



Population forecast and housing market until 2040

High regional divergence. Increasing bottlenecks in economically strong regions and easing in weaker regions

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Population forecast until 2040: The population should increase to 85.4 million by 2032, after which the number of people living in Germany should decline. In 2040, there should be only 84.9 million people. We assume a high level of immigration over the entire forecast period from 2024 to 2040. We also assume that the low number of births and the high number of deaths in 2023 were temporary – at least in the short term. According to our forecast, the natural population balance will improve in 2024 compared to 2023. However, it will fall significantly by 2040. At the end of the forecast period, it will finally exceed the influx.

Key developments in housing demand:

- If the trends in internal migration also continue, then the eleven metropolitan regions will have almost 2 million more inhabitants in 2040 than today, with aggregated figures for the three largest cities of Berlin, Hamburg, and Munich already accounting for growth of 1.2 million and the remaining metropolitan areas for 0.6 million.
- The number of inhabitants also continues to rise in major cities outside the metropolitan regions such as Aachen, Bielefeld, Dresden, Kiel, and Münster. In contrast, regions with a weak infrastructure will probably become increasingly sparsely populated.
- The trend towards smaller households is also likely to continue, as it has in recent decades. The trend in many regions is very similar to the national figures. The average household size will fall from around 2 people today to an estimated 1.86 people by 2040.

Significant developments in housing supply:

- We anticipate a sharp decline in new construction in 2024 and 2025. In the following years, we expect a recovery and then the construction of almost 300,000 flats per year from 2028 to 2040. The target of 400,000 new flats per year will likely not be reached in our forecast period.
- Based on these assumptions, the nationwide housing market is easing noticeably. According to our projections, there will be too many rather than too few flats in more and more regions, not because of new construction activity, but because of a shrinking population.
- In many metropolises and large cities, however, the fundamental shortage of supply will continue to increase.
- We therefore expect major regional imbalances.

What can you expect?

For our forecast, we take into account both the nationwide population development including births, deaths and net immigration as well as new construction and household size. After a decline in new construction in 2024, we assume a recovery from 2025 to 2029 and then a sideways movement in the coming decade. For household size, we continue the existing trends towards smaller households, especially single households. We also model internal migration. This allows us to calculate the population development for eleven metropolitan regions and 400 rural districts or independent cities (summarised below as "districts"). We calibrate the regional projections so that they are aggregated in line with the national forecast. To calculate the number of inhabitants in each district, we take into account both the natural population balance and the influx.

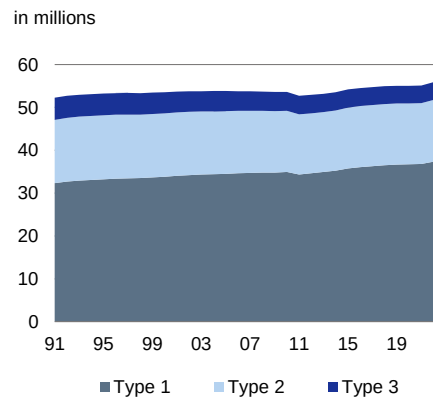
Our modelling is based on the observation that population growth follows robust regional trends. We define district types over two periods, firstly from 1998 to 2010 and secondly from 2011 to 2022. For district type 1, the number of inhabitants grew in both periods. This applies to almost half of the 400 districts. Of these, 128 districts are located in the metropolitan regions. More than 51 million people lived there in 2022, i.e. around 60% of Germany's population. In type 2, which includes around 130 districts with almost 23 million people, there was initially a decline and then an increase in the number of inhabitants. This group is often of particular interest because vacancies, price and rental growth can potentially reverse the trend. In type 3, the number of inhabitants shrank in both periods. This applied to more than 70 districts with just over 10 million people.

Definition of district types: Development of population over two periods

		2011-2022	
		growing ↑	shrinking ↓
1998-2010	↑	Type 1	n.a.
	↓	Type 2	Type 3

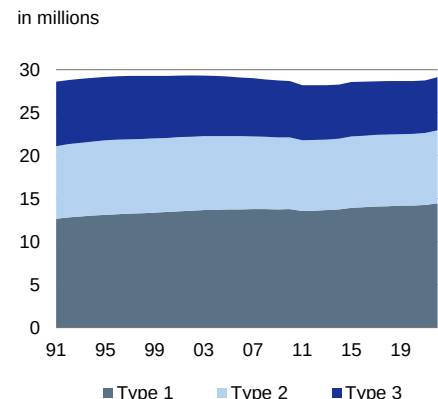
Source: Deutsche Bank Research

1991-2022 Metropolitan regions: Inhabitants by types of district



Sources: bulwiengesa, Deutsche Bank Research, Federal Statistical Office

1991-2022 Non-metropolitan region: Inhabitants by types of districts



Sources: bulwiengesa, Deutsche Bank Research, Federal Statistical Office

This modelling approach is helpful for several reasons:

- i. In none of the districts did the number of inhabitants increase in the first period and decrease in the second. There is therefore no fourth type of district, which simplifies the modelling.
- ii. The robustness of this approach can be seen from the fact that more than 90% of all districts also developed in line with their classification between 2018 and 2022. The largest deviations were in the group of districts that shrank over both periods. Here, population growth between 2018 and 2022 declined in 6% of the 400 districts or 32% of all districts of type 3. The high influx of



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refugees may have led to a trend reversal, but this may only be a temporary development.

- iii. A key variable for the change in housing demand is international migration, 73% of which took place in district type 1 between 1991 and 2022. These districts are mainly, but not exclusively, located in the metropolitan regions. The influx was 70% to the metropolitan regions, although more than 55 million inhabitants lived there in 2022 and thus more than in district type 1. Defining these three types is therefore helpful in comparison to modelling the affiliation of a district to a metropolitan region.
- iv. In 2011, there was a significant correction to the number of inhabitants due to the census. By looking at the two large periods 1998 to 2010 and 2011 to 2022, the data revision probably only slightly distorts the analysis.

Here are the details of our calculations.

Population increased significantly in 2023

In 2023, the population in Germany rose to 84.7 million, an increase of more than 300,000 people compared to the previous year. The strong net influx of 650,000 people was offset by a particularly negative natural population balance, defined as births minus deaths, of 320,000 people. The number of deaths was possibly even higher as a late consequence of the pandemic. However, the higher proportion of older people also plays a role. For example, 1.0 million people died, around 60,000 more than in 2019. The number of births was also particularly low. The war, the energy crisis, the generally high level of economic uncertainty and, in some regions, possibly also the housing shortage are likely to have reduced the desire to have children. In 2023, only 690,000 babies saw the light of day, compared to more than 780,000 in 2019.

Forecast of national population development until 2040

We model the number of births using the number of women of childbearing age between the ages of 15 and 49. Over the last 25 years, their number has gradually fallen from 19.8 million to 16.5 million. In 2040, this cohort will only number 14.2 million people. Before the pandemic, their birth rate was relatively constant at around 4.5% children per year. This is also the historical average. This rate is also the basis for our forecast. According to this, the number of births will fall from 735,000 in 2024 to just 640,000 in 2040. Deaths reached their minimum in 2004 at 820,000 and increased to 940,000 by 2019. A further increase is to be expected due to the ageing population. According to our model, the number of deaths will rise from almost 1.0 million in 2024 to 1.16 million in 2040.

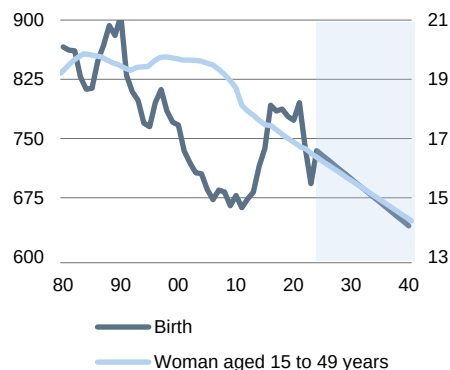


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Births and women aged 15 to 49 years

4

left y-axis: in k
right y-axis: in millions

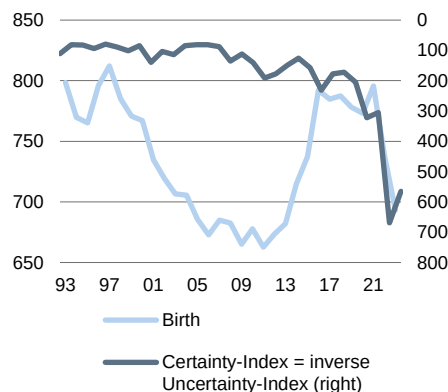


Sources: Deutsche Bank Research, Federal Statistical Office

1993-2023: Births

5

left y-axis: in k
right y-axis: 1993-2010=100

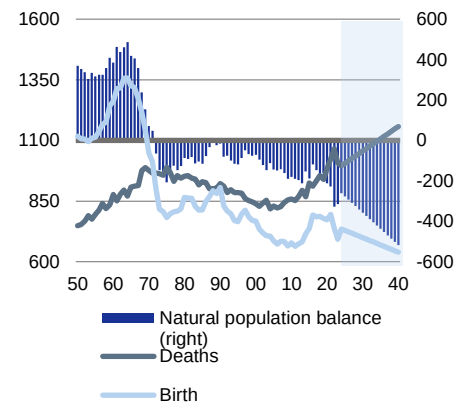


Sources: Baker, Bloom und Davis, Deutsche Bank Research

1950-2040: Births & Deaths

6

both y-axis: in k



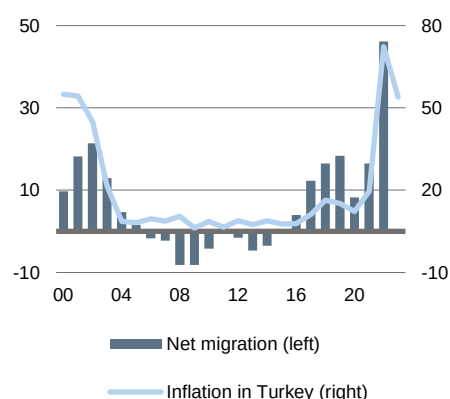
Sources: Deutsche Bank Research, Federal Statistical Office

In our models to date, we have anticipated a net influx of around 320,000 people. However, there are a number of reasons in favour of an increase. The average over the last 15 years was significantly more than 400,000. In addition, geopolitical events typically increase immigration and the geopolitical situation is likely to remain tense over the coming years. Minor crises, such as high inflation in Turkey or the Brexit, are also fuelling the influx from these countries to Germany. Furthermore, we have been forecasting since 2020 that India is on its way to becoming the main country of origin. In 2022, more than 40,000 people net migrated from India to Germany, significantly more than in the past. As economic relations between the currently third and fifth largest economies intensify, more Indians are also likely to work in Germany. As a result of these developments, we are increasing the forecast annual net immigration to 400,000 people per year.

2000-2023 Migration from Turkey vs. inflation rate

7

linke y-Achse: in k per year
rechte y-Achse: Delta in percentage points

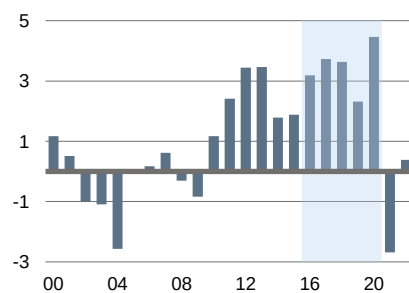


Sources: Deutsche Bank Research, Federal Statistical Office, IMF

2000-2022: Net migration from UK

8

in k per year

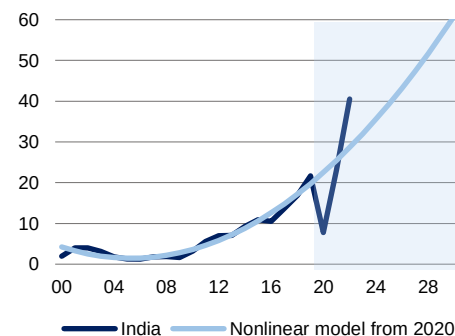


Sources: Deutsche Bank Research, Federal Statistical Office

Germany: Net migration from India

9

in '000



Sources: Deutsche Bank Research, Federal Statistical Office

In our forecast, immigration exceeds natural population growth until 2032. After that, however, this balance is greater than 400,000 per year and then exceeds 500,000 in both 2039 and 2040. In the next decade, Germany would need a net influx of around half a million people to keep the number of inhabitants constant. In view of the capacity limits of bureaucracy as well as the shortage of accommodation and the partial failures in integration, which reduce the social acceptance of migration, we consider this forecast to be too high. Based on our



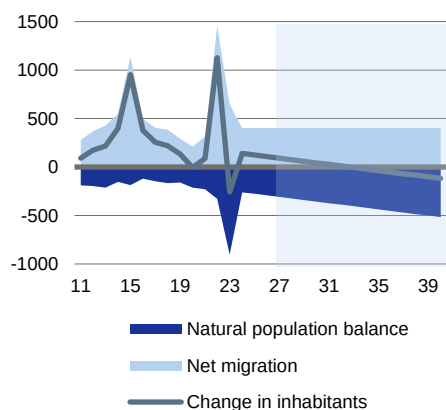
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assumptions, the number of inhabitants will peak at 85.4 million in 2032 and then gradually fall to 84.9 million by 2040.

2011-2040 Change in inhabitants:
Natural population balance and
net migration

10

in k per year

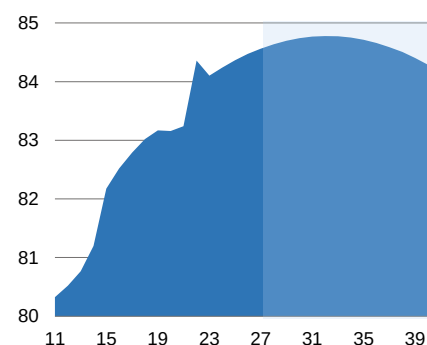


Sources: Deutsche Bank Research, Federal Statistical Office

2011-2040: Population

11

in Mio.



Sources: Deutsche Bank Research, Federal Statistical Office

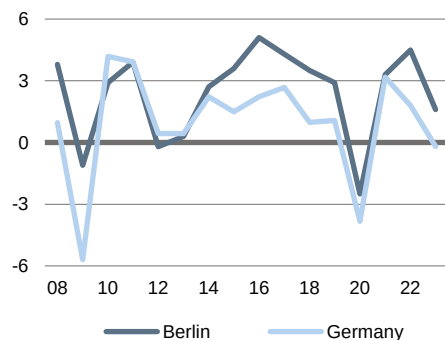
Internal migration: Self-reinforcing effects are significant

In addition to international migration, internal migration is also significant for local and regional demand for housing. This typically takes place from economically weak to strong regions, in the direction of metropolitan regions and in type 1 districts. In recent decades, this effect has been particularly positive for the federal states of Bavaria, Baden-Württemberg and Hesse. A large part of the nationwide population growth took place in these three federal states. Migration after reunification was also mainly from east to south and not from east to west. This is also reflected in the number of inhabitants in the metropolitan regions of Munich, Stuttgart, Rhine-Neckar, and Rhine-Main. They have grown by 13% since 1991, while the increase across all eleven metropolitan regions was only 7%.

GDP: Germany vs. Berlin

12

% year-over-year



Sources: Amt für Statistik Berlin-Brandenburg, Deutsche Bank Research, Federal Statistical Office

The economic strength of a region is typically a structural and often self-reinforcing factor that attracts people over long periods of time. The absolute economic strength typically grows with the number of people. In addition, new residents tend to be young and often well educated. This further increases the attractiveness and economic productivity of a region and attracts companies and other newcomers. Ultimately, this results in a higher growth trajectory. This can be clearly observed in Berlin. In recent years, GDP growth there has regularly been almost 2 percentage points higher than nationwide growth.

Accordingly, there are significant economic differences between our three district types. For example, district type 1 has a particularly high purchasing power per inhabitant, a low unemployment rate and a high labour force participation rate. In addition, employees often work in sectors that require a higher level of education, such as technology, media and telecommunications or higher business-related services. District type 2 also typically has better economic indicators than type 3.



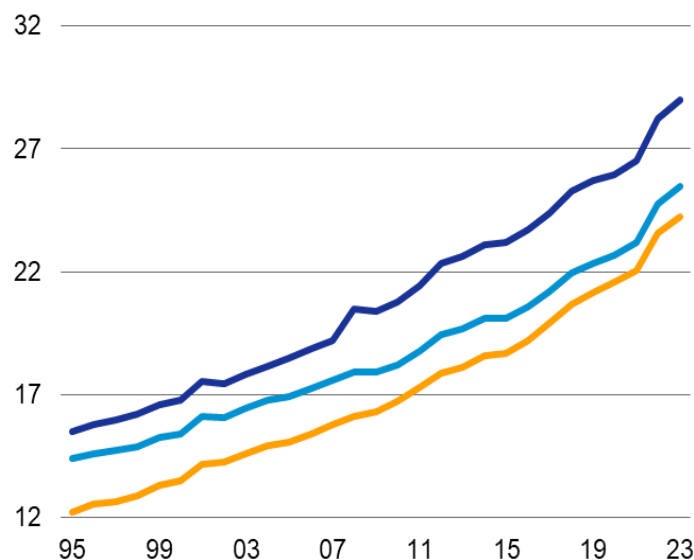
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Important economic differences between the three district types

13

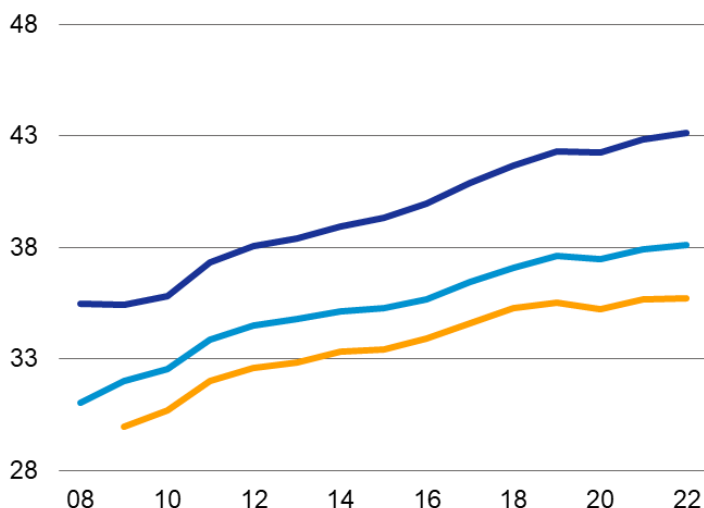
Purchasing power

in '000 Euro per inhabitant



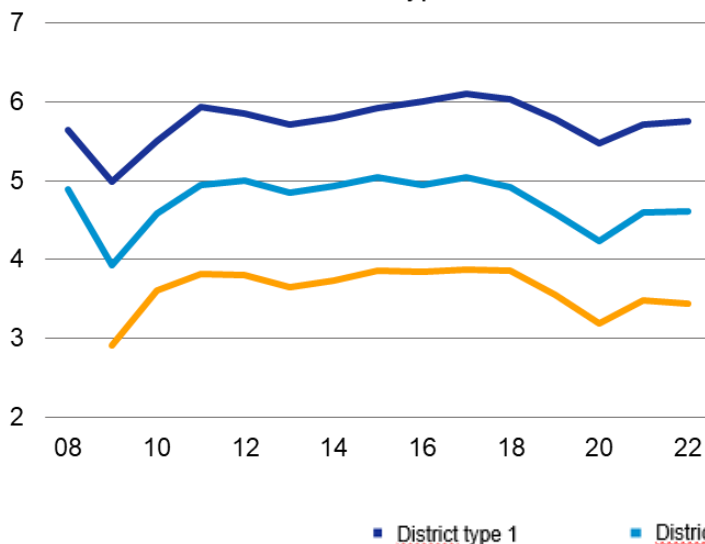
Employees subject to social contribution

in % of inhabitants of each type of district



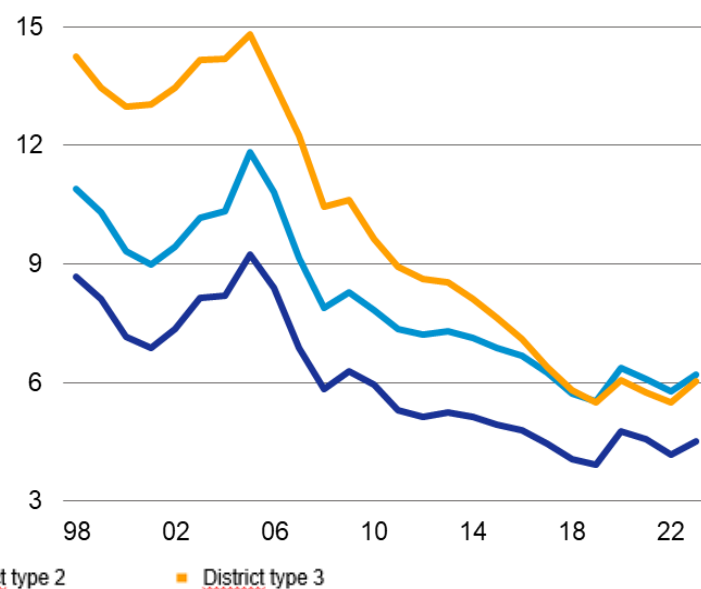
Employees subject to social contribution in the sector higher business-related services

in % of all employees subject to social contribution in each district type



Unemployment rate

in % of the civilian labor force
Averages of each type of district



Sources: bulwiengesa, Federal Statistical Office, Deutsche Bank Research

Internal migration and immigration via the three district types

In 2022, there were 6.6 million inflows and 5.2 million outflows across district borders. The difference is the net influx to Germany, which was mainly due to Ukrainian refugees. Around two thirds of this migration was to district type 1. From 1990 to 2022, 73% of international migration to Germany was to this type and around 23% was to district type 2. In recent years, the influx in both types has mostly more than compensated for the negative natural population balance.

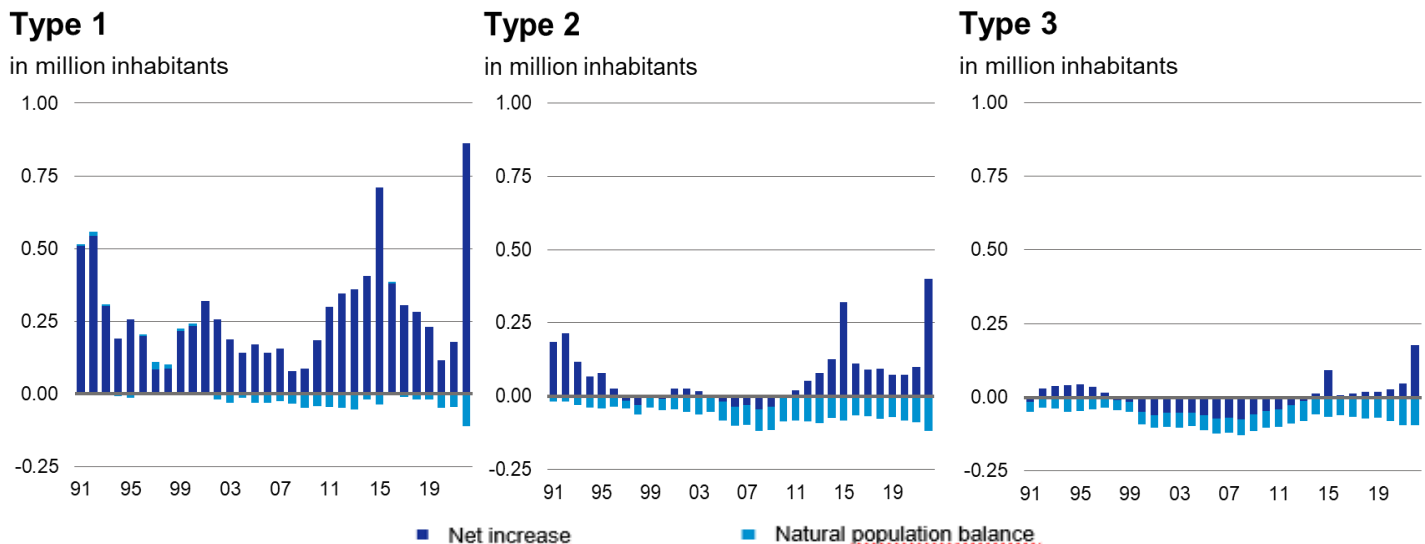


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As a result, the number of inhabitants increased. In type 3, there was typically even an out-migration until 2013. Only since 2014 has the net inflow been consistently positive. However, the number of inhabitants mostly continued to shrink due to the negative natural population balance. The exceptions were the years 2015 and 2022, which were characterized by high immigration.

Net increase and natural net population balance in the three district types

14



Sources: bulwiengesa, Federal Statistical Office, Deutsche Bank Research

Excursus: Number of new tenancy agreements per year

Historically, the number of people moving across district boundaries has been lower than in 2022, with most moves being between 4 and 6 million. The number of moves within the districts is probably similar. As a rule of thumb, around 10 million people move every year. With an average household size of 2 people per household, this equates to around 5 million households. At the current rental rate of 58%, around 2.9 million new tenancy agreements are concluded each year, which corresponds to around 12% of all tenancy agreements. The number of new leases is important for the question of how much existing rents will rise in future. However, to our knowledge it is not known whether the same households tend to move and therefore a large proportion of the old contracts remain in place for a long time or whether this happens more by chance and new households are therefore always signing new contracts. In the latter case, the average nationwide existing rents would rise significantly faster than if the same households moved more often. We assume that around one third move relatively frequently and two thirds hold on to a flat for a long time. Due to the large difference between new and existing rents, this is of central importance for the economic development of rents and therefore also for inflation in the coming years. Due to this difference, we assume that net rents in the consumer price basket will grow by an average of 3% year-on-year over the next few years with net inward migration and natural population balance in the three district types.



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Housing demand and supply until 2040

We extrapolate the trend towards smaller households into the future using simple bivariate regressions for each district. Since the early 1990s, the size of households nationwide fell from 2.3 persons to just 2 persons per household by 2022. In our projection, the average number of people continues to fall and will be just 1.86 by 2040. The average household size in metropolises and large cities is already often around 1.8 people, while in rural regions the average household size tends to be just over 2. In our projection, household size will fall everywhere by 2040. In the metropolises and large cities, it falls to around 1.75 people and in rural areas to around 1.9 people. The current difference will therefore be maintained. The ratio of the number of inhabitants to household size then determines the demand for housing for each year and each district. This was less than 36 million homes in 1990, reached 43 million in 2022 and, according to our projection, will gradually increase to 46.4 million in 2040.

Our new construction forecast for 2024 and 2025 is based on a model that takes into account building permits, interest elasticity and a mark-up from the construction backlog. We expect 260,000 and 265,000 completed flats for these years. The construction recession is likely to end in the second half of 2024. As a result, new construction is likely to increase further due to the high demand for housing. In addition, we are likely to have reached the interest rate peak and the improved depreciation rules of the Growth Opportunities Act, the introduction of the new non-profit status for residential communities and social housing subsidies should also boost construction activity somewhat. As a result, we expect a steady increase to 295,000 completed flats by 2029 and then a sideways movement at this level until 2040. The target of 400,000 new flats per year will not be achieved in our forecast period. We also use each district's share of nationwide construction activity from 2016 to 2022 as the basis for the projections of new construction in each district.

From 2011 to 2022, the total number of completions totaled 3.13 million flats, while the stock only grew by 2.77 million flats due to disposals. There are major differences between the regions. Historically, around two thirds of all flats are built in the metropolitan regions and one third in the non-metropolitan regions. With minor fluctuations, the nationwide share of district type 1 is 73% of new construction, type 2 typically accounts for 20% and type 3 for around 7%. It is also true that in districts with typically high vacancy rates, the number of new builds was high. This applies in particular to many eastern German districts, where demolitions were also extensive in some cases. Although vacancy rates fell in many places as a result of this demolition, they often remain high in regions with weak infrastructure. For this reason, we also use the historical ratios of the increase in the stock to the number of completed flats for the projections.

As a result of our assumptions, the housing stock increases from 43.4 million in 2022 to 48.0 million in 2040. Aggregated, the housing supply for district types 2 and 3 therefore increasingly exceeds demand. This reflects the high vacancy rates outside the metropolitan regions and especially in rural areas. According to the BBSR, around 1.7 million flats were vacant in Germany in 2018. However, this does not apply to type 1 in our projection, where the fundamental supply shortage will still exist in aggregate in 2040.

Calculation of the housing market equilibrium

As in previous publications, we do not calculate the fundamental supply shortage using absolute figures. In our opinion, this approach has some disadvantages. Firstly, this comparison could measure behavioural changes



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rather than shortages in the housing market. For example, more students could increase the number of shared flats, which would tend to increase the number of households. However, it is also likely that some student communities are founded deliberately and not due to shortages. Secondly, when looking at the absolute figures, bottlenecks that occurred a long time ago are also included in the calculation, which we consider to be a disadvantage when measuring the fundamental shortage of supply. Thirdly, this approach requires vacancy rates, which we do not have in full. In addition, projecting vacancy rates is quite challenging. Fourthly, shortages were very limited before the boom from 2009 to 2022 and housing policy was rarely the focus of public debate. Last but not least, a census took place in 2011 after a break, which led to massive revisions in population figures and completions.

As before, we therefore assume a balance between housing supply and demand in 2011.¹ For the following years, we then determine the cumulative additional housing demand realized since 2011 via the increase in the number of inhabitants, taking into account the development in household size. We also calculate the cumulative additional housing supply via new construction and the resulting increase in the existing stock. We then define the difference between housing supply and demand as a fundamental supply shortage in the case of a negative value and as a surplus in the positive case. A value of zero means that the market has returned to its 2011 level. In individual cases, the market may still be tight because the market was already tight in 2011. In general, however, we consider our method to be expedient.

Bottlenecks will increase in some regions by 2040

The fundamental supply shortage calculated in this way was particularly severe in 2015. This year, 166 districts with more than 44 million inhabitants were affected. Both values are the maximum in our calculations. By 2021, the number of districts with a fundamental supply shortage had fallen to just 71 districts with 23 million inhabitants. With the start of the war, the number increased again and rose to 107 districts with just over 33 million inhabitants in 2023. Our projections show that the situation is improving almost gradually despite our cautious construction forecast. Nevertheless, 47 districts with 23 million inhabitants will still be affected in 2040. In addition, the shortage of supply continues to increase in many large cities. In 2040, for example, there will be 13 districts in which the supply shortage will be more than 10% of the respective housing stock. The larger and better-known cities are Berlin, Frankfurt am Main, Cologne, Leipzig, Munich, and Stuttgart. This is due to the assumed lack of new construction as well as high demand. The number of inhabitants in these six cities will rise from 7.2 million in 2022 to 8.6 million in 2040. 4.5 million people will live in Berlin alone and 1.9 million in Munich according to our projections, which is around 20% more than today.

¹ The 2011 census resulted in a major correction to the number of inhabitants as well as a correction to the housing stock, which is why this year is better suited as a starting point for comparison than 2009, which in our view represents the starting point for the boom in the housing market.

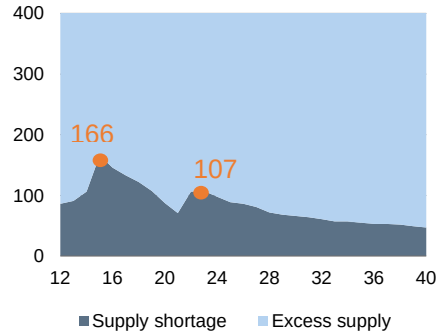


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2012-2040: Cumulated fundamental supply shortage

15

of districts

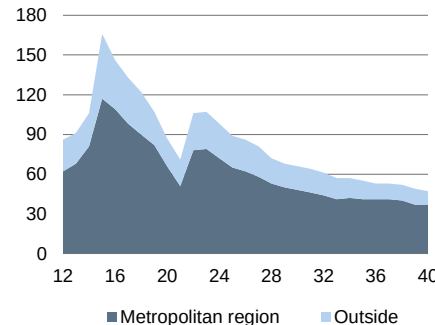


Sources: Deutsche Bank Research, Federal Statistical Office

Districts with supply shortages

16

of districts

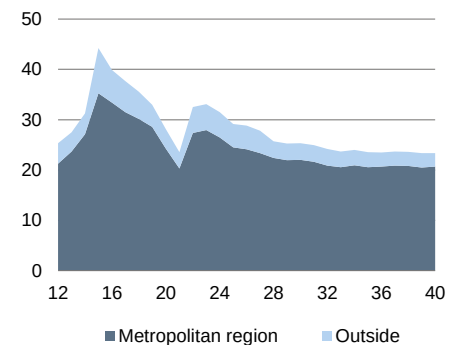


Sources: bulwiengesa, Deutsche Bank Research, Federal Statistical Office

Inhabitants in districts with a fundamental supply shortage

17

in millions



Sources: bulwiengesa, Deutsche Bank Research, Federal Statistical Office

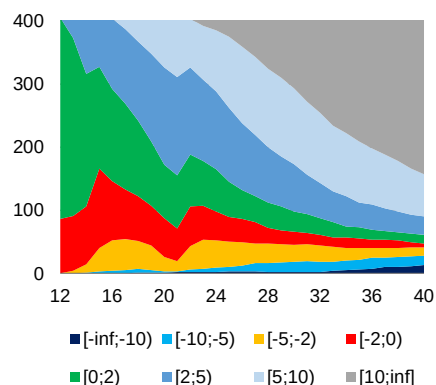
Of the districts with fundamental supply shortages, around 73% were historically located in the eleven metropolitan regions. In 2040, there will be significantly fewer districts with shortages in all metropolitan regions than today. In Hamburg, Hanover-Brunswick-Göttingen-Wolfsburg, Northwest, Nuremberg, and Central Germany, only one city will still be affected. In the north-west metropolitan region it is Osnabrück and in Nuremberg it is Fürth, otherwise it is always the metropolis itself. In Berlin/Brandenburg, Rhine-Ruhr and Rhine-Neckar, there are only shortages in a few other districts in addition to the metropolises. Most flats are still lacking in Rhine-Main, Stuttgart, and Munich.

The shortage of supply outside the metropolitan regions should also decrease between 2023 and 2040. It should roughly halve from 28 districts with 5.1 million inhabitants to 10 districts with 2.7 million inhabitants. The top 30 cities in terms of population also include Dresden, Bielefeld, Münster, Kiel, and Aachen, which are located outside the metropolitan regions. Only Bielefeld shows no bottlenecks either in the past or in our projection up to 2040. In Kiel, the bottlenecks are only reducing very slowly. The imbalance will likely not be eliminated until 2040. This also applies to Münster. However, Münster already had a relatively tight market with low vacancy rates in 2011. In contrast, we calculate a further intensification of the bottlenecks for Aachen. There is a shortage of 3,900 flats here, which corresponds to 2.6% of the stock in 2040. In Dresden, there is a shortage of as many as 17,000 flats, or almost 5% of the stock. Housing policy in many cities is therefore likely to remain the focus of public attention for many years to come.

2012-2040: Cumulated fundamental supply shortage

18

y-axis: # of districts, legend: in % of the housing stock, respectively



Sources: Deutsche Bank Research, Federal Statistical Office

Regional housing markets: More and more districts with surplus supply

At the same time, however, the number of districts with surplus supply should also increase. Their number increases from 299 in 2022 to 358 in 2040. The number of districts with very high surpluses is also increasing significantly. In 2022, 2 districts had a supply surplus of more than 10% of their respective housing stock. By the end of the 2030s, their number should increase to over 200 districts in our projection. The number of districts in the non-metropolitan regions is initially significantly higher than in the metropolitan regions. From 2039, this reverses and by 2040, 114 districts in the metropolitan regions and 103 districts in the non-metropolitan regions have high surpluses. They are mainly located in the less economically strong metropolitan regions. Around 90% of the districts there have surpluses. By contrast, in the Rhine-Main, Rhine-



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Neckar, and Stuttgart only in about two thirds of the districts and in the Munich metropolitan region only in about every second district.

Important: Our regional projections are not forecasts

In the event of a permanently high supply surplus, construction activity is likely to decline significantly. Similarly, if there is a sustained fundamental shortage of supply, demand is likely to be channeled into neighbouring districts or a supply-oriented housing policy will ultimately be implemented. Our projections also do not take into account special regional factors such as natural disasters. A recent example is the flood disaster in the Ahr valley. As a result, the population in the Ahrweiler district fell from 130,500 in 2020 to 128,100 in 2021. The relocation of companies can also have far-reaching consequences for the housing market. Examples of this include Tesla settling in Grünheide with more than 11,000 employees. The population there increased by more than 3,000 or 1.7% from 2021 to 2022. The population in Mainz also increased by 2,000 people during the pandemic, which corresponds to an increase of almost 1% and could be due in large part to the increase in Biontech's workforce of several thousand employees. In both Mainz and Grünheide, however, the growth of the companies overlapped with the wave of refugees, which is also likely to have accounted for a significant proportion of the population growth. The relocation of Eli Lilly in Alzey in the Alzey-Worms district, Northvolt in Heide in the Dithmarschen district, Intel in Magdeburg and TSMC and Infineon in Dresden, for example, are also likely to boost demand for housing. Another regional factor can be demand from tourists. The metropolises in particular, as well as districts in the mountains and on the coasts, are likely to show increased demand here, which we do not take into account. In principle, the smaller the population and the more employees are hired, the greater the influence on the regional housing market. Modelling these special factors, the turnaround to a supply-oriented policy or the market reaction to high surpluses is complex, which is why we refrain from making forecasts and limit ourselves to projections. Nevertheless, we consider our calculations to be a valuable point of orientation.

Evaluation of the projections

Although the projections surely overstate the future developments, we believe that the big question for both politicians and the construction industry is whether the potential surpluses and bottlenecks can be offset across the metropolitan regions and Germany, for example through regional differences in rents or the opportunities offered by working from home. In this case, the developments described here will be dampened. Some solution modules are already known. These include serial, modular construction and prefabricated construction. Less bureaucracy and streamlined administrative and authorization processes could also help, as could general increases in construction productivity. The relocation of tradespeople and construction companies from districts with surpluses to regions with shortages could also help. However, even under optimal conditions, it will probably not be possible to eliminate the bottlenecks in all districts. Because even if we were to build 400,000 flats per year from 2024 to 2040, our calculations show that by 2040 there would still be 32 districts with shortages and still 6 districts with a fundamental shortage of supply of more than 10% of the respective stock. The topic of the housing market and housing shortages is therefore likely to remain a perennial issue, at least in the economically strong regions.

Jochen Möbert (+49 69 910-31727, jochen.moebert@db.com)



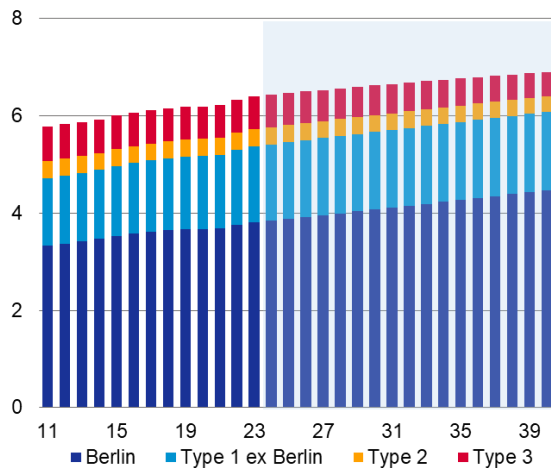
Population forecast and housing market until 2040

2011-2040 Projections for metropolitan region Berlin/Brandenburg

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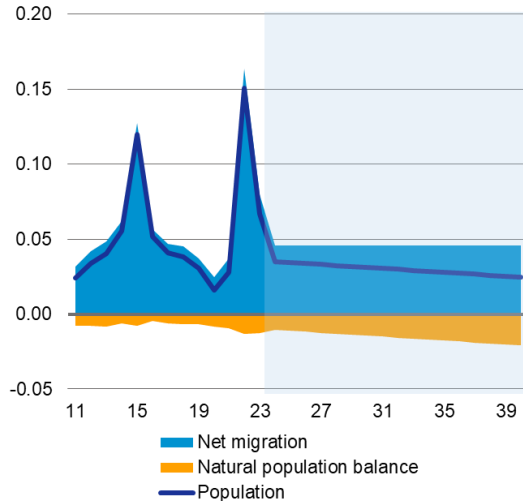
Population

in millions



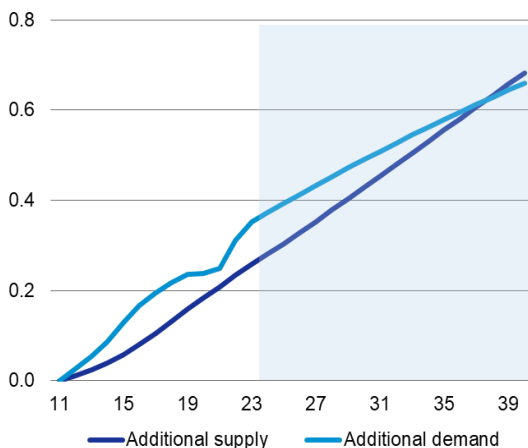
Rise in population

in millions per year



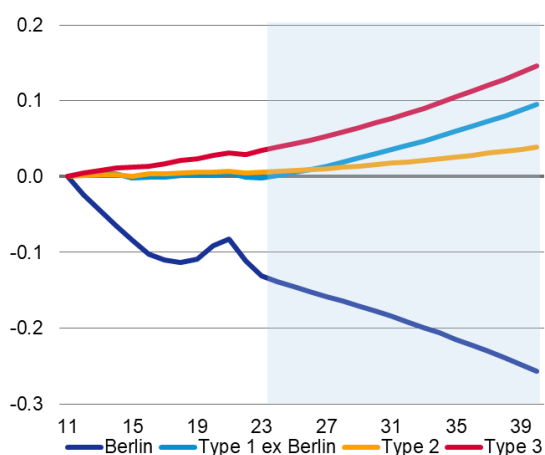
2011-2040: Cumulated housing market (in)equilibrium

in millions dwellings



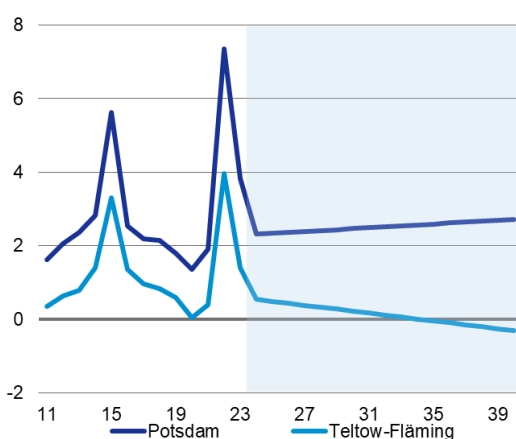
Housing market: Supply minus demand

dwellings in millions



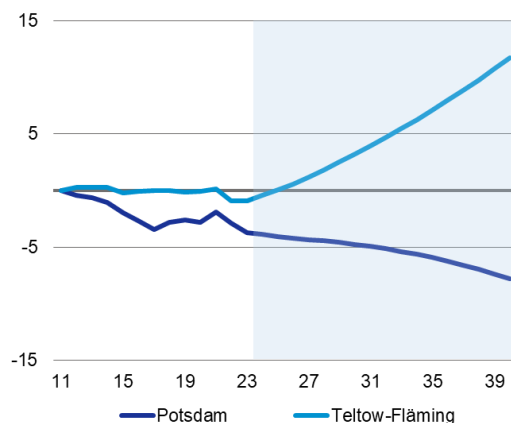
Additional districts with fundamental supply shortage: Increase in population

in '000 per year



Additional districts with a fundamental supply shortage: Supply minus demand

in '000 dwellings (plus: excess, minus: shortages)



Sources: bulwiengesa, Federal Statistical Office, Deutsche Bank Research



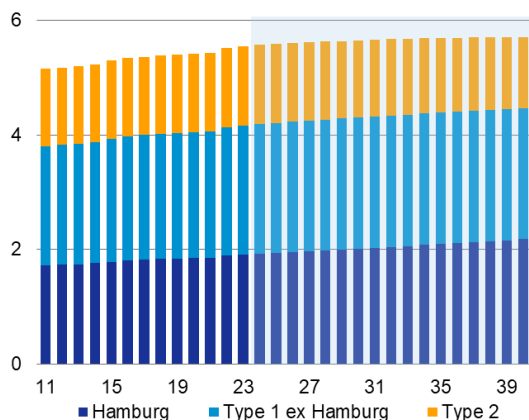
Population forecast and housing market until 2040

2011-2040 Projections for metropolitan region Hamburg

20

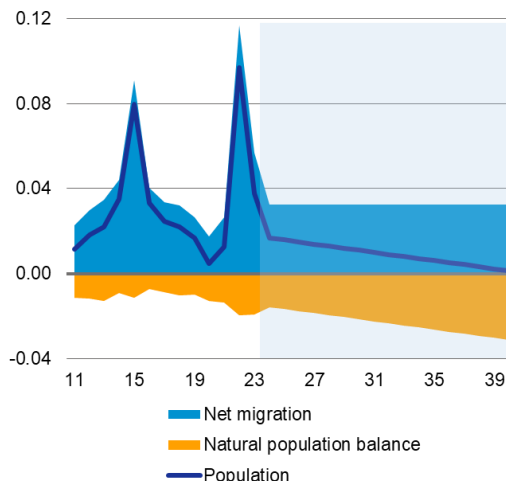
Population

in millions



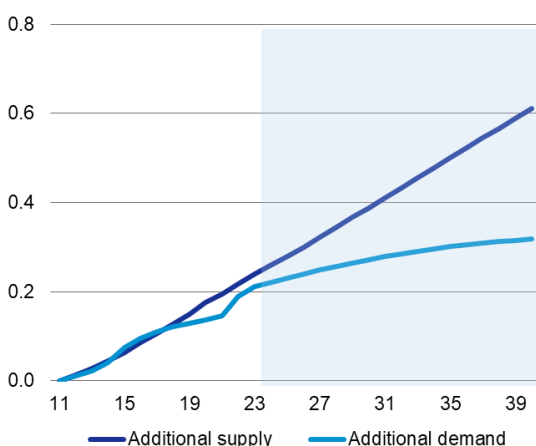
Rise in population

in millions per year



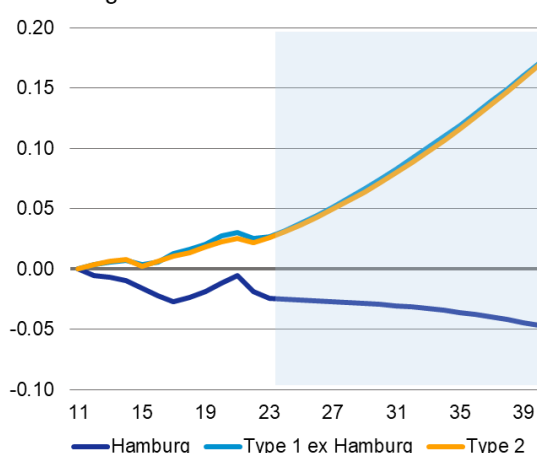
2011-2040: Cumulated housing market (in)equilibrium

in millions dwellings



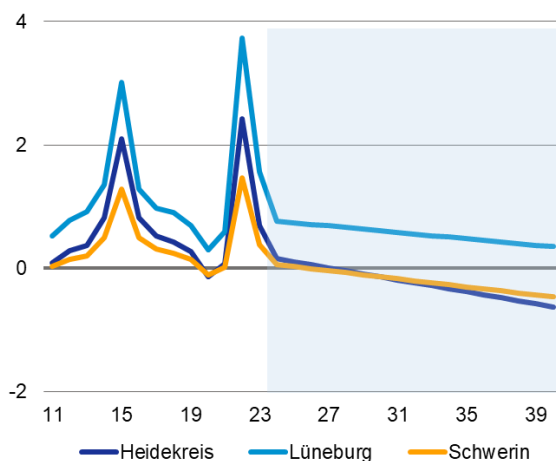
Housing market: Supply minus demand

dwellings in millions



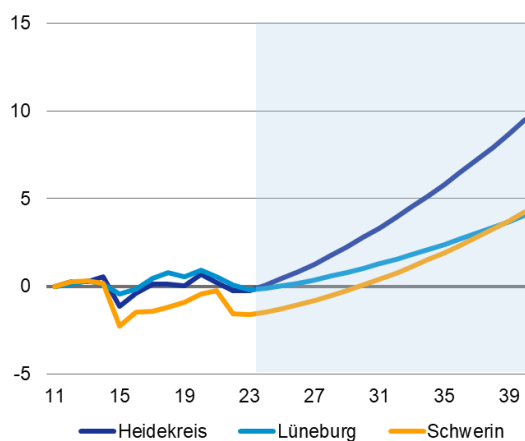
Additional districts with fundamental supply shortage: Increase in population

in '000 per year



Additional districts with a fundamental supply shortage: Supply minus demand

in '000 dwellings (plus: excess, minus: shortages)



Sources: bulwiengesa, Federal Statistical Office, Deutsche Bank Research



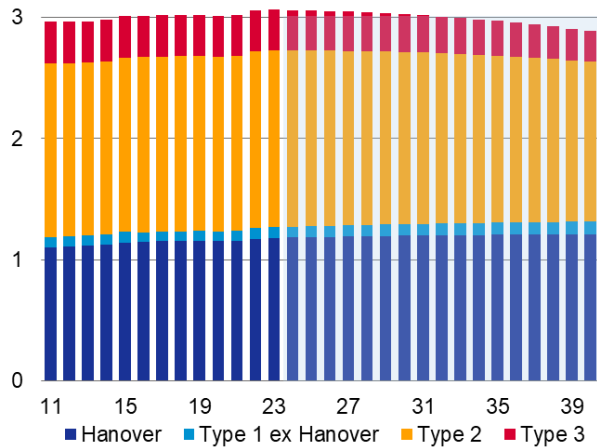
Population forecast and housing market until 2040

2011-2040 Projections for metropolitan region Hanover-Braunschweig-Göttingen-Wolfsburg

21

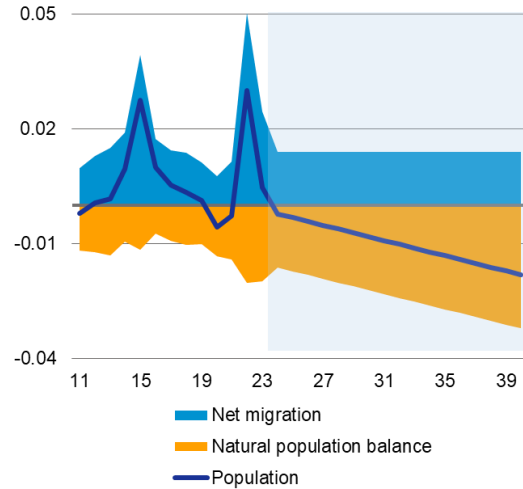
Population

in millions



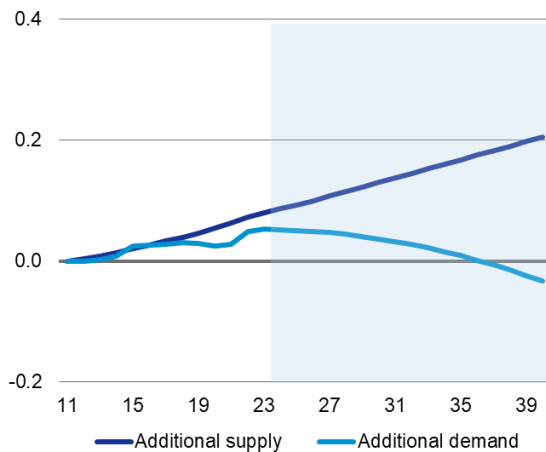
Rise in population

in millions per year



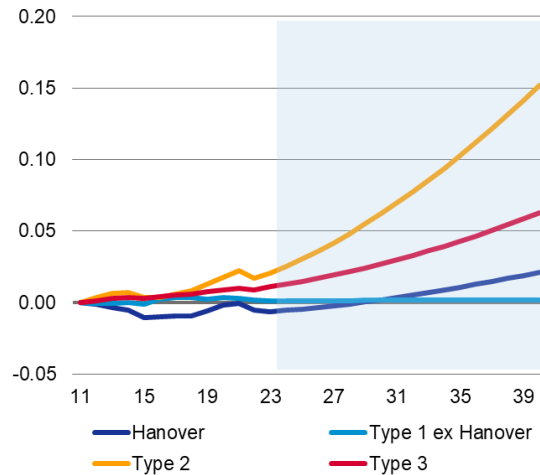
2011-2040: Cumulated housing market (in)equilibrium

in millions dwellings



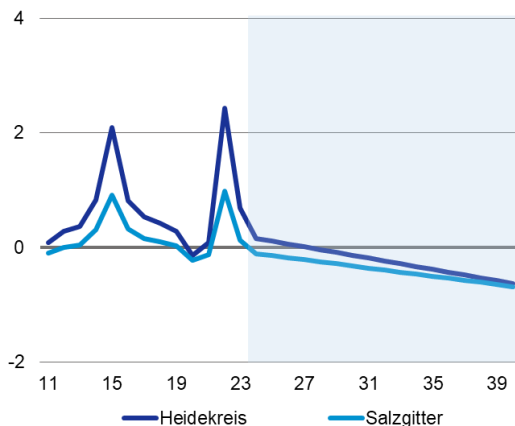
Housing market: Supply minus demand

dwellings in millions



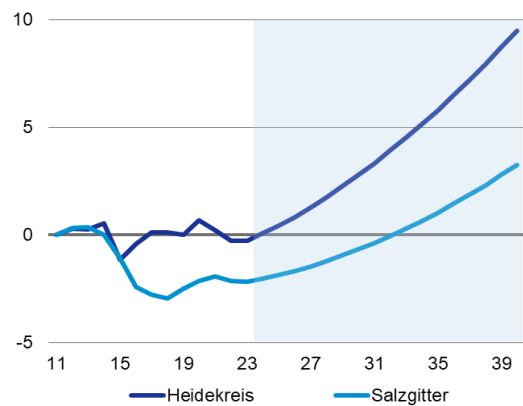
Additional districts with fundamental supply shortage: Increase in population

in '000 per year



Additional districts with a fundamental supply shortage: Supply minus demand

in '000 dwellings (plus: excess, minus: shortages)



Sources: bulwiengesa, Federal Statistical Office, Deutsche Bank Research



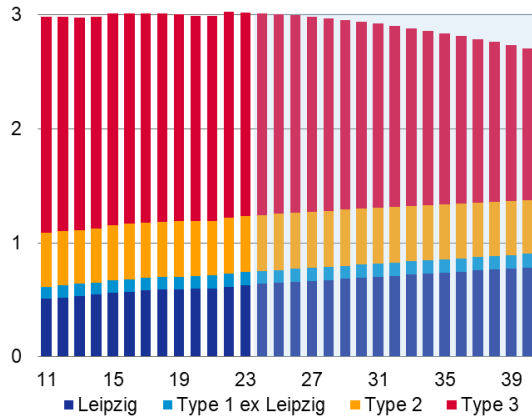
Population forecast and housing market until 2040

2011-2040 Projections for metropolitan region Central Germany

22

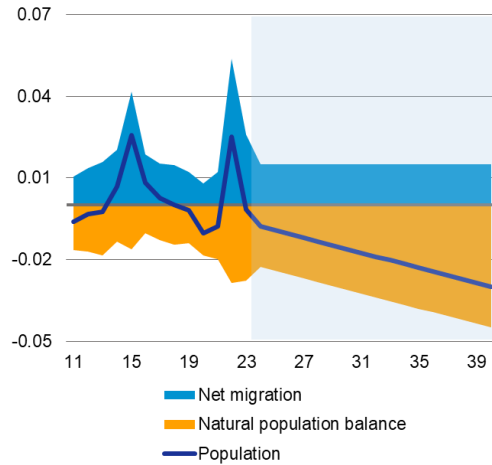
Population

in millions



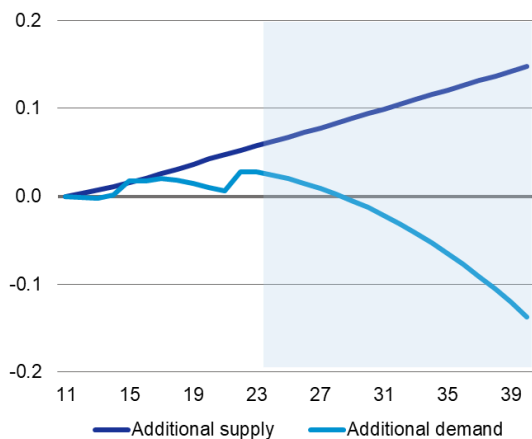
Rise in population

in millions per year



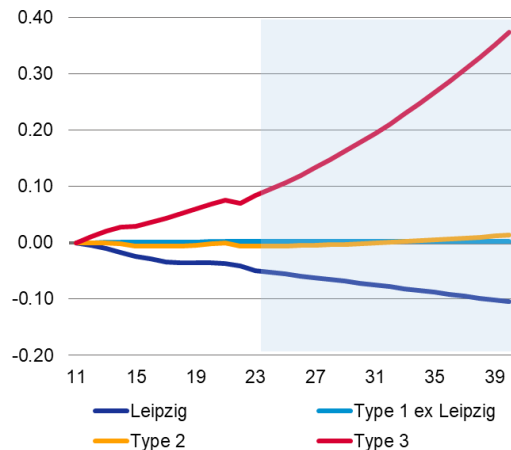
2011-2040: Cumulated housing market (in)equilibrium

in millions dwellings



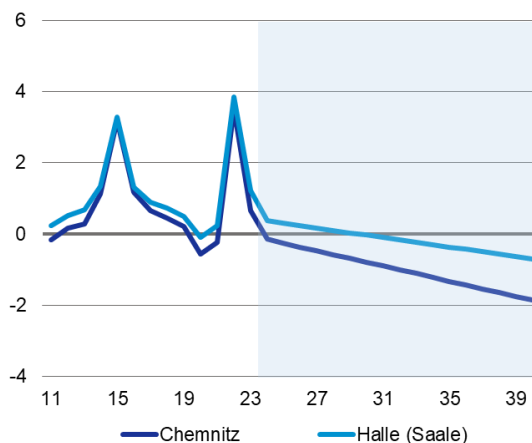
Housing market: Supply minus demand

dwellings in millions



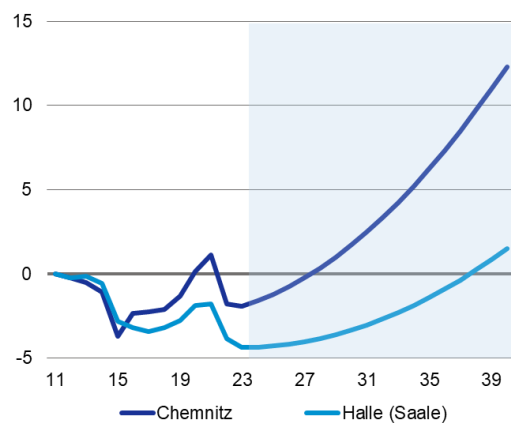
Additional districts with fundamental supply shortage: Increase in population

in '000 per year



Additional districts with a fundamental supply shortage: Supply minus demand

in '000 dwellings (plus: excess, minus: shortages)



Sources: bulwiengesa, Federal Statistical Office, Deutsche Bank Research



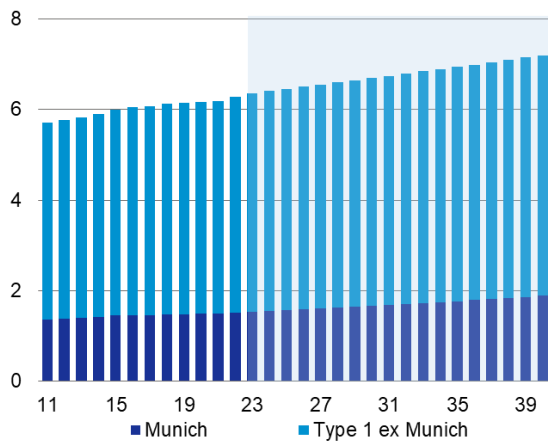
Population forecast and housing market until 2040

2011-2040 Projections for metropolitan region Munich

23

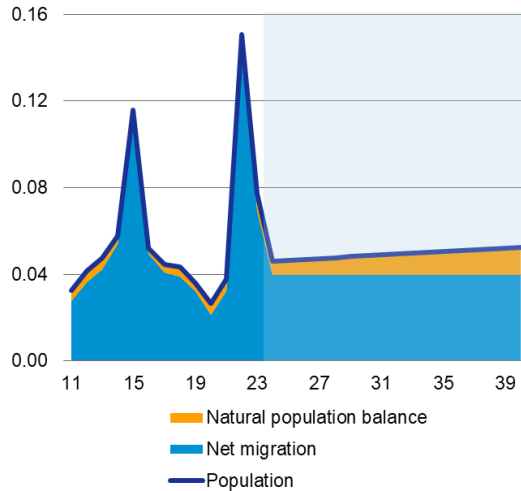
Population

in millions



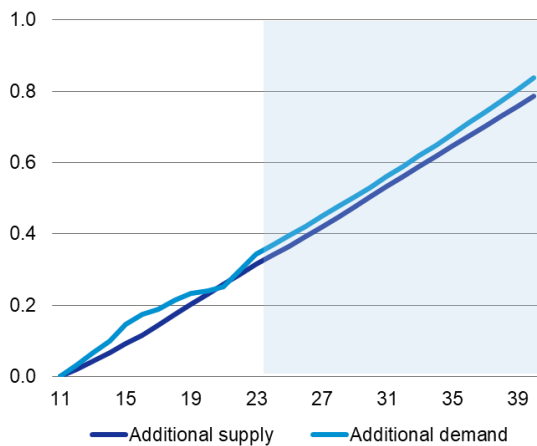
Rise in population

in millions per year



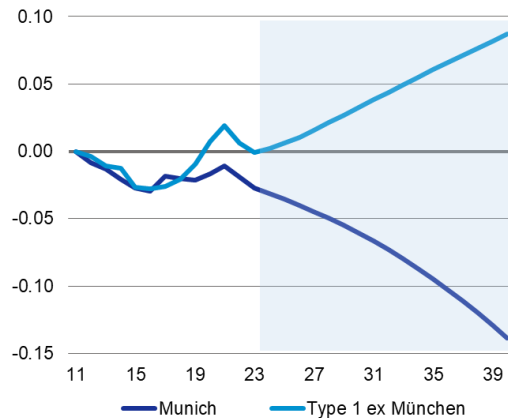
2011-2040: Cumulated housing market (in)equilibrium

in millions dwellings



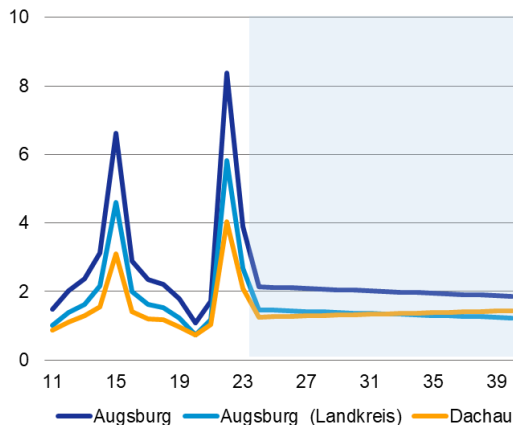
Housing market: Supply minus demand

dwellings in millions



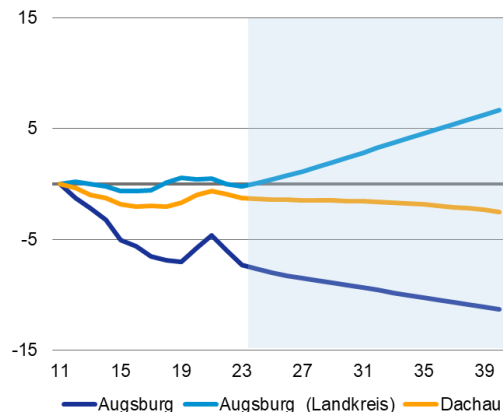
Additional districts with fundamental supply shortage: Increase in population

in '000 per year



Additional districts with a fundamental supply shortage: Supply minus demand

in '000 Wohnungen (plus: Überschuss, minus: Knappheiten)



Sources: bulwiengesa, Federal Statistical Office, Deutsche Bank Research



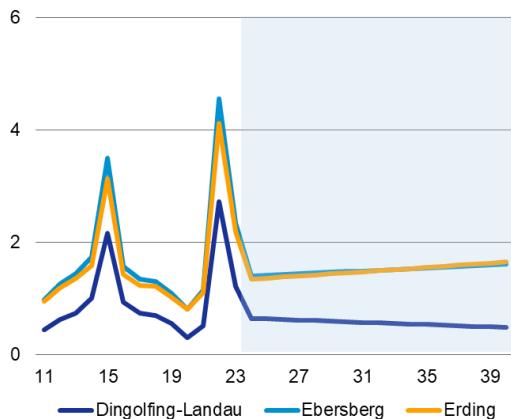
Population forecast and housing market until 2040

2011-2040 Projections for metropolitan region Munich (continued)

24

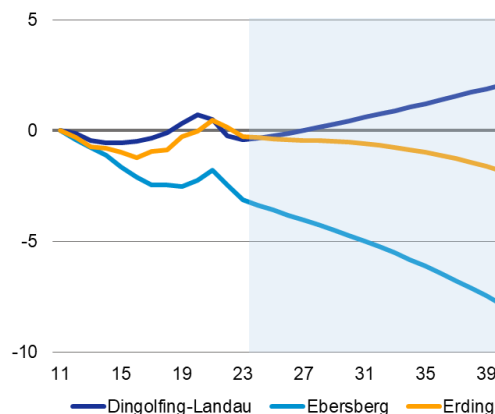
Additional districts with fundamental supply shortage: Increase in population

in '000 per year



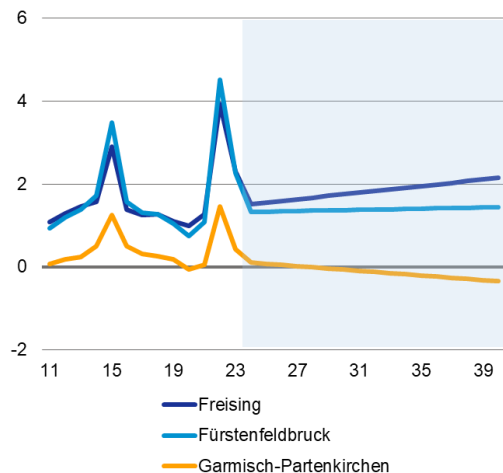
Additional districts with a fundamental supply shortage: Supply minus demand

in '000 dwellings (plus: excess, minus: shortages)



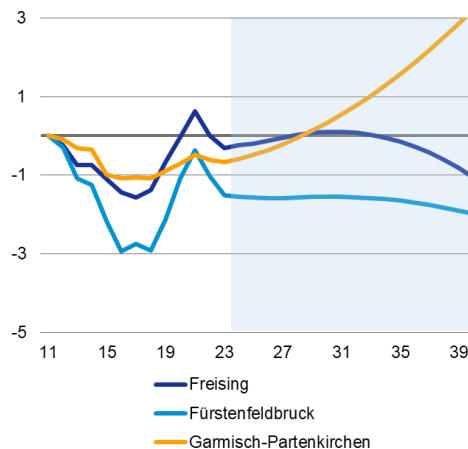
Additional cities with fundamental supply shortage: Increase in population

in '000 per year



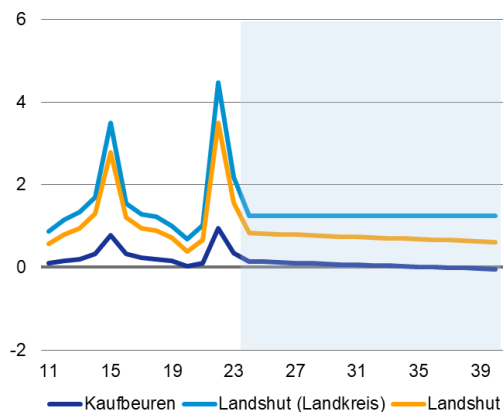
Additional districts with a fundamental supply shortage: Supply minus demand

in '000 dwellings (plus: excess, minus: shortages)



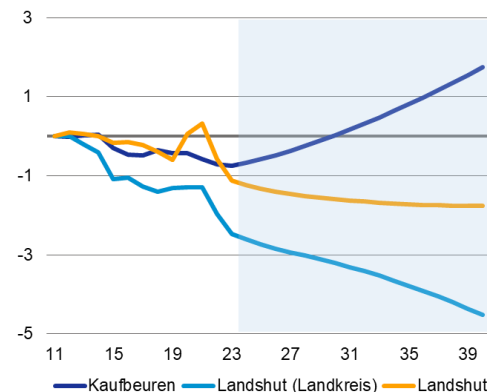
Additional cities with fundamental supply shortage: Increase in population

in '000 per year



Additional districts with a fundamental supply shortage: Supply minus demand

in '000 dwellings (plus: excess, minus: shortages)

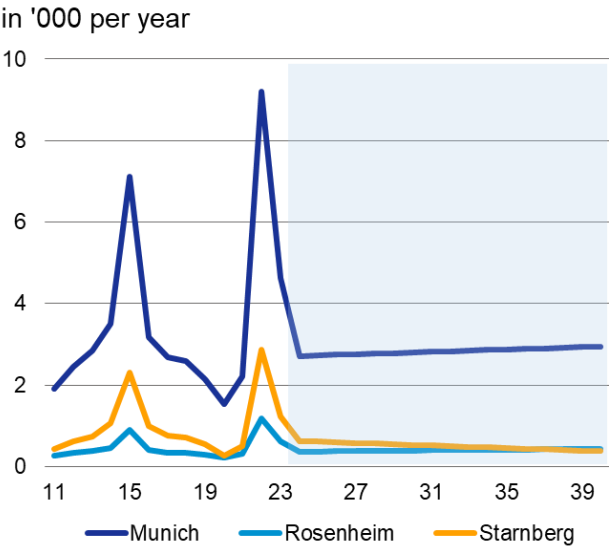


Sources: bulwiengesa, Federal Statistical Office, Deutsche Bank Research

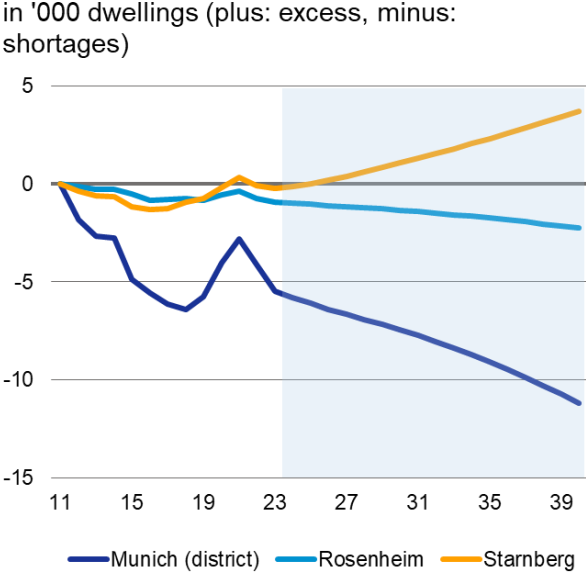
2011-2040 Projections for metropolitan region Munich (continued)

25

Additional cities with
fundamental supply shortage:
Increase in population



Additional districts with a
fundamental supply shortage:
Supply minus demand



Sources: bulwiengesa, Federal Statistical Office, Deutsche Bank Research



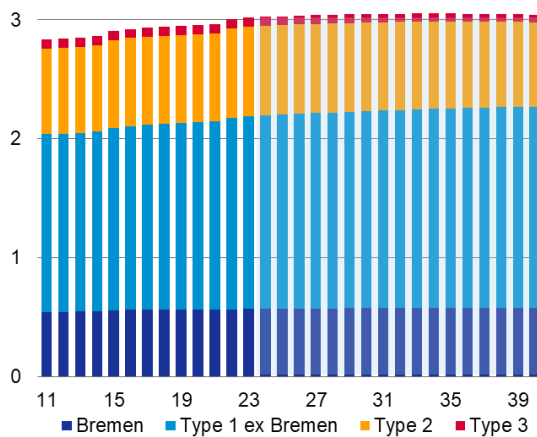
Population forecast and housing market until 2040

2011-2040 Projections for metropolitan region Northwest

26

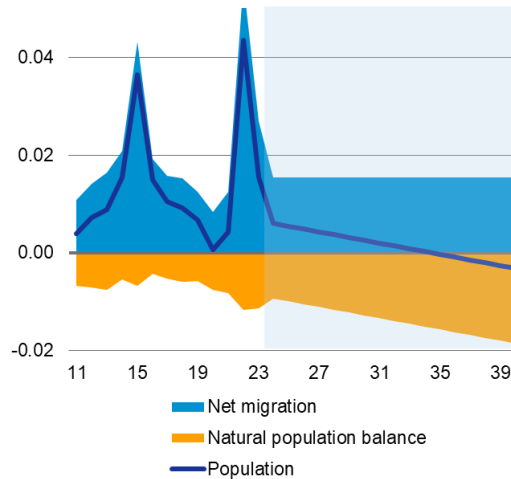
Population

in millions



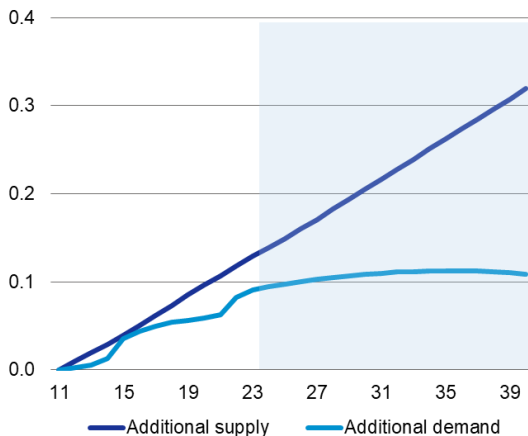
Rise in population

in millions per year



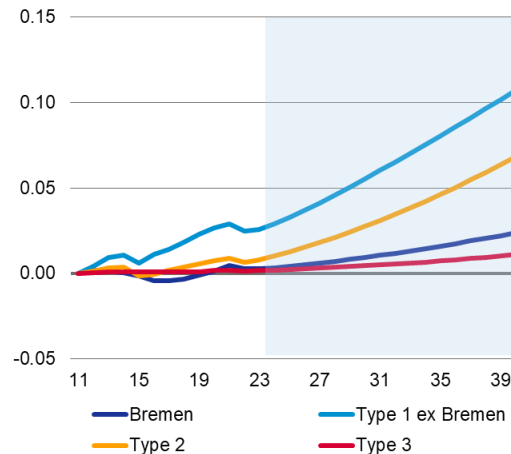
2011-2040: Cumulated housing market (in equilibrium)

in millions dwellings



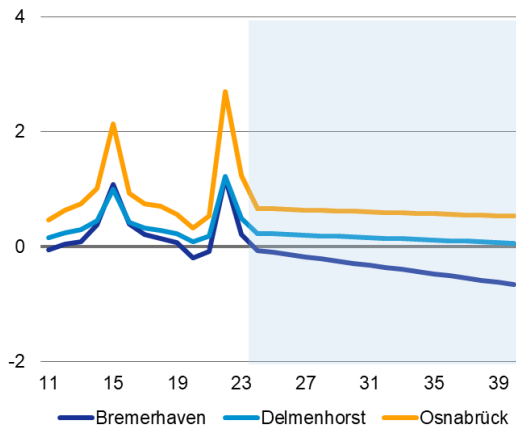
Housing market: Supply minus demand

dwellings in millions



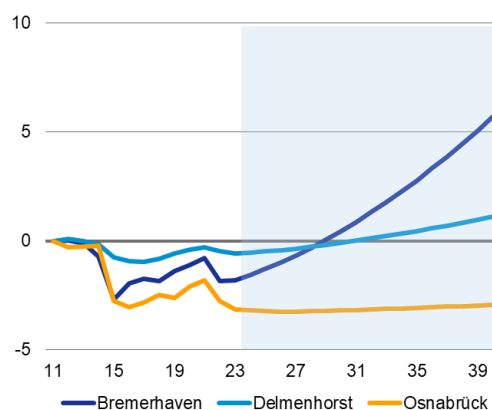
Additional districts with fundamental supply shortage: Increase in population

in '000 per year



Additional districts with a fundamental supply shortage: Supply minus demand

in '000 Wohnungen (plus: Überschuss, minus: Knappheiten)



Sources: bulwiengesa, Federal Statistical Office, Deutsche Bank Research



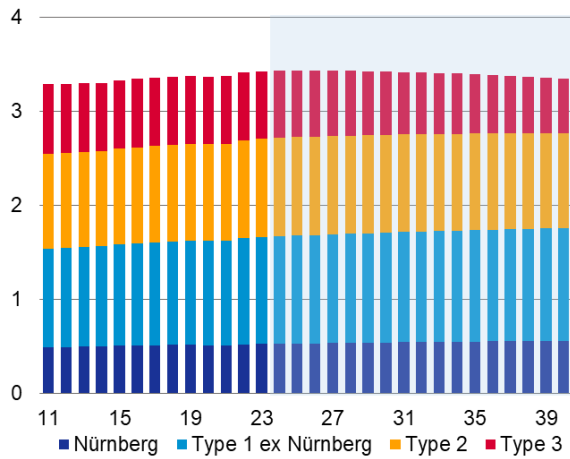
Population forecast and housing market until 2040

2011-2040 Projections for metropolitan region Nuremberg

27

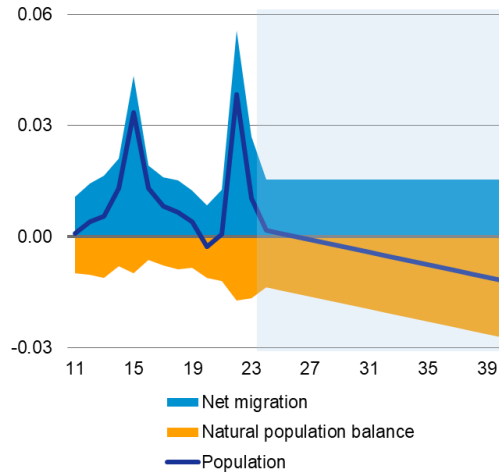
Population

in millions



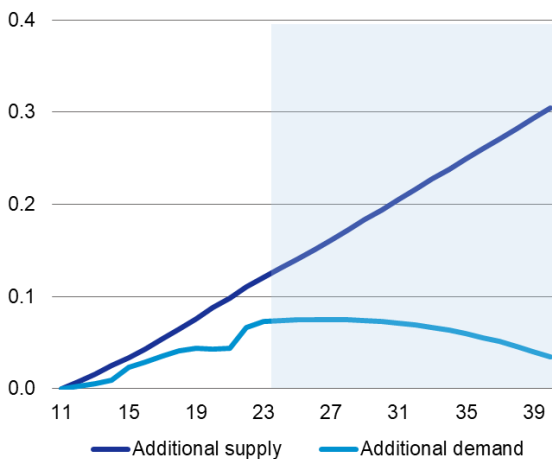
Rise in population

in millions per year



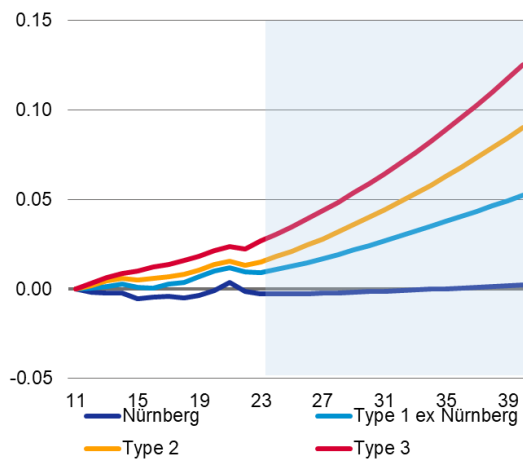
2011-2040: Cumulated housing market (in)equilibrium

in millions dwellings



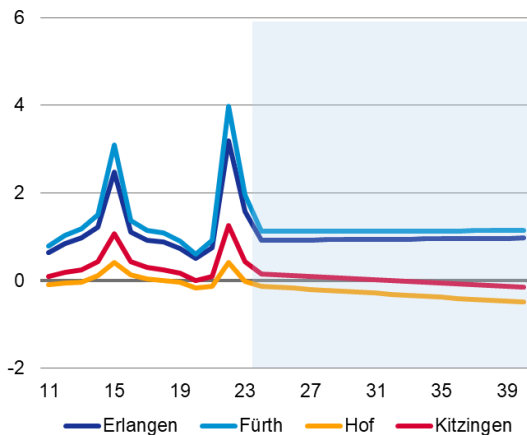
Housing market: Supply minus demand

dwellings in millions



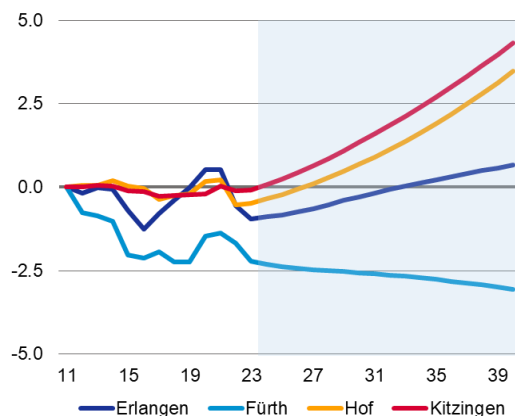
Additional districts with fundamental supply shortage: Increase in population

in '000 per year



Additional districts with a fundamental supply shortage: Supply minus demand

in '000 dwellings (plus: excess, minus: shortages)



Sources: bulwiengesa, Federal Statistical Office, Deutsche Bank Research



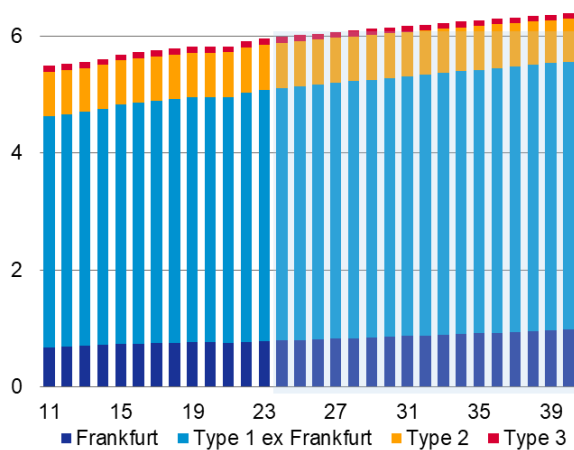
Population forecast and housing market until 2040

2011-2040 Projections for metropolitan region Rhine-Main

28

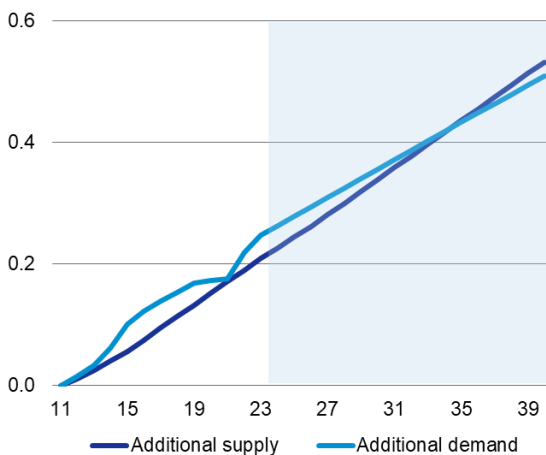
Population

in millions



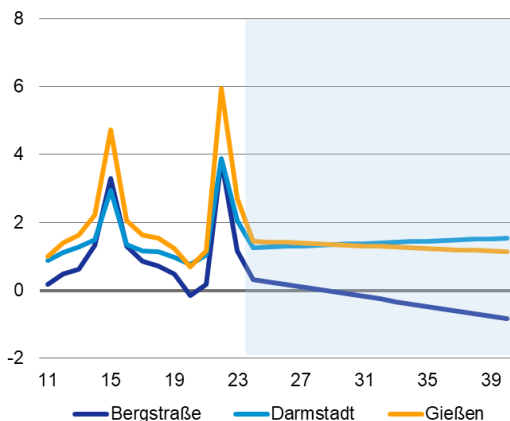
2011-2040: Cumulated housing market (in)equilibrium

in millions dwellings



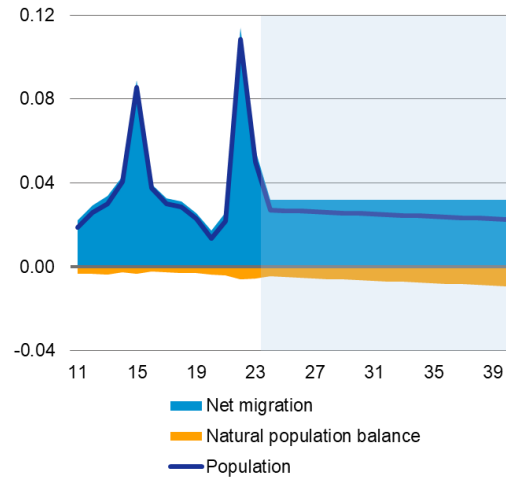
Additional districts with fundamental supply shortage: Increase in population

in '000 per year



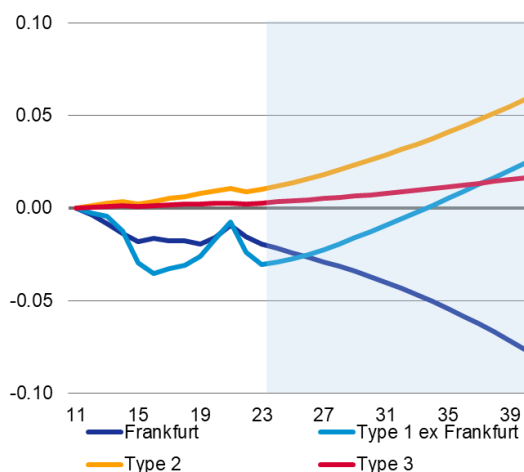
Rise in population

in millions per year



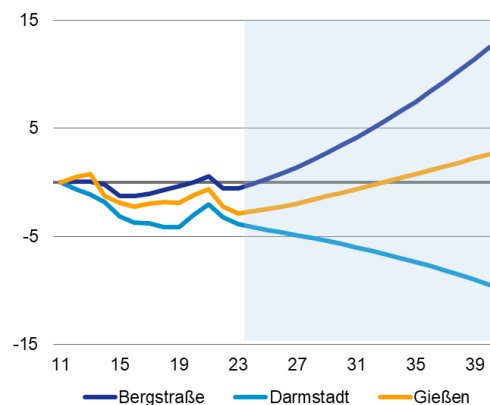
Housing market: Supply minus demand

dwellings in millions



Additional districts with a fundamental supply shortage: Supply minus demand

in '000 dwellings (plus: excess, minus: shortages)



Sources: bulwiengesa, Federal Statistical Office, Deutsche Bank Research



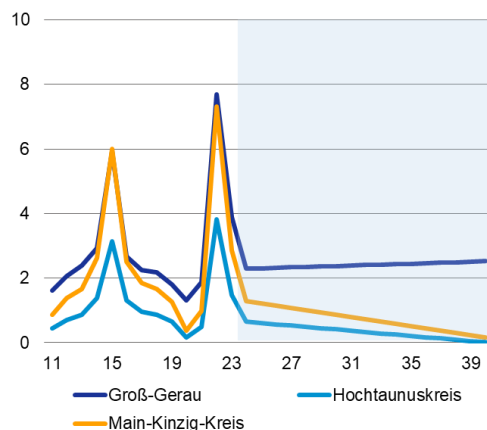
Population forecast and housing market until 2040

2011-2040 Projections for metropolitan region Rhine/Main (continued)

29

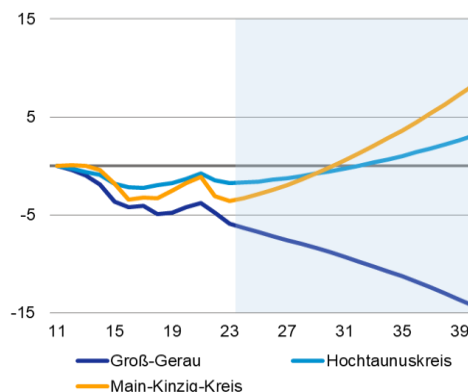
Additional cities with fundamental supply shortage: increase in population

in '000 per year



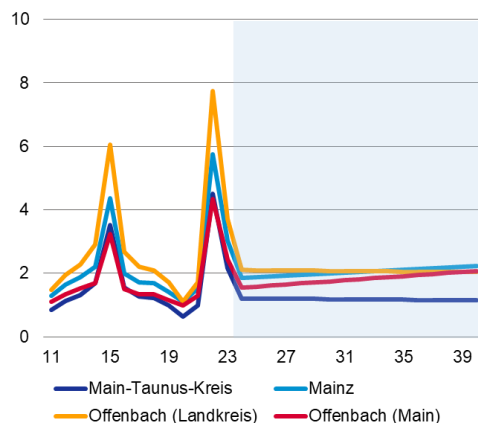
Additional districts with a fundamental supply shortage: Supply minus demand

in '000 dwellings (plus: excess, minus: shortages)



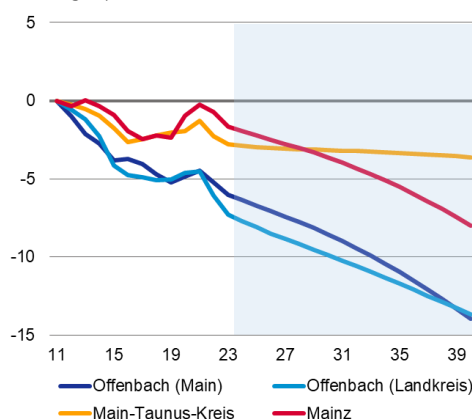
Additional cities with fundamental supply shortage: Increase in population

in '000 per year



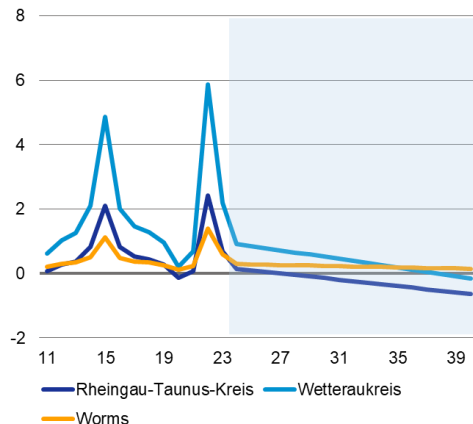
Additional districts with a fundamental supply shortage: supply minus demand

in '000 dwellings (plus: excess, minus: shortages)



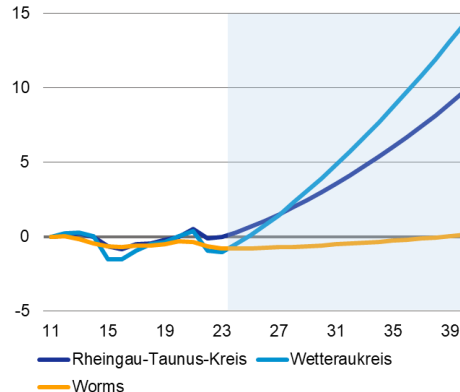
Additional cities with fundamental supply shortage: increase in population

in '000 per year



Additional districts with a fundamental supply shortage: Supply minus demand

in '000 dwellings (plus: excess, minus: shortages)



Sources: bulwiengesa, Federal Statistical Office, Deutsche Bank Research



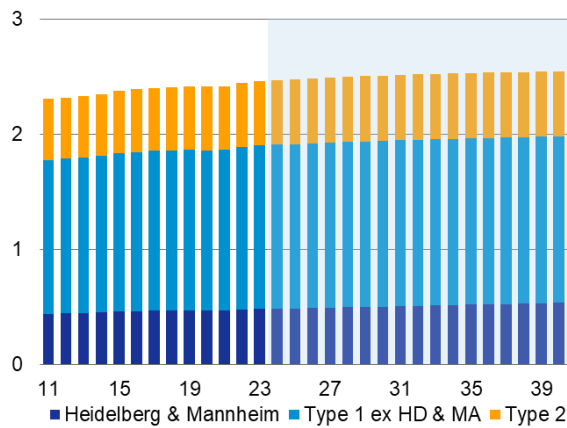
Population forecast and housing market until 2040

2011-2040 Projections for metropolitan region Rhine-Neckar

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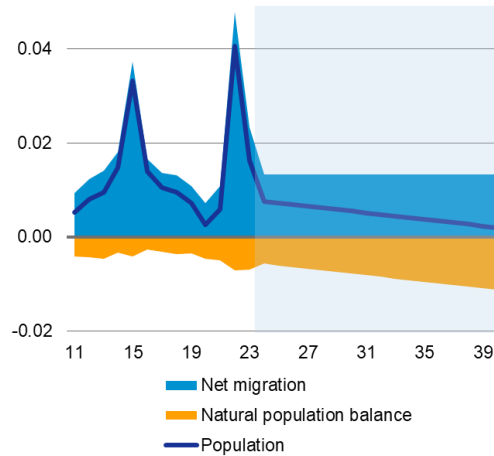
Population

in millions



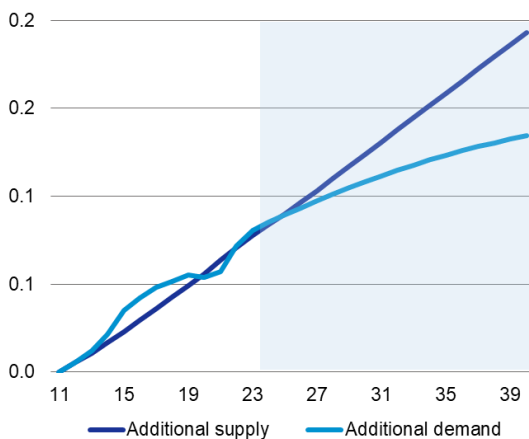
Rise in population

in millions per year



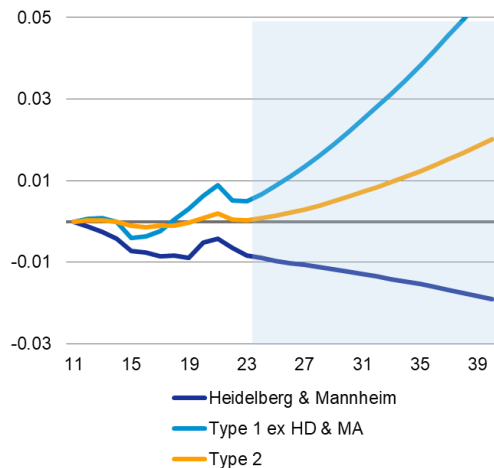
2011-2040: Cumulated housing market (in)equilibrium

in millions dwellings



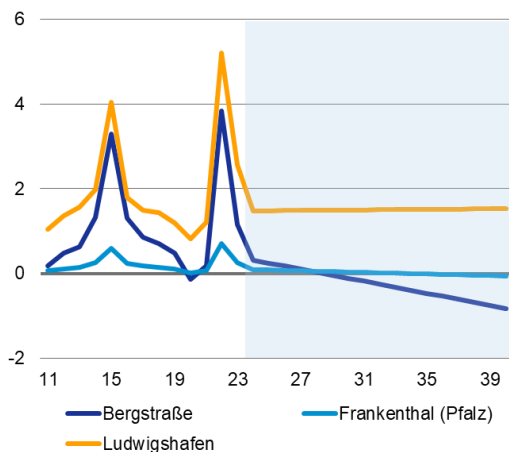
Housing market: Supply minus demand

dwellings in millions



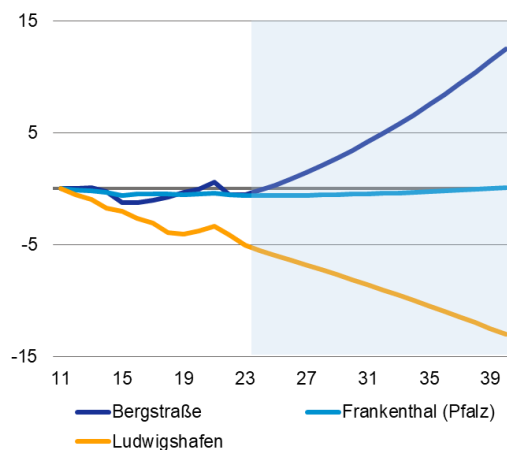
Additional districts with fundamental supply shortage: Increase in population

in '000 per year



Additional districts with a fundamental supply shortage: Supply minus demand

in '000 dwellings (plus: excess, minus: shortages)

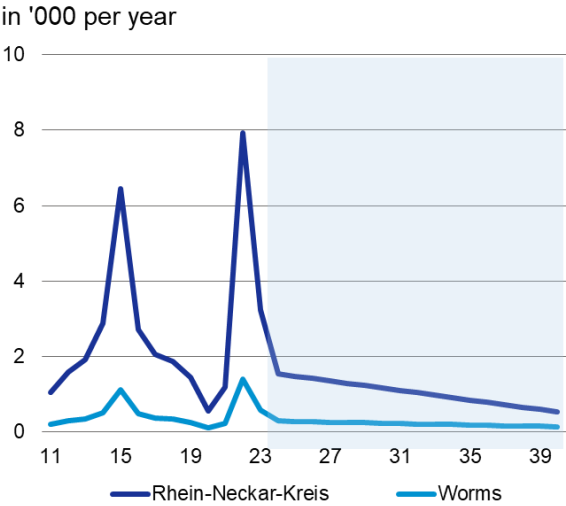


Sources: bulwiengesa, Federal Statistical Office, Deutsche Bank Research

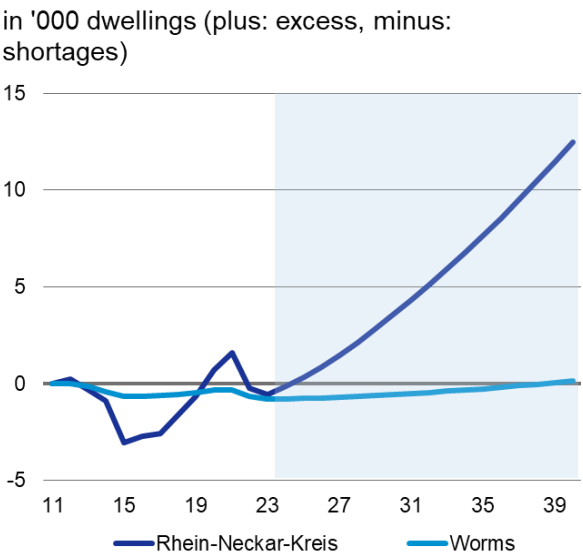
2011-2040 Projections for metropolitan region Rhine-Neckar (continued)

31

Additional districts with
fundamental supply shortage:
Increase in population



Additional districts with a
fundamental supply shortage:
Supply minus demand



Sources: bulwiengesa, Federal Statistical Office, Deutsche Bank Research



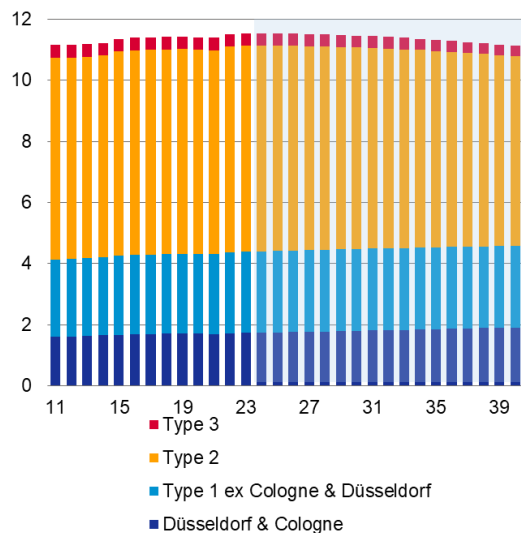
Population forecast and housing market until 2040

2011-2040 Projections for metropolitan region Rhine-Ruhr

32

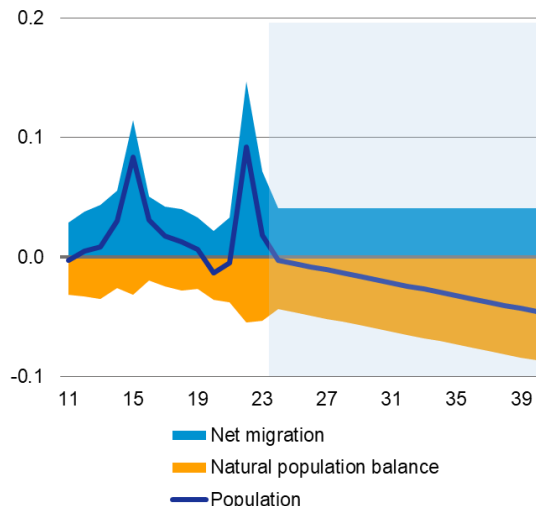
Population

in millions



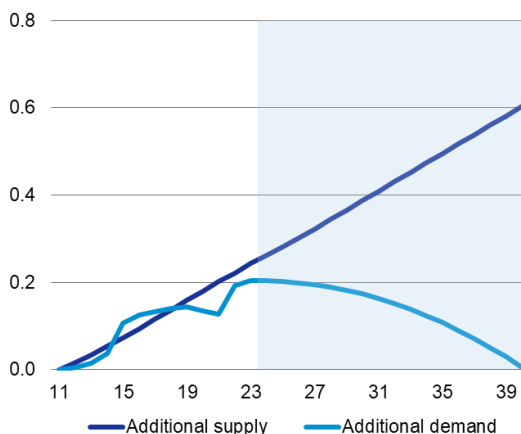
Rise in population

in millions per year



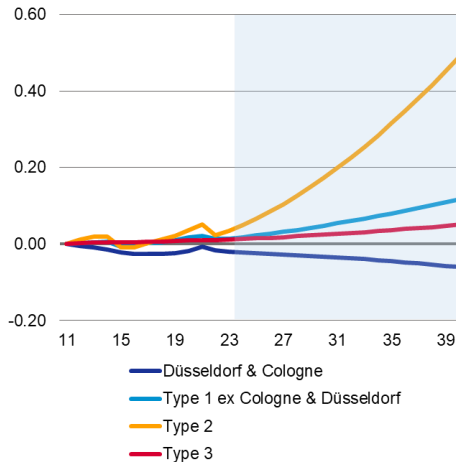
2011-2040: Cumulated housing market (in)equilibrium

in millions dwellings



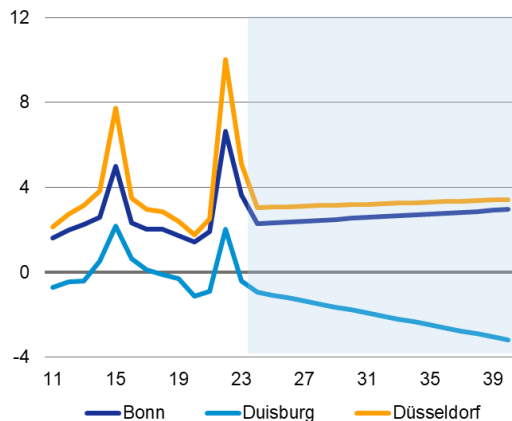
Housing market: Supply minus demand

dwellings in millions



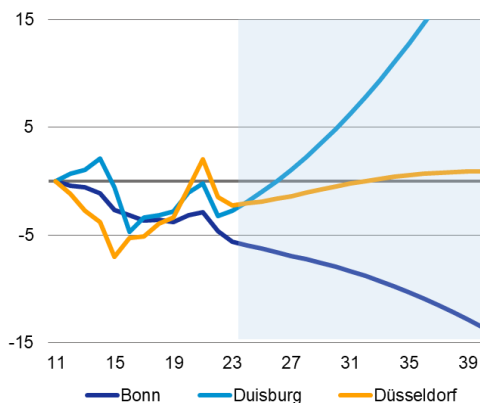
Additional districts with fundamental supply shortage: Increase in population

in '000 per year



Additional districts with a fundamental supply shortage: Supply minus demand

in '000 dwellings (plus: excess, minus: shortages)

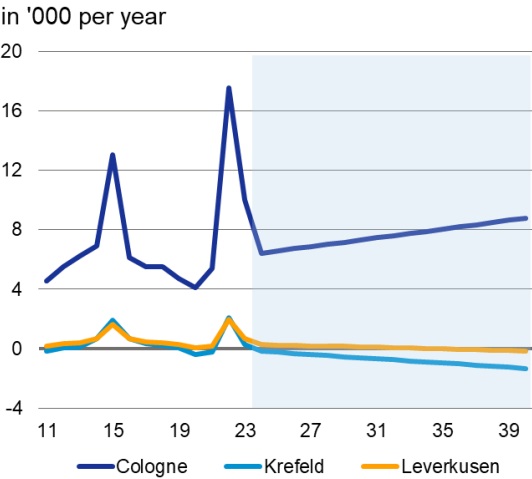


Sources: bulwiengesa, Federal Statistical Office, Deutsche Bank Research

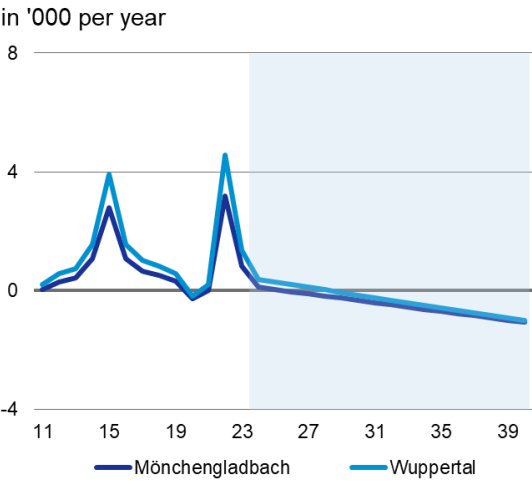
2011-2040 Projections for metropolitan region Rhine-Ruhr (continued)

33

Additional districts with
fundamental supply shortage:
Increase in population

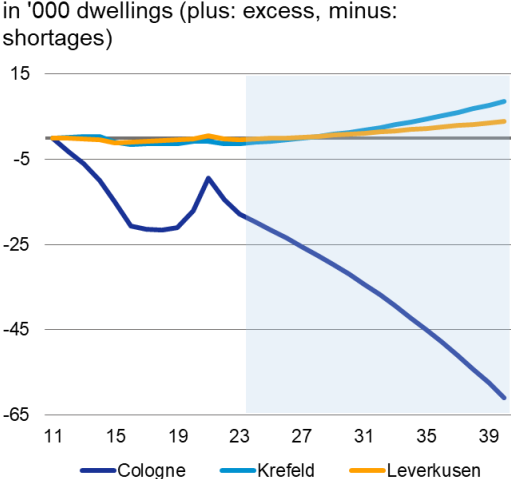


Additional cities with
fundamental supply shortage:
Increase in population

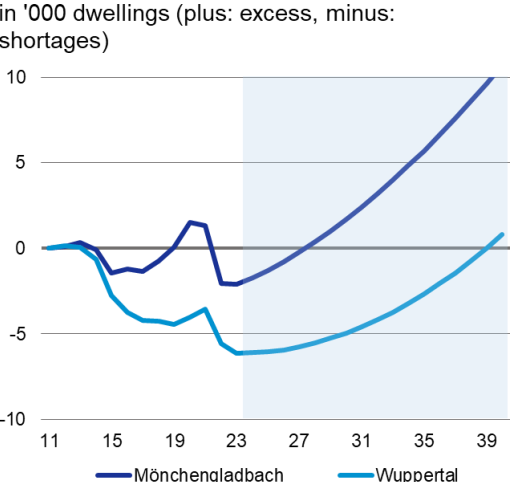


Sources: bulwiengesa, Federal Statistical Office, Deutsche Bank Research

Additional districts with a
fundamental supply shortage:
Supply minus demand



Additional districts with a
fundamental supply shortage:
Supply minus demand





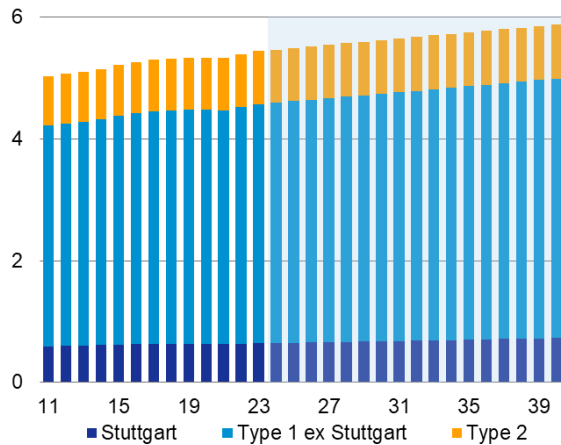
Population forecast and housing market until 2040

2011-2040 Projections for metropolitan region Stuttgart

34

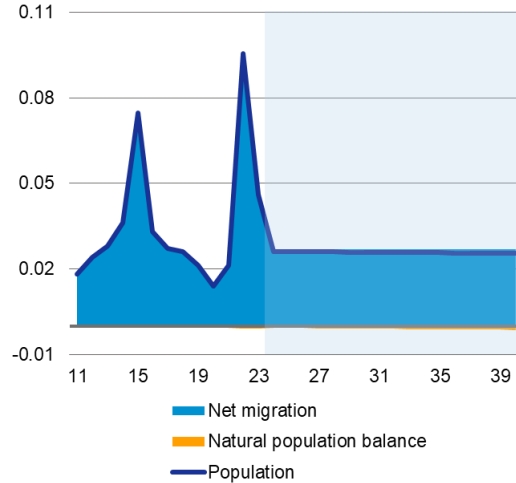
Population

in millions



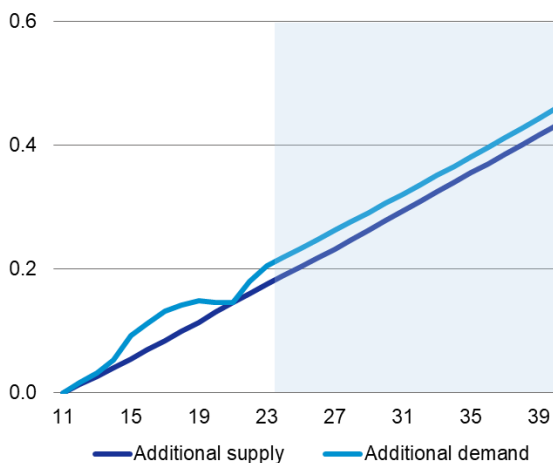
Rise in population

in millions per year



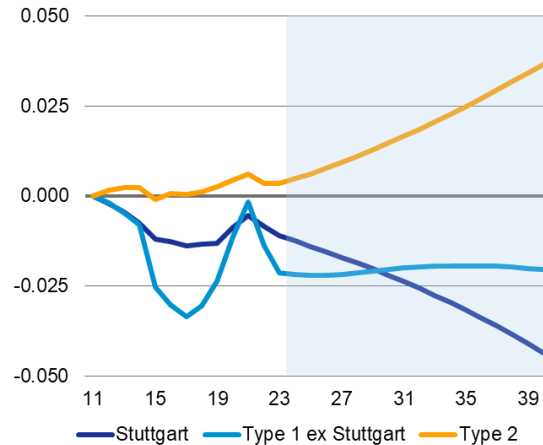
2011-2040: Cumulated housing market (in)equilibrium

in millions dwellings



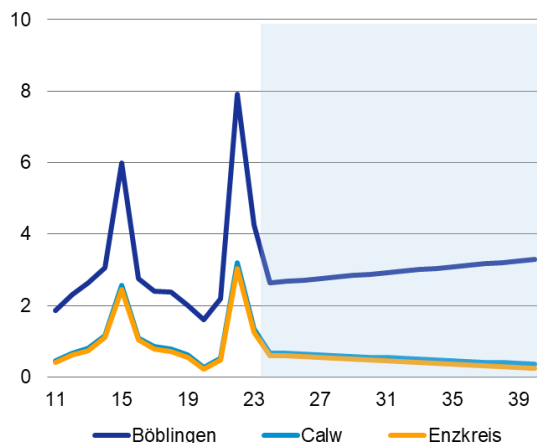
Housing market: Supply minus demand

dwellings in millions



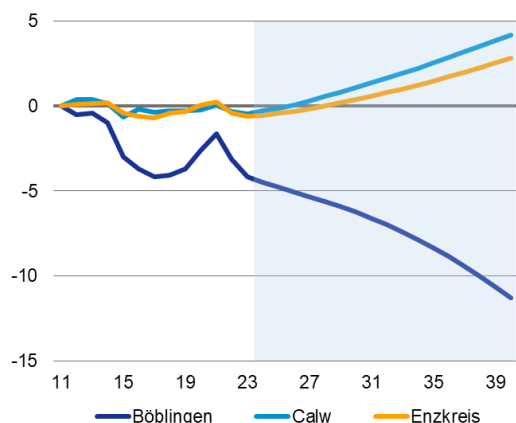
Additional districts with fundamental supply shortage: Increase in population

in '000 per year



Additional districts with a fundamental supply shortage: Supply minus demand

in '000 dwellings (plus: excess, minus: shortages)



Sources: bulwiengesa, Federal Statistical Office, Deutsche Bank Research



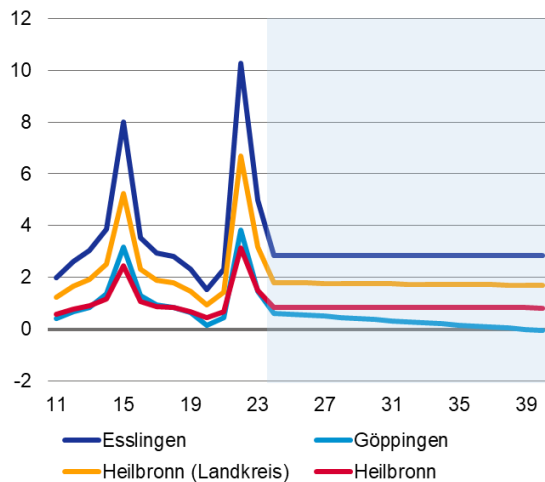
Population forecast and housing market until 2040

2011-2040 Projections for metropolitan region Stuttgart (continued)

35

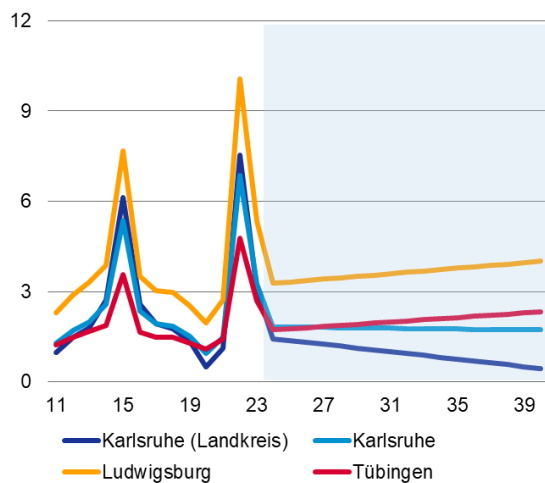
Additional cities with fundamental supply shortage: Increase in population

in '000 per year



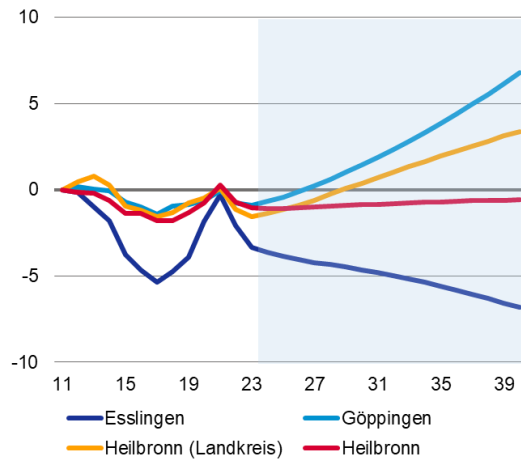
Additional cities with fundamental supply shortage: Increase in population

in '000 per year



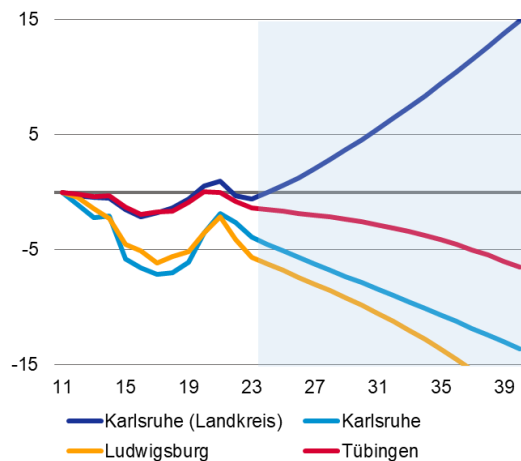
Additional districts with a fundamental supply shortage: Supply minus demand

in '000 dwellings (plus: excess, minus: shortages)



Additional districts with a fundamental supply shortage: Supply minus demand

in '000 dwellings (plus: excess, minus: shortages)



Sources: bulwiengesa, Federal Statistical Office, Deutsche Bank Research



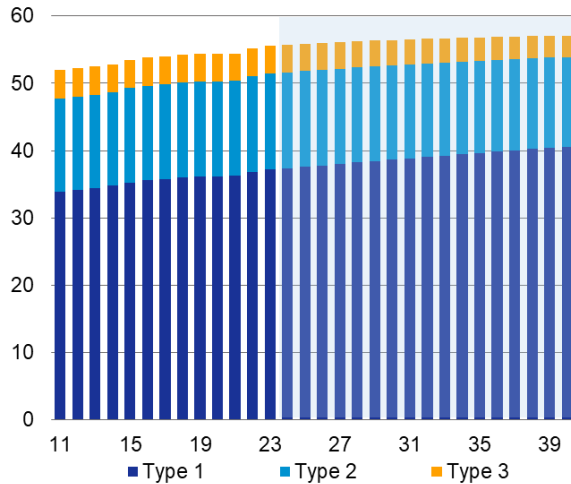
Population forecast and housing market until 2040

2011-2040 Projections for all metropolitan regions

36

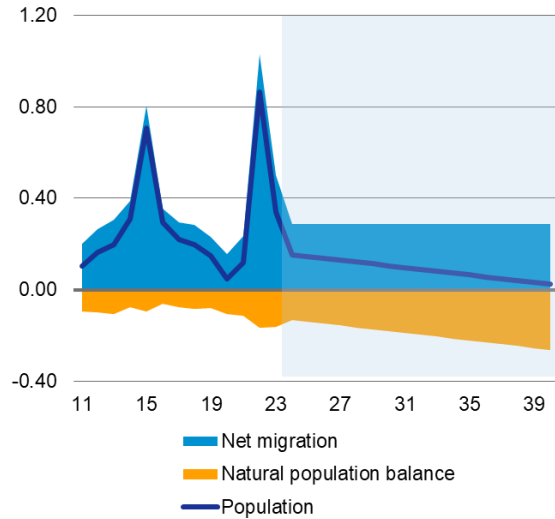
Population

in millions



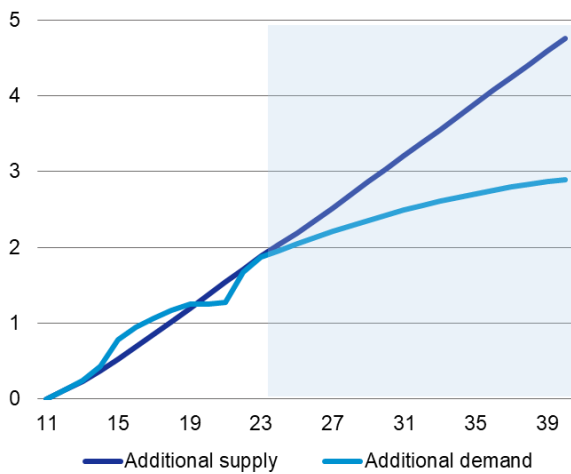
Rise in population

in millions per year



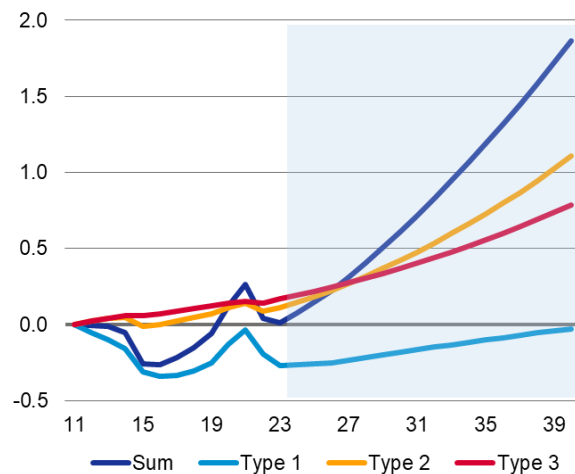
2011-2040: Cumulated housing market (in)equilibrium

in millions dwellings



Housing market: Supply minus demand

dwellings in millions



Sources: bulwiengesa, Federal Statistical Office, Deutsche Bank Research



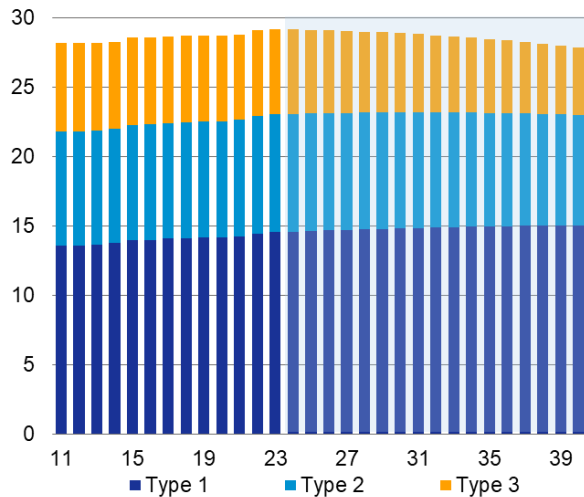
Population forecast and housing market until 2040

2011-2040 Projections for all Non-metropolitan regions

37

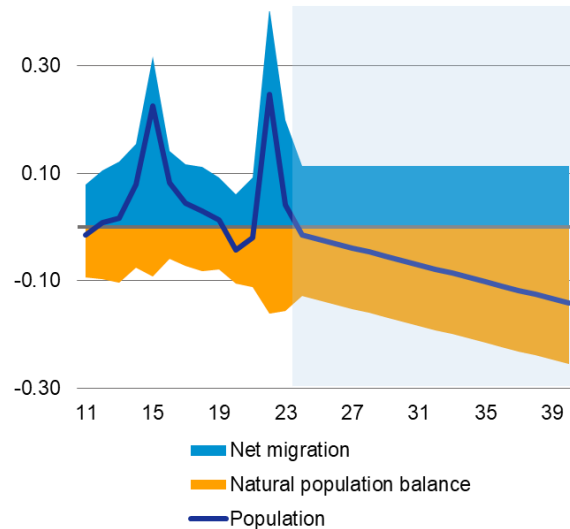
Population

in millions



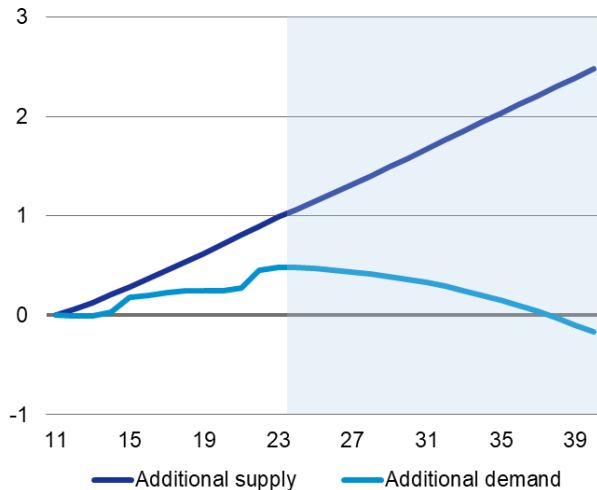
Rise in population

in millions per year



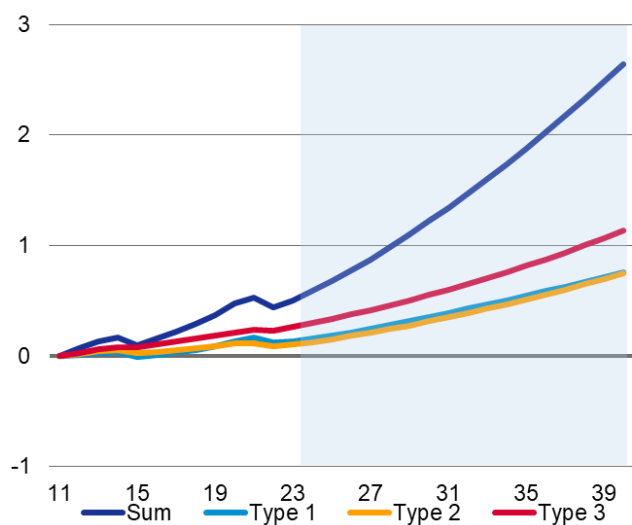
2011-2040: Cumulated housing market (in)equilibrium

in '000 dwellings (plus: excess, minus: shortages)



Housing market: Supply minus demand

dwellings in millions



Sources: bulwiengesa, Federal Statistical Office, Deutsche Bank Research



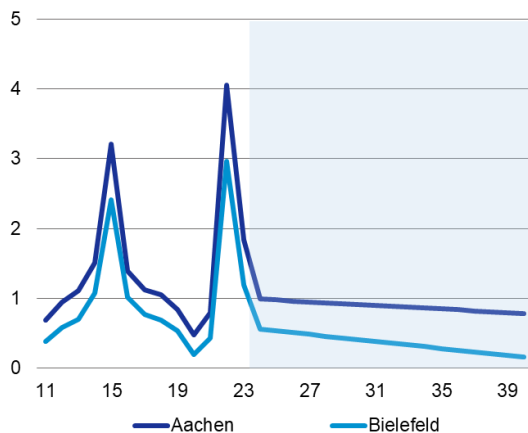
Population forecast and housing market until 2040

2011-2040 Projections for 5 biggest cities in metropolitan regions

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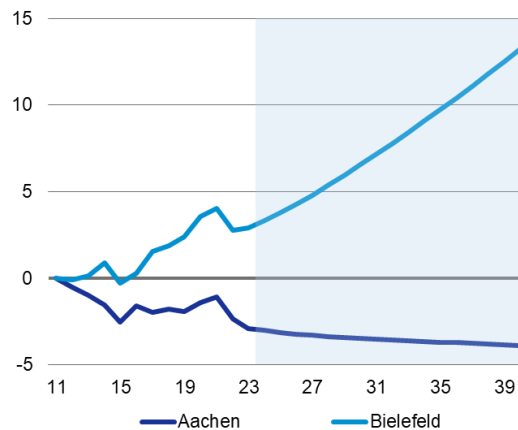
Additional cities with fundamental supply shortage: Increase in population

in '000 per year



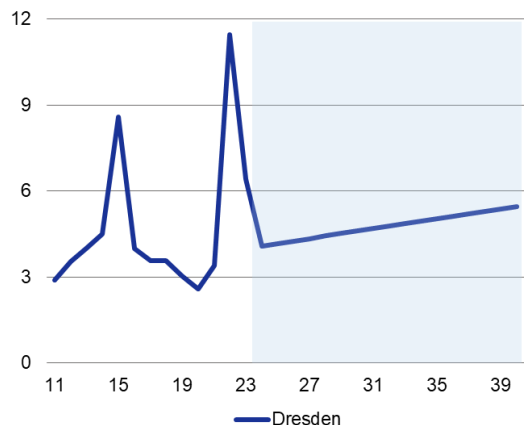
Cities with fundamental supply shortage: Supply minus demand

in '000 dwellings (plus: excess, minus: shortages)



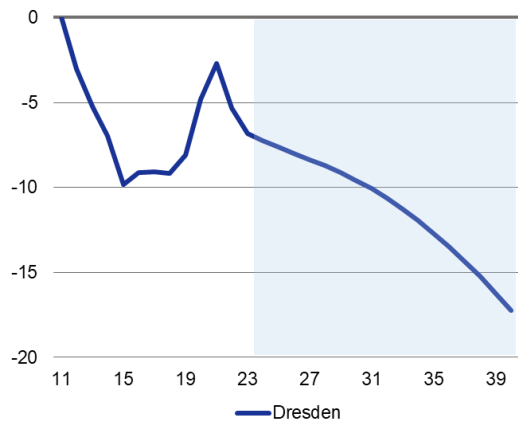
Additional cities with fundamental supply shortage: Increase in population

in '000 per year



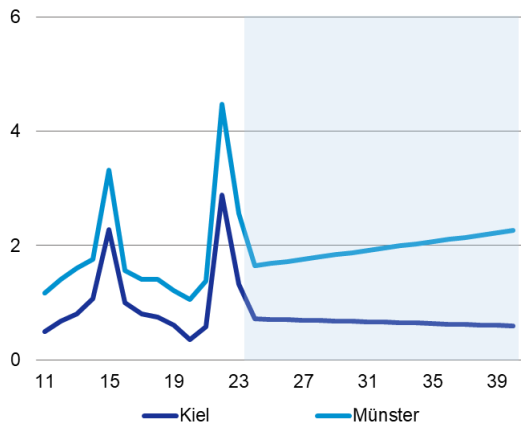
Cities with fundamental supply shortage: Supply minus demand

in '000 dwellings (plus: excess, minus: shortages)



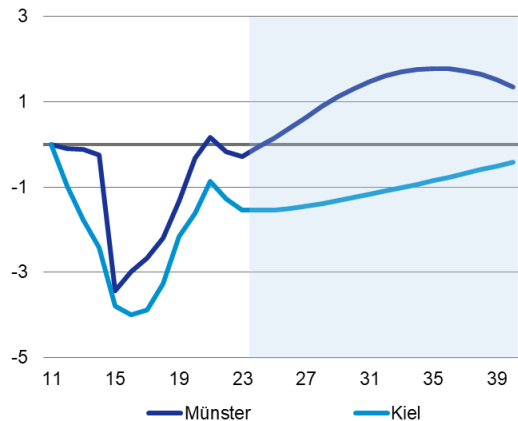
Additional cities with fundamental supply shortage: Increase in population

in '000 per year



Cities with fundamental supply shortage: Supply minus demand

in '000 dwellings (plus: excess, minus: shortages)



Sources: bulwiengesa, Federal Statistical Office, Deutsche Bank Research



Population forecast and housing market until 2040

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