

# Housing Affordability in Germany and its Dynamics

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## Abstract

The study examines housing affordability in Germany from 2017 to 2023 in light of rising real estate prices and challenges in the housing market. It uses the Housing Affordability Index to identify trends and patterns and propose policy measures to tackle the problems. The results show regional differences, with large cities in particular facing rising prices. Overall, the housing affordability burden has worsened across the country, with the western federal states being particularly affected. Future research should focus on evaluating policy measures and analyzing future trends in order to develop appropriate strategies and make predictions for the future.

**Keywords:** housing affordability, housing affordability index, property price boom, real estate, real estate economics, real estate price bubbles, residential property

**JEL Classification:** D23, R2, R21, R3, R31

## Introduction

Access to affordable housing is crucial for quality of life and socio-economic development, especially in Europe. The motivation for this research stems from the increasing relevance of housing availability given the challenges in the German real estate market. Understanding these dynamics is relevant in order to develop suitable measures to address the challenges in the German housing market.

The motivation for this study lies in the growing concern about the availability of housing, particularly in urban centers in Germany. With rising real estate prices and increasing demand for housing, access to affordable housing is becoming increasingly challenging for many households. This issue not only affects individuals and families, but also has wider implications

for social cohesion, economic stability and urban development. By analyzing the trends and factors that influence housing availability, this study aims to provide insights into the current state of the housing market.

The main objective of this study is to analyze the trends and patterns of housing availability in Germany from 2017 to 2023. Specifically, the study aims to assess the changes in housing availability over the study period and to identify regional differences in housing availability between different cities and federal states. An analysis of the German real estate market is also relevant for foreign investors, as Germany is considered a stable and resilient market, especially in times of crisis. Strict tenant protection laws, conservative financing practices and a high level of regulatory control offer valuable insights into mechanisms that produce stability. In addition, challenges such as rising housing costs and regional differences may reveal parallels with other countries. Strategies for overcoming these problems could serve as a model for similar markets. Germany's role as an important economic engine in Europe also makes its market development internationally significant.

To achieve these goals, this study uses a quantitative approach that analyzes housing affordability indices. The central approach is the Housing Affordability Index (HAI), which uses data from the Federal Statistical Office, major real estate platforms and a renowned German financial services provider. The analysis uses statistical approaches to examine trends and dynamics in housing availability between different regions and population groups.

The results of this study reveal considerable differences in housing availability in Germany, with urban centers facing greater challenges than rural areas. Income inequality, population growth and housing supply constraints prove to be key determinants of housing availability. Policy measures such as rent controls, social housing programs and zoning reforms have varying effects on housing availability. Overall, the study provides valuable insights into the complex dynamics of housing availability and offers policy makers additional information base for addressing the housing problem. The insights provided are important for political decision-makers for all Europe. The development of the European real estate markets is not identical, but similar. Solutions tailored to the German real estate market may also be relevant for other real estate markets, such as the Czech one.

The first section of the study deals with the fundamentals of housing affordability and how these are structured on the German real estate market. In the second section, the Housing Affordability Index and the calculation of the MINC are explained in terms of content and the formulas used. The data sources used are also presented in detail. The results of the analysis and the resulting interpretation are then presented. Finally, the most important findings

of the study are presented in the conclusion, where we also outline the perspectives for future research in the field of housing affordability.

## 1. Affordability of Housing

The affordability of housing is of crucial importance for the quality of life and socio-economic development in every economy worldwide, especially in Europe. The importance of housing affordability is made up of various factors. Rising property prices and rents have a significant impact on migration, regional developments and human behavior (Arnold and Landgraf, 2017; Kholodilin and Rieth, 2022). In Germany, metropolitan regions are particularly affected by this. It has been observed that income development and the development of property prices no longer go hand in hand (Kholodilin and Rieth, 2022). As a result, the affordability of housing is deteriorating. An increase in household expenditure on housing that is not offset by a positive trend in real wages leads to a higher housing cost burden (Arnold and Landgraf, 2017). In addition, the high demand for housing is being met by an insufficient supply of properties, which is exacerbating the problem (Stawarz et al., 2020).

To counteract this problem, it makes sense for low-income households to be granted access to affordable properties financed by public bodies (Czischke and van Bortel, 2018). In Germany, there are already a number of measures in place to meet the challenges of the housing market. These include housing benefit, the owner-occupied housing allowance and the rent cap.

Looking at other European real estate markets from a German perspective, the complexity of the residential real estate markets in the Czech Republic, for example, has made apartments financially unaffordable in some regions (Cermáková and Hromada, 2022). In the Czech Republic, Brno and Prague are particularly affected by this. Affordability conditions have deteriorated here in recent years, while they have improved in other parts of the country (Cermáková and Hromada, 2022). Differences in economic activity and consumer habits contribute to the variability of affordability conditions (Cermáková and Hromada, 2022). In the Austrian capital Vienna, on the other hand, the housing market has developed into an investment sector, which benefits financially strong property owners with high purchasing power but also leads to an increased demand for affordable housing for population groups and households with lower incomes (Kadi et al., 2020). In general, it should be noted that the relocation behavior of households in large cities or metropolitan areas can be influenced by rising housing costs, which can exacerbate social and economic inequalities (Winke, 2020; Stawarz et al., 2020).

The discussion on housing affordability refers to a norm that states that housing costs should not exceed a certain proportion of household income (Czischke and van Bortel, 2018).

For this, internationally comparable databases can be crucial to characterize the unequal affordability of housing in metropolitan regions and promote social cohesion (Le Goix et al., 2021). Such an affordability crisis can lead to selective access to housing markets, spatial exclusion of low-income households and exacerbate social tensions within the population (Le Goix et al., 2021). In order to pursue the goal of improving affordability and the effective demand for housing, the development and continuous improvement of the long-term mortgage credit sector is also essential (Torluccio and Dorakh, 2011). In doing so, the development of the affordable housing market requires simultaneous incentives for both the demand and supply sides of the housing market (Torluccio and Dorakh, 2011).

## 2. Methodology and Data

Various approaches can be used to assess the affordability of housing. The Housing Affordability Index (HAI) was used in this study. The mortgage-to-income ratio (MIR) assesses the affordability of mortgage rates for households that have taken out a mortgage to buy a house or apartment (Nwuba and Kalu, 2018). The mortgage payment should not account for more than a certain percentage of the net household income. Accordingly, a statement can be made as to whether an apartment or house is affordable or unaffordable for a household, for example, if the mortgage payment is above the prescribed guideline value of e.g., 35%. The HAI is calculated as follows:

$$HAI = \frac{MEDINC}{QINC} \times 100 \quad (1)$$

The MEDINC stands for the median family income per household. The QINC is the income required to qualify for a loan (Torluccio and Dorakh, 2011). In this context, the QINC measures the minimum income required to qualify for a loan for a typical apartment or house (Nwuba and Kalu, 2018). Accordingly, it determines the limit that is set on the amount of credit a household can receive. It is also subject to the condition that no more than a certain percentage of income should be spent on housing (Nwuba and Kalu, 2018). The QINC is calculated as follows:

$$QINC = PMT \times 4 \times 12 \quad (2)$$

The PMT stands for the monthly mortgage payment amount (Torluccio and Dorakh, 2011). This is the amount you pay each month to repay a mortgage loan. The payment is made up of two main components: (1) the interest portion and (2) the repayment portion.

In the context of affordability analyses, the PMT value shows how much households have to spend on housing costs each month. The PMT can be calculated as follows:

$$PMT = MEDPRICE \times 0.8 \times \frac{\left(\frac{IR}{12}\right)}{\left(1 - \left(\frac{1}{(1 + IR/12)^{360}}\right)\right)} \quad (3)$$

In this equation, MEDPRICE refers to the median property price for houses and apartments and IR is the mortgage interest rate for property financing. An average 70 m<sup>2</sup> apartment was assumed.

The NAR index for Housing Affordability assumes a qualification rate of 25% and a down payment of 20% of the house price (National Association of Realtors, 2017). Accordingly, the monthly payment of principal and interest may not exceed 25% of the monthly family income. These parameters were also chosen for the calculation of this paper.

For the HAI, an index value of 100 means that a family with the median income has just enough income to qualify for a mortgage on a house or apartment with the median price. An index of over 100 indicates that a family with the median income has more than the necessary income to qualify for a mortgage on a house or apartment (Nwuba and Kalu, 2018). Accordingly, an index value of 130 means that a household with the median income has 130% of the income required to obtain a conventional loan for 80% of the median price of an existing building or apartment.

In Korea, for example, a different interpretation of the HAI is used. In the context of this paper, however, the index is interpreted using the NAR. In addition to the parameters listed above, the MINC was also calculated as an alternative parameter for assessing the affordability of housing. The MINC can be calculated as follows:

$$MINC = \frac{(PMT \times 12)}{MEDINC} \times 100 \quad (4)$$

The MINC can assess the affordability of housing in relation to the average household income. For example, if the MINC in a county is 49.1, it can be seen that the monthly income necessary for covering the mortgage installment is 49.1% of the median family income to be able to afford the monthly mortgage payment amounts (PMT). This value therefore indicates the percentage of monthly income that must be spent on the monthly mortgage payment.

All data on property prices comes from immowelt.de, Germany's second-largest real estate platform. immowelt.de offers a research tool that allows users to view property prices in all

cities and districts throughout Germany since 2017. The average value of apartment and house prices was then calculated for each district and each year. All data relating to average household income comes from the Federal Statistical Office (DESTATIS). However, the household incomes provided only extend to 2021, which is why the annual growth rate for individual household incomes was calculated for each district in order to subsequently extrapolate the disposable incomes from 2022 onwards. Last but not least, interest rate data for mortgage rates for real estate financing from Dr. Klein Privatkunden AG, a well-known German financial services provider, was used. This assumes a fixed interest rate of 10 years with a down payment of 20%.

### 3. Results and Their Interpretation

In the following evaluation, the parameters described above for assessing the affordability of housing were calculated for the German residential real estate market as a whole. All 401 districts<sup>1</sup> and independent cities were considered and evaluated for this purpose. The analysis period of 2017–2023 was selected. Basically, the analysis provides an overview of the development of housing affordability in the German districts, independent cities and federal states as well as the national average in the 2017–2023 study period.

**Table 1: MINC in the major German cities, 2017–2023**

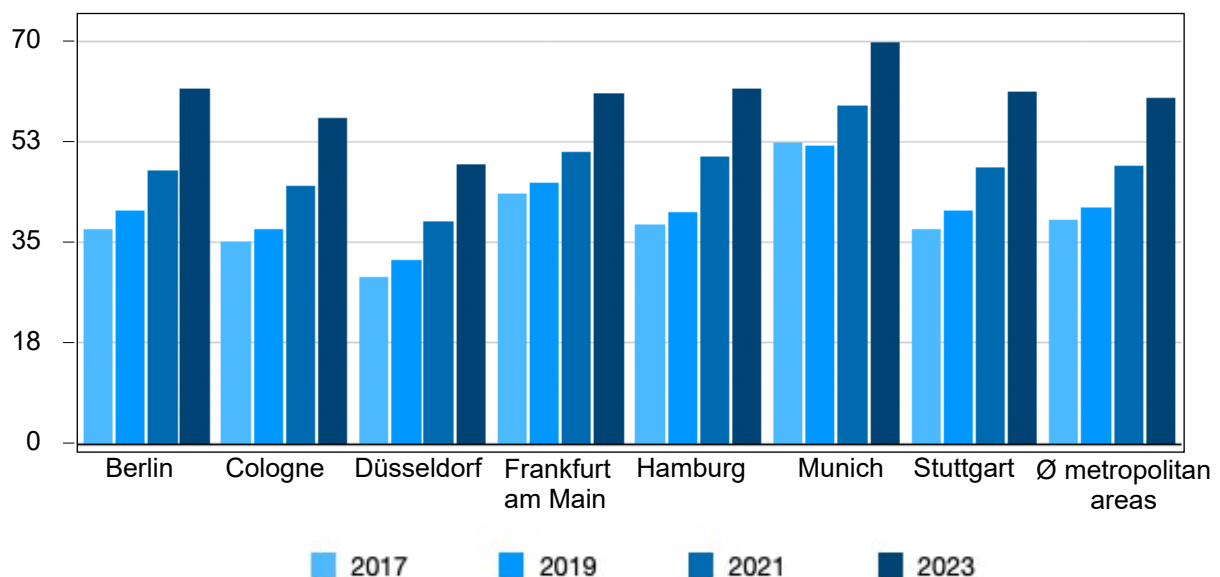
Metropolitan region	2017	2019	2021	2023
Berlin	37.37	40.44	47.54	61.57
Cologne	35.19	37.30	44.78	56.51
Düsseldorf	29.13	31.94	38.65	48.69
Frankfurt am Main	43.53	45.28	50.74	61.02
Hamburg	38.07	40.13	49.86	61.72
Munich	52.23	51.79	58.82	69.82
Stuttgart	37.41	40.57	48.06	61.10
Ø metropolitan areas	<b>38.99</b>	<b>41.06</b>	<b>48.35</b>	<b>60.06</b>

Source: author's calculation based on data from immowelt.de, Federal Statistical Office (DESTATIS) and Dr. Klein Privatkunden AG.

<sup>1</sup> According to the official municipal directory of the Federal Statistical Office, there are currently 294 districts and 107 independent cities and urban districts in the Federal Republic of Germany.

As can be seen in Table 1 and Figure 1, the analysis of the MINC for the major German cities shows that Düsseldorf had the lowest MINC in 2017 at around 29%. Düsseldorf was also the cheapest German metropolis in subsequent years, with MINC values of 31.94% (2019), 38.65% (2021) and 48.69% (2023). At the beginning of the study period, people in Düsseldorf still had to spend around 29% of their monthly income on property financing. By 2023, this had increased to almost 49% of monthly income, reflecting a deterioration in affordability in Düsseldorf. Accordingly, an increase of around 20% in the monthly income to be used for property financing was observed during the period under review. The biggest jump in this increase was observed from 2021 to 2023. An increase in the MINC of around 10% was observed here. Table 1 and Figure 1 also show that Cologne is the second most favorable metropolis in the period under review. A MINC of around 35% was recorded here for 2017. Cologne was also the second most favorable metropolis in Germany in subsequent years, with MINC values of 37.30% (2019), 44.78% (2021) and 56.51% (2023). At the beginning of the study period, around 35% of monthly income still had to be spent on real estate financing in Cologne. By 2023, this had increased to almost 57% of monthly income, reflecting a deterioration in affordability in Cologne. Accordingly, an increase of around 22% in the monthly income to be used for property financing was recorded during the period under review. The biggest jump in this increase was observed from 2021 to 2023. An increase in the MINC of around 12% was observed here. The study already shows at this point that the metropolitan regions in North Rhine-Westphalia are more favorable than those in other German federal states.

**Figure 1: MINC in the major German cities, 2017–2023**



Source: author's processing

The analysis of the MINC for major German cities also revealed that Munich had the highest MINC in 2017 at around 52%. Munich was also the most expensive German metropolis in subsequent years, with MINC values of 51.79% (2019), 58.82% (2021) and 69.82% (2023). At the beginning of the study period, people in Munich already had to spend around 52% of their monthly income on property financing, i.e. more than half of their disposable income. By 2023, this had increased further to almost 70% of monthly income, highlighting the further deterioration in affordability in Munich. Accordingly, an increase of around 17% in the monthly income to be used for property financing was observed during the period under review. The biggest jump in this increase was observed from 2021 to 2023. An increase in the MINC of around 11% was recorded here. Accordingly, real estate financing is not financially viable for average earners in the Bavarian metropolis of Munich during the period under review, underlining the very poor affordability in this major city. Frankfurt is the second most expensive metropolis in the period under review, closely behind Munich. A MINC of around 44% was recorded here for 2017. In most subsequent years, Frankfurt was the second most expensive metropolis in Germany with MINC values of 45.28% (2019) and 50.74% (2021). In 2023, however, Hamburg was still slightly more expensive than Frankfurt. A MINC of 61.72% was recorded here. Frankfurt was therefore the second most expensive German metropolis in three of the four years examined. At the beginning of the study period, people in Frankfurt already had to spend around 43% of their monthly income on real estate financing, i.e., almost half of their disposable income. By 2023, this had increased even further to around 61% of monthly income, illustrating the further deterioration in affordability in Frankfurt. Accordingly, an increase of around 18% in the monthly income to be used for real estate financing was recorded during the period under review. The biggest jump in this increase was observed from 2021 to 2023. Here, an increase in the MINC of around 11% was observed. This means that even in the Hessian metropolis, real estate financing is financially difficult or impossible for the average earner in the period under review. This also underlines the poor affordability of housing in Frankfurt.

On average, the MINC in major German cities was around 39% in 2017. By 2023, this average value will have risen to around 60% on average, which corresponds to an increase of around 21%. This means that residents of major German cities will have to spend around 60% of their monthly income on property financing in 2023. This is not financially feasible for the average household and is also not recommended. It also represents too great a risk for the lending bank. The biggest jump in this increase process was observed from 2021 to 2023. An increase in the MINC of around 12% was observed here. The rise in mortgage interest rates in 2022 after a historically long period of low interest rates certainly contributed more to this deterioration.

The rising MINC values in major German cities from 2017 to 2023 are primarily due to higher property prices and the sharp rise in mortgage interest rates since 2021. While demand for housing remained high in sought-after metropolitan areas such as Munich and Frankfurt, limited building space and slower growth in incomes led to an increasing burden. The rise in interest rates further exacerbated the situation, as financing costs rose sharply. Regional differences show that cities such as Düsseldorf and Cologne remain comparatively affordable, while Munich and Frankfurt were particularly affected by poor affordability.

**Table 2: HAI in the major German cities, 2017–2023**

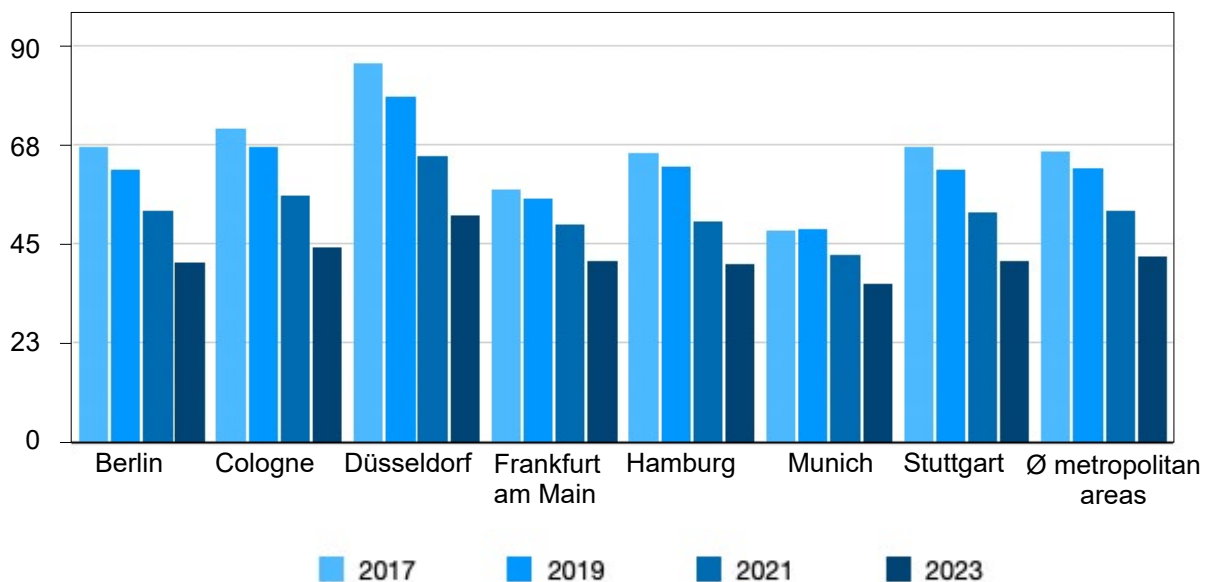
Metropolitan region	2017	2019	2021	2023
<b>Berlin</b>	66.89	61.81	52.58	40.60
<b>Cologne</b>	71.04	67.02	55.83	44.24
<b>Düsseldorf</b>	85.83	78.27	64.69	51.35
<b>Frankfurt am Main</b>	57.43	55.21	49.27	40.97
<b>Hamburg</b>	65.67	62.30	50.14	40.51
<b>Munich</b>	47.86	48.27	42.50	35.81
<b>Stuttgart</b>	66.83	61.62	52.02	40.92
<b>Ø metropolitan areas</b>	<b>65.94</b>	<b>62.07</b>	<b>52.43</b>	<b>42.06</b>

Source: author's calculation based on the data from immowelt.de, Federal Statistical Office (DESTATIS) and Dr. Klein Privatkunden AG.

Table 2 and Figure 2 show the analysis of the Housing Affordability Index (HAI) in the German metropolitan areas. This showed that Düsseldorf also had the highest value for this index in 2017 at 85.83. Düsseldorf was also the most affordable German metropolis in each of the following years, with HAI values of 78.27 (2019), 64.69 (2021) and 51.35 (2023). At the beginning of the study period, the index value in Düsseldorf was around 14 points below the NAR benchmark. The average monthly household income is therefore around 14% lower than the NAR considers appropriate. This value falls to around 51 points by 2023, again showing the deterioration in the affordability of housing in Düsseldorf. Accordingly, an index loss of around 34 points was recorded in the period under review. The biggest drop in the index value was observed from 2019 to 2021. Here, the city of Düsseldorf lost around 14 points. Table 2 and Figure 2 also show that the metropolis with the second-best affordability in terms of HAI in the reporting period was, once again, Cologne. In 2017, an index value of around

71 was recorded here. Cologne was also the second most affordable metropolis in Germany in each of the following years, with HAI values of 67.02 (2019), 55.83 (2021) and 44.24 (2023). At the beginning of the study period, the index value in Cologne was around 29 points below the NAR benchmark. The average monthly household income is therefore around 29% lower than the NAR considers appropriate. This value falls to around 44 points by 2023, again showing the deterioration in the affordability of housing in Cologne. Accordingly, an index loss of around 27 points was recorded in the period under review. The largest drop in the index value was observed from 2019 to 2021. Here, the city of Cologne lost around 12 points.

**Figure 2: HAI in the major German cities, 2017–2023**



Source: author's processing

An analysis of the affordability indices of German cities highlights Munich as a clear example of extremely high housing costs. In 2017, the Bavarian city had an index value of just 48, which hardly improved in the following years, but rather continued to manifest unaffordable housing conditions. The chronology of the index values illustrates this trend: Munich recorded a similarly low value of around 48 in 2019, followed by a drop to around 43 in 2021 and a sharper decline to around 36 in 2023. These alarming figures make it clear that Munich consistently holds the inglorious top position in terms of lack of affordability. In 2017, the index value of this metropolis was around 52 points below the assumed benchmark value, which is less than half the value set by the NAR. The discrepancy between the observed values and the assumed norms is worrying. Furthermore, it can be seen that Munich's index value is

continuously decreasing over the years, with a significant drop of around 7 points between 2021 and 2023 in particular. This development illustrates the increasing deterioration of the housing situation in the Bavarian metropolis, making it more difficult for residents to find and finance suitable living space. The situation in Frankfurt am Main is similarly worrying, with the city proving to be the second least affordable metropolis in Germany in three of the four years surveyed. In 2017, Frankfurt recorded an index value of around 57, which fell by around 16 points to around 41 by 2023. The period between 2021 and 2023 in particular was characterized by a sharp decline in the index value, with Frankfurt recording a loss of 8 points.

In 2017, the Housing Affordability Index (HAI) in German metropolitan areas had an average value of around 66 points. By 2023, this index had deteriorated significantly and averaged around 42 points, which corresponds to a deterioration of 24 points. As a result of this development, the HAI was on average around 58 points below the NAR benchmark in 2023. This benchmark is used by banks to assess the financial affordability of real estate financing for average households. A difference of this magnitude would mean that the NAR advises banks not to grant real estate financing to average households, as this would not be financially viable for them. The greatest loss in the index value was observed from 2021 to 2023, with a decrease of just over 10 points. This indicates a significant deterioration in the housing situation in the years 2021 to 2023. Both the MINC and the HAI come to similar conclusions and confirm each other. Both analyses show that Munich, Frankfurt and Hamburg are to be classified as unaffordable, while Düsseldorf and Cologne are considered comparatively affordable. This consistency of results between the two analysis methods strengthens the validity of the respective approaches. Furthermore, both the MINC and the HAI equally reflect the deterioration in affordability in the German metropolitan areas. This indicates that, regardless of the chosen method of analysis, a clear trend in the housing situation towards increasing unaffordability can be identified.

The development of the Housing Affordability Indices (HAI) in German cities reflects an increasing deterioration in housing affordability, mainly due to rising real estate prices and interest rates. The decline in the indices is particularly dramatic in cities such as Munich, Frankfurt and Hamburg, where high demand and limited supply are driving prices. The period 2021 to 2023 was characterized by a sharp rise in interest rates, which significantly increased financing costs. At the same time, incomes remained relatively constant, further widening the gap between costs and affordability. Cities such as Düsseldorf and Cologne performed better but also showed a significant deterioration in affordability.

**Table 3: MINC in the German federal states, 2017–2023**

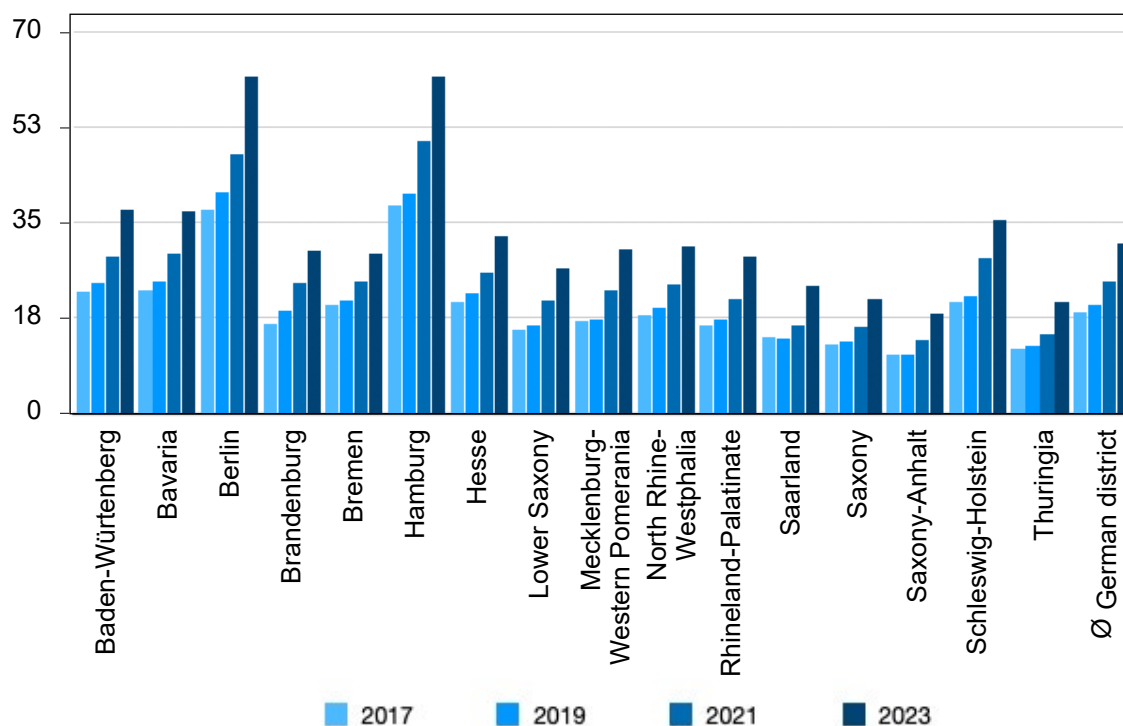
<b>Federal state</b>	<b>2017</b>	<b>2019</b>	<b>2021</b>	<b>2023</b>
<b>Baden-Württemberg</b>	22.18	23.81	28.80	37.43
<b>Bavaria</b>	22.58	24.28	29.40	37.15
<b>Berlin</b>	37.37	40.44	47.54	61.57
<b>Brandenburg</b>	16.33	18.94	23.93	29.88
<b>Bremen</b>	19.95	20.67	24.21	29.30
<b>Hamburg</b>	38.07	40.13	49.86	61.72
<b>Hesse</b>	20.43	21.99	25.79	32.45
<b>Lower Saxony</b>	15.25	16.28	20.61	26.49
<b>Mecklenburg-Western Pomerania</b>	17.01	17.23	22.69	30.20
<b>North Rhine-Westphalia</b>	18.09	19.47	23.77	30.51
<b>Rhineland-Palatinate</b>	16.15	17.20	21.00	28.68
<b>Saarland</b>	13.88	13.81	16.03	23.42
<b>Saxony</b>	12.55	13.31	15.94	20.85
<b>Saxony-Anhalt</b>	10.68	10.91	13.54	18.20
<b>Schleswig-Holstein</b>	20.48	21.44	28.47	35.41
<b>Thuringia</b>	11.94	12.33	14.61	20.37
<b>Ø German districts</b>	<b>18.52</b>	<b>19.82</b>	<b>24.23</b>	<b>31.24</b>

Source: author's calculation based on the data from immowelt.de, Federal Statistical Office (DESTATIS) and Dr. Klein Privatkunden AG.

Table 3 and Figure 3 present the analysis of the housing cost burden in the German federal states with the help of the MINC and provides information on the regional differences in the affordability of real estate. It should be noted that the federal states of Hamburg and Berlin were excluded from this analysis, as they were already considered metropolitan areas in their own right. In 2019, Saxony-Anhalt proved to be the most affordable federal state in terms of MINC,

with the index value remaining continuously low over this period: 10.68 in 2017, 10.91 in 2019, 13.54 in 2021 and 18.20 in 2023. This shows a relatively stable situation in which a household in Saxony-Anhalt had to spend an average of around 10.68% of its monthly income on property financing in 2017. By 2023, however, this proportion had risen to around 18.20% of monthly income, which represents an increase of around 8% over the entire period under review. Table 3 and Figure 3 also show that the largest increase in MINC was observed in Saxony-Anhalt from 2021 to 2023, with an increase of around 5%. Thuringia also proved to be a comparatively favorable federal state in the period under review. In 2017, the MINC in Thuringia was around 11.94%, while it rose to around 20.37% in 2023. This corresponds to an increase of around 9% in monthly income over the period under review. The largest increase in the MINC in Thuringia was also observed from 2021 to 2023, with an increase of around 6%. It is interesting to note that the federal states in eastern Germany are on average more favorable than those in western Germany. These results show that despite regional differences in housing cost burdens, there is a general trend towards increasing burdens over time.

**Figure 3: MINC in the German federal states, 2017–2023**



Source: author's processing

In 2017, Bavaria proved to be the most expensive federal state in terms of MINC, with a value of 22.58. This trend continued in 2019 and 2021, with Bavaria again being identified

as the most expensive federal state with values of 24.28 and 29.40 respectively. However, in 2023, Baden-Württemberg was even slightly more expensive than Bavaria with a MINC of 37.43, which represents a significant change in the ranking of the most expensive federal states. It can be seen that Bavaria was the most expensive federal state in three of the four years surveyed, while Baden-Württemberg occupied this position in 2023. In 2017, a household in Bavaria had to spend an average of around 23% of its monthly income on real estate financing. By 2023, this proportion had risen to 37.15% of monthly income in Bavaria and even 37.43% in Baden-Württemberg, which represents an increase of around 14% and 15% respectively over the entire period under review. The largest increase in MINC in Bavaria was observed from 2021 to 2023, with an increase of around 8%, while the largest increase in Baden-Württemberg of almost 9% was observed over the same period. Baden-Württemberg also proved to be the second most expensive federal state in the period under review, with the MINC rising from 22% in 2017 to 37.43% in 2023. Baden-Württemberg was therefore the second most expensive federal state in three of the four years examined. These results illustrate the heavy financial burdens that households in Bavaria and Baden-Württemberg face when financing property. They also show that the housing cost burden in these federal states has continued to increase over time, possibly due to various factors such as congestion and limited housing availability.

The analysis of the MINC in the 401 German districts and independent cities provides insights into the development of the housing cost burden across the country during the period under review. In 2017, the average MINC in these areas was around 18.52%. Over the study period, this figure rose to a remarkable 31% in 2023, representing an increase of around 13% in the monthly income required to finance a property over the entire study period. These results show a deterioration in the affordability of housing on average across the country. In fact, the cost of property finance has almost doubled on average, indicating a financial burden on households. The largest increase in the MINC was also observed here from 2021 to 2023, with an increase of around 7%. This underlines the ongoing trend of rising housing cost burdens and highlights the need for action to overcome this challenge.

The Indices are developing due to a combination of rising property prices, higher construction costs and the sharp rise in mortgage interest rates after 2021. Regions such as Bavaria and Baden-Württemberg show particularly high values, as demand for housing there exceeds the limited supply, which drives up prices. In eastern Germany, such as Saxony-Anhalt and Thuringia, the burdens are lower as incomes and property prices remain lower. The period 2021–2023 was characterized by a drastic turnaround in interest rates, which significantly increased financing costs. These developments highlight regional disparities and a nationwide trend towards rising housing cost burdens.

**Table 4: HAI in the German federal states, 2017–2023**

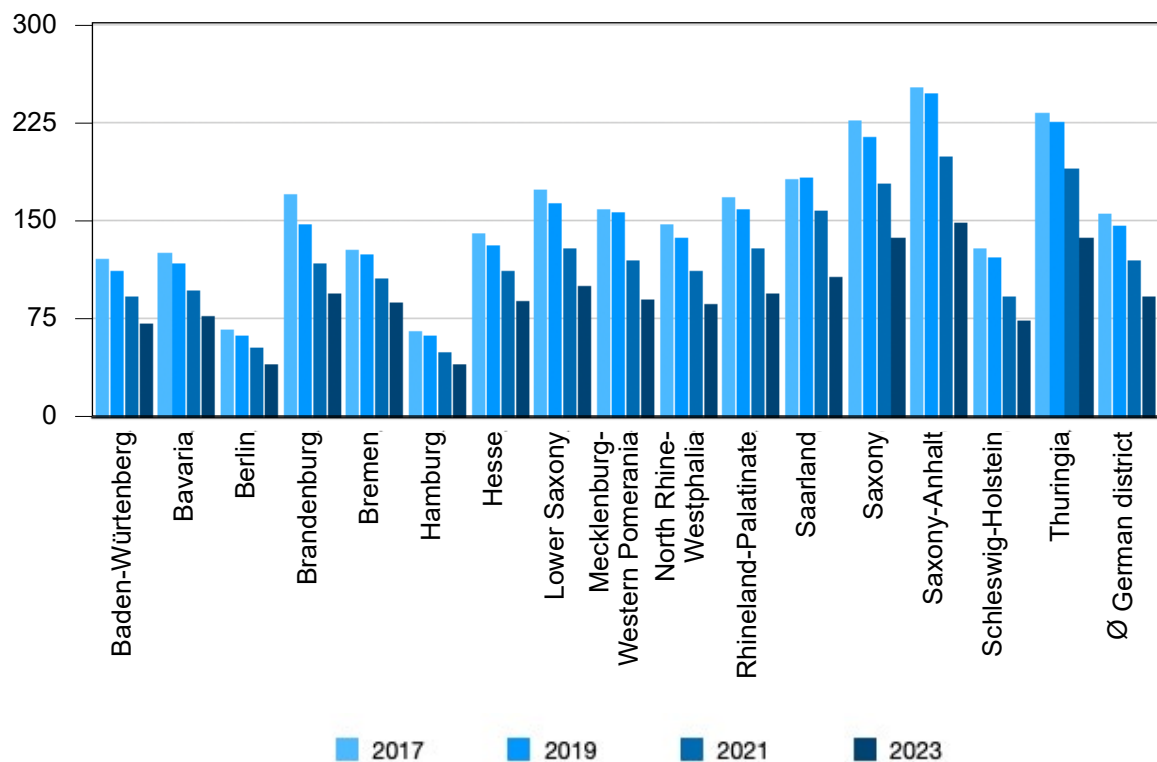
<b>Federal state</b>	<b>2017</b>	<b>2019</b>	<b>2021</b>	<b>2023</b>
<b>Baden-Württemberg</b>	120.33	112.08	92.54	71.31
<b>Bavaria</b>	125.49	117.16	96.67	76.75
<b>Berlin</b>	66.89	61.81	52.58	40.60
<b>Brandenburg</b>	169.82	147.49	117.49	94.72
<b>Bremen</b>	128.11	123.82	105.77	87.48
<b>Hamburg</b>	65.67	62.30	50.14	40.51
<b>Hesse</b>	140.69	130.91	111.30	88.48
<b>Lower Saxony</b>	173.79	163.01	128.77	100.29
<b>Mecklenburg-Western Pomerania</b>	158.86	156.64	119.16	89.51
<b>North Rhine-Westphalia</b>	147.34	136.57	111.70	86.84
<b>Rhineland-Palatinate</b>	168.27	158.21	129.38	94.87
<b>Saarland</b>	181.95	182.48	157.33	107.65
<b>Saxony</b>	226.07	213.33	178.75	137.16
<b>Saxony-Anhalt</b>	252.06	246.85	199.36	148.32
<b>Schleswig-Holstein</b>	128.37	122.32	92.08	74.01
<b>Thuringia</b>	231.90	224.85	190.07	136.64
<b>Ø German districts</b>	<b>155.17</b>	<b>145.79</b>	<b>119.23</b>	<b>91.70</b>

Source: author's based on the data from immowelt.de, Federal Statistical Office (DESTATIS) and Dr. Klein Privatkunden AG.

Table 4 and Figure 4 present the analysis of the Housing Affordability Index (HAI) in relation to the German federal states and provides information on the affordability of housing at regional level. The federal states of Hamburg and Berlin were also excluded due to their inclusion as independent metropolitan areas. Saxony-Anhalt had the highest HAI value in the period from 2017 to 2023, which indicates a particularly favorable housing cost burden in this federal state. In 2017, the index value was around 252 and fell continuously to around 148 points by 2023, which still shows comparatively good affordability despite the decline. In 2017, 2019 and 2021, Saxony-Anhalt's HAI scores even exceeded the NAR's benchmark of 100 by a factor of two or more, meaning that buying property in this federal state was extremely affordable and

affordable for the average earner. Table 4 and Figure 4 also show that, despite a loss of more than 100 points in the period under review, real estate financing in Saxony-Anhalt remained affordable in 2023. Thuringia also recorded good housing affordability, with the HAI value at around 232 in 2017 and falling to around 137 by 2023. Although Thuringia was considered the second most affordable federal state in three of the four years studied and Saxony took this position in 2023, the affordability of housing was also maintained here. Despite a loss of around 95 points over the study period, Thuringia's HAI score in 2023 was still around 37 points above the NAR benchmark, indicating good affordability. These results underline the regional differences in the housing cost burden in the German federal states and show that, despite some deterioration, housing finance in Saxony-Anhalt and Thuringia remained affordable for many households in 2023.

**Figure 4: HAI in the German federal states, 2017–2023**



Source: author's processing

In 2017, Baden-Württemberg had the worst affordability among the federal states with an HAI value of around 120, followed by similarly high values in 2019 and 2023. In 2021, Schleswig-Holstein was ahead of Baden-Württemberg as the federal state with the worst affordability with an HAI value of around 92. These results show that Baden-Württemberg had the worst affordability in three of the four years analyzed. Baden-Württemberg's HAI

score in 2017 was around 20 points above the NAR benchmark, which still indicates positive affordability. However, this value deteriorated by around 49 points by 2023 and was therefore around 29 points below the NAR guideline value, indicating that the purchase of property in Baden-Württemberg was significantly unaffordable on average in 2023. The greatest loss in the HAI score was observed from 2021 to 2023, with a loss of around 22 points. Bavaria showed a similar trend, with the second-worst score in two of the four years analyzed. In 2017, the HAI value in Bavaria was around 125 and fell by around 48 points by 2023. The largest loss was recorded from 2019 to 2021, with a loss of around 20.49. These results also highlight the challenges of the housing cost burden in federal states such as Baden-Württemberg and Bavaria and show the need for measures to improve housing affordability in these regions.

In 2017, the average HAI value in the German districts and independent cities was around 155 points, which indicates good affordability on a national average. This means that the average household income in the country is sufficient to afford 155% of a property loan. By 2023, however, the situation had deteriorated, with the average HAI score falling to around 92 points. This deterioration of 63 points indicates that real estate financing in Germany was no longer affordable in 2023 and was even below the NAR benchmark. Accordingly, the NAR would on average advise banks against real estate financing for the average household, as it is financially difficult for the average household to afford. The largest loss in HAI score was observed from 2021 to 2023, with a loss of around 27 points. Again, these results highlight the continued deterioration of the housing cost burden in Germany and the challenges many households face in financing housing.

The development of HAI values can be explained by rising real estate prices, higher interest rates and stagnating incomes. In federal states such as Saxony-Anhalt and Thuringia, values remain relatively high, as lower real estate prices and lower financing requirements prevail there. In contrast, high demand, limited supply and higher living costs in regions such as Bavaria and Baden-Württemberg are having a considerable negative impact on HAI values. The sharpest decline in HAI between 2021 and 2023 is mainly due to the sudden rise in mortgage rates. Overall, there is a nationwide trend towards decreasing affordability, with regional differences due to local market conditions and economic factors.

The analysis of the affordability of real estate in Germany from 2017 to 2023 shows a steady deterioration in the housing situation in the country. At the beginning of the period in 2017, the initial situation was generally positive despite already rising property prices. Low interest rates made real estate financing easier accessible to more households in Germany. However, in 2022 interest rate changes happen, leading to rising interest rates after a historically long

low-interest rate period. Even if real estate prices in Germany declined a little bit, they were still very high. These factors combined led to a widespread deterioration in the affordability situation in Germany. Most of the federal states were below the benchmark values set by institutions such as the NAR. The western German federal states in particular showed a deterioration in affordability, with exceptions such as Lower Saxony and Saarland, which just managed to exceed the NAR benchmark. However, it is not justified to speak of a generally poor affordability situation in Germany. The eastern federal states such as Saxony-Anhalt and Thuringia continued to record good affordability values and easily exceeded the NAR benchmark. This shows that there are regional differences in affordability. The major German cities, especially the well-known metropolitan areas, are of particular concern. The values there were already poor in 2017, and this negative starting position has worsened by 2023. Due to the high population density in these areas, it is therefore important to work more intensively on the provision of affordable housing. However, the high demand for housing in these cities makes it difficult to implement appropriate measures.

## Conclusion

The main objective of this paper was to analyze the trends and patterns of housing availability in Germany from 2017 to 2023. The analysis of the housing cost burden in Germany from 2017 to 2023 described before shows a steady deterioration in the housing situation in the country. While the initial situation was generally positive at the beginning of the period in 2017 despite already rising property prices, changes in interest rates and continued high property prices led to a widespread deterioration in the housing cost situation in Germany.

However, it is not justified to speak of a generally poor housing cost burden situation in Germany. The eastern federal states such as Saxony-Anhalt and Thuringia continued to record good figures for housing cost burdens and easily exceeded the NAR benchmark. This shows that there are regional differences in the housing cost burden. The major German cities, especially the well-known metropolitan regions, are of particular concern. The figures there were already poor in 2017, and this negative starting position has worsened by 2023. Due to the high population density in these areas, it is therefore important to work more intensively on the provision of affordable housing. However, the high demand for housing in these cities makes it difficult to implement suitable measures. In general, it can be stated that the main objective of this work was achieved with the help of the analysis carried out. The HAI and MINC calculations enabled concrete statements to be made about the development, trends and patterns of affordability in Germany's major cities and federal states. After carrying out this

analysis, it was therefore also possible to make a well-founded statement about the general affordability and the cross-section of housing affordability in Germany.

The insights gained on the German real estate market are also relevant for the real estate markets of other countries. It should be noted that regional differences are crucial. The regional differences in housing costs show that real estate markets are not homogeneous. While rural regions or economically less developed areas (such as Saxony-Anhalt and Thuringia in Germany) often have lower housing costs, conurbations and metropolitan regions are heavily burdened due to high demand. The same also applies in most countries. Countries or cities with highly centralized economic centers should take into account regional differences in housing cost burdens and property availability. Accordingly, the strategies for overcoming the challenges on the real estate markets must be adapted locally. It can also be seen that, as in Germany and other countries, the high population density in cities poses a structural challenge to the creation of affordable housing. Measures such as the construction of social housing or rent caps often encounter resistance in such markets, e.g. due to limited building space or economic constraints. Demand in metropolitan areas is often boosted by economic, social or infrastructural advantages. Governments and cities need to take innovative measures, such as the promotion of building construction projects, urban densification or better transport connections, to take the pressure off central city locations.

Future research could focus on examining and evaluating the impact of specific policy measures on the housing cost burden in more detail. In particular, the effectiveness of existing measures such as rent control, social housing programs and changes in building standards could be further investigated in order to develop appropriate strategies to combat the rising housing cost burden. In addition, research could further investigate the potential impact of future developments such as demographic changes and economic trends on the housing situation in order to make well-founded forecasts for the future of the housing cost burden.

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