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3 Report by Martin Gornig, Claus Michelsen, and Laura Pagenhardt

German construction industry remains on its path of growth during the coronavirus recession

- German construction industry has largely stable business; construction volume will increase from 2020 to 2022
- Residential construction is relatively robust while commercial construction is facing challenges; hope rests in the public sector
- Financial reform and reducing old debts could give municipalities scope for sufficient construction investments

LEGAL AND EDITORIAL DETAILS



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AT A GLANCE

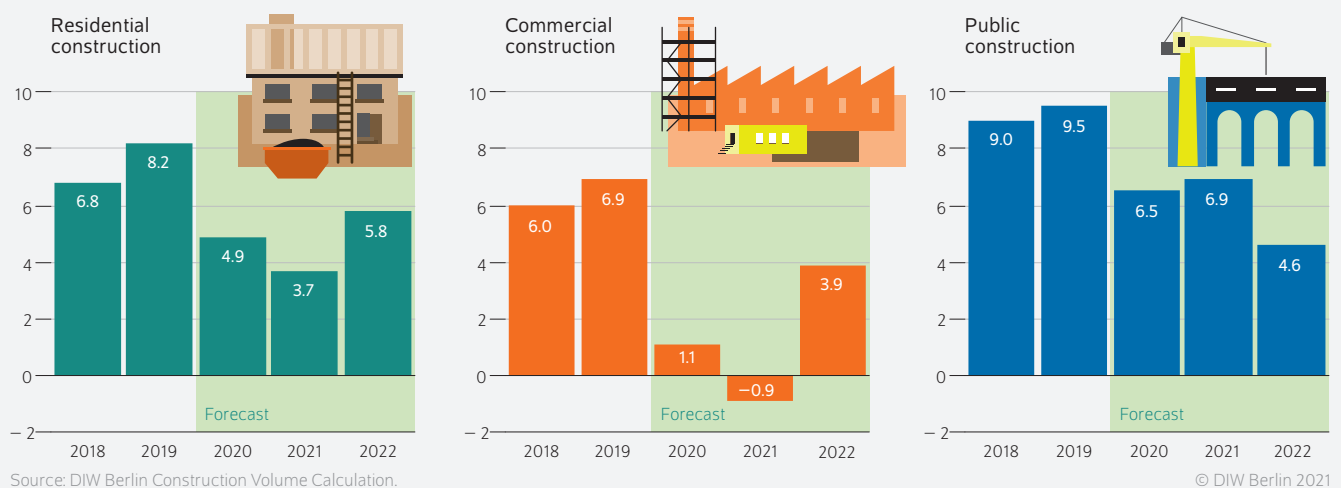
German construction industry remains on its path of growth during the coronavirus recession

By Martin Gornig, Claus Michelsen, and Laura Pagenhardt

- Business was largely stable in the construction sector in Germany during the coronavirus pandemic in 2020; construction volume (new and existing housing stock) grew by four percent
- DIW Berlin's construction volume calculation forecasts growth of almost three percent and five percent in nominal terms in 2021 and 2022, respectively
- The Federal Government's measures to ensure favorable real estate credits and stable household incomes help residential construction, which continues to grow
- Firms are investing significantly less in construction over the course of the economic crisis, also influenced by the change to the working world; commercial construction will shrink in 2021
- Hopes rest on public investment spending, municipal implementation is faltering; financial reform and reducing old debts could help in the long term

Residential construction continues despite the coronavirus recession, investments in commercial construction shrinking, public sector intervening

Nominal change (in percent) to the total of new and existing housing stock compared to the previous year



FROM THE AUTHORS

"The construction industry experienced powerful growth over the past decade. In the future, growth will be up to the municipalities in particular. A lot of money was distributed, but it has also been announced that debts will have to be paid off again in the coming years. Typically, investments in infrastructure in particular suffer in such consolidation phases, which would not be a good thing." — Claus Michelsen —

MEDIA



Audio Interview with Claus Michelsen (in German)
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German construction industry remains on its path of growth during the coronavirus recession

By Martin Gornig, Claus Michelsen, and Laura Pagenhardt

ABSTRACT

The coronavirus pandemic has led to a deep worldwide economic crisis. In many countries, the construction industry has been impacted. In Germany, however, construction activity is one of the economic sectors that has remained largely stable: In 2020, the total construction volume in Germany is expected to have increased by around four percent to 444 billion euros after increasing by around eight percent in 2019. DIW Berlin's most recent construction volume calculation expects an increase of almost three and five percent for 2021 and 2022, respectively. This growth is due to Germany's decision to allow construction work on site to continue as well as to allow trade and repair companies to continue conducting business in households in adherence with hygiene measures. Nevertheless, the pandemic is still affecting construction firms; commercial construction in particular is likely to not escape unscathed. The overall performance of non-residential construction, however, is likely to depend primarily on the public sector. If federal and state government capital spending is increased and local governments' budget holes are plugged, as was previously planned, public construction should stabilize construction activity.

The construction industry has fared relatively well during the coronavirus pandemic and is expected to experience solid growth in the 2020s. Nevertheless, the pandemic is leaving its mark on the industry. In the short-term there has been less demand—in the commercial construction sector in particular—and work on existing buildings was also reduced. According to the DIW Berlin construction volume calculations,¹ which include building investments as well as repairs that do not add value, construction volumes are likely to increase more strongly in 2022 after decline in business in 2021. Furthermore, in addition to construction in the literal sense, the calculations encompass related sectors, such as steel and light metal construction, the manufacture of pre-fabricated buildings, building fittings, planning services, and other services. As a supplement to the investment calculation of the Statistical Offices, DIW Berlin differentiates between new housing construction activity and housing stock modernization.²

DIW Berlin not only calculates and documents the construction volume of past years; it also forecasts corresponding values for the current (2021) and subsequent years (2022). This forecast (Box) is integrated into DIW Berlin's Economic Outlook, particularly with regard to investment activity.³ In addition to the present estimates regarding the development of construction investment, the construction volume calculation includes forecasts on the growth of new and existing housing volumes in the structural engineering, residential,

¹ The construction volume calculation is financed with funds from the *Zukunft Bau* research initiative for the sustainable development of the German construction industry of the Federal Ministry of the Interior, Building, and Community (*Bundesministerium des Innern, für Bau und Heimat*, BMI). Also see the definition of "Bauvolumen" in the DIW Glossary (in German; available online, accessed on January 8, 2021. This applies to all other online sources in this report unless stated otherwise).

² Martin Gornig, Bernd Görzig, and Claus Michelsen, "Strukturdaten zur Produktion und Beschäftigung im Baugewerbe – Berechnungen für das Jahr 2019," *BBSER-Online-Publikation 15* (2020) (in German; available online).

³ Cf. Claus Michelsen et al., "DIW Economic Outlook Winter 2020," *DIW Weekly Report* no. 50 (available online) and Marius Clemens, Geraldine Dany-Knedlik, Simon Junker, and Claus Michelsen, "'Harter' Lockdown infolge der zweiten Corona-Welle: Deutsche Wirtschaft wächst 2021 deutlich weniger stark," *DIW aktuell* no. 57 (2020) (in German; available online).

and non-residential sectors.⁴ In addition, these figures are used to derive the development trends of the core construction industry and the renovation sector.

Residential construction remains stable

Although residential construction remains the key pillar of construction growth, it has not escaped the coronavirus pandemic unscathed. In contrast to other economic sectors, there have been no signs of an abrupt halt in new construction activity. However, the renovation sector, which has already been weakening for some time, recorded a significant drop in production in the summer months of 2020 (Figure 1). The uncertainty regarding the overall economic situation and income trends probably caused many households to postpone less urgent work. Capacity utilization, which reached an all-time high at the beginning of 2020, remained below the high level of previous years until recently (Figure 2).

Meanwhile, demand for housing remains high. The influx into metropolitan areas from recent years has caused rents and real estate prices to rise (Figure 3).⁵ Currently, the influx into large cities has noticeably slowed, but metropolitan regions as a whole should remain attractive locations.

Favorable financing conditions continue to support residential construction activity as well. Interest rates for housing loans remained at the historically low levels of the pre-crisis period despite banks' heightened risk perception in summer 2020 (Figure 4).⁶ The German government's decisive intervention to stabilize household incomes, such as through short-time working scheme, and the temporary VAT reduction are also likely to have prevented a more severe slump in construction activity in 2020: The completion date of a building is important for calculating the gross price, so many clients may have been motivated to complete projects before the end of 2020. Measures such as special tax deductions for new multi-story residential buildings⁷ and *Baukindergeld*⁸ (a subsidy granted per child to help families purchase homes) continue to support the refurbishment of existing buildings in particular. In contrast, the debates on tightening rental law are likely to result in rather hesitant investment behavior on the part of existing landlords in this sector.

⁴ Cf. Claus Michelsen and Martin Gornig, "Prognose der Bestandsmaßnahmen und Neubauleistungen im Wohnungsbau und im Nichtwohnungsbau," *BBSER-Online-Publikation* 7 (2016) (in German; available online).

⁵ Cf. Konstantin A. Kholodilin and Claus Michelsen, "Wohnungsmarkt in Deutschland: Trotz Krise steigende Immobilienpreise, Gefahr einer flächendeckenden Preisblase aber gering," *DIW Wochenbericht* no. 37 (2020): 642-652 (in German; available online).

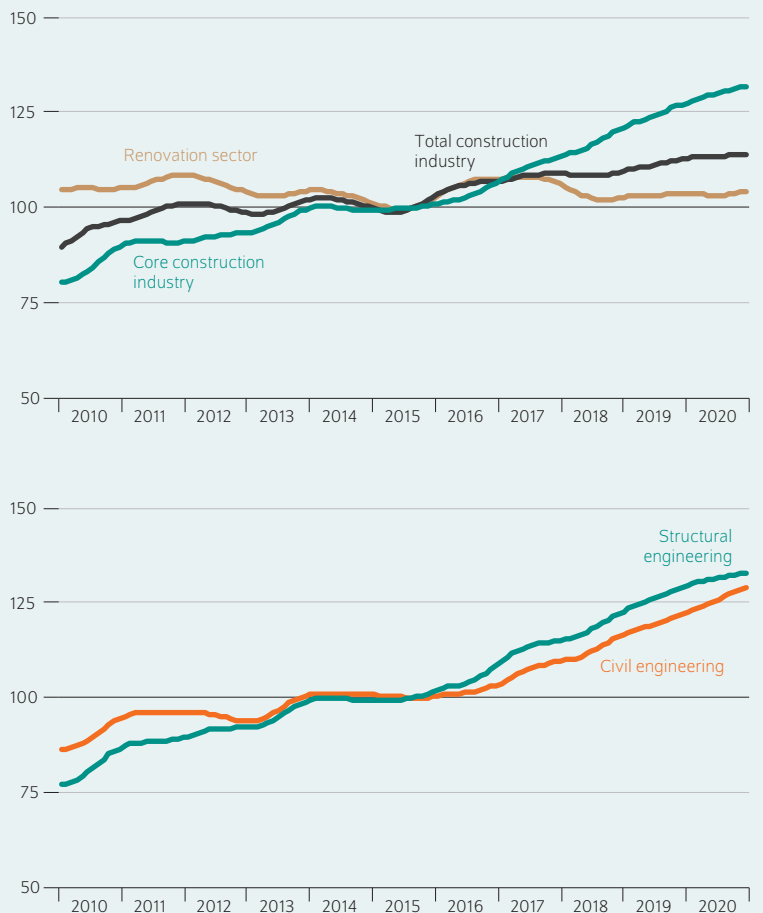
⁶ European Central Bank, *The euro area bank lending survey – Second quarter of 2020* (2020) (available online).

⁷ Claus Michelsen, "Stellungnahme anlässlich der öffentlichen Anhörung des Finanzausschusses des Deutschen Bundestages am 19. November 2018 zum Entwurf eines Gesetzes zur steuerlichen Förderung des Mietwohnungsneubaus," Bundestagsdrucksache 19/4949 (2018) (in German; available online).

⁸ Claus Michelsen, Stefan Bach, and Michelle Harnisch, "Baukindergeld: Einkommensstarke Haushalte profitieren in besonderem Maße," *DIW aktuell* no. 14 (2018) (in German; available online).

Figure 1

Production in the construction industry Index 2015 = 100, constant prices, trend component



Source: Federal Statistical Office.

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Growth was very robust, especially in the core construction industry, despite the coronavirus recession in 2020.

Following an increase of almost 4.9 percent in 2020, residential construction volume is expected to increase by 3.7 percent in 2021 and by around 5.8 percent in 2022 (Table 1).

The crisis-resistant residential unit construction sector

In 2020, new construction activity is likely to have increased quite dynamically once again at 5.2 percent in nominal terms, albeit at a slower pace than in previous years (Figure 5). Despite temporarily fewer orders due to the coronavirus pandemic, incoming orders are trending upwards uninterrupted (Figure 6). As a result, there should be brisk activity on construction sites in 2021. The existing orders, which are increasing again after a period of stagnation, indicate brisk activity as well (Figure 7).

Box

Method for forecasting construction volume

Several steps are required for forecasting construction volume. Initially, the calculations for new construction and existing building stock are available on an annual basis. The first step involves calculating the trends during the year. The volumes of existing stock are adjusted for the quarterly trend in building installation and other construction work using quadratic minimization.¹ New construction volumes are calculated as the difference between overall volume and existing volumes as a means of ensuring consistency in the construction volume calculation. Next, these series are adjusted for seasonal patterns using the ARIMA-X12 procedure.

In the second step, the new construction and existing stock series are "nowcast" using the information currently available. Numbers from the monthly reports of the construction industry and employment in the construction industry, as well as weather information, are used.² 2020 is actually only an interim estimate of construction volume. Final values are not available until the following year, when the statistical offices publish complete reports of all the relevant series.

In the third step, the individual series are forecast. The volumes of existing stock and new construction are estimated separately. Statistical models supported by indicators are used in this step. In addition, the variables to be forecast (e.g., commercial building volume) are regressed to an autoregressive term and the lagged

values of the relevant indicator. The forecasting equation has the following form:

$$y_t = \alpha + \sum_{i=1}^n \beta_i y_{t-i} + \sum_{j=1}^m \gamma_j x_{t-j} + \varepsilon_t$$

y_t stands for the value to be forecast, x_t for the indicator, and ε_t for the statistical error term. α , β and γ are the estimated parameters. Delay periods n and m (quarters) are determined based on the autocorrelation or cross-correlation function. The different specifications are assessed based on information criteria. The approach of estimating a number of individual models and using average values for the forecast has proven effective. For an individual series, up to 50,000 single models are estimated. Construction permits, incoming orders, production, interest, loan volumes, employment and income trends, and surveys of construction companies and freelance architects have proven to be suitable indicators. Capacity utilization is also included in the estimates.³ Expected civil engineering work is equal to the difference between total volume and construction volume.

In the last step, the forecast results are transferred to the construction volume calculation formula. Demand-side trends are also considered by taking the special features of non-investment construction work over the business cycle into account. As a means of differentiating by other structural characteristics, more finely classified information on construction permits and the order backlog are included. In this way, it is possible to estimate the different patterns of individual producer groups, such as core construction and the renovation sector.

¹ See Frank T. Denton, "Adjustment of monthly or quarterly series to annual totals: an approach based on quadratic minimization," *Journal of the American Statistical Association* 66, no. 333 (1971): 99–102.

² For a documentation of the methodology, see Claus Michelsen and Martin Gornig, "Prognose der Bestandsmaßnahmen und Neubauleistungen im Wohnungsbau und im Nichtwohnungsbau," Federal Institute for Research on Building, Urban Affairs and Spatial Development (BBSR) Online Publication no. 07 (2016) (in German; available online).

³ See Claus Michelsen and Martin Gornig, "Prognose der Bestandsmaßnahmen."

After an unusually strong start to 2020, construction firms were overly pessimistic about future business performance during the first lockdown. However, sentiment brightened considerably when the measures were lifted after the first lockdown: the business climate and the assessment of the business situation also indicate that the firms surveyed by the ifo Institute expect business to improve again over the later course of 2021. Similar developments can be viewed in the number building permits issued: following a decline in spring 2020, growth has been trending upwards (Figure 8). This trend is strongly influenced by cost development; the number and size of newly approved buildings have stagnated in past years. As of January 2021, building permits are increasing again: from January to September 2020, the number of approved permits approved were 4.2 percent higher than the same period in 2019.⁹ This significant permit surplus

should continue to stimulate activity at construction sites. Currently, the construction backlog is roughly equivalent to about two and a half years' worth of residential construction.

Sales in residential unit construction are also expected to increase in 2021 and 2022. However, growth is likely to be less than in previous years: At current prices, new construction activity will increase by around four percent in 2021 and by 5.5 percent in 2022. Prices are increasing less powerfully than in previous years: In real terms, growth is likely to be around two percent in 2021 and 2.5 percent in 2022.

Renovation and modernization shaken by the recession

Construction activity on existing residential buildings was significantly more impacted than new construction activity (Table 1). The poor economic situation and low disposable incomes—together with hygiene measures and contact restrictions—result in non-urgent necessary construction

⁹ Cf. Statistisches Bundesamt, *Press release 451 from 13 November 2020* (in German; available online). Approved residential buildings in September 2020: +0.9 percent compared to September 2019; January to September 2020: +4.2 percent compared to January to September 2019.

work being postponed. These factors may also play a role in winter 2020/2021, as hardware stores had to close during the second but not the first lockdown. If income does not stabilize along with overall economic recovery and the gradual reduction of short-time work over the coming months of 2021, the additional relief for households should once again have a stimulating effect. The purchasing power of middle and high income households will increase following the abolishment the solidarity surcharge in beginning of 2021 and thus stimulate demand for renovation and modernization work. Additionally, the new options for writing off energy-related renovation projects for owners of owner-occupied homes should provide support.¹⁰ These measures were decided together with the introduction of a CO₂ price by the *Bundestag* to make saving energy more attractive.¹¹

After around 4.7 percent growth in 2020, DIW Berlin is projecting an expansion of existing activities by only 3.6 percent in 2021 before increasing more strongly by 5.9 percent in 2022.

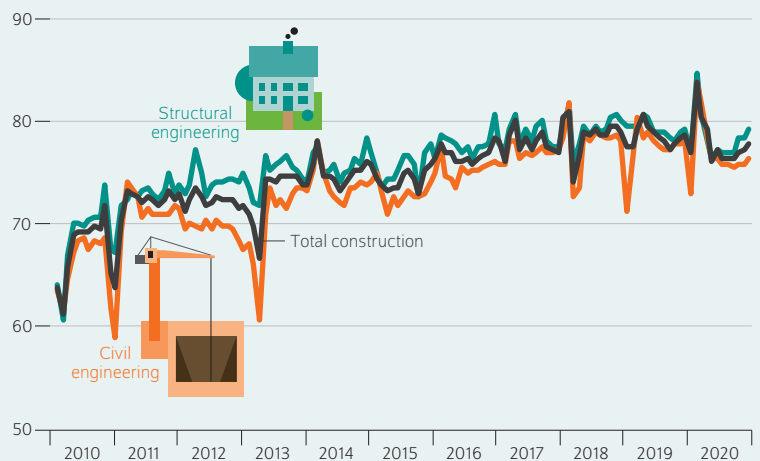
Non-residential construction: public sector construction becoming more important

The coronavirus pandemic has noticeably slowed non-residential construction. Overall, the volume of construction services increased by 2.8 percent in 2020, the slowest growth rate since 2016 (Table 2). Commercial building construction in particular experienced a drop in orders. On the one hand, German industry, already threatened by international trade conflicts and the possibility of a hard Brexit, also suffered from blocked supply chains and trade routes. Likely due to these blocks, the already weak demand for production and warehouse space has come to a virtual standstill. On the other hand, commercial construction lost the previously stabilizing effects of the demand from the services sector, which was significantly affected by the lockdown measures in spring 2020 and winter 2020/2021 as well as the subsequent slump in consumption.

In addition, the stimulating effect of the public sector of past years did not have its full impact. Due to a drop in trade tax revenues, municipalities' investment behavior was restrained and the lockdown and the more thinly staffed public administration offices contributed further. The recovery package showed little traction by the end of 2020. From 2021 onwards, an increased outflow of funds from the Local Authority Investment Promotion Fund (*Kommunalinvestitionsförderungsfonds*) can be expected once again. In addition, the recovery package measures, the compensation of municipalities for their tax deficits, and the investment initiative of the Federal Government will likely have a stimulating effect. As before, many municipalities are likely to have a personnel bottleneck. The number of

Figure 2

Capacity utilization in the construction sector As a percentage of normal seasonal machine utilization



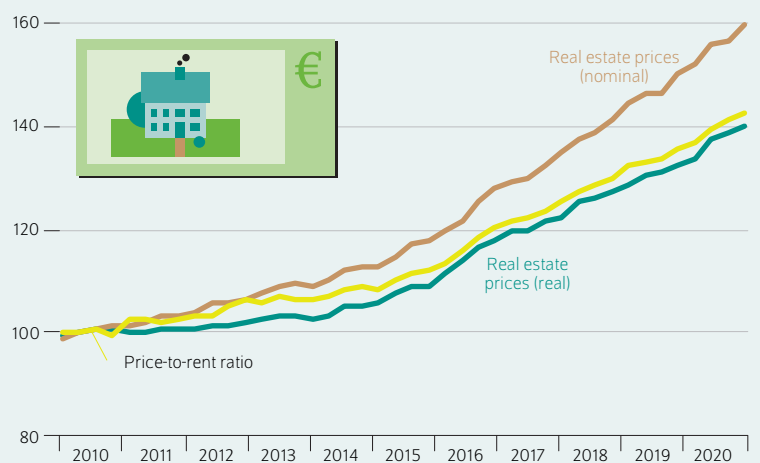
Source: ifo Institute.

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Capacity utilization in the construction industry is currently lower than a year ago.

Figure 3

Prices for residential real estate Index, 2010 = 100



Source: bulwiengesa.

© DIW Berlin 2021

Real estate prices have increased significantly over the past years.

¹⁰ Cf. Bundesministerium der Finanzen, *Steuerliche Förderung energetischer Gebäudesanierungen* (2020) (in German; available online).

¹¹ Cf. Bundesrat, "Gesetz zur Umsetzung des Klimaschutzprogramms 2030 im Steuerrecht," Drucksache 608/19 (2019) (in German; available online).

CONSTRUCTION VOLUME CALCULATION

Table 1

Residential construction in Germany, 2013 to 2021

	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022
	In billion euros at the respective year's prices									
New construction volume ¹	47.54	51.36	56.45	62.81	67.25	71.70	75.57	79.50	82.68	87.23
Construction on existing buildings ²	127.52	130.80	131.32	136.34	143.18	153.12	167.72	175.60	181.88	192.63
Total residential construction volume	175.06	182.16	187.77	199.15	210.43	224.81	243.29	255.10	264.56	279.86
	Change in percent									
New construction volume ¹		8.0	9.9	11.3	7.1	6.6	5.4	5.2	4.0	5.5
Construction on existing buildings ²		2.6	0.4	3.8	5.0	6.9	9.5	4.7	3.6	5.9
Total residential construction volume		4.1	3.1	6.1	5.7	6.8	8.2	4.9	3.7	5.8
	Shares in percent									
New construction volume ¹	27.2	28.2	30.1	31.5	32.0	31.9	31.1	31.2	31.3	31.2
Construction on existing buildings ²	72.8	71.8	69.9	68.5	68.0	68.1	68.9	68.8	68.7	68.8
Total residential construction volume	100	100	100	100	100	100	100	100	100	100

1 Estimated using the estimated construction costs (construction activity statistics), plus surcharges for architects' services and fees, exterior facilities, and internal activities of investors.

2 Buildings and housing modernization (incl. conversion and extension measures) as well as repair services in the construction industry.

Sources: Federal Statistical Office; DIW Construction Volume Calculation.

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Table 2

Non-residential construction volume in Germany, 2013 to 2021

	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022
	In billion euros at the respective year's prices									
New construction volume ¹	30.92	31.67	32.38	35.41	37.95	40.99	44.71	45.56	46.11	48.41
Construction on existing buildings ²	56.64	57.86	57.49	56.36	57.99	60.41	63.81	66.00	67.27	69.68
Total construction volume ³	87.56	89.53	89.87	91.77	95.94	101.40	108.52	111.56	113.38	118.09
	Change in percent									
New construction volume ¹		2.4	2.2	9.4	7.2	8.0	9.1	1.9	1.2	5.0
Construction on existing buildings ²		2.2	-0.6	-2.0	2.9	4.2	5.6	3.4	1.9	3.6
Total construction volume ³		2.2	0.4	2.1	4.5	5.7	7.0	2.8	1.6	4.2
	Shares in percent									
New construction volume ¹	35.3	35.4	36.0	38.6	39.6	40.4	41.2	40.8	40.7	41.0
Construction on existing buildings ²	64.7	64.6	64.0	61.4	60.4	59.6	58.8	59.2	59.3	59.0
Total construction volume ³	100	100	100	100	100	100	100	100	100	100

1 Includes agricultural buildings.

2 Includes other non-agricultural buildings.

3 Construction volume in commercial and public construction.

Sources: Federal Statistical Office; DIW Construction Volume Calculation.

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employees in construction planning offices has continued to fall despite the brisk construction activity in recent years.¹²

According to DIW Berlin's construction volume calculation, non-residential construction volume is expected to expand by 1.6 percent (at current prices) in 2021 and by 4.2 percent in 2022. This is a significant slowdown in non-residential construction following a roughly seven percent increase in activity in 2019.

Working from home decreasing need for office buildings

Since the pandemic began, there has been a major shift in the perspective on how we work. Attitudes towards working from home and the importance of being physically present in an office have changed in many places. Private firms as well as public institutions expanded the possibilities of working from home throughout 2020. Thus, the longer-term viability of new office buildings is increasingly in question. This is reflected in the state of building permits for office and administrative buildings, which are stagnating after a strong upward trend (Figure 8). Although there is no prospect of introducing legislation on the right to work from home, the trend is likely to at least partly continue after the pandemic

¹² Cf. Martin Gornig and Claus Michelsen, "Kommunale Investitionsschwäche: Engpässe bei Planungs- und Baukapazitäten bremsen Städte und Gemeinden aus," *DIW Wochenbericht* no. 11 (2017): 211-219 (in German; available online).

has ended. It remains unclear what impact this will have on the office real estate market in the medium term.¹³ In the short term, however, this uncertainty will continue to curb demand for new office and administrative buildings. The effects of the pandemic can be seen even more clearly in the number of permits issued for factory and workshop buildings and commercial and warehouse buildings, both of which declined last year.

Stabilization is expected in the further course of 2021, especially from the public sector, likely leading to an ultimate increase in sales in 2022. In nominal terms, new construction volume is expected to expand by around 1.2 percent in 2021. At around four percent, growth in the proportionally smaller public building construction sector is likely to be much stronger than in commercial building construction, where a decline of around one percent is expected (Table 2). A recovery is expected in both sectors in 2022.

Renovation of public buildings noticeably expanded

Renovation and modernization activity accelerated markedly over the past few years and is expected to increase significantly by 3.4 percent in 2020. This growth is likely due to lively renovation activity in the public sector, which is now tackling the backlog of necessary renovation work from past years. According to the KfW Municipal Panel (*KfW-Kommunalpanel*), the investment requirements have increased, likely mainly due to higher construction prices.¹⁴

In the commercial construction sector, the extension measures are likely to focus reinvestments. Reduced capacity utilization provides room for modernization work, but considering the economic uncertainty and decrease in corporate turnover, work that is not urgently necessary would be considered too great a risk for many firms. Therefore, they are likely to concentrate on maintaining the substance of their business and initiate expansion projects only to a limited extent in 2021.

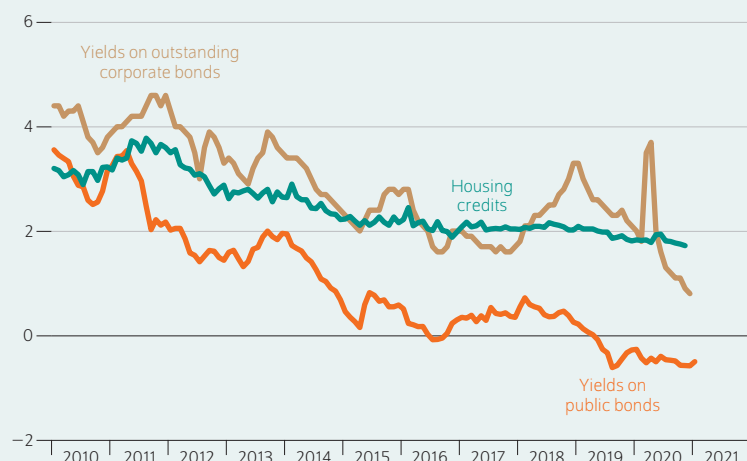
All in all, increases in existing nonresidential construction are expected to be around 1.9 percent in nominal terms in 2021 (Table 2), with a slight decline in real terms. In 2022, the activity is likely to grow by almost four percent nominally. Growth will continue to be primarily shaped by the development of public construction, which will likely increase by almost seven percent in 2021. Commercial construction activity, on the other hand, is likely to be a good one percent lower in 2021 compared to 2020.

Growth in civil engineering sector continuing

After significant increases in the construction volume of civil engineering in past years, its upward trend slowed markedly in 2020 (Table 3). In particular, incoming orders

Figure 4

Interest rates and yields In percent, monthly average



Source: German Central Bank.

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Despite banks' heightened risk perception, housing credits remained at a historically low level in 2020.

in commercial civil engineering and road construction have declined and capacity utilization has been reduced markedly and remained low until recently (Figures 2 and 6). This may have been largely due to state reluctance in many areas. In particular, the state has supported infrastructure expansion to a lesser extent during the coronavirus pandemic. However, as economic recovery resumes, it should provide further significant momentum. The commercial civil engineering sector has also been significantly affected by the coronavirus recession and is only gradually compensating for the losses.

Continued weak growth is expected for the commercial construction sector in particular in 2021. Until recently, production remained stable and was trending slightly upwards. Thus, the low demand in the commercial construction sector can be at least partially offset by an increase in public sector investments. According to DIW Berlin's construction volume calculation, an increase of almost two percent is expected in the civil engineering construction volume in 2021. In 2022, it is likely to increase by 4.2 percent in nominal terms. The growth rates of commercial and public civil engineering construction are likely to converge once more.

Core construction industry no longer leading in growth rate

The core construction industry has profited far more than average from the construction boom of past years (Table 4). Between 2016 and 2019 alone, real construction volume in the core construction industry increased by almost 13 percent. In contrast, real growth in the renovation sector was not even half as much, and the rest of the producer groups

¹³ Dror Poleg, "The Future of Offices When Workers Have a Choice," *The New York Times* (2021).

¹⁴ KfW Bankengruppe, *KfW-Kommunalpanel 2020* (2020) (in German; available online).

CONSTRUCTION VOLUME CALCULATION

Table 3

Civil engineering in Germany, 2013 to 2021

	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022
In billion euros at the respective year's prices										
Commercial civil engineering	28.11	29.31	29.55	30.29	32.90	35.02	37.75	38.15	37.73	39.17
Public civil engineering	25.19	27.36	27.35	28.50	30.88	34.44	37.77	39.54	41.34	43.22
Total civil engineering	53.30	56.67	56.89	58.79	63.79	69.46	75.51	77.70	79.07	82.39
Change in percent										
Commercial civil engineering	0.2	4.3	0.8	2.5	8.6	6.4	7.8	1.1	-1.1	3.8
Public civil engineering	2.9	8.6	0.0	4.2	8.4	11.5	9.7	4.7	4.5	4.6
Total civil engineering	1.4	6.3	0.4	3.3	8.5	8.9	8.7	2.9	1.8	4.2
Shares in percent										
Commercial civil engineering	52.7	51.7	51.9	51.5	51.6	50.4	50.0	49.1	47.7	47.5
Public civil engineering	47.3	48.3	48.1	48.5	48.4	49.6	50.0	50.9	52.3	52.5
Total civil engineering	100	100	100	100	100	100	100	100	100	100

Sources: Federal Statistical Office; DIW Berlin Construction Volume Calculation.

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Table 4

Key figures for development of construction volume in Germany up to 2021

	2015	2016	2017	2018	2019	2020	2021	2022	2016	2017	2018	2019	2020	2021	2022
	In billion euros at the respective year's prices								Change from the previous year in percent						
Total construction volume	334.53	349.71	370.16	395.67	427.33	444.35	457.01	480.34	4.5	5.8	6.9	8.0	4.0	2.9	5.1
Residential construction	187.77	199.15	210.43	224.81	243.30	255.10	264.56	279.86	6.1	5.7	6.8	8.2	4.9	3.7	5.8
Commercial construction	101.41	103.33	109.68	116.29	124.27	125.60	124.43	129.31	1.9	6.1	6.0	6.9	1.1	-0.9	3.9
Public construction	45.35	47.23	50.05	54.57	59.77	63.66	68.02	71.17	4.1	6.0	9.0	9.5	6.5	6.9	4.6
Price development									1.9	3.6	4.9	4.2	1.7	1.8	2.5
	Real, chain index 2010=100														
Total construction volume	105.37	108.09	110.51	112.73	116.50	119.11	120.36	123.47	2.6	2.2	2.0	3.8	2.2	1.1	2.6
By construction sector															
Residential construction	109.88	114.24	116.96	119.60	123.77	127.51	129.52	133.24	4.0	2.4	2.3	3.5	3.0	1.6	2.9
Commercial construction	103.84	104.01	106.21	107.29	110.00	108.88	106.91	109.12	0.2	2.1	1.0	2.5	-1.0	-1.8	2.1
Public construction	92.79	94.85	96.72	99.72	104.23	109.83	114.55	117.04	2.2	2.0	3.1	4.5	5.4	4.3	2.2
By producer group															
Core construction industry	112.13	115.95	120.48	124.44	130.52	133.54	135.24	138.48	3.4	3.9	3.3	4.9	2.3	1.3	2.4
Finishing trades	98.85	100.75	101.45	102.93	105.85	108.51	109.83	112.81	1.9	0.7	1.5	2.8	2.5	1.2	2.7
Other producers	107.52	110.84	114.34	118.46	121.41	123.42	124.08	127.21	3.1	3.2	3.6	2.5	1.7	0.5	2.5

Sources: Federal Statistical Office; DIW Berlin Construction Volume Calculation.

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failed to reach two-digit growth. The positive development in residential unit construction is affecting the core construction industry especially favorably. However, the resurgence of public-sector construction activity between 2016 and 2019 also contributed to the core construction sector's good performance.

In the renovation sector in particular, personnel shortages are likely to have increasingly limited real growth.¹⁵ Thus, the renovation sector presumably was less able to access labor from other European countries than the core construction industry. Moreover, the core construction industry also

achieved significantly higher increases in productivity than the renovation sector.¹⁶

However, these differentiating influences play an increasingly less important role in light of the current sharp decline in the general pace of growth of construction activity. For 2021, it is expected that real construction volume in the core construction sector and in the renovation sector will increase by only one percent each. The development of construction volume in the other producer groups lags behind. Thus, contributions from industry in particular will be weaker due to the decline in commercial construction. In contrast, it is expected that all producer groups will benefit to the same degree from the resurgence in construction activity

¹⁵ Bundesministerium der Finanzen, "Die Bauwirtschaft: Engpass für die öffentliche Investitionstätigkeit? – Ergebnisse eines BMF-Workshops," BMF Monthly Report, January 2020 (2020) (in German; available online).

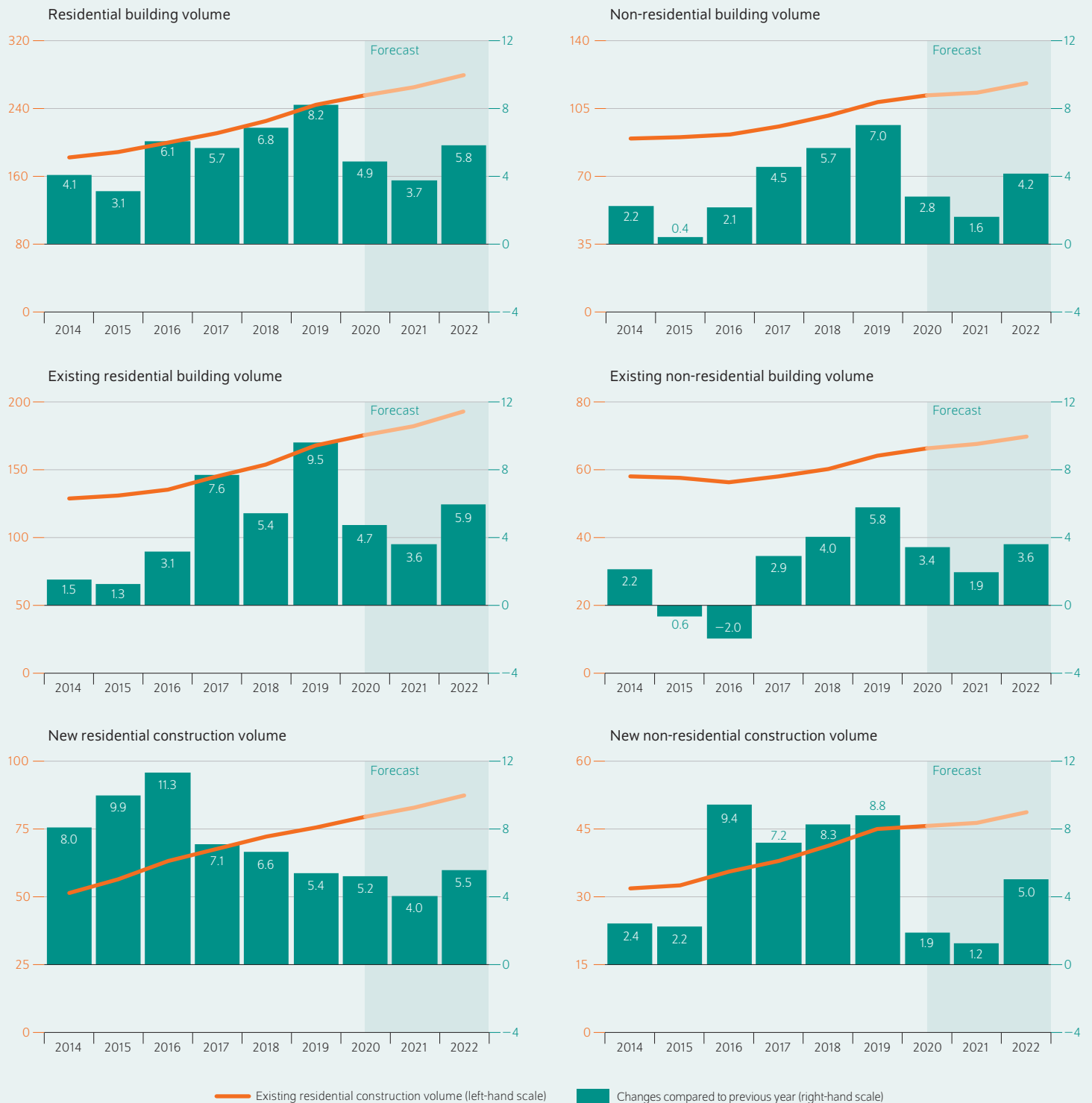
¹⁶ Gornig, Gözlig, and Michelsen, "Strukturdaten zur Produktion und Beschäftigung im Baugewerbe."

CONSTRUCTION VOLUME CALCULATION

Figure 5

Structural engineering in Germany according to new and existing housing stock

In billions of euros in respective prices (left-hand axis); change from previous year in percent (right-hand axis)



Source: DIW Berlin Construction Volume Calculation.

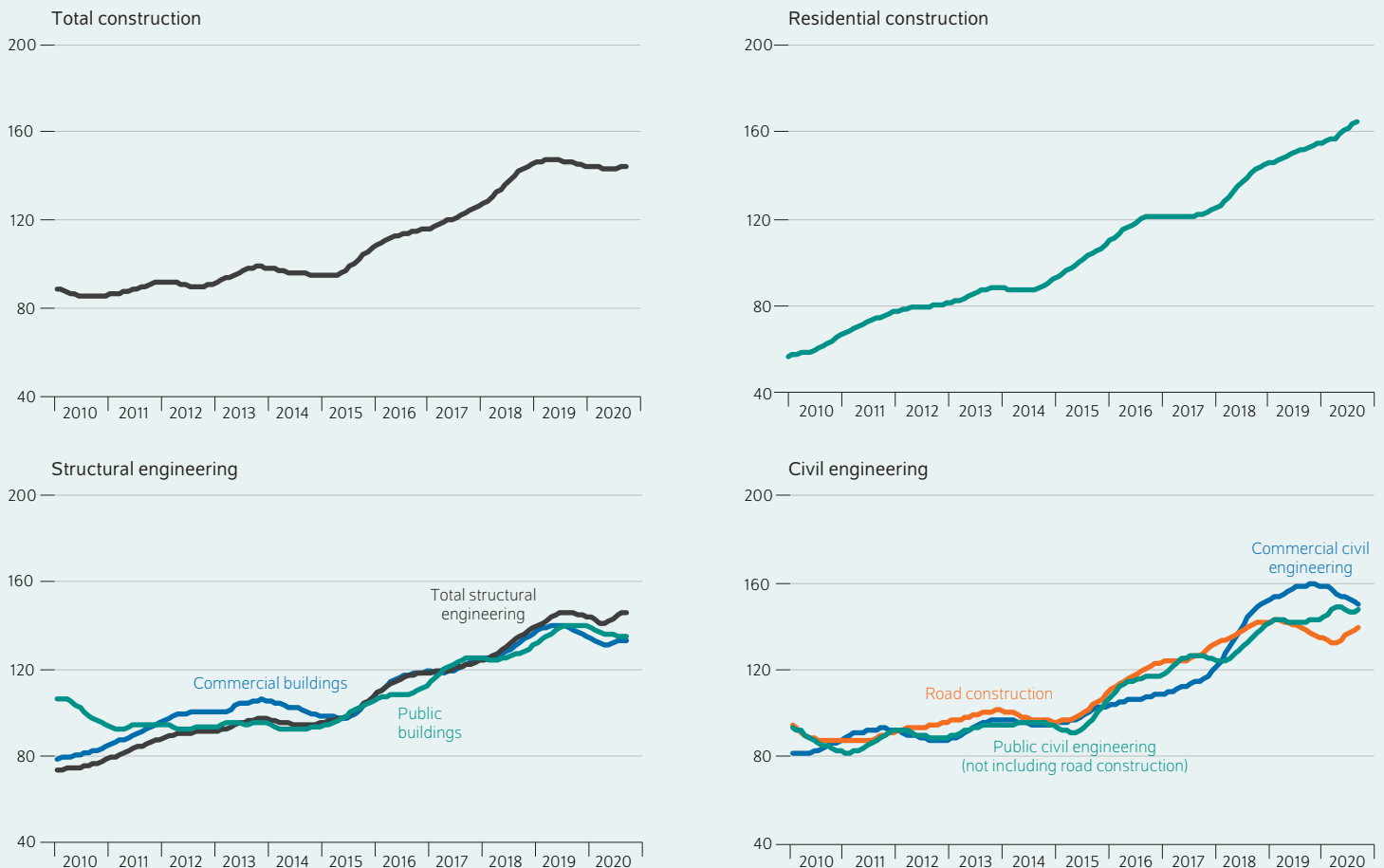
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The pace of structural engineering development will slow this year.

Figure 6

Incoming orders in the core construction industry

Index 2015 = 100, respective prices, trend component



Source: Federal Statistical Office.

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Incoming orders continue to increase uninterruptedly in residential construction.

in 2022, although the renovation sector could be slightly ahead of the others.

Conclusion: up to the municipalities

The economic situation in the construction industry is comparatively good despite the serious slumps caused by the coronavirus pandemic. There is still considerable investment in new construction and renovation of residential buildings, which is providing a major boost to the construction sector. The situation is different for commercial and public construction. For firms in particular, the effects of the pandemic are reflected in significantly lower construction investments. Losses, a distortion of equity, and uncertainty are resulting in lower economic activity and thus a lower need for additional production capacities. Moreover, the coronavirus pandemic has at least in the short term spurred on a major change in the working world. Many companies have reorganized to function in a more decentralized manner and have learned

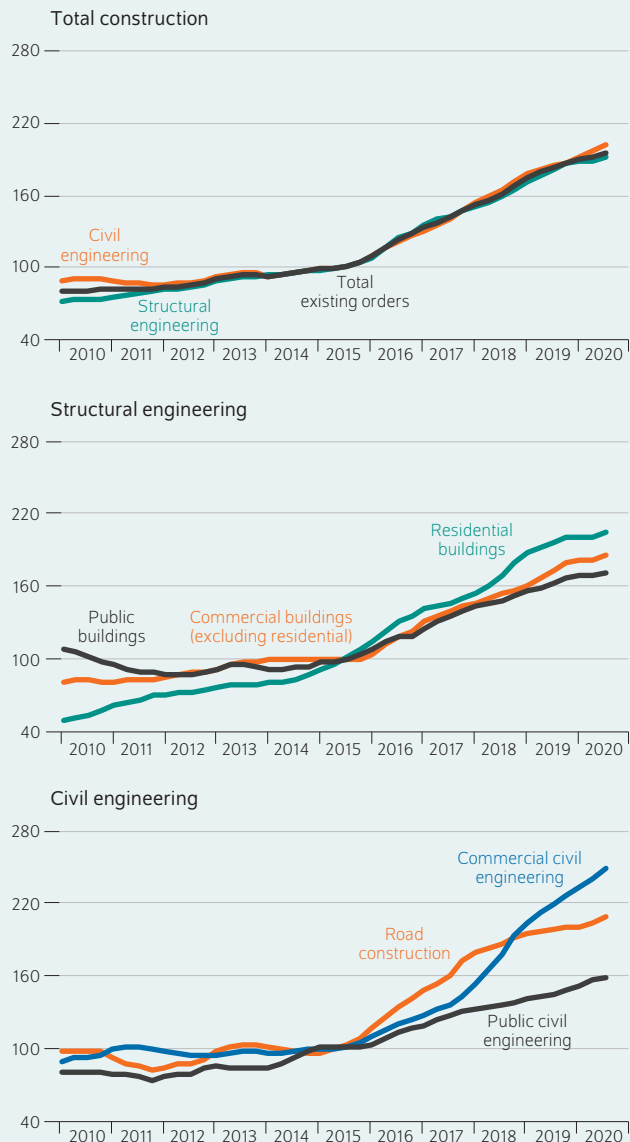
working this way is also effective. Stationary retail lost out to online businesses. In the medium term, this may also lead to shifts in demand, although it is not yet possible to predict whether and to what extent this change will last.

Public construction investments depend considerably on the activities of the municipalities, whose finances have been significantly affected by the lower tax revenue and higher costs in the social sphere. Here, the Federal Government has provided substantial funding to compensate for tax deficits and to enable additional investments. Whether this funding actually reaches the construction industry depends on how it is utilized by the municipalities. In case of doubt, the conditions for municipal cost sharing must once again be made more advantageous so that the necessary investments in education, climate protection, infrastructure, and digitalization do not falter at the municipal level. Here, the states in particular have a duty, because they can assume full co-financing, for example.

CONSTRUCTION VOLUME CALCULATION

Figure 7

Existing orders in the core construction industry Index 2015 = 100, respective prices, trend component



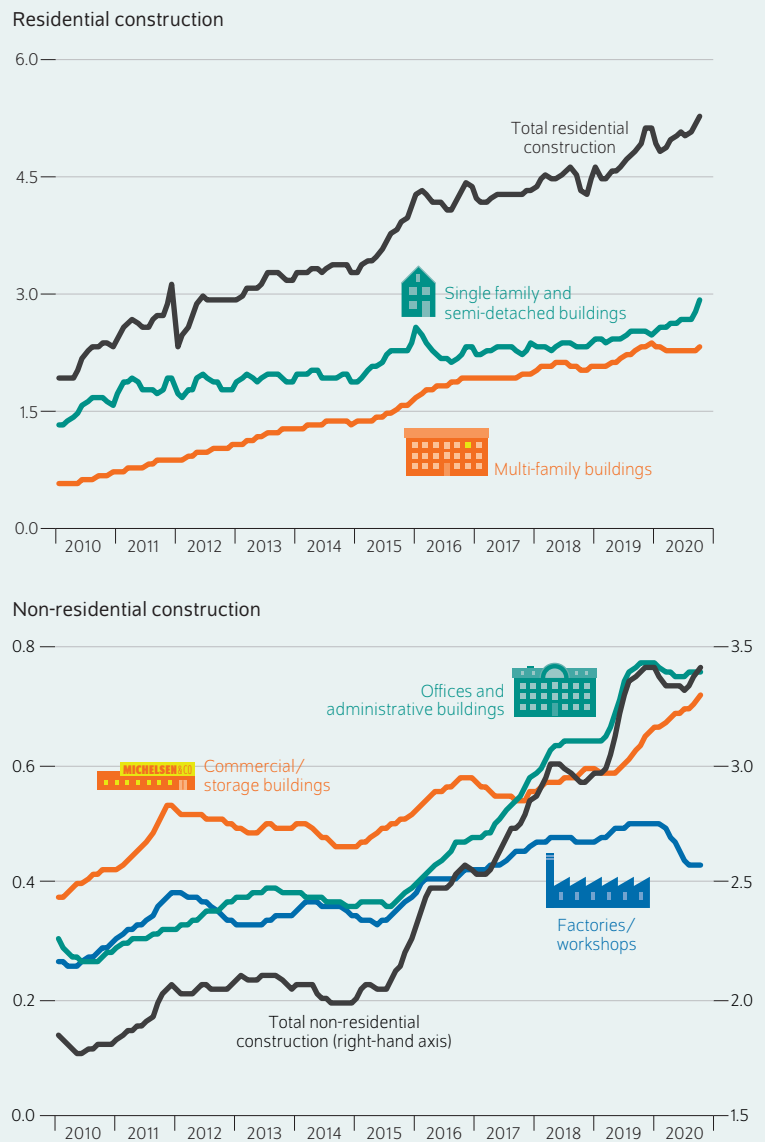
Source: Federal Statistical Office.

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The order books are fuller once more following a short period of stagnation.

Figure 8

Building permits in structural engineering in Germany Respective prices in billion euros, trend component



Sources: Federal Statistical Office; DIW Berlin Construction Volume Calculation.

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The total value of approved construction projects recently rose again after a dip in the spring of 2020.

Over the long time, municipal finance reform will remain on the agenda. The dependency of cities in particular on the trade tax, which fluctuates strongly depending on the

economic situation, should be reduced. Likewise, it would help many over-indebted municipalities if their past debts were reduced, though this is primarily a matter for the states.

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