Impact of Coronavirus Pandamic on the Property Market and Valuation Purposes

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SUMMARY

Nearly 18 mounth ago, the Covid 19 pandemic hit the global economy unexpectedly. Over the past few months governments around the world have tried to mitigate the impact on society and economy by lockdowns. Worldwide, real estate is an indicator of people's quality of working and living conditions. And the real estate market is one of the most important markets in the countries. So it is important to examine the effects of the first pandemic shotdown to be prepared for right decisions concerning the effects of future ”waves” on the property market.

The market trends of the last years in many European countries were characterised by a continuously rising development of housing prices, a stabilisation of office markets and a slow decline of retail property prices in city centres. Residential property prices in Germany, for example, have been rising steadily since around 2010, leading to very high housing prices in many German cities such as Berlin, Hamburg and Munich. However, prices there are still lower compared to house prices in other European capitals like London, Paris oder Madrid.

At the beginning of the pandemic in March 2020, it was quickly suspected that the price boom would now be quickly broken and the bursting of a real estate bubble was predicted. However, the evaluation of real estate market data in Germany and Europe for 2020 does not show a declining short-term "corona effect".

The authors address the pandemic effects on property markets in a theoretical and data-driven examinations of the impact of economic shocks on real estate markets. In doing so, the changes in important general market conditions are considered within the model of how real estate markets function. It then considers medium- and long-term market impacts, taking into account available data from 2020. Finally, the handling of uncertainties due to the pandemic situation in connection with the valuation of real estate will be briefly discussed.

In a long-term view, changes on the office market due to higher home-office rates and changes in the city centers due to the declining retail market and increasing online platforms are discussed. The chances may lie in a good further development of the rural areas and possibly in a residential revitalization of the inner cities. In addition, other branches of the economy, such as the logistics industry or flexible workspace environments develop and improve the economic situation of the countries.

1. INTRODUCTION

The influence of the corona pandemic on the entire living environment in almost all countries of the world is currently the main subject of discussion in families, in politics, in companies and in clubs and circles of friends. The question of the extent to which the economy of the countries in particular is influenced also is the subject of controversial scientific discussions.

This also applies to the expected developments on the real estate markets. It is one of the most important submarkets of the countries' economies. In Germany the monetary turnover in the sale of real estate amounted to approximately 270 billion Euro in 2018 [AK OGA 2019]. This corresponds to about 8% of the gross domestic product of Germany in 2018. The domestic turnover of the automotive industry in Germany amounted to about 150 billion Euro in 2018, i.e. slightly more than half of the turnover in real estate sales. The figures do not include sales of real estate companies.

Based on the so far known data about the real estate market in Germany in 2020, we expect a further increase in turnover to around 300 billion Euro for property sales. In 2021, the amount is expected to reach around 315 billion Euro. We therefore do not assume that the willingness to buy real estate in Germany will not be declined as a result of the Corona pandemic in 2020 and 2021.

Discussions on the impact of the pandemic on the real estate market began immediately after the rapid spread of the coronavirus got obvious.
In March 2020, future declines in Germany's economic strength were suspected and, in this context, questions revolving around the real estate market became louder:

- Is the real estate boom in Germany suddenly over due to the pandemic?
- Who are the losers and profiteers due to a possible drop in property prices?
- Is a real estate bubble bursting and will this again lead to a financial and economic crisis like that in the years 2007 to 2009?

We are now in a "3rd wave" of the Corona pandemic in many countries. Initially the property market was not impressed by the pandemic, New questions are:

- What will happen if the pandemic continues in many of the countries?
- What if governmental financial supports does not prevent businesses from closing?
- How does a higher home office rate change the office property market and
- how will city centres and their retail properties develop in the future?

Since April 2020, DVW e. V. German Association for Geodesy, Geoinformation and Land Management (DVW) has been engaged in ongoing discussions on the question of what effects the pandemic could probably have on the real estate market in Germany, how measures affect the real estate market, and which submarkets could be affected less or more. The DVW e. V. position already published in April 2020 and updated in September 2020 [DVW 2020] showed essential assessments about the effects:

- The residential property market has so far been rather unimpressed by the effects of the crisis. Short-term effects of the Corona pandemic are partly noticeable, but in many regions tendencies towards catch-up effects could be noticed in the second half of the year. Overlaps with other effects that would have occurred even without the lockdown measures to contain the pandemic or trends that were already emerging beforehand and possible effects due to the Corona-related measures cannot be separated.
- Impacts on the commercial property submarkets vary by property class; some commercial property submarkets already show approaches of decline. However, significant and exclusive influences of the pandemic cannot be measured exactly here either. In some sub-sectors, such as the hotel industry or retail, the restrictions on public life could accelerate insolvencies of already previously critical businesses.
- Assessments of influences, if based on comprehensive expertise, are legitimate and meaningful. They can form a good basis for informed forecasts based on data. Poorly founded publications by so-called experts, on the other hand, should be treated with great caution. Long-term investment decisions must not be driven by short-term influences and dubious assessments.
- Future forecasts should be data-based and contain indications of probabilities of occurrence.

After more than a year of the global pandemic, it gets clearer that we are not dealing with a quickly passing phenomenon. The hope that the virus will simply disappear is also disappearing more and more.

This motivates us to think about how the restrictions of the last 18 months may affect the society in the long and medium term. It is necessary to find creative solutions to minimise the economic and thus the social and political disadvantages.

In this paper we want to tighten the knowledge about the short-term effects by market results of the pandemic year 2020 and have a look at the medium and long-term trends. Naturally, there is still a lack of "hard data". Nevertheless, theoretical considerations on the functioning of the real estate market in general and current findings on the reaction of the market in 2020 in particular can be used to discuss medium- and long-term effects.

2. INFLUENCE OF ECONOMIC SHOCKS ON REAL ESTATE MARKETS

2.1 Some aspects to classify economic shocks

Shocks - unexpected events with extensive negative implications – relevant to the real estate market can be triggered by sudden changes within the real estate market itself, e. g. the bursting of overheated market conditions (real estate bubble), or by extraordinary and sudden events changing the general economic market determinants (e.g. environmental or economic disasters, pandemics as exogenous shocks). The COVID-19 pandemic can be seen as an example for the latter type. Of course, an exogenous shock is able to push on a real estate bubble if in the period before the market conditions already tend to be overheated.

However, there are different types of exogenous shocks with different characteristics and different consequences in economy and – subsequently – on real estate markets. The corona pandemic can be seen as the trigger of an exogenous shock, which can lead to uncertainty among the population and thus to unsafe behavior on the economic markets. The terrorist attack on the twin towers in New York in 2001 and the subsequent collapse of the stock markets, the bursting of property bubbles (e.g. USA 2007), civil wars (e.g. Libya 2011) or environmental disasters (e.g. Chernobyl 1986), but also pandemics (e.g. Spanish flu 1918) are among these triggers of economic shocks. Shocks in this context are occurring conditions or extraordinary events that significantly change originally expected economic developments (models). For example, the high number of people infected and killed by the Spanish flu - according to the WHO it had been around 20 to 50 million worldwide - had a significant social and economic impact [Michels, 2010]. There had been various estimates with considerable unreported numbers of the ultimate number of deceased people. In the spring of 1918 and early 1919, the pandemic spread in three waves across almost every continent on earth. From the statistical material on mortality in German cities, it can only be concluded that the experiences with the pandemic in the municipalities were very different and that there were no clear indicators for infections such as the geographical location, the size of the cities or the social composition of the residents could be identified [Michels, 2010].

Jordà, Singh, Taylor (2020) analysed the macroeconomic consequences of major pandemic events of the last centuries. They found out large pandemic events have effects that last over decades. In a long-term perspective depressed investment opportunities could be registered in four decades after the events with strongest impacts after 20 years. While pandemics ”may induce relative labor scarcity and/or a shift to greater precautionary savings”, the consequence of shock events like wars mainly result in the destroying of capital[Jordà, Singh, Taylor 2020, p. 16].

With respect to the COVID-19 pandemic next to long-term consequences the short- and mid-term effects are in the center of interest.

- Is it possible to monitor short-term changes in real estate markets, e. g. based on data of the last 12 months, and to derive reasonable expectations with mid-term perspective (next 2 – 3 years) based on a qualitative model of the functioning of real estate markets?
- Which are the main indicators / influence factors and how do they impact the market functioning along the categories of demand and supply?

In case of the corona pandemic, the shock event due to the economy in general and the real estate market in specific - in addition to the pandemic itself - primarily consists of three aspects:

- Impact of the protective measures and the emergency management (lockdown).
- Duration of the pandemic and the lockdown measures (short-term and long-term effects).

- Impact on the behavior of stakeholders due to information, expectations and uncertainties (psychological effects).

Such shocks initially have short-term consequences, which can result in both panic selling (e.g. stock market) or waiting and the cessation of all activities. Only after clarification about the new situation, e.g. changed framework conditions, the medium to long-term effects can gradually crystallize after the market participants have included the changes in their considerations (e.g. through pricing). When these effects occur, depends - among other indicators, on the duration of the shock event. However, the duration and scope of the infection process and the lockdown measures cannot be foreseen immediately, and the changes in the behavior of market participants are hypothetical and cannot be observed. In contrast, for example, the changed situation after an earthquake (regional dimension) or such a huge explosion as in the port of Beirut (local dimension) in August 2020, becomes a sad fact in very short time.

2.2 Real estate market model of legal framework, actors and outcome

The following simplified model of the market functioning of real estate markets enables to classify changes of market conditions. The model cannot derive quantitative forecasts of market results. But the composition of the relevant legal framework, the societal aims and the strategies and opportunities of the stakeholders (market environment) classifies the changing indicators in relation to all influence factors.

Finally the functioning of a national or local property market produces an ”outcome” in form of land and property prices, in realized transactions, in consumption of lands, in yields, in numbers of new flats etc..

The outcome shows if the market functioning is appropriate with the aims and delivers the desired results. If not, changes especially of the legal framework or of aims and market environment should be implemented; the new outcome will show if the measures had been successful.

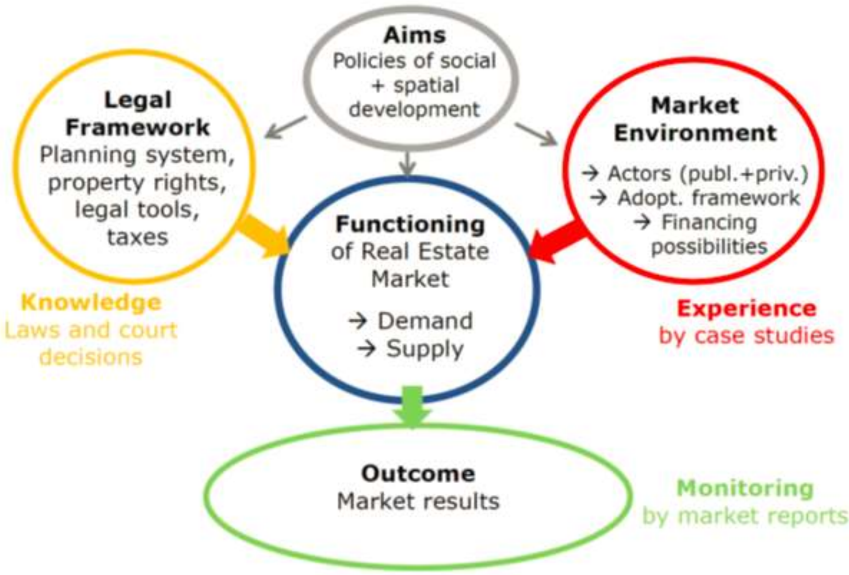


Fig. 1: Model of the functioning of real estate markets (own illustration based on Voß, Dransfeld, 1993)

- It is essential to agree upon the criteria of a market we would label as a ”well-functioning real estate market”; typically these criteria are those **land policy aims** which should be supported by the real estate market. Very often these aims and criteria are not fixed in a tangible way and – typically for land issues – different goals often are in conflict with each other. Very common aims are e. g. sufficient supply of land for residential and commercial property investments, an appropriate quota of housing affordable for lower income groups, limitation of land consumption and urban sprawl, economically motivated re-use of brownfield lands or the prevention of real estate bubbles.
- The **legal framework** of the property market system is very important and represents the most important domain of the public sector to influence the market functioning. The legal framework relevant for the real estate market is very extensive and divers. However, some rules are most essential, e. g. legal framework in view of the institution and transfer of land and property rights, land-use planning and building permit system or the property tax system.
- The **market environment** is the core part of the functioning according to basic market mechanisms of supply and demand. The results depend on different aspects within this mechanism: the ”economic framework” or general market environment, the individual conceptions/goals of the activities of the different stakeholder groups (private and public) including their competitiveness or the scope of applying the legal framework (complete or uncomplete application of the available legal framework).
- The **functioning** is the interaction of these main market forces under the respective conditions of supply and demand. Additional the location quality is another decisive factor within the functioning.
- It is very difficult to analyse the market functioning itself. Typically we watch and analyse the different **outcomes** of the market functioning (examples mentioned above)

and retrace to the mechanism how the market functions, e. g. how public and private stakeholders and their cooperation seems to work.

The monitoring of market outcomes offers the possibility to reverse the model and to determine modifications of the legal framework or the activities of stakeholder groups and their market environment with the intention to improve market functioning and market outcomes.

2.3 Effects of corona pandemic measures

How does pandemics influence real estate markets?

- Initially a pandemic shock will make people insecure and their acting more cautious; often decisions will be postponed. This impacts the demand for flats and office space as well as the projects of developers and investors on the supply-side of the market.
- Stronger consequences are generated by countermeasures against the pandemic – e. g. a lockdown or shutdown of many public and private activities - in order to prevent further dispersion of the pandemic. Measures like production stops in industries or closure of shops and retail activities strongly strike the demand for commercial properties and put property owners return at risk; if the salary payments of the employees are stopped or reduced, additionally the demand for residential properties will come under pressure. The effects are as bigger as the uncertainty of the stakeholders and the reduction of available income will be. This is strongly correlated to the scope of a lockdown.
- Otherwise, in the current pandemic the governments of many countries support people financially by compensating the loss of income partly. Such measures attenuate the consequences of a lockdown for people and companies and may reduce the decline of demand and supply.

A decline in demand for real estate in many segments is to be expected:

- A lower disposable monthly income in private households in case of short-time work or (threatened) job loss,
- loss of sales volume while maintaining fixed costs due to the lockdown for self-employed and companies in many industries and service sectors or
- the permanent establishment of home office work will reduce demand for offices.

A reduction of the real estate supply can be expected e. g. because of the possible postponement of projects and investments, especially in the initiation and planning phase of the projects; other reasons are additional financing bottlenecks or increased yield expectations covering the new risks of the pandemic situation.

According to the market model changes in the legal framework are possible to stabilize the outcome of the market; time limitations of the pandemic should be mentioned. In Germany amendments came into force since April 2020 due to rules for protection against eviction of rent contracts or insolvencies (Jardin 2020). However, the effects of the pandemic mainly are operative within the market environment part and will change the decision making of the stakeholders more or less.

The impact on the social and economic system of a country and subsequently on the real estate market depends on the one hand on the extent of the subsidy measures - and notably their effects on the demand side - and on the other hand for how long and to what extent the restrictive measures of a lockdown will continue. In addition, different scenarios also depend on international effects, such as the course of travel restrictions (e.g. tourism), the development of global trade relations or the development of economic power in third countries with consequences for increasing migration flows. In Germany in the first instance there had been uncertainty on both sides. In addition to the restrictions on freedom of movement under the Infection Protection Act that have been in force since March 2020, the national and states' governments regulations primarily aimed at supporting consumers' demand.

In case of uncertainty and shutdowns a decline in the number of transactions is to be expected. In accordance with market mechanisms, an impact on property prices can be expected if the decline shifts supply and demand relative to one another. However, the functioning of the real estate market depends on a range of important factors and uncertainties due to the future development (future risks) are typically part of each property investment and – to a limited extent – part of the functioning of the market. Some of the most important drivers of the real estate boom in recent years continue to have an unrestricted effect in the pandemic period too, these are in particular very low loan interest rates and a lack of investment alternatives.

This chapter intended to show the effects of the pandemic embedded in the market functioning and the typical countermeasures as lockdowns on the one hand (decreasing of real estate market) and governmental aid and subsidies on the other hand (support to stakeholders of real estate market). In the following part we will have a view to current market results (outcome) in order to find indications for pandemic impacts on the (sub-)markets. However, the outcome is a conglomerate of the different pandemic effects, they cannot be differentiated in the following market data.

3. SHORT-TERM EFFECTS OF CORONA-PANDEMIC

3.1 Short-Term Effects in Europe

In many cases, it can be noted that the real estate market varies greatly from region to region. Therefore, it can also be assumed that very different performances can also be identified in the countries of Europe. Furthermore, it can be assumed that the effects of the real estate market are also different in the countries themselfes. The differences in market trends could be even more pronounced depending on the government measures.

In order to get an impression of the trend of the entire real estate market, it is useful to look at residential and commercial real estate. In Germany, the share of cash turnover from sales of residential real estate is around 67% of total turnover. The share of sales of commercial real estate is about 28 %. In addition, good data on the performance of residential property prices is now available in Europe. A good source is the European House Price Index from the statistical office of the European Union, called "eurostat" (www.eurostat.eu). Eurostat is Analyses and publishes the price trend of, among others, single-family houses in the European member states since 2007[1].

In order to show by way of example how different the developments of the house price in European countries are, the price developments and 6 countries with very different measures to combat the pandemic are chosen. The basis for the selection is the "Bloomberg Covid Resilience Ranking[2]", which currently ranks 53 countries worldwide according to various factors (e.g. infection figures, death rates, vaccination rates). In this ranking, New Zealand, Singapore, Australia, Taiwan and Israel are currently in the first 5 places; Peru, Poland, Brazil, the Czech Republic and Mexico are in the last 5 places. Germany is roughly in the middle in 23rd place. Based on this ranking of the European states, the following countries should be mentioned as examples:

- Finland (13th place)
- Denmark (14th)
- Germany (23th)
- Italy (39th)
- Romania (46th)
- Poland (50th)

The following chart shows the trends in the development of owner-occupied homes in the above-mentioned European states.

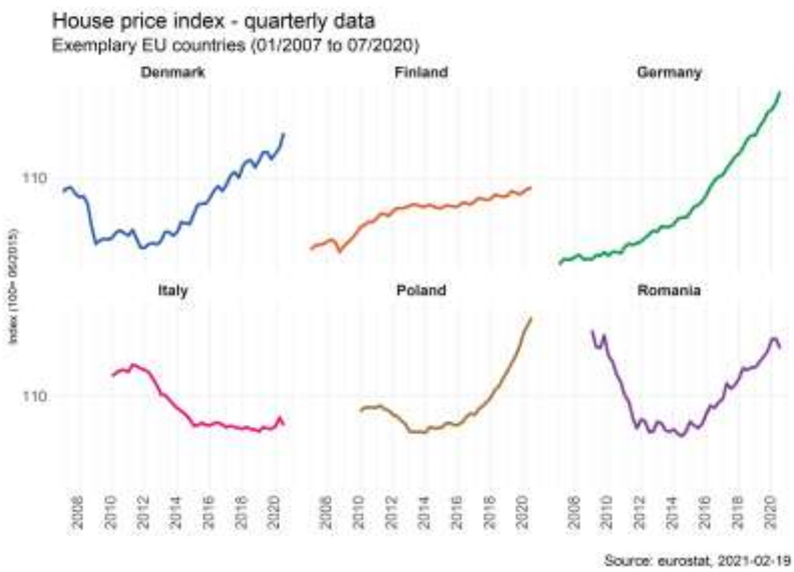


Fig.2: House price Index in exemplary states, eurostat 2021-02-19

[1]Retrieved from the website: https://ec.europa.eu/eurostat/databrowser/view/tipsho40/default/line, 19.02.2021, 11:00 a.m.
[2] Retrieved from the website: https://www.bloomberg.com/graphics/covid-resilience-ranking/, 01.04.2021, 11:00 a.m

Well recognisable is that house prices have risen in all countries but Italy in the last few years. The price increase in Denmark, Finland, Germany, Poland and also Romania has been quite strong. A decrease in 2020 can only be figured out in Romania and Italy.

There is no sign of a decline in Poland (No. 50 from 53 in the Bloombergs- Ranking). Thus, the theoretical question remains whether, for example, in Italy and Romania the "Corona effect" is actually responsible for the decline in prices or whether other economic effects are not superimposed. Overall, it can be assumed that the short-term effects of the measures and restrictions due to the Corona pandemic on the real estate market in Europe are relatively small.

Data-based information on performances in the hotel markets, retail or logistics real estate is not yet available in a quality that would allow serious statements to be made. According to the information published by reputable and independent experts, it can be assumed that the short-term effects on the markets for commercial real estate were rather small.

3.2 Short-Term Effects in Germany

Based on the data and information currently available, no short-term effect of the Corona pandemic on the various property submarkets can be identified for Germany. To substantiate this finding, we have examined some regions and submarkets on the basis of real sales contract data. We took a closer look

- at the federal state of Lower Saxony as a mainly rural region in the north of germany and
- the city of Stuttgart as a large and significant city in the south.

Example: Lower Saxony as mainly rural region

Lower Saxony is a German state situated in northwestern Germany. It is the second-largest state by land area, with 47,624 km² (18,388 sq mi), and fourth-largest in population (7.9 million) among the 16 federal states as the Federal Republic of Germany. Lower Saxony borders on the North Sea, the states of Schleswig-Holstein, Hamburg, Mecklenburg-Vorpommern, Brandenburg, Saxony-Anhalt, Thuringia, Hesse and North Rhine-Westphalia, and the Netherlands. Furthermore, the state of Bremen forms two enclaves within Lower Saxony, one being the city of Bremen, the other, its seaport city of Bremerhaven. In fact, Lower Saxony borders more neighbours than any other single state. The state's principal cities include the state capital Hanover, Braunschweig (Brunswick), Lüneburg, Osnabrück, Oldenburg, Hildesheim, Wolfenbüttel, Wolfsburg, and Göttingen.

Therefore, Lower Saxony can be a good example for the developments on the real estate market in Germany.

Residential buildings in Lower Saxony

The number of monthly sales of developed residential properties has ranged from approx. 2,000 to 7,000 cases since 2007. On average, 4,700 developed residential properties are sold per month.

Fig. 3:Median Number of Transactions per month for residential buildings (2020 is not complete)

Fig. 3 shows the average transactions per month from 2007 to 2020 (in 2020 only until Oct. 2020). The slight declines at the turn of the years 2010 to 2011 and 2013 to 2014 are a reaction of the real estate market to the increase in the tax on the purchase of land at the beginning of 2011 and 2014. A restrained willingness to buy in the years 2007 to 2009 due to the financial and economic crisis and the catch-up effect in 2010 are also recognizable.

The evolution of transactions per month is shown in a closer view in Fig. 4. Here, the concrete development of the monthly transaction figures is compared year by year. In 2020, there are no significant deviations from the figures for the years 2009 to 2019 in the monthly view.

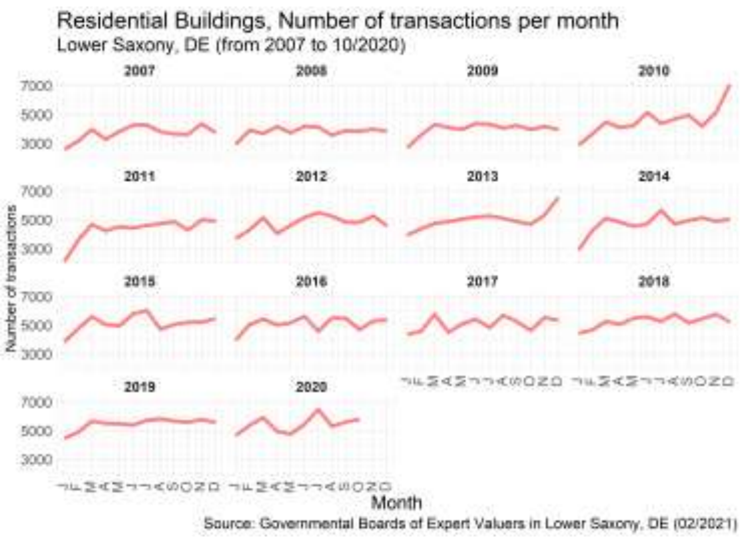


Fig. 4: Residential buildings, number of transactions per month

The more volatile transactions in 2020 compared to 2018 and 2019 is clearly visible. However, no lasting effect can be seen in 2020. Although the transaction numbers declined in April and May, in July they had already risen considerably above the level of previous years. Similar pictures can be expected for the months of October to November due to the increased lockdown.

The analysis of the price trends of owner-occupied homes shows an even clearer picture than that of the transaction figures: Prices have been rising steadily since around June 2006.

Fig. 5: Private Homes, Median-price per month

Of course, there are monthly fluctuations in prices, this corresponds to the normal circumstances in the market of homes. In 2020, however, this variance in prices does not differ significantly from the monthly variation in previous years.

This means for the prices that there is no significant "corona effect" in 2020 for private homes in Lower Saxony.

Commercial Buildings in Lower Saxony

The number of transactions in developed commercial real estate is considerably lower than in residential real estate. The monthly average sales numbers have ranged from around 300 to 870 sales per month since 2007. On average, around 480 transactions are registered for disposals. From 2010 to 2011 and from 2013 to 2014 we can see the same “tax-effect” as with residential real estate.

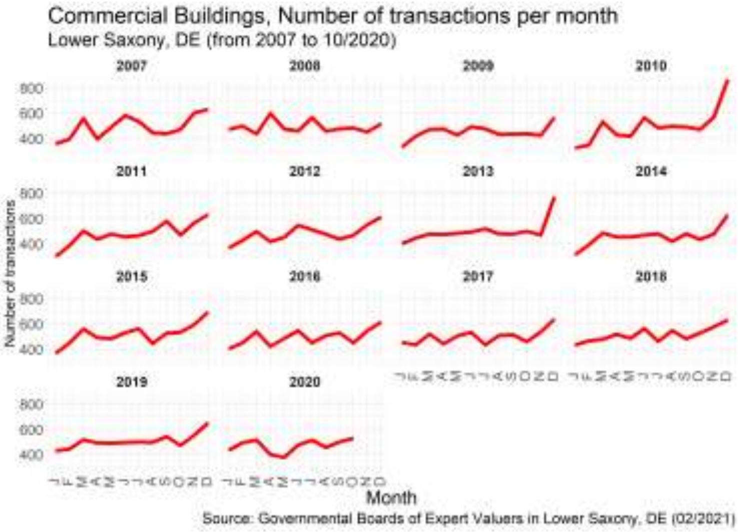


Fig. 6: Commercial Buildings, Number of transactions per month

Despite the comparatively low number of transactions per month, the overall trend in sales transactions remained stable in 2020. The slump in April/May 2020 was made up comparatively quickly in the following months.

In the case of commercially used property, the focus is less on the price and more on the performance of the return. A downward trend has been evident here in Lower Saxony for several years. This trend is evident not only in Lower Saxony but throughout Germany.
For some time now, purchasers of income-producing properties have been willing to pay higher prices for the property, even if the achievable rent does not rise sharply. It can be assumed that the real estate is classified as a very safe investment compared to other investment goods.

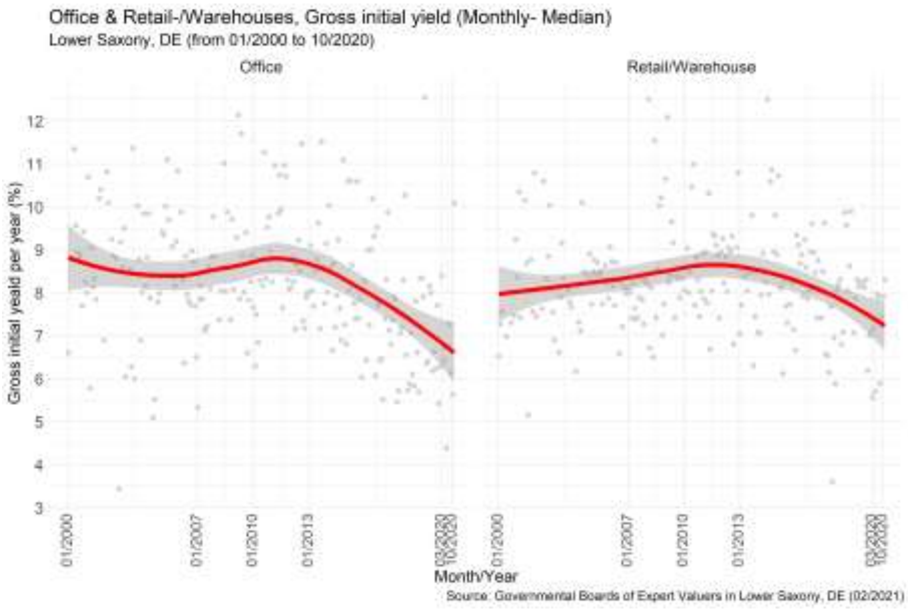


Fig.: 7: Gross initial yield in for Office and Retail-/ Warhouses in Lower-Saxony

The gross initial yield for economically office- and retail- real estates in Lower-Saxony is shown in it trends since 2000 in figure 7.

The sharp downward trend in gross initial yields since 2012 is particularly striking in the case of office buildings. While the yield here was still almost 9% per year, it end in returns in 2020 as ... is not due to the impact of the Corona pandemic. Rather, this trend has already been evident for several years.

Fig.: 7: Gross initial yield in monthly median für Office- Retail- and Warehousebuildings

Due to the Corona crisis, this trend could possibly accelerate, but this assumption does not have to actually occur; it is merely a speculation for now.

Example: Stuttgart as a large and significant city in the south

Stuttgart ist germany's sixth-largest city and it is the centre of the Stuttgart region, which has around 2,8 million inhabitants and is one of the largest conurbations in Germany. It is also the core city of the European metropolitan region of Stuttgart (about 5.3 million inhabitants), the fifth largest in Germany. Stuttgart has the status of a city district and as the seat of the state government and the state parliament of Baden-Württemberg there are numerous state and some federal authorities, Stuttgart is the political centre of the state. It is the seat of the Stuttgart Regional Council, which administers the administrative district of the same name. The regional parliament of the Stuttgart Region, one of the three regions in the Stuttgart administrative district, meets in Stuttgart. In addition, Stuttgart is the seat of the Protestant regional bishop of Württemberg and part of the Catholic diocese of Rottenburg-Stuttgart. The city is also an important business location and financial centre. It is known as the home of the German automobile companies Daimler and Porsche. Therefore, Stuttgart can be a good example for the trends on the real estate market in big cities of germany.

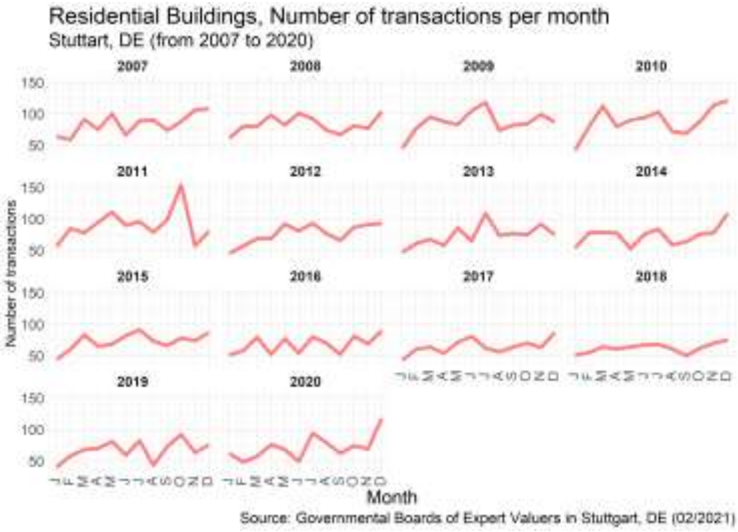
<u>*Residential buildings in Stuttgart*</u>

The number of monthly sales of developed residential properties has ranged from approx. 60 in 2018 to nearly 90 cases in 2010. As one can see, there was a decreasing trend from 2012 to 2018 and then – since 2019 – the number of transactions increased. Whether the decline in transactions can be attributed to the corona pandemic remains doubtful. Looking at the confidence interval, it is more likely that this is also normal market behaviour.

Fig. 8: Number of Transactions per month for residential buildings in Stuttgart

Figure 8 shows that there has been a downward trend in the number of monthly transactions in Stuttgart since 2010. Speculatively, it could be suspected that the increase in transactions would have been even stronger without the Corona pandemic. However, in view of the development throughout Germany, which has not been affected by the pandemic, this is unlikely to be the case.

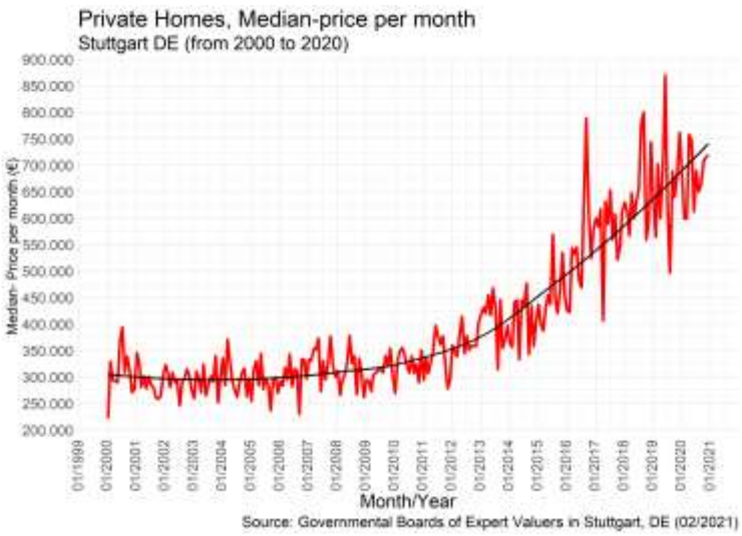
Th rising trend for the whole year seems to result here especially from the months of July and December. These seem to be catch-up effects from the previous months, which were influenced by Corona.



At the same time, some uncertainty among potential acquirers can be seen in the increased volatility in 2020. The stronger monthly swing in the number of purchase contracts is comparable to the market behaviour in 2009/2010. The number of transactions in the months of 2017 and 2018 are showing more stability.

Fig. 9: Residential buildings, number of transactions per month

The analysis of the price trends on homes in Stuttgart shows an even clearer picture than that of the transaction figures: Prices have been rising steadily since around 2007, not really impressed by the worldwide financial crises in those times.



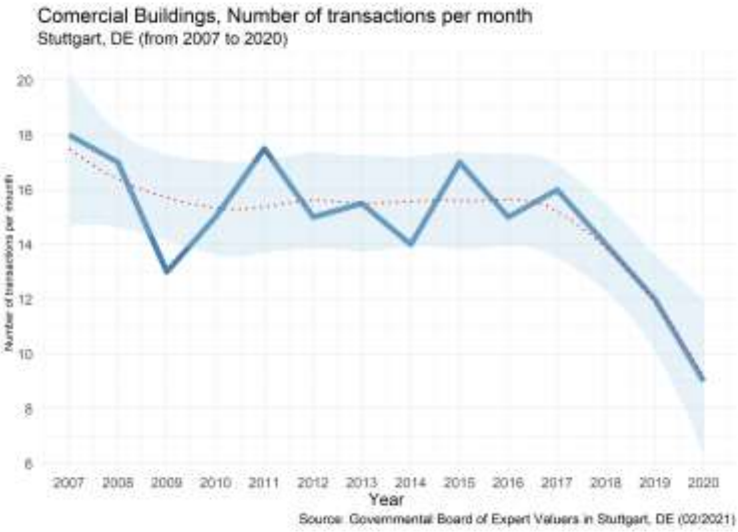
The variance of the prices increased considerably in 2016, but since 2014, an even stronger increase in prices can be seen than in the years before. In 2000, the median home in Stuttgart cost around 300,000 euros; by the end of 2020, the price will be around 750,000 euros, i.e. more than double the price.

Fig. 2: Private Homes in Stuttgart, Median-price per month

As is the case on average throughout Germany, there is no significant influence of the Corona pandemic here either.

Commercial Buildings in Stuttgart

The picture of transaction figures (Fig. 11) for commercial real estate is different from that for residential real estate: Here, a clear decline in transactions is evident for the year 2020. However, it is also clear that this trend already began in 2017 and only seems to have continued in 2020.



Here, too, it is very speculative to assume that the trend in 2019 would have reversed in 2020 without the pandemic, or at least would not have been as strong.

Fig. 11: Commercial Buildings, Number of transactions per month

Conclusion on short-term effects

As the examples have shown, there are no effects on the real estate market for 2020 which are direct outcomes of the Corona pandemic. It is possible that effects are discernible in certain submarkets such as hotels or leisure facilities, but these are not actually measurable on a wide database all over Germany. Overall, it can be concluded that the real estate market in Germany has not strongly reacted to the restrictions of the lockdown imposed by the federal or state governments in short term, i.e. in 2020. The prices of residential real estate but also the yields of commercial real estate as a whole did not show any particular reaction but continued the trends of previous years. In case of commercial properties the impact might be different in specific submarkets and regions. An example of experiences in the Region Hannover, the capital city of Lower Saxony in northern Germany, shows in terms of 2020 compared to the previous years that the general investment market and the retail submarket as well as especially the hotel and gastronomy submarkets registered explicit decreases. The office market was on a stable level despite a strong increase of home office work; the logistic market even increased [Region Hannover 2021].

4. MEDIUM- AND LONGTERM EFFECTS OF CORONA PANDEMIC

The impact in a **medium-term perspective** will first of all depend from the further progress of the pandemic situation: Are there further pandemic waves with the necessity of strong lockdowns and how far will the vaccination limit the infection rates? Up to now the time of an appropriate control of the Covid-19 infection is not conceivable. The strength of the impact depends directly on the duration of the restrictions to contain the pandemic and whether the economically supportive government decisions are sufficient and far-reaching. However, the functioning of the markets includes and the stakeholders tend to price in expectations and risks of possible future developments at an early stage. From that point of view it seems to be less presumable to have another pandemic shock. But if the pandemic becomes worse and is followed by an unfavourable economic development, of course this will impact the markets heavily in the next years.

Indeed, most of the experts agree that the Covid-19 pademic will result in **long-term changes** which are relevant for the real estate market too. The pandemic experience will speed up evolutions that are already in progresss. The following impacts are discussed:

A permanent establishment of much more home office workplaces.

- Boosted home office use and long-lasting measures to restrict personal (business) contacts and to keep distance rules will bring about permanent changes in the office market. It will result in changes in the demand for office space due to quantity and quality. Relevant are changes in the way of working and innovations in further digitalisation.
- This will also have impact on the demand for housing including appropriate and enough space for 1 – 2 home office workplaces – and if so for home schooling places.
- If increased home office use leads to a permanent reduction in mobility, this is more likely to affect demand on the rental market than the owner-occupied segment. Combined with further increases in prices and rents in the cities, this could lead to an increase of suburbanisation and new demand in rural areas.

The importance of the market for affordable housing will increase.

- Developments in the submarket of homes and flats are determined by the population's need for adequate and affordable housing as well as the budget available in households. The effects of job losses due to insolvencies of small and medium-sized companies (esp. catering, food-services, hotel and retail sectors) as well as redundancies in large companies (e.g. Lufthansa) will lead to a reduction in household incomes and restrict the liquidity of residential property owners as well as prospective buyers and builders. Demand in the housing market would shift from the more expensive segments to the low-priced segments, which are already in high demand.

A permanent increase in online shopping will weaken the retail market and the inner cities.

- The increase in online shopping activities will strengthen the demand for logistic real estate. New locations for logistic activities predominamtly at the fringe of the towns will come into development.
- A strong impact will decrease rents in inner city locations, especially in the retail submarket but with effects for real estate in central locations in general. The vacancies in core locations will increase and the re-use of buildings with new types of land use will be more important on the agenda.

These new priorities will provoke impacts on spatial development.

- The discussion about the future of the inner cities has already started. If restrictions in distance-keeping, in meeting in groups and in arranging events are limited, especially the already mentioned consequences for shopping but also for each type of cultural events, the attractiveness of the inner cities will be reduced and the value of the core real estate locations definitely will decline in a distinct range.
- On the other side the peri-urban and rural areas may benefit from a strong digital progress and the decline of inner cities. The real estate markets in urban and rural areas may be converging somewhat and getting more balanced; however, this perspective strongly depends from the developments in ecological fair mobility.

5. COVID-19 - UNCERTAINTIES IN THE VALUATION

Finally we want to adress some consequences for valuation porposes. In the pandemic period valuations are more difficult and combined with more uncertainty. From our point of view, it is important to name these uncertainties and to assess them on the basis of the expert's experience.

Difficulties may start with restrictions in inspecting a property and collecting information which is not available in digital manner. In addition, the description of the general market conditions is more complex and should recognize which part of the pandemic course is relevant - the situation before the pandemic or in special periods of lockdowns or special ”pandemic waves”. Waves and lockdowns in future could be different from specifications in the past; they also may differ in regional context. The temporal assignment of the available informations and comparables is an essential aspect for a reliable valuation. Each information, comparable transactions, rent collection, property rate etc. has to be classified due to the course of the pandemic. A mixture of data sources with different temporal assignments can create inapplicable results. The date of valuation is of explicit importance. The temporal modification of information comes along with many uncertainties in times of pandemic.

Valuations in pandemic periods which are dealing with a bigger range of uncertainties have to make tranparent data sources and valuation steps for the clients. The special aspects of handling the relevant aspects due to the pandemic should be agreed upon with the clients in advance and should be recorded in a survey. Furthermore a material uncertainty declaration (disclaimer) should be included in the valuation reports. The following example is recommended by DVW e. V. German Association for Geodesy, Geoinformation and Land Management:

> ”The COVID-19 pandemic can result in changes of nearly all fields of living and thus also in complex consequences of the real estate market. Their essential impacts on the value-determining components are evaluated in this survey according to the currently known information about these consequences. Conclusions about their influence on the respective values in the real etsate market are combined with major uncertainites.” (DVW 2020)

There are more recommendations for valuation aspects in the COVID-19 pandemic available from the international valuation associations:

- RICS:https://www.rics.org/de/upholding-professional-standards/sector-standards/valuation/valuation-coronavirus/, updated from Nov. 2020
- IVSC: https://www.ivsc.org/files/file/view/id/1719, March 2020;
- TEGOVA: https://www.tegova.org/en/p5e78ef30d01d7, March 2020.

6. CONCLUSION

In summary, it can be stated that the real estate market in Germany and in the many countries in Europe has remained essentially unaffected by the Corona pandemic in 2020. This can be well demonstrated on the basis of the data now available both for Germany and for most of the European countries. It should also be noted, however, that some developments in the markets have been accelerated by the effects of the pandemic that were already apparent before the pandemic came true. This is especially true for those sectors that are particularly affected by government's lockdown measures, such as hotels, restaurants, tourism-oriented businesses and the retail trade sector. The influences in an **intermediate time perspective** will very much depend on how the further overall situation of the pandemic develops. In particular, the effects on the real estate market will vary with decisions made by governments regarding restrictions and subsidies for specific sectors. In a medium-term perspective, we assume that the real estate market will not show significant effects solely due to the Corona pandemic.

In the **longer term**, however, it is likely that the general social and economic changes will also lead to changes in the real estate market. This is not an unnatural behaviour, however, as the real estate market is regularly oriented towards social and economic requirements. It can be assumed, for example, that due to the increasing home office developments, the rural areas will tend to develop positively and the inner cities will possibly be designed for additional residential use insteed of office use. Against the background of the current huge extra expenditures of the governments, especially in view of the resulting budget burdens for the future, it can be assumed that the economic situation in the countries of Europe will not develop to the same progress as in the last ten years. The resulting decline in income in certain population groups will lead to an even greater demand for affordable housing as existing today. This can result in an increase in prices for affordable housing and a stop of the price rallye in the expensive and luxury housing sector.

Various developments are expected in the different sectors of commercially used real estate. It is possible that the restaurant and hotel market will not decline in the long term; there will be a catch-up effect here. The same development can be expected in the tourism sector. On the other hand, it can be assumed that the retail sector will change considerably. The development of online shopping will take over more and more market shares here. This will change inner city locations in particular.

There will be a similar strong long-term development of offices to different workspace environments and that might stabilize the office market. The changes in the type of offices, and in the locations too, are expected because of the technical change (digitalisation) and the establishment of home offices.

In summary, the current pandmic will be the initiation for many changes in our social and economic life – with many long-term effects on the real estate markets. However, the changes on the real estate markets will not be the decisive factor for an economic crisis in 2022 and beyond compared to the financial and economic crisis of 2007/2008. The real estate market will overcome the aftermath of the pandemic and with the help of ongoing strong drivers will remain stable compared to other markets.

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