (Statistics Sweden, 2023). Graph I displays the historical development of MCCs' outstanding loan volume to help comprehend what their market share means in absolute terms.

[4] Market share calculated using lending to Swedish households with residential security as of June 2023.
[5] The report (SOU 2015:40) was inquired by the Department of Justice, then led by Morgan Johansson, to investigate how 2008/48/EG, 2013/36/EU, and regulation (EU) No 1093/2010 would be translated into Swedish law. Following the report, the Department of Justice submitted a bill (Proposition 2015/16:197) that was passed into law through "Lag 2016:1024".

Graph I: MCCs Outstanding Mortgage Volume Over Time in SEK Million



Graph I: This graph presents MCCs outstanding mortgage volume in SEK million, split on months.

Mortgage credit companies distinguish themselves from monetary financial institutions in many ways; they have different rights and obligations. A major difference between the two categories of mortgage institutions is how their mortgages are financed. MFIs mainly finance their mortgages through deposits and covered bonds, while MCCs issue or transfer mortgages, which they, in turn, sell to alternative investment funds (AIFs). These AIFs, which are usually subsidiaries of mortgage credit companies, develop investment products derived from these mortgages and sell them to investors (Sveriges Riksbank, 2020). Investors primarily include Nordic pension funds and insurance companies, but the funds are available to all investors interested in Swedish mortgages (Sveriges Riksbank, 2020; Hypoteket, 2023). Mortgage credit companies' financing structure alleviates certain risks in the mortgage market. This international risk sharing, facilitated by the securitisation of mortgage debt, effectively distributes the risks associated with domestic credit. It not only helps to mitigate financial strains on local mortgage institutions but also broadens the investor base (Hoffman & Nitschka, 2012). However, international investment in the Swedish mortgage market is a well-established practice, where investors have had the option to allocate money into covered bonds issued by monetary financial institutions prior to MCCs existence. Yet, while investors in MFIs hold a claim against the issuer and the underlying assets, those who invest in mortgage credit companies only have a claim on the fund itself (Sveriges Riksbank, 2020). Consequently, in the event of default, investors holding covered bonds issued by monetary financial institutions benefit from an additional layer of security (Sveriges Riksbank, 2013).

In addition to using different financing methods, mortgage credit companies target customers with safer risk profiles. MCCs have a maximum loan-to-value ratio of 0.60 to 0.75, compared to monetary financial institutions' ratio of 0.85. By setting a lower loan-to-value threshold, MCCs reduce credit risk for those investing in their funds, while their mortgage customers benefit from more competitive rates (Sveriges Riksbank, 2020). However, it is worth recognising that in Sweden, the average loan-to-value ratio in 2017 was only 0.40, making the difference between institutions' credit risk marginal (SEB, 2017). In addition to targeting less risky customers, mortgage credit companies' business model is built on the idea that they can offer lower rates due to cost savings (Sveriges Riksbank, 2020). Nonetheless, more recently, with the shift in the Swedish Central Bank's monetary policy and the subsequent rise of interest rates, mortgage credit companies are struggling to offer competitive interest rates (SvD Näringsliv, 2023). In September 2023, the growth rate for mortgages issued by MCCs decreased by 5.8 percent, compared to the same period the previous year (Statistics Sweden, 2023). Meanwhile, as mortgage credit companies face difficulties, Sweden's four largest banks have collectively made a profit of SEK 120 billion in the first three quarters of 2023. These substantial earnings have raised a debate regarding the mortgage market's competitive climate (Dagens Nyheter, 2023). According to Sweden's largest political party, Socialdemokraterna, large banks are reaping profits at the expense of struggling households, upholding a competitive landscape with unfair pricing (Riksdag, 2023).

1.3 Sweden's Mortgage Market in a European Context

To further describe the characteristics of the Swedish mortgage market, it is essential to recognise the factors that set it apart, as well as its shared features with the European market. The European Union is characterised by its free movement of resources and harmonisation of financial structures, which provides flexibility for customers to fulfil their individual needs. Despite this alignment, there is a distinct heterogeneity between the European Union's mortgage markets (European Covered Bond Council, 2023). This variety is evident in Sweden, whose mortgage market displays several factors that set it apart from other member countries.

One differentiating factor is the preferred interest rate fixation period. In Sweden, 72 percent of new mortgages are issued with variable interest rates, a proportion that is high compared to the rest of Europe, where fixed rates are more common (Swedish Banking Association, 2018). Additionally, Sweden's outstanding mortgages per capita amount to EUR 57.5 thousand, compared to the EU average of EUR 20.5 thousand (European Covered Bond Council, 2023).[6, 7] Non-performing loans, as a percentage of gross loans, is 0.23 percent in Sweden, lower than the EU average of 1.75 percent.[8] Furthermore, Sweden's average default rate is 0.08 percent, compared to the European average of 0.81 percent, implying that the Swedish mortgage market is less risky (European Banking Authority, 2023).[9] Despite these differences, there are similarities between Sweden and its neighbouring countries. Research on the mortgage markets in Sweden, Norway, Denmark, Finland, and the Netherlands, published

[6] The EU average includes Iceland and Norway.
[7] Mortgages per capita excludes individuals under the age of 18 years old.
[8] Non-performing loans are defined as loans where payments are overdue by 90 days or more.
[9] Average default rate numbers are for retail loans secured on real estate property.

by the Swedish Financial Supervisory Authority (2023), reveals that market concentration is relatively high across these countries. In addition, the Swedish average mortgage interest rate makes out the EU median at 3.8 percent (The Global Economy, 2023).

Like in Sweden, most European mortgages are issued by monetary financial institutions. Only a subset of countries has entities with similar business models to Swedish mortgage credit companies (European Covered Bond Council, 2023). Amongst these countries are the Netherlands, Ireland, and the United Kingdom (Sveriges Riksbank, 2020). In the Dutch mortgage market, MFIs represent a dominant market share that is growing partially at the expense of other financial institutions (OFIs), which exhibit similar characteristics to Swedish MCCs. This market trend can be explained by a reclassification of mortgage institutions alongside new accounting standards (De Nederlandsche Bank, 2023). In the Irish mortgage market, besides MFIs, other institutions have mortgages on their balance sheets. These institutions are called retail credit firms (RCFs) and unregulated loan owners (ULOs), which together make up 18 percent of total Irish mortgages. In the United Kingdom, there are also institutions that do not fit the criteria of MFIs and exhibit similar characteristics to Swedish MCCs. These UK institutions are labelled as other specialist lenders (OLSs) and non-MFIs, which account for 7.6 percent and 3.6 percent of total mortgages issued (Sveriges Riksbank, 2020).

We choose to limit our study to the Swedish mortgage market based on the diversity of mortgage markets across different countries. Also, by focusing on the Swedish market, our study's findings can better contribute to the ongoing discussion about mortgage market competition in Sweden. Nevertheless, insights from our study are valuable for governments, such as those in the Netherlands, Ireland, and the United Kingdom, which currently permit entities like mortgage credit companies to operate, or those governments contemplating making similar legislative changes. If governments can regulate in favour of institutions similar to mortgage credit companies, they can potentially redistribute market power away from large banks and thereby improve customer terms.

2. Literature Review and Hypothesis Development

The central concept of our study is the price-competition relationship, a topic that has been discussed and studied for the last century. Neoclassical economic theory has long championed the idea of perfect competition (Marshall, 1920). However, more recent research supports a more complex price-competition relationship, emphasising the importance of market dynamics (Gabaix et al., 2016). Evidently, the interaction between price and competition is a well-established concept. However, it is not until more recently that these theories have been applied to the mortgage market.

Van Leuvensteijn et al. (2008) investigate how market competition affects the cost of borrowing and the pass-through of the European Central Bank's policy rate on loans and deposits in the Euro Area. A central finding is that bank interest rate spreads (the difference between market rate and bank rate) on most loans, including mortgages, are significantly lower with greater competition. Furthermore, the study finds that changes to the ECB's policy rate are more effectively transmitted to loan and policy rates when there is heightened competition. Their result supports the idea that competition reduces prices and increases social welfare, as mortgage interest rates are lower with greater competition. However, the same effect cannot be observed when looking at deposits, as banks compensate for losses in the loan market by lowering their deposit rates. This idea that there is a discrepancy in competitive pressure between deposits and mortgages contradicts the findings of Corvoisier and Gropp (2002). In contrast, they propose that customers have a more comprehensive range of options when allocating deposits due to the differing requirements for information and geographical proximity between deposits and mortgages. Therefore, depositories face more competition and must adjust their prices accordingly, offering more attractive deposit rates. However, the possibility that this effect results from a more efficient market structure cannot be excluded.

An additional perspective is provided by Allen et al. (2014), who examine the relationship between market concentration and the variation in mortgage prices, analysing the changes brought about by a merger in the Canadian mortgage industry. Their study explores how bank mergers influence interest rates, considering the search and negotiation processes in mortgage contract formation. They discover that average interest rates rise following a bank merger, though this is not highlighted as the most significant finding. More importantly, the merger reduces price dispersion and affects borrowers to varying degrees. Those who had previously secured better terms and were at the lower end of the interest rate spectrum are affected more. This finding emphasises the role of bargaining power in the mortgage market and demonstrates that competition's effect on pricing differs amongst individual borrowers.

Treur and Boonstra (2014) propose an alternative view on mortgage market concentration. Their study examines the impact of Dutch mortgage market conditions on mortgage funding and mortgage interest rates following the 2008 financial crisis. They discover a correlation between higher market concentration and rising mortgage interest rates; however, they do not imply a cause-and-effect relationship between the two variables. Instead, they believe that funding costs drive changes in market concentration and mortgage interest rates. Compared to other countries, the Netherlands has a high loan-to-deposit ratio, and its mortgage market relies heavily on international capital markets for funding. After the financial crisis, deposit rates and the capital market's risk premia increased, making mortgage funding more

challenging. They highlight the relevance of financial market conditions when measuring the effect of competition on mortgage interest rates, adding to previous understanding of the price-competition relationship. The findings by Treur and Boonstra (2014) are insightful to our study, as the Swedish mortgage market shares many characteristics with the Dutch market.

Based on previous research demonstrating the relationship between price and competition in the mortgage market, we anticipate a decrease in Swedish average mortgage interest rates as the market share of mortgage credit companies increases. Consequently, we have developed the following hypotheses:

Null hypothesis (H_0): Mortgage credit companies have no effect on average mortgage interest rates.

Alternative hypothesis (H_1): Mortgage credit companies have an effect on average mortgage interest rates.

Moreover, the perspective offered by Treur and Boonstra (2014) can be used to expand our hypothesis by including different financial market conditions. Building on their insights, we incorporate the effect of recent changes in Swedish monetary policy on mortgage interest rates. We hypothesise that MCCs' presence influences average mortgage interest rates during periods of low repo rates but not during high repo rates.

3. Data

In this section, we present our variables, descriptive statistics, data collection process, and discuss the limitations of our data.

3.1 Dependent Variables

Whole market average mortgage interest rates *(Whole Market Average Mortgage Interest Rate):* the average monthly interest rate that all mortgage institutions' customers pay, i.e., the list interest rate (starting price) less individually negotiated discounts. Mortgage institutions consist of monetary financial institutions as well as mortgage credit companies and alternative investment funds. Transparency from institutions regarding average rates is required by the Swedish Financial Supervisory Authority and compiled monthly by Statistics Sweden.
MFI average mortgage interest rates *(MFIs Average Mortgage Interest Rate):* the average monthly interest rate that all monetary financial institutions' customers pay, i.e., the list interest rate (starting price) less individually negotiated discounts. Monetary financial institutions include banks, banking corporations, savings banks, foreign bank branches in Sweden, housing institutes, finance companies, and "other" MFIs. The monthly data compiled by Statistics Sweden further breaks down the average interest rate for each institution category.

For both dependent variables, the data is limited to only account for Swedish household mortgages. Swedish mortgage customers are defined by their residence, meaning that the data on average mortgage interest rates can include mortgages issued by non-Swedish companies. To align more closely with our thesis's aim and offer relevant insights into the discussion about mortgage market competition, we focus exclusively on household mortgages, excluding corporations.

Furthermore, the data on average mortgage interest rates is limited to new and renegotiated contracts. We remove outstanding contracts to analyse better the direct effects of changes in market conditions on the rates. Because outstanding contracts are constructed based on past market conditions, excluding them reduces noise in our model and better reflects our purpose. This delimitation is essential when examining fixed interest rates, which are set months or years in advance and thus do not reflect contemporary market changes. Lastly, the dependent variables for average mortgage interest rates are separated based on interest rate fixation period: ≤ 3 months (variable interest rate) and > 3 months (fixed interest rate), as well as the total. The data on fixed interest rates are an aggregated measure that includes several different interest rate fixation periods that all fall under the umbrella term "fixed rate" (> 3 months to 10 years). We separate variable and fixed interest rates to account for potential differences. Fixed rates offer more stability, whereas variable rates are more volatile and represent a different risk profile. For mortgage institutions, these fixation periods require different pricing assumptions, as the pass-through of financing costs varies amongst them. Fixed interest rates require stronger assumptions as the future economic climate is more uncertain. Due to these inherent differences between fixation periods, they are separated to not interfere with the interpretation of our results.

3.2 Independent Variable

Mortgage credit companies market share *(MCC Market Share):* the percentage of all outstanding mortgages to Swedish households attributable to mortgage credit companies and alternative investment funds. We use market share to measure mortgage credit companies' presence in the mortgage market. Using a relative measure, we exclude the effects of volume fluctuations in the overall market. Data on lending volume per institution is calculated and published monthly by Statistics Sweden.

3.3 Control Variables

Growth in GDP *(GDP Growth):* the quarterly growth of Swedish Gross Domestic Product in current prices. The data is converted to monthly numbers with a compounded monthly growth rate for the intra-quarter months. GDP growth acts as a macroeconomic health indicator, as higher growth tends to fuel higher wages and consumption. Swedish GDP is calculated and published quarterly by Statistics Sweden.

Inflation *(Inflation)*: the Swedish consumer price index (CPI). Due to the design of mortgage contracts, which are based on future payments, inflation plays a major role in mortgage loan pricing. A higher inflation rate will directly dilute the purchasing power of future money that lenders receive. To account for this dilution, mortgage institutions price mortgages accordingly, thereby influencing average mortgage interest rates. Data on CPI is published monthly by Statistics Sweden.

Repo rate *(REPO):* a monetary policy tool defined as the interest rate at which the Swedish Central Bank lends money to commercial banks. Changes to the repo rate are communicated by the Swedish Central Bank six times a year, and the rate remains constant in between these announcements. The repo rate is included due to its effects on mortgage institutions' cost of borrowing. Furthermore, the Swedish repo rate is closely linked to the risk-free rate (commonly defined as STIBOR in Sweden) and, hence, represents a foundational component of the capital market. The data is published by the Swedish Central Bank and updated per announced change.

Housing sales *(Housing Sales):* the number of housing cooperative units, houses, and vacation homes sold. Data published on houses and vacation homes are split on monthly numbers. However, data on housing cooperative units are made yearly and, therefore, have been evenly distributed over the twelve months to match the rest of the data observations. Housing sales are included as a proxy for housing demand, affecting the demand for new mortgages. If mortgage institutions want to maintain profitability across periods, a change in mortgage demand can impact mortgage interest rates, as banks compensate for loss in volume with higher rates. The data on housing sales is published yearly by Statistics Sweden.

3.4 Fixed Effect Variables

Year fixed effect: dummies for each year (2012 - 2023) are included to control for year specific shocks that impact average mortgage interest rates and to minimise omitted variable bias.

3.5 Excluded Control Variables

In addition to the variables in our model, we have also attempted to include other variables to control for variation not attributable to *MCC Market Share*. The following variables have, however, been excluded: household loan-to-assets, treasury discount notes, consumer confidence index, unemployment rate, and mortgage margin. While these variables have the potential to explain variation in our dependent variables (Average mortgage interest rates), they are excluded due to issues with multicollinearity. The excluded control variables are highly correlated with other variables, and therefore, we assume that their effect is already controlled for in the model. Thus, their removal will not create omitted variable bias. Definitions and rationale for the excluded variables can be found in Appendix 1.

3.6 Data Collection

For the full time period, data is collected from January 1st 2012 to August 31st 2023. This data set is then split into two periods of equal length from 1st March 2021 - 31st August 2023 to answer the latter part of our research question: *have changes to monetary policy with respect to repo rates affected mortgage credit companies' ability to influence real mortgage interest rates?* We chose to exclude data from years before 2012 since there is less reliable data available from that time. Furthermore, excluding data affected by the 2008 financial crisis helps us to avoid distortions of our results. This caution is due to the stark mispricing of mortgages during the years leading up to the crisis (Crotty, 2009). Additionally, we chose data from 2012 and onwards to investigate a period where the digital transformation in the banking sector has already occurred (Swedish Bankers' Association, 2022). Otherwise, digitalisation, which we do not control for, can explain some variation in our dependent variable and distort our results. All data is sourced from Statistics Sweden, except for the repo rate, which is collected from the Swedish Central Bank. The regressions are run using monthly data; thus, if possible, data is collected monthly. However, due to the lack of more precise data on certain variables, some data points are collected on a quarterly or yearly basis. To align all observations, the yearly and quarterly data are converted to fit the monthly periods by assuming constant values across months. Data on average mortgage interest rates (whole market and MFIs), MCCs' market share, inflation, and repo rates are published monthly; thus, we collect data until the latest available data point. However, data on housing sales is published yearly, and consequently, we assume that the aggregate data from December 2022 remains constant throughout all months leading up to August 31st, 2023. In addition, data on GDP growth is published quarterly, and to solve this, monthly growth is assumed to remain constant from the end of June 2023 to the end of August 2023.

3.7 Limitations to the Data

There are certain limitations to our data set. As mentioned, data on housing sales are published yearly and GDP growth quarterly. This forces us to include estimates for the months without available data. We make the assumption that the last recorded data point remains constant throughout the missing months, for both variables. To assume constant values is a

simplification of reality, and these data points will, therefore, deviate from the real values. However, to understand the impact of this limitation, we conduct sensitivity analyses for the eight estimated values (1st January 2023 - 31st August 2023) of the *Housing Sales* variable. The sensitivity analyses in Appendix 2 and 3 show that a -50 to +50 percent change to the estimated values has an insignificant effect on the p-value and estimate of the *MCC Market Share* variable. This observation is true for both the full time period and the post-policy rate shock period. No sensitivity analysis is run for the pre-shock period, as no estimated values are included in that data set. Observing from our analysis, to assume housing sales to be constant does not impact the quality of our results. Furthermore, given that only two months of data are missing for the *GDP Growth* variable, we anticipate that this does not significantly impact the outcomes of our regressions.

3.8 Summary Statistics

Table I presents descriptive statistics for all variables included in our applied model, covering the full time period (2012 - 2023). Looking at the table, we observe minimal variation between the different interest rate fixation periods and the rates for both market scopes. As MCCs' market share is small and the only factor differentiating the two data sets, homogenous data is expected. Further, the observed similarity across interest rate fixation periods can be explained by our decision to include interest rates from new and renegotiated contracts rather than focusing on outstanding ones. As a result, mortgages with fixed interest rates tend to closely resemble those with variable rates since these new and renegotiated mortgages are influenced by market conditions prevalent at the same time. Moreover, we observe that GDP growth displays smaller values compared to other variables, a difference that can be attributed to the data construction. As detailed in section 3.3, the data is a growth measure calculated as a percentage. Consequently, its values are smaller relative to the other variables included in our model.

Table I: Descriptive Statistics

	Summary						
Variable	Mean	Median	Min	Max	Q1	Q3	SD
Rate (Total - Whole market)	2.1%	1.6%	1.3%	4.5%	1.5%	2.6%	0.9%
Rate (Total - MFIs)	2.1%	1.6%	1.3%	4.5%	1.5%	2.7%	0.9%
Rate (Variable - Whole market)	2.1%	1.6%	1.4%	4.7%	1.5%	2.5%	0.9%
Rate (Variable - MFIs)	2.1%	1.6%	1.4%	4.7%	1.5%	2.5%	0.9%
Rate (Fixed - Whole market)	2.1%	1.7%	1.2%	4.2%	1.5%	2.9%	0.9%
Rate (Fixed - MFIs)	2.1%	1.7%	1.2%	4.2%	1.5%	2.9%	0.9%
GDP Growth	0.0%	0.0%	-0.0%	0.0%	-0.0%	0.0%	0.0%
Inflation	332.1	323.7	310.8	406.0	314.2	337.3	24.2
REPO	0.3%	0.0%	-0.5%	3.8%	-0.4%	0.8%	0.9%
Housing Sales	14,440	14,310	11,143	18,652	13,312	15,416	1,543
MCC Market Share	0.3%	0.0%	0.0%	1.0%	0.0%	0.6%	0.4%

Table I: The descriptive statistics are reported for the full time period (2012 - 2023), where the data is subdivided monthly. Rate refers to the average mortgage interest rate, and the parenthesis contains the respective market scopes and interest rate fixation periods to which the average mortgage interest rate belongs.

3.9 Correlation and Multicollinearity

In Table II, we present the correlation matrix and variance inflation factor ("VIF") for variables in our model across the full time period and total interest rate fixation period. We compile identical correlation matrices for variable and fixed interest rates in Appendix 4 and 5. However, due to the minimal differences between fixation periods, the total will be the foundation of our discussion on correlation and multicollinearity. In Table II, we observe a highly positive correlation between repo rates and average mortgage interest rates (0.93), according to Belsley, Kuh and Welsch's definition (1980). However, this positive relationship is expected, as the repo rate is a foundational component of mortgage financing and pricing in Sweden. Moreover, we recognise that VIF values across all variables are < 10, which most practitioners consider the threshold for problematic multicollinearity (O'Brien, 2007).

Table II: Correlation Matrix, Total Interest Rate Fixation Periods, Whole Market

	Variables						VIF
	Rate	**GDP**	**Infl**	**REPO**	**HS**	**MCC**	**VIF**
Rate	1.00						NA
GDP Growth	-0.05	1.00					1.02
Inflation	0.36	0.07	1.00				6.92
REPO	0.93	-0.03	0.51	1.00			1.78
Housing Sales	-0.46	0.14	0.14	-0.34	1.00		1.44
MCC Market Share	0.14	0.09	0.90	0.34	0.28	1.00	6.26

Table II: This correlation matrix presents the correlation for every combination of variables used in the model. The coefficients describe the degree to which variables move in relation to each other. A negative coefficient indicates that the variable pair moves opposite to each other, and a positive coefficient indicates that the variable pair move together. Additionally, the table presents the VIF values for each variable. The VIF values quantify how much of the variance of an estimated regression coefficient increases if the variable is correlated with other predictors.

4. Methodology

This section outlines our model and clarifies how it is used to address our research questions.

4.1 Description of Applied Model

In our study, we use a multiple linear regression model, which is an empirical tool developed by Galton (1886) that assesses how changes in multiple independent variables affect a dependent variable. For us, it is the effect of mortgage credit companies' market share (independent variable) on average mortgage interest rates (dependent variable) that is of interest. However, to isolate the effect of mortgage credit companies on rates, it is crucial to control for outside influence. In our model, the following control variables are incorporated: *GDP Growth, Inflation, REPO, and Housing Sales.* These control variables are selected to best reflect real-world dynamics while simultaneously minimising excessive multicollinearity.

The model used to test whether mortgage credit companies influence average mortgage interest rates for the whole market – is stated as follows:

$$\text{Whole Market Average Mortgage Interest Rate}_{tf} = \beta_0 + \beta_1 \times \text{GDP Growth}_t + \beta_2 \times \text{Inflation}_t + \beta_3 \times \text{REPO}_t + \beta_4 \times \text{Housing Sales}_t + \beta_5 \times \text{MCC Market Share}_t + \varepsilon_t \quad (1)$$

The model used to test whether mortgage credit companies influence average mortgage interest rates for monetary financial institutions (MFIs) – is stated as follows:

$$\text{MFIs Average Mortgage Interest Rate}_{tf} = \beta_0 + \beta_1 \times \text{GDP Growth}_t + \beta_2 \times \text{Inflation}_t + \beta_3 \times \text{REPO}_t + \beta_4 \times \text{Housing Sales}_t + \beta_5 \times \text{MCC Market Share}_t + \varepsilon_t \quad (2)$$

In addition to controlling for independent variables, we use year fixed effects. By introducing dummy variables for every year, we account for year-specific shocks that can impact our variables. These year-specific shocks are unique to a specific point in time, and their variation should, therefore, not contribute to explaining the variation in the dependent variable. Additionally, by including year fixed effects, we minimise the risk of omitted variable bias and contribute to the mitigation of trend and seasonality not captured by the control variables (Wooldridge, 2019).

Models (1) and (2) are used for all regressions to test all aspects of our research questions. The subscripts t and f correspond to interest rate fixation period f in time t. The interest rate fixation periods are divided as follows: ≤ 3 months (variable interest rate) and > 3 months (fixed interest rate), and the total for both interest rate fixation periods. Further, the time interval is separated into three different periods: full time (1st January 2012 - 31st August 2023), pre-policy rate shock (1st March 2021 - 31st May 2022), and post-policy rate shock (1st June 2022 - 31st August 2023). The pre- and post-policy rate shock periods are separated by the Swedish Central Bank's policy rate change on May 4th, 2022. The post-policy rate shock period starts on 1st June, as it is the first whole month following the policy rate change.

A multiple linear regression model can be constructed in several different ways. For model (1) and (2), we run an ordinary least squares (OLS) multiple regression for the shorter periods, pre-policy rate shock and post-policy rate shock. The OLS model identifies the coefficients that minimise the sum of squared residuals, meaning the best-fit hyperplane through the data. The residuals are squared to prevent positive and negative values from cancelling out each other and are calculated using the following formula:

$$\sum(\varepsilon^2) = \sum(\text{Average Mortgage Interest Rate}_{tf} - (\beta_0 + \beta_1 \times \text{GDP Growth}_t + \beta_2 \times \text{Inflation}_t + \beta_3 \times \text{REPO}_t + \beta_4 \times \text{Housing Sales}_t + \beta_5 \times \text{MCC Market Share}_t))^2$$

Additionally, an OLS model is more sensitive to outliers, as it allocates a disproportionate amount of weight to extreme values. According to the Gauss-Markov theorem, the OLS model is the "best linear unbiased estimator" (BLUE), meaning it has the smallest variance amongst all unbiased estimators, given that the classical linear assumptions are satisfied. These assumptions are linearity, independence, homoscedasticity, and zero mean of errors. When residuals follow these assumptions, OLS offers the most reliable estimates (Graybill, 1976). We perform several robustness tests to test these assumptions, which are further discussed in section 5.2.2. For the pre- and post-policy rate shock periods, the model passes most tests, indicating that an OLS model is sufficient in explaining the relationship between mortgage credit companies and average mortgage interest rates.

However, when running the OLS regression for the full time period, model (1) and (2) fail the Breusch-Pagan test. It suggests that the models' residuals are heteroscedastic and consequently proposes that OLS is not the "best linear unbiased estimator" (BLUE) for this data set. To combat heteroscedasticity, we replace OLS with an alternative approach called weighted least squares (WLS). The difference between these methods is that while OLS gives all observations equal importance when determining the best-fitting hyperplane, WLS assigns weights to observations differently. In addition, the WLS model does not assume homoscedasticity. There are several ways to assign weights in a WLS model. We use inverse variance weighting with fitted values as a proxy, which is a widely adopted method recognised in the field of econometrics (Wooldridge, 2019). To determine the appropriate weights, we start by regressing the fitted values of the OLS model on the squared residuals. We do this to determine if the fitted values can significantly predict the variance of residuals and, if true, will act as a good determinant for heteroscedasticity. The regression output is presented in Table III, where we can confirm that fitted values are good estimates for residuals' variance for all interest rate fixation periods.

Table III: Regression, Squared Residuals on Fitted Values

Model	P.Value
Total	3.6507e-05 ***
Variable	1.0857e-05 ***
Fixed	2.2374e-04 ***

Table III: This is a tailored regression output describing the level of statistical significance for the regression, which is run to test if the fitted values from the OLS model can accurately predict the squared residuals.

Lastly, we take the inverse of the estimated variance to determine the weights for each observation. The formula used to calculate appropriate weights is as follows:

$$w_{tf} = \frac{1}{(Fitted(OLSmodel)_{tf})^2} \tag{3}$$

The rationale for the weighting formula (3) is that observations with higher uncertainty (larger variances) should be given less weight, and observations with less uncertainty (smaller variances) should be given more weight (Wooldridge, 2019). As a result of this weighting, model (1) and (2), for the full time period, pass the Breusch-Pagan test.

5. Empirical Results

This section outlines the key empirical findings of our paper. We start by presenting the results from the full time period to answer: *How has the recent emergence of mortgage credit companies affected real mortgage interest rates in Sweden?* After that, we report the results from our pre- and post-policy rate shock periods, answering the question: *Have changes to monetary policy with respect to repo rates affected mortgage credit companies' ability to influence real mortgage interest rates?* Lastly, we present the results of the robustness tests conducted to strengthen our empirical results further.

5.1 Results and Analysis

In the upcoming sections, we present the output of the *MCC Market Share* variable for each regression. Following models (1) and (2) specified in section 4.1, we analyse how the market share of mortgage credit companies affects average mortgage interest rates. This analysis covers both the whole market as well as monetary financial institutions. The effect of mortgage credit companies' market share is also regressed on different interest rate fixation periods: total, variable, and fixed. The regressions' results are displayed in separate tables based on the time period of data collection. The analysis is divided into two parts - the full time period and pre- and post-policy rate shock periods - as these answer different parts of our research question.

5.1.1 Results and Analysis – Full Time Period

Table IV presents the WLS regression results, analysing whether mortgage credit companies' market share affects average mortgage interest rates for the full time period. In this section, we only display the output for the *MCC Market Share* variable. For a detailed table with all variables, refer to Appendix 6. The coefficient for *MCC Market Share* is negative across all interest rate fixation periods and the two market scopes. This means that an increase in mortgage credit companies' market share leads to a decrease in average mortgage interest rates. Moreover, the adjusted R^2 values are all > 0.93, suggesting that a large part of the dependent variable's variance is accounted for by the respective models (Newbold, Carlson & Thorne, 2023). Adjusted R^2 is included instead of multiple R^2 as it provides a more accurate measure in the presence of multiple independent variables. This accuracy stems from its adjustment based on the number of variables included in the model, which prevents overestimation of the model's explanatory power. All coefficients are statistically significant at the 5 percent level (p-values < 0.05). Thereby, we can reject our null hypothesis and confirm our alternative hypothesis with a low probability of a type I error (falsely rejecting the null hypothesis). Overall, according to the results, a linear relationship exists between an increase in mortgage credit companies' market share and a decrease in average mortgage interest rates for both market scopes and across all interest rate fixation periods.

Table IV: Regressions, Full Time Period

	Mortgage Credit Companies Market Share Comparison Full Period			
Model	Estimate	T-statistic	P-value	Adjusted R Squared
Total - Whole market	-1.1379	-4.3833	0.0000 ***	0.9559
Total - MFIs	-1.1447	-4.3758	0.0000 ***	0.9552
Variable - Whole market	-1.0713	-4.2139	0.0000 ***	0.9548
Variable - MFIs	-1.0746	-4.2145	0.0000 ***	0.9545
Fixed - Whole market	-1.4503	-4.0793	0.0001 ***	0.9327
Fixed - MFIs	-1.4487	-4.0741	0.0001 ***	0.9326

Table IV: This is a tailored regression output aimed at describing the level of statistical significance (p-value), degree of explained variance (R^2), and estimate for the dependent variable *MCC Market Share* in a more digestible way. The t-statistic is included for transparency regarding the significance calculations. Significant p-vales (*,**,***) demonstrate the level of significance.

5.1.2 Results and Analysis – Pre- and Post-Policy Rate Shock

Tables V and VI present the output from the OLS regressions analysing whether mortgage credit companies' market share affects average mortgage interest rates in the pre- and post-policy rate shock periods. Like with the full time period, we only display the output for the *MCC Market Share* variable. For a detailed table with all variables, refer to Appendix 7 and 8. Tables V and VI demonstrate that consistent with the findings from the full-time period analysis, the coefficient for *MCC Market Share* remains negative for all regressions. However, for the pre- and post-monetary shock, most estimates are, in comparison, more negative. Another notable distinction is that the adjusted R^2 values are consistently lower for the pre-policy rate shock compared to those observed for the post-policy rate shock and the full time period. There is no universal rule for an acceptable adjusted R^2, so intermediate values do not necessarily suggest a poorly constructed model. However, this indicates that a portion of the variance in the dependent variable is not explained by the regression equation (Newbold et al., 2023). A plausible explanation for the lower R^2 is that other factors, which our model does not account for, have a greater influence on average mortgage interest rates in the pre-policy rate shock. As for the significance level, the coefficient for *MCC Market Share* is statistically significant (p-values < 0.05) for all regressions, except for the regressions run for the post-policy rate shock period with fixed rates. As the *MCC Market Share* variable for these regressions surpasses the 5 percent significance level, we cannot reject the null hypothesis - that mortgage credit companies have no effect on average mortgage interest rates. This suggests that there is insufficient evidence to conclude that mortgage credit companies significantly impacted fixed interest rates during this time. However, the results suggest that mortgage credit companies affected all rates before the rise in the Swedish Central Bank's policy rate, as well as variable and total interest rates after the shock.

Table V: Regressions, Pre-Shock Period

	Mortgage Credit Companies Market Share Comparison (Pre-Shock)			
Model	Estimate	T-statistic	P-value	Adjusted R Squared
Total - Whole market	-6.9362	-3.3320	0.0088 **	0.8041
Total - MFIs	-7.0834	-3.3253	0.0089 **	0.8037
Variable - Whole market	-3.3713	-3.0887	0.0130 *	0.4005
Variable - MFIs	-3.3682	-3.1590	0.0116 *	0.4435
Fixed - Whole market	-11.5342	-2.9094	0.0173 *	0.7830
Fixed - MFIs	-11.5756	-2.9128	0.0172 *	0.7818

Table V: This is a tailored regression output aimed at describing the level of statistical significance (p-value), degree of explained variance (R^2), and estimate for the dependent variable *MCC Market Share* in a more digestible way. The t-statistic is included for transparency regarding the significance calculations. Significant p-vales (*,**,***) demonstrate the level of significance.

Table VI: Regressions, Post-Shock Period

	Mortgage Credit Companies Market Share Comparison (Post-Shock)			
Model	Estimate	T-statistic	P-value	Adjusted R Squared
Total - Whole market	-3.5903	-3.7014	0.0060 **	0.9865
Total - MFIs	-3.7326	-3.7227	0.0058 **	0.9852
Variable - Whole market	-4.1854	-3.4646	0.0085 **	0.9856
Variable - MFIs	-4.3390	-3.4651	0.0085 **	0.9844
Fixed - Whole market	-1.1754	-0.8786	0.4053	0.8955
Fixed - MFIs	-1.2103	-0.9027	0.3930	0.8941

Table VI: This is a tailored regression output aimed at describing the level of statistical significance (p-value), degree of explained variance (R^2), and estimate for the dependent variable *MCC Market Share* in a more digestible way. The t-statistic is included for transparency regarding the significance calculations. Significant p-vales (*,**,***) demonstrate the level of significance.

5.2 Robustness Tests

To check whether our results are robust and not overly sensitive to changes in assumptions or the presence of unusual data points, the regressions are put through diagnostic tests, including Breusch-Pagan and Shapiro-Wilk. We conduct robustness tests for each regression and organise them into tables according to time periods in Tables VII - IX. Additionally, the discussion is divided into two sections: the full time period, and the pre- and post-policy rate shock periods, to address the differences in sample sizes.

5.2.1 Robustness Tests – Full Time Period

The Breusch-Pagan test checks for heteroskedasticity, as it examines the dependency of residual's variance on the values of the independent variables. Table VII shows that the Breusch-Pagan test has a p-value of > 0.05 across all regressions. Because the test does not pass the 5 percent significance level, we fail to reject the null hypothesis of homoscedasticity and, therefore, can assume homoscedastic data. The Shapiro-Wilk test, also displayed in Table VII, determines if a model's sample is drawn from a normally distributed population. Testing the model with the Shapiro-Wilk test suggests that the observed data deviates significantly from a normal distribution. As p-values are < 0.05, it forces us to reject the null hypothesis of

normally distributed data. However, according to the Central Limit Theorem (CLT), dubbed by Pólya (1920), as the sample size increases, the distribution of sample means resembles a normal distribution, irrespective of the population's distribution. According to Newbold et al. (2023), sample sizes ≥ 25 are satisfactory for the CLT to hold. As our sample size is 140, CLT applies to our model, and therefore, the assumption of normal distribution can be made. Altogether, the tests imply that our regressions' empirical findings are robust, and consequently, more weight can be put into their conclusions and explanatory value.

Table VII: Model Diagnostics for Full Time Period, Breusch-Pagan and Shapiro-Wilk

	Diagnostic Tests (Full Time)	
Model	Breusch-Pagan	Shapiro-Wilk
Total - Whole market	0.9467	5.2058e-08 ***
Variable - Whole market	0.9427	5.7945e-10 ***
Fixed - Whole market	0.6990	8.3492e-07 ***
Total - MFIs	0.9492	3.8890e-08 ***
Variable - MFIs	0.9454	4.4620e-10 ***
Fixed - MFIs	0.6989	8.3231e-07 ***

Table VII: The table presents a tailored test output describing the level of statistical significance for the Breusch-Pagan and Shapiro-Wilk test. Significant values (*,**,***) indicate that the model fails the test.

5.2.2 Robustness Tests – Pre- and Post-Policy Rate Shock

Examining the results of the Breusch-Pagan test, displayed in Table VIII and IX, most p-values are > 0.05, meaning there is no statistical evidence of heteroskedasticity. However, we observe p-values of 0.0457 (Whole market) and 0.0437 (MFI) for the variable rates in the pre-shock period, meaning that these regressions pass the 5 percent significance level by a narrow margin. This forces us to reject the null hypothesis of homoscedastic data and assume heteroscedasticity. Consequently, less weight can be put into the results of the pre-shock regressions using variable rates. Further, testing the model using the Shapiro-Wilk test, in Table VIII and IX, p-values are > 0.05. These results suggest that there is no significant evidence to reject the null hypothesis of normality distributed data, and therefore, normality can be assumed. The robustness tests provide further creditability to our findings and the conclusions we can draw from them.

Table VIII: Model Diagnostics for Pre-Shock Period, Breusch-Pagan and Shapiro-Wilk

	Diagnostic Tests (Pre-Shock)	
Model	Breusch-Pagan	Shapiro-Wilk
Total - Whole market	0.1228	0.2867
Variable - Whole market	0.0457 *	0.5632
Fixed - Whole market	0.1214	0.1710
Total - MFIs	0.1235	0.2868
Variable - MFIs	0.0437 *	0.5426
Fixed - MFIs	0.1216	0.1726

Table VIII: The table presents a tailored test output describing the level of statistical significance for the Breusch-Pagan and Shapiro-Wilk test. Significant values (*,**,***) indicate that the model fails the test.

Table IX: Model Diagnostics for Post-Shock Period, Breusch-Pagan and Shapiro-Wilk

	Diagnostic Tests (Post-Shock)	
Model	Breusch-Pagan	Shapiro-Wilk
Total - Whole market	0.3811	0.1776
Variable - Whole market	0.3349	0.8014
Fixed - Whole market	0.2633	0.1190
Total - MFIs	0.3423	0.2121
Variable - MFIs	0.3124	0.6927
Fixed - MFIs	0.2576	0.1219

Table IX: The table presents a tailored test output describing the level of statistical significance for the Breusch-Pagan and Shapiro-Wilk test. Significant values (*,**,***) indicate that the model fails the test.

6. Discussion

Our study aims to answer the research questions: *How has the recent emergence of mortgage credit companies affected real mortgage interest rates in Sweden? And have changes to monetary policy with respect to repo rates affected mortgage credit companies' ability to influence real mortgage interest rates?* In this part of the paper, we discuss the findings of our study and what it entails for the research questions. We begin by discussing the rationale for the results of the full time period regressions, for both market scopes and all interest rate fixation periods. Additionally, we make comparisons to related literature that studies similar dynamics of the price-competition relationship. Thereafter, we discuss the rationale for the results obtained from the pre- and post-policy rate shock regressions for both market scopes and all interest rate fixation periods. We relate these findings to literature that studies the effect of policy rate changes on mortgage interest rates.

6.1 Market Pressure from Mortgage Credit Companies

From the results of the full time period (1st January 2012 - 31st August 2023), we observe that mortgage credit companies' market share significantly affects average mortgage interest rates. The results confirm our alternative hypothesis and align with existing literature. They highlight a correlation between increased market fragmentation and rising mortgage interest rates, similar to the findings of Treur and Boonstra (2014). Moreover, research by Allen et al. (2014), which illustrates how bank mergers increase average mortgage interest rates, further corroborates our findings. However, the study by Allen et al. (2014) analyses the effects of market consolidation and does not specifically address market fragmentation. Despite this difference in focus, the observed correlation between price and competition aligns with our results. Additionally, the same relationship can be observed when studying the Euro Area (van Leuvensteijn et al., 2008). Furthermore, our results reinforce the idea brought forward by the Swedish Central Bank (2020). They suggest that as mortgage credit companies' loan volume increases, MFIs' gross mortgage margins decrease.[10] This simultaneous trend implies that mortgage credit companies might be influencing the Swedish market by offering competitive rates. Additionally, the trend observed in MFIs' gross margins is in accordance with our findings, indicating that MCCs influence average mortgage interest rates across the whole market and for MFIs separately.

Several causes, supported by existing literature, can describe our significant results. Firstly, the concept of price and competition can explain why MCCs market share and rates move in opposite directions. However, opinions on this relationship vary. The theory of perfect competition suggests that prices should decrease as the number of competitors increases (Marshall, 1920). Yet, perfect competition remains a theoretical concept, as it does not exist in the real world (Malkiel, 2003). Nonetheless, we argue that the Swedish mortgage market is moving closer to the concept of perfect competition. This is evident through the growing number of competitors and improved access and quality of price information. Another

[10] MFIs' mortgage gross margins are approximated based on numbers from Swedbank, Nordea and Handelsbanken.

perspective on competition is presented by McNulty (1968) and Gabaix et al. (2016). They argue that the degree of rivalry, specific market characteristics, and customer preferences play significant roles in determining how market fragmentation impacts prices. Despite these differences in theory, there is a broad consensus that increased competition and market efficiency can potentially reduce prices, or in the context of our study, mortgage interest rates.

Secondly, digitalisation and organisational efficiencies can explain our significant results. Mortgage credit companies, unlike MFIs, specialise in mortgage lending, enabling them to reduce costs. They use a more scalable business model, offering a digitalised application process, no possibility for bargaining, and the ability for customers to transfer existing mortgage debts to their services without human interaction. By leveraging these specialised operations, mortgage credit companies should be able to reduce costs, thereby enhancing their ability to offer more competitive rates (Sveriges Riksbank, 2020). This strategy of using digitalisation to provide competitive rates also aligns with the findings of Ferreira et al. (2019), who argue that industry digitalisation can transform competitive landscapes.

6.2 The Effect of Tightening Monetary Policy

On May 4th, 2022, the Swedish Central Bank raised the repo rate to 0.25 percent, making it the first time the repo rate surpassed 0 percent since 2014 (Sveriges Riksbank, 2022). In connection with this raise, the Central Bank issued a caution regarding the potential for further tightening of monetary policy going forward. As of August 2023, the repo rate has increased to 3.75 percent (Sveriges Riksbank, 2023). This rise in policy rate has altered the conditions of the Swedish mortgage market, a change evident in our findings.

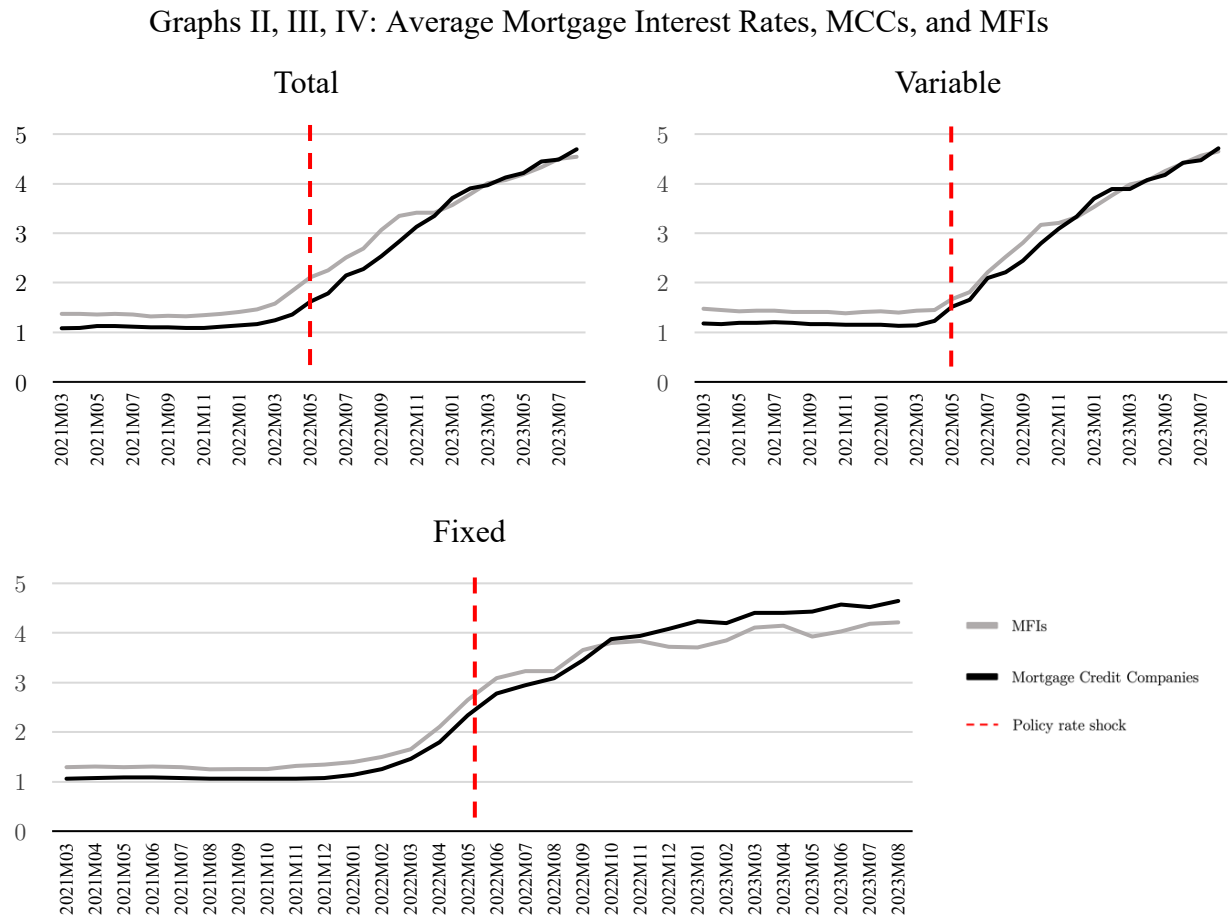
Upon analysing the output from the pre-policy rate shock (1st March 2021 - 31st May 2022), it is evident that the market share of mortgage credit companies significantly affects average mortgage interest rates. However, we obtain slightly different results when assessing the output of the post-policy rate shock (1st June 2022 - 31st August 2023). In this latter period, mortgage credit companies continue to significantly affect average mortgage interest rates for both variable and total interest rate fixation periods. However, for fixed rates, the impact is insignificant, affecting neither the whole market nor MFIs. Given that 60 percent of Swedish mortgages are tied to variable rates (Swedish Financial Supervisory Authority, 2023), it is unsurprising that the total interest rate fixation period follows variable rates.

Several factors can explain the diminished significance of MCCs' impact on fixed rates. One possible explanation is the limited number of observations used for the post-policy rate shock period (n=15). Garriga, Kydland and Šustek (2017) proved that the transmission mechanism of the policy rate is more effective for variable rates compared to fixed rates. This lag in the transmission of the policy rate adds complexity to our regression model due to its few observations, making it more challenging to explain the variation observed in fixed rates. Another possible explanation for MCCs' unsignificant influence on fixed rates during this period is displayed in Graphs II-IV. The graphs show the difference in average mortgage interest rates for MCCs and MFIs, where the red dotted line indicates the policy rate change that separates the pre- and post-policy rate shock. After October 2022, it is evident that mortgage credit companies are unable to offer competitive fixed rates. This challenge might arise from mortgage credit companies supplying unsustainable rates during periods of tight

monetary policy to remain attractive to customers (SvD Näringsliv, 2023). To set fixed rates, MCCs must predict future funding costs, which are largely determined by the policy rate. If they price their fixed interest rates low while their funding costs increase over time, it can erode profits. The uncertainty of funding costs makes it riskier for MCCs to offer attractive fixed rates compared to variable rates, mainly since they already operate with squeezed margins (Statistics Sweden, 2022). In contrast, MFIs, can maintain good margins throughout periods with strict monetary policy, as they can absorb more risk in the long term due to their diverse financing methods (SvD Näringsliv, 2023). That fixed rates are riskier for lenders is supported by Santomero (1983), who argues that fixed interest rates are less desirable to lenders due to the inherent uncertainties in funding costs.

According to our results, it is for the fixed interest rates that MCCs lose influence. However, Graphs II-IV show that they struggle to compete with lower interest rates across all fixation periods in the post-policy rate shock period. The key reason for this is the difference in financing options available to MCCs and MFIs and the attractiveness of these options under different economic climates. While MFIs have access to a broad range of financing methods, including covered bonds and deposits, MCCs rely on alternative investment products. During times of high repo rates, MCCs' lack of deposit financing becomes a major disadvantage (SvD Näringsliv, 2023). When the Central Bank raises the repo rate, deposit rates take longer to adjust than mortgage interest rates (Riksdag, 2023). This lag results in greater net interest (difference between mortgage and deposit rates) for monetary financial institutions, making deposit financing cheaper relative to other financing methods.

Simultaneously, as the repo rate rises, covered bonds and other similar investment products, like investments in alternative investment funds, become less attractive. Their value decreases as newer investment products that offer higher interest rates become available (SvD Näringsliv, 2016). As a result, MFIs, especially those with substantial deposit holdings, can offer more competitive interest rates than mortgage credit companies without compromising their profitability. This is supported by, Fuster, Plosser, Schnabl and Vickery (2019) who recognise that access to low-cost deposit funding is a competitive advantage. Given that mortgage credit companies' business model is primarily based on the ability to offer lower interest rates, sustained high repo rates pose a threat to their market position going forward (SvD Näringsliv, 2023).



Graphs II-IV: These graphs present the average mortgage interest rate split by category of mortgage institution. The red dotted line marks the repo rate change on May 4th 2022, separating the pre- and post-policy rate shock.

Our findings highlight the challenges mortgage credit companies face in maintaining competitive prices in changing economic climates. When these companies were first legalised in 2017, the intention was to increase market competition. Yet, as observed in our results, this positive effect on competition has not been sustained. In the current economic climate, characterised by high repo rates, some MFIs are making large profits, while mortgage credit companies like Hejmo, Bofink, and Youple need to liquidate their operations (Dagens Industri, 2023). Therefore, to prevent MCCs from being outcompeted, legislative measures are necessary to mitigate the dominance of larger mortgage institutions. This could involve supporting mortgage credit companies or imposing restrictions on monetary financial institutions. An interpellation introduced to the Swedish parliament proposes a temporary tax on MFIs' net interest. By penalising large profits, they want to prevent large banks from exploiting households through unfair deposit rates and foster a more competitive climate (Riksdag, 2023).

7. Conclusion

7.1 Concluding Remarks

In this paper, using a multiple linear regression model, we explore our hypothesis that mortgage credit companies growing market share impacts average mortgage interest rates in Sweden. This hypothesis is tested on rates for the whole mortgage market and MFIs, with data from January 1st 2012 to August 31st 2023. Our analysis reveals that mortgage credit companies exert downward pressure on average mortgage interest rates for both market scopes and across all studied interest rate fixation periods. The discussion highlights the price-competition relationship alongside digitalisation and organisational efficiencies as possible explanations for the observed effects.

Further, we investigate how changes to monetary policy with respect to repo rates affect mortgage credit companies' ability to influence real mortgage interest rates. We find that MCCs, irrespective of policy rate climate (pre- and post-policy rate shock), exert downward pressure on rates across most interest rate fixation periods. The only exception is the fixed rate in the post-policy rate shock period. The diminished impact of mortgage credit companies on fixed rates in this period can be attributed to their unsustainable interest rates and squeezed margins, as well as the increased attractiveness of deposit financing during periods of strict monetary policy.

In conclusion, the Swedish government's implementation of "Lag 2016:1024", which allowed for the entrance of mortgage credit companies, has stimulated the mortgage market by increasing competition. It has led to the benefit of lower mortgage interest rates for Swedish borrowers. However, our study implies that in tougher financial climates, mortgage credit companies' positive impact on market competition may diminish over time. To effectively maintain competitiveness and advantages for borrowers, also in periods of stricter monetary policy, legislators will have to address advantages inherent in different financing methods.

7.2 Further Research

Considering the delimitation of our study, we have suggestions for extensions that can be used in further research. First, we want to address the limited time frame that is available. The law allowing mortgage credit companies to enter the market was first introduced in 2017, and the Swedish Financial Supervisory Authority's requirement to report average interest rates was not implemented until 2019. This limitation affects the number of available data points for the pre- and post-policy rate shock periods (n=15). Therefore, replicating our study with a more extensive data set in the future would help validate our results. Additionally, a future study conducted at a more suitable time would allow for the circumvention of using estimations for annually reported variables.

Second, multiple studies have examined the intensity of banking competition using measurements like the Boone Indicator, Lerner Index, and Herfindahl-Hirschman Index. Building on this, one could expand our study by introducing a control variable for the intensity of competition. This would help to isolate the effect attributable to mortgage credit companies as an alternative way to finance mortgages.

Third, further research could segment the borrower data per loan-to-value decile to investigate how mortgage credit companies' impact differs across leverage levels. Moreover, such a study would distinguish the effect on mortgage interest rates offered to customers with loan-to-value ratios not exceeding 0.75. This would allow for the exclusion of customers with higher risk profiles, who are not targeted by mortgage credit companies and, therefore, not directly influenced by their presence.

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9. Appendices

Appendix 1. Excluded Control Variables

Household loan-to-assets: the ratio between outstanding loan balance and total financial assets held per household. Household loan-to-assets was intended to be used as a proxy for mortgage customer's leverage risk. It reflects individuals' vulnerability to economic downturns and changes to mortgage interest rates, as it affects their ability to service debt. The data is published yearly by Statistics Sweden.

Treasury discount note: the Swedish 3-month treasury discount note yield. The treasury discount note serves as an indicator of short-term interest rates in the capital market, influencing short-term borrowing for mortgage institutions which in turn affects mortgage interest rates. The data is published monthly by Statistics Sweden and calculated as the average monthly yield.

Consumer confidence index: the consumer confidence index (CCI) assesses households' view of their personal finances, serving as a proxy for housing and mortgage demand. [11] CCI is derived from the Economy Tendency Survey conducted by the National Institute of Economic Research.

Unemployment rate: the unemployment rate serves as an economic health indicator, as increasing unemployment rate is assumed to reduce housing and mortgage demand. [12] The data is published monthly by Statistic Sweden, derived from their Labour Force Survey (LFS).

Mortgage margin*:* mortgage gross margins, published by the Swedish Financial Supervisory Authority. The proxy is calculated using an estimate of mortgage financing costs from three of Sweden's largest MFIs (Swedbank, Nordea, and Handelsbanken). This proxy has been excluded from the model because of its simplification and inaccuracy to determine real gross margins across all mortgage institutions due to the small sample size.

[11] Consumer confidence index formula: *"confidence indicator = financial situation of the household now + financial situation of the household within 12 months + Swedish economy now + Swedish economy within 12 months + good time to buy consumer durables now (simplified by Statistics Sweden, 2023)."*

[12] Unemployment rate is defined in accordance with Statistics Sweden's definition: *"The unemployment rate refers to the proportion of people in the labour force aged 15-74 years who are unemployed. An unemployed person is a person who was without a job during a certain week (the reference week) but who has been actively seeking work in the past four weeks and was available to start work within two weeks from the end of the reference week. The definition of an unemployed person also includes people who have found a job that starts within three months, provided they could have started working within two weeks from the end of the reference week.*"

Appendix 2. Sensitivity Analysis, Housing Sales Estimation, Full Time Period

Model	Percentage change in Housing Sales	Change in MCC P-value	Change in MCC Estimate
Total - Whole market	-50	1.3531e-16	-3.3307e-16
	-25	1.6966e-15	9.8810e-15
	0	0.0000e+00	0.0000e+00
	25	1.1727e-15	8.1046e-15
	50	1.8111e-15	1.1435e-14
Total - MFIs	-50	3.4694e-17	-6.6613e-16
	-25	1.3531e-15	8.4377e-15
	0	0.0000e+00	0.0000e+00
	25	1.0304e-15	7.8826e-15
	50	1.5508e-15	1.0769e-14
Variable - Whole market	-50	1.1692e-15	7.7716e-15
	-25	1.8562e-15	1.1546e-14
	0	0.0000e+00	0.0000e+00
	25	9.5410e-16	6.5503e-15
	50	1.6029e-15	1.0769e-14
Variable - MFIs	-50	1.2490e-15	8.3267e-15
	-25	1.9706e-15	1.2768e-14
	0	0.0000e+00	0.0000e+00
	25	9.8185e-16	6.9944e-15
	50	1.5855e-15	1.1213e-14
Fixed - Whole market	-50	-5.5511e-17	-9.9920e-16
	-25	7.3552e-15	1.1102e-14
	0	0.0000e+00	0.0000e+00
	25	4.9960e-15	8.3267e-15
	50	7.8271e-15	1.2879e-14
Fixed - MFIs	-50	9.7145e-16	8.8818e-16
	-25	6.9944e-15	1.0436e-14
	0	0.0000e+00	0.0000e+00
	25	4.9127e-15	8.1046e-15
	50	6.8834e-15	1.1102e-14

Note: The numbers presented in the “Changes in MCC P-value” and “Changes in MCC estimate” columns refer to changes in the p-value and estimate for the *MCC Market Share* variable in each model. The change made to the *Housing Sales* variable is specified in the “Percentage change in Housing Sales column”.

Appendix 3. Sensitivity Analysis, Housing Sales Estimation, Post-Policy Rate Shock

Model	Percentage change in Housing Sales	Change in MCC P-value	Change in MCC Estimate
Total - Whole market	-50	-1.0408e-17	1.3323e-15
	-25	1.1883e-16	3.9968e-15
	0	0.0000e+00	0.0000e+00
	25	1.4311e-16	4.8850e-15
	50	9.6277e-17	3.1086e-15
Total - MFIs	-50	-2.1684e-17	4.4409e-16
	-25	1.1536e-16	3.1086e-15
	0	0.0000e+00	0.0000e+00
	25	1.2056e-16	2.6645e-15
	50	7.6328e-17	2.2204e-15
Variable - Whole market	-50	-7.8063e-17	-1.7764e-15
	-25	3.2266e-16	5.3291e-15
	0	0.0000e+00	0.0000e+00
	25	4.4235e-16	1.3323e-14
	50	2.8103e-16	6.2172e-15
Variable - MFIs	-50	-7.9797e-17	-8.8818e-16
	-25	3.0531e-16	6.2172e-15
	0	0.0000e+00	0.0000e+00
	25	4.0766e-16	1.3323e-14
	50	2.4807e-16	6.2172e-15
Fixed - Whole market	-50	1.1102e-16	1.3323e-15
	-25	-5.5511e-16	-1.5543e-15
	0	0.0000e+00	0.0000e+00
	25	-1.4433e-15	-3.3307e-15
	50	-1.6653e-15	-3.5527e-15
Fixed - MFIs	-50	6.6613e-16	2.2204e-15
	-25	-5.5511e-16	-1.9984e-15
	0	0.0000e+00	0.0000e+00
	25	-1.5543e-15	-3.9968e-15
	50	-1.4433e-15	-3.5527e-15

Note: The numbers presented in the "Changes in MCC P-value" and "Changes in MCC estimate" columns refer to changes in the p-value and estimate for the *MCC Market Share* variable in each model. The change made to the *Housing Sales* variable is specified in the "Percentage change in Housing Sales column".

Appendix 4. Correlation Matrix for Full Time Period (Variable Rates)

	Variables						VIF
	Rate	**GDP**	**Infl**	**REPO**	**HS**	**MCC**	**VIF**
Rate	1.00						NA
GDP Growth	-0.06	1.00					1.02
Inflation	0.33	0.07	1.00				6.92
REPO	0.94	-0.03	0.51	1.00			1.78
Housing Sales	-0.45	0.14	0.14	-0.34	1.00		1.44
MCC Market Share	0.12	0.09	0.90	0.34	0.28	1.00	6.26

Note: Certain variables have been shortened to fit the table. HS in the table refers to the *Housing Sales* variable.

Appendix 5. Correlation Matrix for Full Time Period (Fixed Rates)

	Variables						VIF
	Rate	**GDP**	**Infl**	**REPO**	**HS**	**MCC**	**VIF**
Rate	1.00						NA
GDP Growth	-0.03	1.00					1.02
Inflation	0.38	0.07	1.00				6.92
REPO	0.88	-0.03	0.51	1.00			1.78
Housing Sales	-0.44	0.14	0.14	-0.34	1.00		1.44
MCC Market Share	0.15	0.09	0.90	0.34	0.28	1.00	6.26

Note: Certain variables have been shortened to fit the table. HS in the table refers to the *Housing Sales* variable.

Appendix 6. Output for Full Time Period, All Variables

Model	Variable	Estimate	T-statistic	P-value	Adjusted R Squared
Total - Whole market	(Intercept)	-8.0776	-6.5782	0.0000 ***	0.9559
	GDP Growth	0.0743	0.1796	0.8578	0.9559
	Inflation	0.0305	8.1861	0.0000 ***	0.9559
	REPO	0.4955	6.9947	0.0000 ***	0.9559
	Housing Sales	0.0000	-3.4047	9e-04 ***	0.9559
	MCC Market Share	-1.1379	-4.3833	0.0000 ***	0.9559
Total - MFIs	(Intercept)	-8.1660	-6.5780	0.0000 ***	0.9552
	GDP Growth	0.0673	0.1613	0.8721	0.9552
	Inflation	0.0307	8.1662	0.0000 ***	0.9552
	REPO	0.4948	6.9216	0.0000 ***	0.9552
	Housing Sales	0.0000	-3.3913	9e-04 ***	0.9552
	MCC Market Share	-1.1447	-4.3758	0.0000 ***	0.9552
Variable - Whole market	(Intercept)	-6.7013	-5.8129	0.0000 ***	0.9548
	GDP Growth	0.1515	0.3719	0.7106	0.9548
	Inflation	0.0262	7.4314	0.0000 ***	0.9548
	REPO	0.5938	8.6308	0.0000 ***	0.9548
	Housing Sales	0.0000	-3.4793	7e-04 ***	0.9548
	MCC Market Share	-1.0713	-4.2139	0.0000 ***	0.9548
Variable - MFIs	(Intercept)	-6.7338	-5.8040	0.0000 ***	0.9545
	GDP Growth	0.1371	0.3349	0.7382	0.9545
	Inflation	0.0263	7.4145	0.0000 ***	0.9545
	REPO	0.5928	8.5785	0.0000 ***	0.9545
	Housing Sales	0.0000	-3.4827	7e-04 ***	0.9545
	MCC Market Share	-1.0746	-4.2145	0.0000 ***	0.9545
Fixed - Whole market	(Intercept)	-11.0641	-6.2546	0.0000 ***	0.9327
	GDP Growth	0.0894	0.1605	0.8728	0.9327
	Inflation	0.0390	7.3406	0.0000 ***	0.9327
	REPO	0.4246	4.3403	0.0000 ***	0.9327
	Housing Sales	0.0000	-2.2296	0.0276 *	0.9327
	MCC Market Share	-1.4503	-4.0793	1e-04 ***	0.9327
Fixed - MFIs	(Intercept)	-11.0413	-6.2383	0.0000 ***	0.9326
	GDP Growth	0.0839	0.1506	0.8805	0.9326
	Inflation	0.0389	7.3242	0.0000 ***	0.9326
	REPO	0.4244	4.3383	0.0000 ***	0.9326
	Housing Sales	0.0000	-2.2204	0.0282 *	0.9326
	MCC Market Share	-1.4487	-4.0741	1e-04 ***	0.9326

Appendix 7. Output for Pre-Shock Period, All Variables

Model	Variable	Estimate	T-statistic	P-value	Adjusted R Squared
Total - Whole market	(Intercept)	-18.8204	-4.3421	0.0019 **	0.8041
	GDP Growth	1.2049	1.0319	0.3291	0.8041
	Inflation	0.0727	4.4109	0.0017 **	0.8041
	Housing Sales	0.0001	1.6326	0.1370	0.8041
	MCC Market Share	-6.9362	-3.3320	0.0088 **	0.8041
Total - MFIs	(Intercept)	-19.2404	-4.3380	0.0019 **	0.8037
	GDP Growth	1.2101	1.0128	0.3376	0.8037
	Inflation	0.0742	4.4013	0.0017 **	0.8037
	Housing Sales	0.0001	1.6302	0.1375	0.8037
	MCC Market Share	-7.0834	-3.3253	0.0089 **	0.8037
Variable - Whole market	(Intercept)	-6.1065	-2.6869	0.0249 *	0.4005
	GDP Growth	0.9434	1.5409	0.1577	0.4005
	Inflation	0.0287	3.3262	0.0089 **	0.4005
	Housing Sales	0.0000	1.4086	0.1926	0.4005
	MCC Market Share	-3.3713	-3.0887	0.0130 *	0.4005
Variable - MFIs	(Intercept)	-6.1352	-2.7635	0.0220 *	0.4435
	GDP Growth	0.8967	1.4993	0.1680	0.4435
	Inflation	0.0288	3.4174	0.0077 **	0.4435
	Housing Sales	0.0000	1.4408	0.1835	0.4435
	MCC Market Share	-3.3682	-3.1590	0.0116 *	0.4435
Fixed - Whole market	(Intercept)	-33.8036	-4.0951	0.0027 **	0.7830
	GDP Growth	2.3870	1.0734	0.3110	0.7830
	Inflation	0.1253	3.9923	0.0031 **	0.7830
	Housing Sales	0.0001	1.4320	0.1859	0.7830
	MCC Market Share	-11.5342	-2.9094	0.0173 *	0.7830
Fixed - MFIs	(Intercept)	-33.8678	-4.0930	0.0027 **	0.7818
	GDP Growth	2.3942	1.0740	0.3108	0.7818
	Inflation	0.1256	3.9918	0.0031 **	0.7818
	Housing Sales	0.0001	1.4308	0.1863	0.7818
	MCC Market Share	-11.5756	-2.9128	0.0172 *	0.7818

Appendix 8. Output for Post-Shock Period, All Variables

Model	Variable	Estimate	T-statistic	P-value	Adjusted R Squared
Total - Whole market	(Intercept)	-16.5429	-4.0693	0.0036 **	0.9865
	GDP Growth	-1.8644	-1.3516	0.2135	0.9865
	Inflation	0.0679	7.6968	1e-04 ***	0.9865
	REPO	-0.2820	-3.1043	0.0146 *	0.9865
	Housing Sales	-0.0001	-2.7294	0.0259 *	0.9865
	MCC Market Share	-3.5903	-3.7014	0.0060 **	0.9865
Total - MFIs	(Intercept)	-16.6559	-3.9635	0.0042 **	0.9852
	GDP Growth	-2.0336	-1.4263	0.1916	0.9852
	Inflation	0.0686	7.5314	1e-04 ***	0.9852
	REPO	-0.2928	-3.1185	0.0143 *	0.9852
	Housing Sales	-0.0002	-2.6730	0.0282 *	0.9852
	MCC Market Share	-3.7326	-3.7227	0.0058 **	0.9852
Variable - Whole market	(Intercept)	-16.7989	-3.3179	0.0106 *	0.9856
	GDP Growth	-2.5929	-1.5093	0.1697	0.9856
	Inflation	0.0713	6.4904	2e-04 ***	0.9856
	REPO	-0.2292	-2.0262	0.0773 .	0.9856
	Housing Sales	-0.0002	-2.8837	0.0204 *	0.9856
	MCC Market Share	-4.1854	-3.4646	0.0085 **	0.9856
Variable - MFIs	(Intercept)	-16.9590	-3.2314	0.0120 *	0.9844
	GDP Growth	-2.8429	-1.5965	0.1490	0.9844
	Inflation	0.0722	6.3407	2e-04 ***	0.9844
	REPO	-0.2384	-2.0334	0.0764 .	0.9844
	Housing Sales	-0.0002	-2.8039	0.0231 *	0.9844
	MCC Market Share	-4.3390	-3.4651	0.0085 **	0.9844
Fixed - Whole market	(Intercept)	-8.3519	-1.4895	0.1747	0.8955
	GDP Growth	-3.0698	-1.6136	0.1453	0.8955
	Inflation	0.0393	3.2299	0.0121 *	0.8955
	REPO	-0.2118	-1.6903	0.1294	0.8955
	Housing Sales	-0.0001	-1.4658	0.1809	0.8955
	MCC Market Share	-1.1754	-0.8786	0.4053	0.8955
Fixed - MFIs	(Intercept)	-8.3360	-1.4834	0.1762	0.8941
	GDP Growth	-3.0736	-1.6121	0.1456	0.8941
	Inflation	0.0393	3.2241	0.0122 *	0.8941
	REPO	-0.2121	-1.6890	0.1297	0.8941
	Housing Sales	-0.0001	-1.4507	0.1849	0.8941
	MCC Market Share	-1.2103	-0.9027	0.3930	0.8941