DIW Weekly Report 1+2 2019

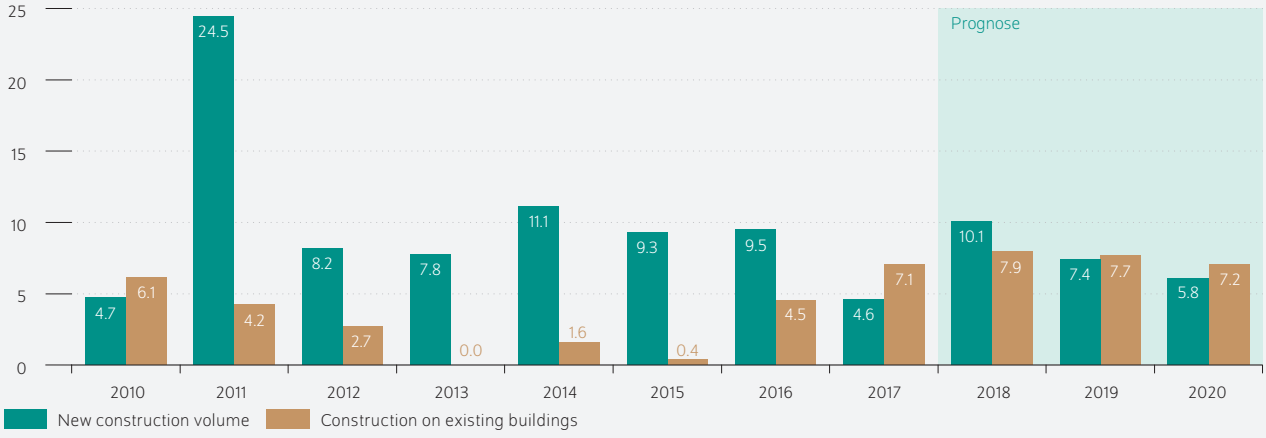
AT A GLANCE

Construction industry momentum continues – state stimulus impacts prices

By Martin Gornig, Claus Michelsen, and Martin Bruns

- The German Institute for Economic Research bases its construction volume forecast on a solid construction industry in the coming years
- Flourishing residential construction will continue to support the industry's business cycle
- The child benefit for building and high amortization rates for rental unit construction will make prices catapult
- Social housing should focus on the inner-city residential market

Resistential construction gains momentum and construction on existing buildings also increases
Change on the previous year in percent



Quelle: Authors'own calculations.

FROM THE AUTHORS

"Given the current pressure on inner-city residential areas, social housing is a problem-solving approach to continue to use the benefits of social mixing."
— Martin Gornig —

MEDIA

Audio Interview with C. Michelsen (in German)
www.diw.de/mediathek

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ABSTRACT

According to the German Institute for Economic Research construction volume forecast, the country's construction industry will continue to flourish in the coming years. Companies can count on a rise in the nominal construction volume of around 7.5 percent in 2019 and 6.5 percent next year. The industry's business cycle continues to be supported by the flourishing residential construction sector, which has received additional stimulus from policy makers. The child benefit for building and increased tax deduction rates for rental unit construction will make prices catapult. But due to the short-term nature of the funding programs, the construction industry will minimally expand its capacity and instead leverage its flexibility in setting prices. The nominal rise in the volume of new construction of over ten percent will be offset by a significantly lower growth rate adjusted for inflation. In view of the nation's tight inner-city housing market and the current high level of real new housing construction, policy makers would do well to establish incentives for urban development – building on vacant lots, in particular – and supporting the construction of additional residential space in urban development zones instead of taking a shotgun approach to funding. Above all, a funding approach for social housing targeted to specific geographical areas would be useful.

In 2019 and 2020, the construction industry will continue to be a key pillar of the business cycle. The German Institute of Economic Research (DIW Berlin) calculations on construction volume[1] – which includes repairs that do not directly increase value[2] in addition to building investment – led to this conclusion. Alongside the construction industry in the literal sense, they encompass related sectors, such as steel and light metal construction, the manufacture of prefabricated 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.

DIW Berlin not only calculates and documents the construction volume of past years; it also forecasts corresponding values for the current and subsequent year. This forecast (see 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, and non-residential sectors.[4] The forecast also includes growth trends for the mainstream construction industry and building trades.

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 for the Environment, Building and Nuclear Safety (*Bundesministerium für Umwelt, Naturschutz, Bau und Reaktorsicherheit*, BMUB). Also see the definition of "Bauvolumen" in the DIW glossary (in German; (available online, accessed on January 8, 2018; this applies to all other online sources in this report unless stated otherwise).

2 Martin Gornig et al., "Strukturdaten zur Produktion und Beschäftigung im Baugewerbe – Berechnungen für das Jahr 2017," *Federal Institute for Research on Building, Urban Affairs and Spatial Development (BBSR) Online Publication* no. 09 (2018) (available online).

3 See Claus Michelsen, et al., "Growth rate of German economy normalizing after prolonged economic boom: DIW Economic Outlook," *DIW Weekly Report* no. 50/51/52 (2018): 510-513 (in German; available online).

4 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 (available online).

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Box

German Institute for Economic Research 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] The last year before the forecast horizon (in this forecast, 2018) 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 generally 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_i and γ_j 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 mainstream 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(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) (available online).

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

New state stimulus for residential construction

For the past eight years, the thriving business cycle has been supported by investment in new residential space and the increased modernization and renovation of existing housing. The highly favorable interest rate and labor market situation and higher collective wage agreements are keeping demand high. And demand for living space remains high in urban areas. The state has also done its part to simulate the industry. Since fall 2018, families can take advantage of the newly implemented "child benefit for building" (*Baukindergeld*), which distributes a sum of 1,200 euros per year per child for ten years to families that build.[5] Further, the government has introduced legislature on special tax deductions for building new residential rental units. It is expected to be adopted in this form. It will allow a total tax deduction of 28 percent in the first five years after the investment was made.[6] The package is rounded out by extra funds for subsidized housing in the amount of 1.5 billion euros by the end of 2019.

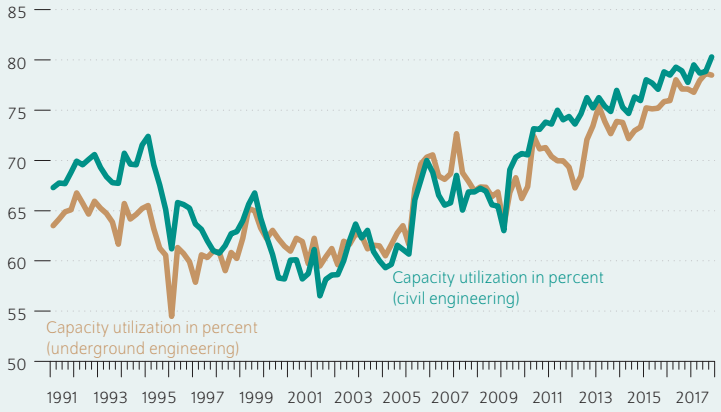
This funding is being granted in a situation where the construction industry is already operating at the limits of its capacity. At no point since German reunification has capacity utilization in the construction industry been as high as it is now (see Figure 1). Since the funding stimulus will only be applied for three years, it will not provide an incentive for construction companies to develop additional capacity. For this reason, the extra buying power of private households and housing associations should accelerate the momentum of price increases even further, driving the nominal rise in housing construction volume.

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

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

Figure 1

Capacity utilization on the construction industry since 1991
Capacity utilization in percent, volume of orders (month) seasonally adjusted



Sources: ifo Institute; authors' own calculations.

Capacity utilization has reached historically high levels.

Overall, after a plus of 8.6 percent in 2018, DIW Berlin expects the housing construction volume to rise by around 7.6 percent this year and around 6.8 percent in 2020 (see Table 1).

New residential unit building subsidies follow shotgun approach

In recent years, new housing construction activity has accelerated sharply. Its geographical distribution is relatively balanced; at least as indicated by the permits for housing construction issued between 2011 and 2016 (see Figure 2). Here measured by permitted housing space per 1,000 residents, the rate of permit issuance shows some fluctuation among the 97 planning regions, but the picture does not have a clear structure.

This applies to the housing market in Germany's larger cities in particular. In those housing markets, quoted rental prices have risen sharply in recent years. In larger cities with more than 500,000 residents, on the contrary, the rate of permit issuance was actually just below the country's average (see Figure 3). It was only noticeably higher in 2014. In cities with a population between 200,000 and 500,000, however, the deviation from the German average was much higher. As a rule, the majority of construction permits in cities were issued for apartment complexes. This results in smaller average living spaces. Despite dramatic population growth, over time there has not been a detectable concentration of new housing permits in Germany's larger cities.

Office space turnover exhibits the same trend (see Figure 4). Since 2011, office space turnover has significantly risen nationwide, but the rate in the larger cities is below average. In cities with over 500,000 residents, it is currently lower than the 2011 value. Real estate prices in these cities, on the contrary, have risen sharply.

Growth in new construction increasingly impacts prices

The tempo of new construction activity in Germany accelerated again in 2018 (see Figure 5). However, the number of building permits has plateaued during the past two years. In October 2018, the number of residential units with permits was only 1.2 percent higher than the value in the same month in 2017 (see Figure 6). The number of permits showed a more positive trend for apartment complexes than for single-family homes. The gap between the number of residential units

Table 1

Residential construction in Germany for the years 2011 through 2020

	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
	In billion euros at the respective year's prices									
New construction volume[1]	41.0	44.3	47.8	52.9	58.0	63.5	66.4	73.1	78.5	83.1
Construction on existing buildings[2]	123.9	127.2	127.3	129.3	129.8	135.7	145.2	156.8	168.8	181.0
Total residential construction volume	164.8	171.5	175.1	182.2	187.8	199.2	211.6	229.9	247.3	264.1
	Change on the previous year in percent									
New construction volume[1]		8.1	7.9	10.6	9.7	9.5	4.6	10.1	7.4	5.8
Construction on existing buildings[2]		2.7	0.0	1.6	0.4	4.5	7.1	7.9	7.7	7.2
Total residential construction volume		4.1	2.1	4.1	3.1	6.1	6.3	8.6	7.6	6.8
	Shares in percent									
New construction volume[1]	24.9	25.8	27.3	29.0	30.9	31.9	31.4	31.8	31.8	31.5
Construction on existing buildings[2]	75.1	74.2	72.7	71.0	69.1	68.1	68.6	68.2	68.2	68.5
Total residential construction volume	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0

1 Proxied 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, author's own calculations.

with permits and estimated construction costs is also widening. This reflects a rise in quality and tougher construction standards on the one hand and on the other hand, rapidly rising prices. As a result, the difference between the nominal and real costs of new apartment complexes is growing.

In the course of 2018, the number of incoming orders for other construction work rose again after a period of stagnation (see Figure 7). There was also an upswing in orders for new construction work. Orders for new housing rose to a new record level (see Figure 8), but months later they returned to a somewhat lower level.

For this reason, DIW Berlin expects new construction activity in Germany to have risen by around ten percent in 2018. However, prices that rose by an above-average rate were responsible for a major portion of this growth. And price increases will also be the determining factor for the nominal growth of investment in new buildings, which should be 7.5 percent in the current year and another six percent in 2020.

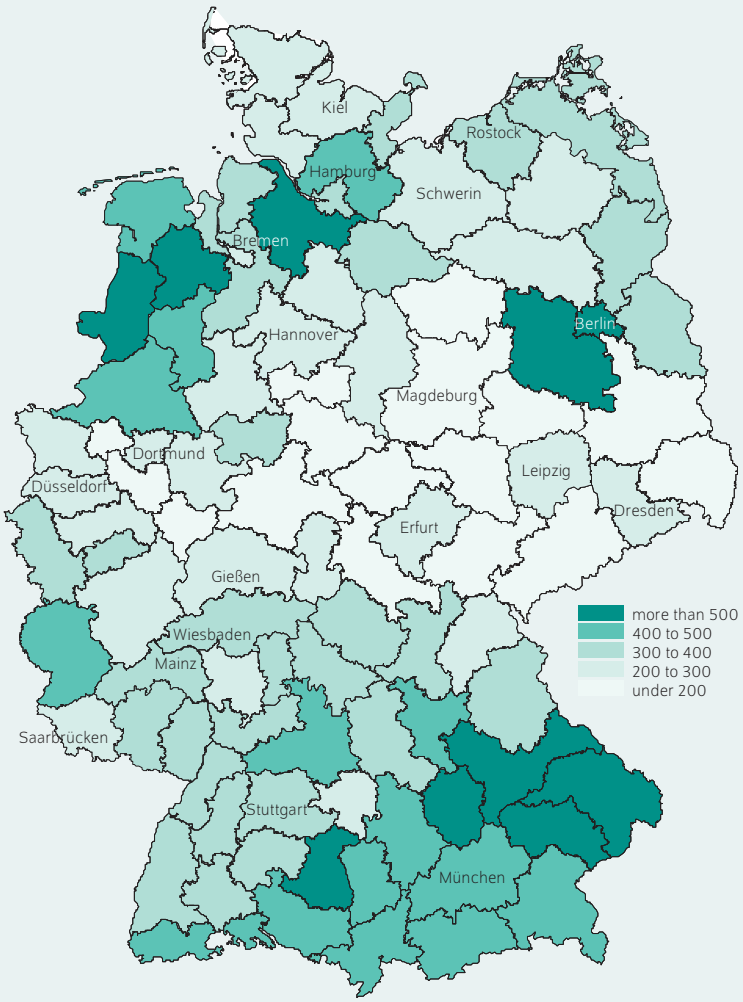
Renovation and modernization gaining momentum

In 2017, renovation and modernization measures experienced a higher growth rate than in previous years and gained momentum. In view of the lively trade in existing real estate, residential unit owners increased their renovation and modernization activity, as changes in housing ownership typically go hand in hand with more thorough modernization measures. The figures indicate that minor measures[7] that are typically carried out indeed were not, and therefore, demand should look good for the renovation sector in particular in the coming years.

It is also being boosted by sharply rising energy prices. They are making energy upgrades more profitable again – renovation volume in this area has expanded significantly since 2016.[8] On the contrary, changes have reduced the modernization apportionment – the option to transfer value-adding investment to tenants – by two percent to equal a total of eight percent. In view of the low interest rate, this should not have a dramatically negative effect on investors, but it does not create much of an incentive to renovate and modernize. Further measures to increase the number of energy upgrades have failed to materialize. Although most parties were in favor of tax incentives, policy makers have not yet made any decisions on them.

Figure 2

Intensity of construction permits by planning regions
Housing permits per capita (1,000) for the years 2011 through 2016



Sources: Federal Statistical Office; authors' own calculations.

Intensity of construction permits shows no distinct urban-rural pattern.

After achieving eight-percent growth in 2018, DIW Berlin expects renovation and modernization activity to expand by 7.7 percent this year and grow by a strong 7.2 percent in 2020.

Non-residential construction: government spends more

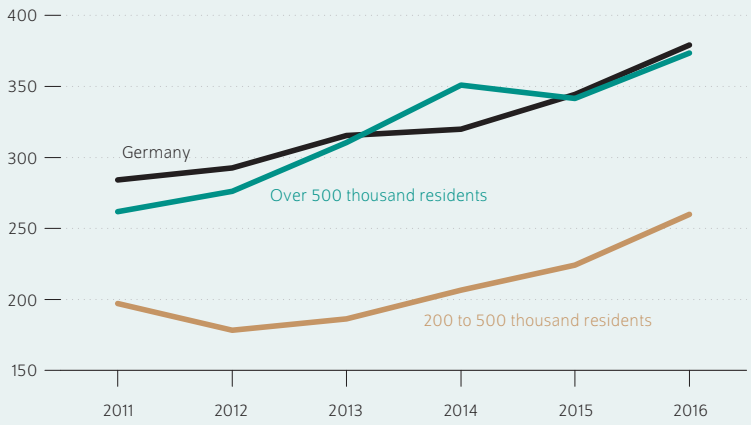
In recent years, the tempo of non-residential construction has been significantly weaker than that of constructing and modernizing residential buildings. Companies in particular have been hesitant to invest, but the state has only provided weak incentives.

7 See Martin Gornig, Christian Kaiserr, and Claus Michelsen, "Bauwirtschaft: Sanierungsmaßnahmen ohne Schwung, Wohnungsneubau mit zweiter Luft," *DIW Wochenbericht* no. 49 (2015): 1153-1162. (In German; available online).

8 Martin Gornig et al., "Strukturdaten zur Produktion und Beschäftigung im Baugewerbe – Berechnungen für das Jahr 2017," *Federal Institute for Research on Building, Urban Affairs and Spatial Development (BBSR) Online Publication* no. 09 (2018); and Jan Stede, Claus Michelsen, and Puja Singhal, "Wärmemonitor 2017: Heizenergieverbrauch stagniert, Klimaziel wird verfehlt," *DIW Wochenbericht* no. 39 (2018): 831-840 (in German; available online).

Figure 3

Intensity of construction permits for the years 2011 to 2016
Housing permits per capita (1,000)



Sources: Federal Statistical Office; authors' own calculations.

Intensity of construction permits has increased equally by different types of regions.

On the bright side, the financial situation of the federal government and municipalities has greatly improved. Many municipalities now have the budget surpluses required to launch new investment projects, or at least enough equity capital to qualify for a payment from the monies available in the Local Authority Investment Promotion Fund (*Kommunalinvestitionsförderungsfonds*).

In view of the jump in prices, real growth in construction volume in this segment will continue to be moderate. This also explains why, despite the significant expansion of expenditures, the government's net fixed capital for non-residential construction remains negative. The gradual shrinkage in personnel in municipal construction planning offices could not be reversed either, putting the brake on both residential and non-residential construction.[9]

The boom years in Germany are over for the time being – this is also noticeable in the non-residential commercial building sector. Expenditures rose significantly in 2018, but this also reflects the sharp jump in prices. In real terms and in view of the solid economic situation, the expenditure increase was moderate at best. The lack of renewed momentum also has to do with corporate estimates being much more pessimistic – especially those in the export-oriented manufacturing industry.[10] The mood is burdened by the smoldering trade war with the U.S., the lack of resolution in the Brexit process, and worry about the situation in Italy, which could lead to turbulence within the euro area. For these reasons, companies are not expanding their investment despite having almost topped out their production capacity.

Given this information, DIW Berlin expects an expansion in the volume of non-residential construction by 6.5 percent in 2019 and 2020, after it rose by an estimated six percent in 2018 (see Figure 5 and Table 2). But here as well, the majority of the growth reflects the rise in construction prices.

Rising demand for office buildings

The number of permits for office and administration buildings has risen, promising new momentum for new

9 See 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).

10 ifo Institut, *ifo Konjunkturperspektiven* 11/2018, 2018 (in German, available online).

Table 2

Non-residential construction volume in Germany for the years 2011 through 2020

	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
	In billion euros at the respective year's prices									
New construction volume[1]	28.8	29.7	30.7	30.9	31.1	34.3	35.1	37.2	40.1	42.5
Construction on existing buildings[2]	59.3	57.5	56.8	58.7	58.8	57.5	60.9	64.7	68.5	73.1
Total construction volume[3]	88.1	87.3	87.6	89.5	89.9	91.8	95.9	101.9	108.6	115.6
	Change on the previous year in percent									
New construction volume[1]		3.3	3.3	0.5	0.7	10.3	2.2	6.2	7.8	5.9
Construction on existing buildings[2]		−3.0	−1.2	3.2	0.2	−2.2	5.9	6.3	5.9	6.8
Total construction volume[3]		−0.9	0.3	2.2	0.4	2.1	4.5	6.2	6.6	6.5
	Shares in percent									
New construction volume[1]	32.7	34.1	35.1	34.5	34.6	37.4	36.6	36.5	37.0	36.8
Construction on existing buildings[2]	67.3	65.9	64.9	65.5	65.4	62.6	63.4	63.5	63.0	63.2
Total construction volume[3]	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0

1 Including agriculture buildings.
2 Including others non-agriculture buildings.
3 Construction volume in commercial and public construction.

Sources: Federal Statistical Office, author's own calculations.

Figure 4

Volume of building lot sales and average sales prices for the years 2011 to 2017
Index 2011 = 100

Sources: Federal Statistical Office; authors' own calculations.

Besides relatively constant sales, the prices for building lots have increased.

non-residential construction (see Figure 6). And reports indicate a lack of these types of spaces in Germany's large cities, the subject of the housing market debate. The competition for building lots makes it difficult to develop more projects in this area.[11]

Demand for new workshop and factory buildings is also on an upswing, while the issuance of new building permits for commercial buildings and warehouses has remained on a plateau.

Accordingly, the growth in orders for public and commercial construction also includes construction activity. For this year, DIW Berlin expects an expansion in the volume of new construction of around eight percent in nominal terms and for 2020, a solid expansion of six percent (see Figure 5).

Excellent business with renovation and modernization activity

Renovation and modernization activity accelerated in 2018 and will remain robust during the forecast horizon. Flourishing business in the German economy should also lead to increased utilization of the infrastructure, augmenting the importance of repairing and maintaining existing buildings. The recent flurry of investment in new machines and plants is likely to lead to further construction measures on existing buildings. After all, plant replacement often goes hand in hand with structural modification.

The extra federal funding for modernizing school buildings and the gradual repair of public buildings that have fallen into disrepair should also provide support. The *KfW Kommunalpanel* survey of municipalities by KfW Group consistently indicates that the infrastructure of many municipalities has fallen into disrepair; school buildings are affected in particular.[12]

Overall, DIW Berlin assumes an expansion in renovation and modernization activity in the non-residential construction sector of six percent in nominal terms for this year and just below seven percent in 2020 (see Figure 5).

Civil engineering sector growth stabilizes

The construction volume in civil engineering has experienced a steady upturn in the past two years (see Table 3). In 2017, it rose by around seven percent and last year by 8.7 percent. Demand from the public sector mainly supported the trend, although commercial investment in civil engineering picked up considerably.

The trend shows no signs of stopping. Incoming orders for civil engineering projects overall – and commercial demand in particular – have sharply risen. The trend in public-sector

11 Ludwig Dorffmeister and Martin Steininger, "Aktuelle Entwicklungen auf dem deutschen Büroimmobilienmarkt," *ifo Schnelldienst* 71.7 (2018): 65-73 (in German; available online).

12 KfW Group, KfW-Kommunalpanel 2018, (2018) (in German; available online).

Figure 5

Residential and non-residential construction for the period 2010 through 2020
Billion Euro in current prices; year over year changes in percent

Source: Authors' own calculations.

Volume of new residential construction gains momentum.

orders, on the contrary, is somewhat flatter – with the exception of road construction (see Figures 7 and 8). For this reason, DIW Berlin expects growth of approximately eight percent in 2019. And in 2020, growth should be around seven percent.

Construction prices show above-average increase

In 2018, the construction volume rose by approximately eight percent and attained an overall volume of 400 billion euros (see Table 4). Price increases made a significant contribution. Recently, both wage and material costs have risen noticeably, fueling the construction price upswing. According to information from the Federal Employment Agency, there is a decisive lack of skilled labor in the German construction industry.[13] In view of the high capacity utilization, profit margins have noticeably expanded as well. For these reasons, construction prices are likely to have risen much more sharply than the general inflation rate of just under two percent. The rise in construction prices almost reached five percent in 2018, yielding a rise in the real construction volume of around 3.3 percent.

Thanks to the high demand for construction work, and due to the availability of additional funds from the child benefit for building or the special amortization rates, the price upswing is expected to continue. Collective bargaining wages are already confirming expectations. Construction prices should rise by around 4.5 percent in 2019 and by another 3.5 percent in 2020.

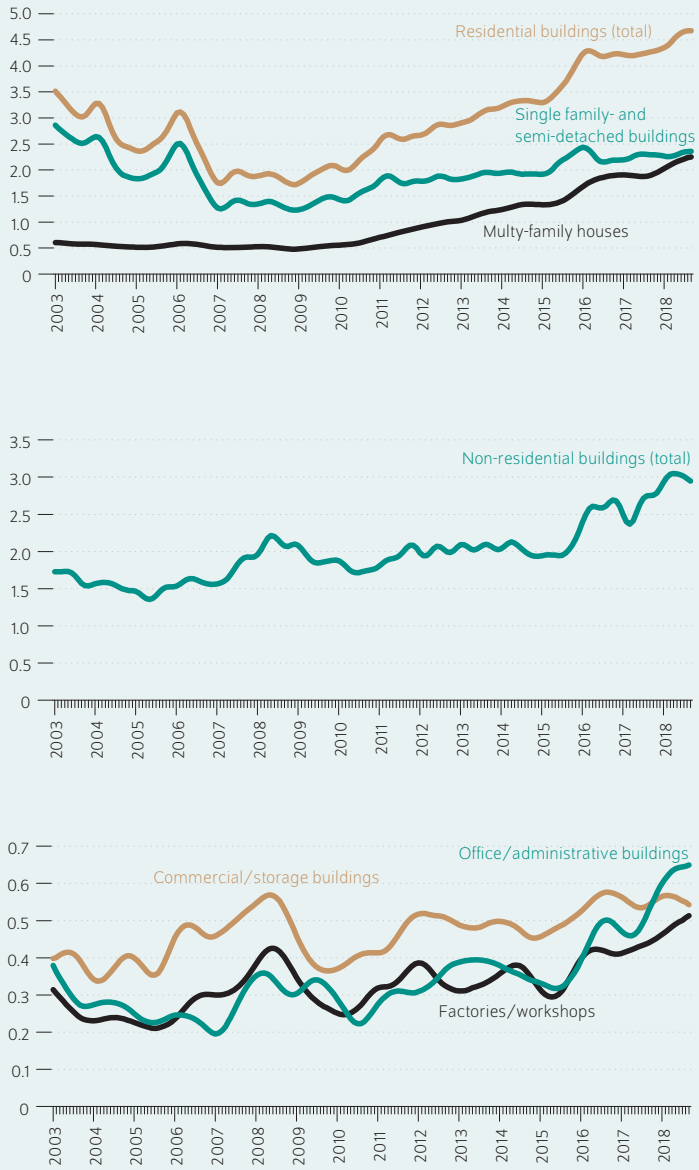
The nominal rate of increase in construction volume to around 430 billion euros in 2019 and just below 460 billion euros in 2020 will therefore translate into significantly weaker rates of increase in real terms. In the current year, they are expected to be 2.9 percent and in 2020, around 3.1 percent (see Table 4). The greater number of working days in 2020 plays a key role here. Residential construction will continue to enjoy support this year and next, with growth rates of 3.3 percent in both years. In real terms, public-sector construction will grow by 3.3 percent this year and in 2020, will probably grow by an additional 2.9 percent. Commercial construction will grow by 1.6 percent this year and in 2020, by an additional 2.9 percent.

All construction industry sectors should benefit from the forecast growth. The mainstream construction industry will continue to be supported by new residential construction and the strong demand for civil engineering contracts, where the increase was around three percent. And in the renovation sector in 2018, volume rose by approximately 3.4 percent. The picture should remain about the same during the entire forecast horizon. The mainstream construction industry can count on real growth of between 2.5 and three percent, the renovation sector on growth of a bit more than three percent.

Figure 6

Building permits

Monthly, in billion euros; trend components



Sources: Federal Statistical Office; authors' own calculations.

Housing permits have been flat since mid 2016.

13 Federal Employment Agency, Blickpunkt Arbeitsmarkt, Fachkräfteengpassanalyse (2018) (in German; available online).

Table 3

Civil Engineering in Germany for the years 2011 through 2020

	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
	In billion euros at the respective year's prices									
Commercial civil engineering	27.8	28.1	28.1	29.3	29.5	30.3	32.4	34.3	36.7	39.4
Public civil engineering	25.0	24.5	25.2	27.4	27.3	28.5	30.5	34.1	37.1	39.7
Total civil engineering volume	52.8	52.6	53.3	56.7	56.9	58.8	62.9	68.4	73.9	79.1
	Change on the previous year in percent									
Commercial civil engineering		1.0	0.2	4.3	0.8	2.5	7.0	6.0	7.0	7.1
Public civil engineering		−2.0	2.9	8.6	0.0	4.2	7.2	11.6	9.0	7.0
Total civil engineering volume		−0.4	1.4	6.3	0.4	3.3	7.1	8.7	8.0	7.1
	Shares in percent									
Commercial civil engineering	52.7	53.4	52.7	51.7	51.9	51.5	51.5	50.2	49.7	49.8
Public civil engineering	47.3	46.6	47.3	48.3	48.1	48.5	48.5	49.8	50.3	50.2
Total civil engineering volume	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0

Sources: Federal Statistical Office, author's own calculations.

Table 4

Key figures for development of construction volume in Germany for the years 2014 through 2020

	2014	2015	2016	2017	2018	2019	2020	2015	2016	2017	2018	2019	2020
	In billion euros at the respective year's prices							Change on the previous year in percent					
Total construction volume	328.36	334.53	349.71	370.49	400.15	429.78	458.78	1.9	4.5	6.0	8.0	7.4	6.8
Residential construction	182.16	187.77	199.15	211.63	229.86	247.30	264.06	3.1	6.1	6.3	8.6	7.6	6.8
Commercial construction	100.66	101.41	103.33	109.18	115.35	122.75	130.50	0.8	1.9	5.7	5.7	6.4	6.3
Public construction	45.54	45.35	47.23	49.68	54.94	59.73	64.23	−0.4	4.1	5.2	10.6	8.7	7.5
Price development								1.8	2.0	3.2	4.8	4.5	3.6
	real, chain index, 2005 = 100												
Total construction volume	105.27	105.37	108.09	111.06	114.62	117.91	121.58	0.1	2.6	2.8	3.2	2.9	3.1
By construction sector													
Residential construction	108.48	109.88	114.24	117.94	122.82	126.88	131.01	1.3	4.0	3.2	4.1	3.3	3.3
Commercial construction	105.12	103.84	104.01	106.28	106.81	108.55	111.64	−1.2	0.2	2.2	0.5	1.6	2.9
Public construction	94.51	92.79	94.85	96.72	101.50	104.90	107.97	−1.8	2.2	2.0	5.0	3.3	3.0
By producer group													
Core construction industry	112.97	112.13	115.95	120.26	123.80	127.11	131.31	−0.7	3.4	3.7	3.0	2.7	3.3
Finishing trades	99.33	98.86	100.76	102.94	106.49	109.61	112.91	−0.5	1.9	2.2	3.5	2.9	3.0
Other producers	105.51	107.52	110.84	114.34	118.46	122.36	126.06	1.9	3.1	3.2	3.6	3.3	3.0

Sources: Federal Statistical Office, author's own calculations.

Conclusion: more focused government stimulus needed

In view of the deceleration in real growth in the new residential construction sector and the lack of focus in new construction activity, we cannot expect a quick turnaround in the tight residential unit market in large cities. Accordingly, new incentives for creating affordable living space in large cities appear necessary.

One hotly debated option for achieving this goal is to build more social housing. Since 2007, the federal states have been responsible for publicly funded residential construction. Based on the most recent constitutional amendment, however, the federal government has more freedom to subsidize housing. In 2019, it provided additional funding in the amount of 1.5 billion euros per year for this purpose.

But the widely documented problems of the past[14] must be taken into consideration when planning subsidized housing for the future. On the one hand, cost efficiency, coattail effects, and misallocation are important factors.[15] And on the other hand, the extensive use of social housing can also

14 Bundesministerium für Wirtschaft und Energie, Soziale Wohnungspolitik (2018) (in German; available online).

15 Michael Schier and Michael Voigtländer, "Soziale Wohnraumförderung auf dem Prüfstand," *IW Trends*, 43(1) (2016): 21-35 (in German; available online).

contribute to the emergence of social flashpoints – as it did in the 1970s, for example.[16]

However, social housing is an excellent means of containing segregation processes.[17] Social housing would be an adequate approach to solving the problem that the current pressure on inner cities poses, if policy makers intend to support the advantages of social mixing.[18]

A new type of social housing is required. The right geographical focus is what counts, not masses of units. Accordingly, municipalities must define areas in which it will be advantageous to invest in social housing in order to retain their socio-geographical mixture. Federal and state funding could be funneled to these areas.

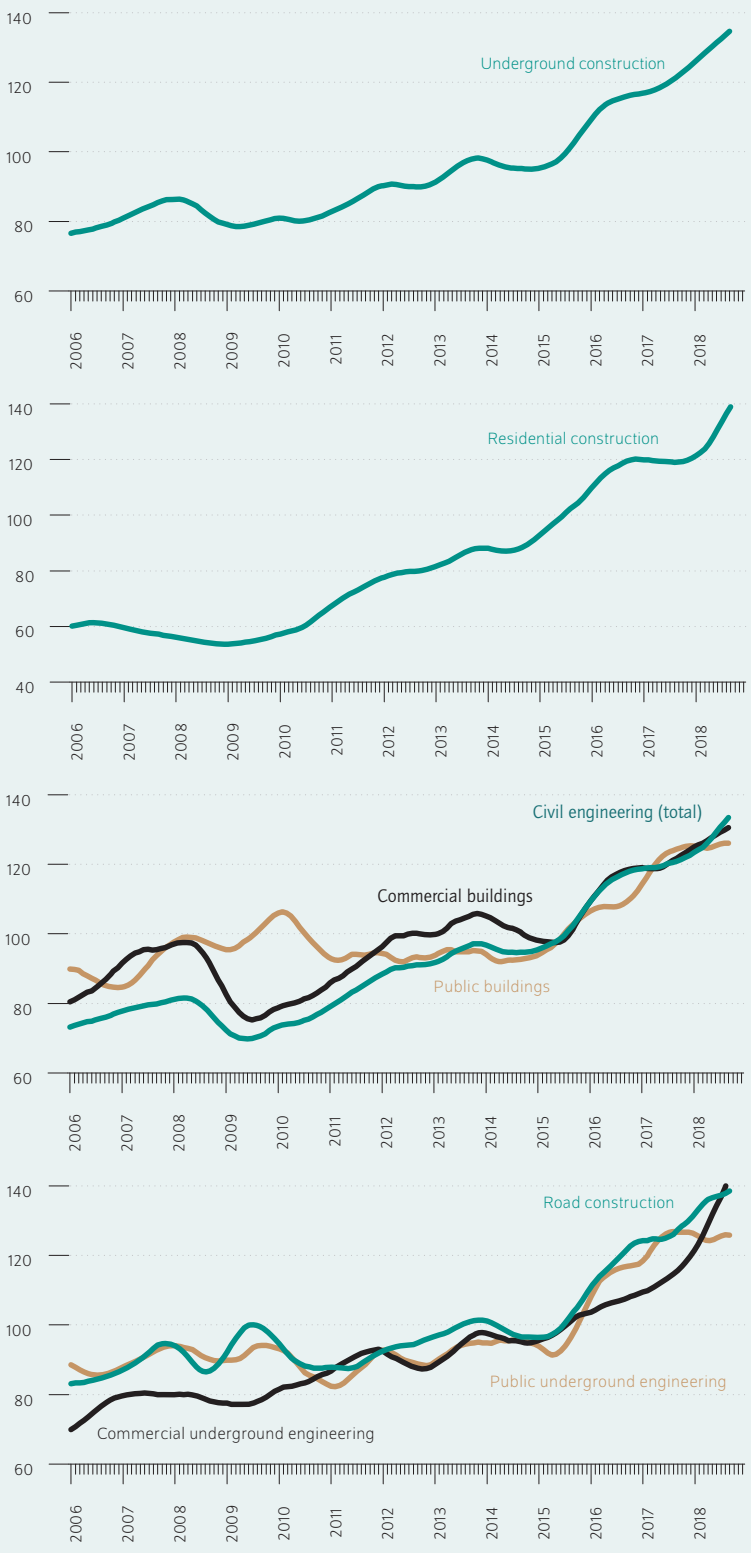
In addition, the development and restoration of the public infrastructure is a permanent focus. The federal and state governments have significantly increased their investment budgets in this area, triggering strong growth in public-sector construction. But municipal investment is still nowhere near meeting demand. The key here would be a reliable permanent increase in municipal investment monies. And the situation of financially weak municipalities, where the cumulative investment deficit is concentrated, must be improved for the long term.[19]

Individual federal-level initiatives cannot provide a solution. Improvements targeted at the education sector infrastructure, which were recently debated and agreed in the Bundestag,[20] are certainly important. However, the municipal investment deficit affects the municipal infrastructure in its entirety. It is only possible to decide which areas, municipalities, and investment objects have priority on the local level. And federal initiatives like these neither increase long-term planning security nor motivate municipalities to expand their building and planning capacity to former levels again.

One point of departure for sustainably improving flexibility with regard to financing municipal investment exists as part of a further development of two existing joint federal-state tasks: the Joint Task for the Improvement of Agricultural Structures and Coastal Protection (*Verbesserung der Agrarstruktur und des Küstenschutzes*, GAK) and the Joint Task for the Improvement of Regional Economic Structures (*Verbesserung der regionalen Wirtschaftsstruktur*, GRW). They

Figure 7

Incoming orders in core construction industry
Value index 2015 = 100; trend components



Sources: Federal Statistical Office, author's own calculations.

The trend of new construction has gained momentum recently.

16 Sako Musterd, "Social and ethnic segregation in Europe: levels, causes, and effects," *Journal of Urban Affairs*, 27(3) (2005): 331-348.

17 See Hartmut Häussermann, "Armutsbekämpfung durch Stadtplanung?" *Aus Politik und Zeitgeschichte* 51-52 (2010) (in German; available online). This primarily applies in comparison to housing allowance payments. See Susin Scott, "Rent vouchers and the price of low-income housing," *Journal of Public Economics*, 83(1) (2002): 109-152; and Doron Sayag and Noam Zussman, "Who benefits from rental assistance? Evidence from a natural experiment," *Regional Science and Urban Economics*, (in press).

18 Robert J. Sampson, "Neighbourhood effects and beyond," *Urban Studies*, 56 (1) (2019): 3-32.

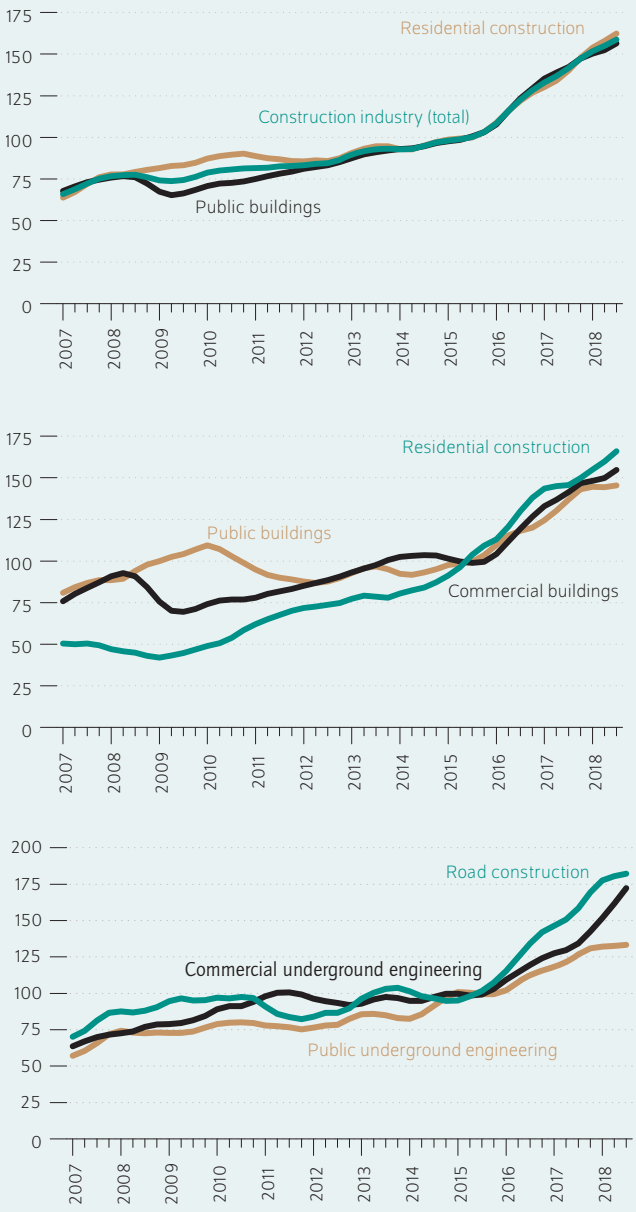
19 See Marcel Fratzscher, Ronny Freier, and Martin Gornig, "Kommunale Investitionsschwäche überwinden," *DIW Wochenbericht* no. 43 (2015): 1019-1021 (in German; available online).

20 See German Bundestag, Grundgesetzänderung soll mehr Investitionen in Bildung ermöglichen, (2018) (in German; available online, accessed on November 28, 2018).

Figure 8

Volume of orders in core construction industry since 2007

Value index 2015 = 100; trend components



Sources: Federal Statistical Office; authors' own calculations.

Order books are full.

could be restructured to allow a larger number of needy municipalities to benefit from the co-financing monies of the federal and state governments. For example, the GRW could be modified to lift its exclusive ties to the economic infrastructure.[21] Alternatively, a new joint task could be considered. This proposal would focus on safeguarding regional public services. The federal and state governments would formulate and finance its key features in partnership. Municipalities would be able to flexibly allocate the funds as part of their regional budgets.[22]

21 See Expertenkommission im Auftrag des Bundesministers für Wirtschaft und Energie, Stärkung von Investitionen in Deutschland (2015) (In German; available online).

22 See Jens Kersten, Claudia Neu, and Berthold Vogel, "Regionale Daseinsvorsorge, Begriff, Indikatoren, Gemeinschaftsaufgabe," *WISO Diskurs Januar*, (Bonn: Friedrich Ebert Foundation, 2015); and Britta Haßelmann, Markus Tressel, and Christian Kühn, "Strukturwandel schwacher Regionen unterstützen," *Frankfurter Rundschau*, August 12, 2017.

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