German Construction Industry: New Residential Construction at Cyclical Peak— Public Construction Gaining Ground

By Martin Gornig and Claus Michelsen

The construction industry remains a key pillar of the German economy. According to the latest construction volume calculations by DIW Berlin, the value of construction in 2014 and 2015 is forecast to grow far more rapidly than the economy as a whole: by a price-adjusted 3.3 percent and 2.1 percent in 2014 and 2015, respectively. Currently, new residential construction is an important engine for growth with the construction volume in this sector estimated to increase by almost 12 percent in 2014, in nominal terms. However, 2014 will also mark significant growth in construction on existing buildings. In addition to gains in residential construction, more positive developments are also currently being observed in commercial and public construction, following declines in these sectors in recent years

However, although residential construction is stable, the high growth rates observed in 2014 are unlikely to continue into 2015. Fears that construction price increases would be (too) strong, precisely in this sector, are not supported by the national average. However, the dynamic growth of new construction is expected to tail off appreciably. Moreover, largely as a result of the gloomy economic outlook, the commercial construction sector is also likely to record only moderate growth in construction volume. The highest increases for 2015 are expected in the public construction sector—although the investment program announced by the government is in fact likely to have very little impact, even if further relevant measures are implemented throughout the year.

The construction industry has been a key pillar of the German economy in recent years. This is evidenced by DIW Berlin's annual construction volume calculations which, in addition to investment in construction, also include renovations that do not increase the value of the property.[1] As well as the construction industry in the narrowest sense, DIW's calculations also take other industries into consideration such as the manufacture of structural metal products and of prefabricated buildings, smithery, planning, and other services. Unlike the investment calculations published by statistical offices, DIW Berlin differentiates between new construction and refurbishment of existing buildings.

As well as documenting construction volume calculations for previous years, DIW Berlin also forecasts the equivalent values for the present and coming year (see Box 1). It has not been possible to date, however, to produce a forecast that breaks down the construction volume into new construction and construction work on existing buildings for each year. To gain a more accurate insight into current trends and to increase forecast quality, DIW Berlin has developed an indicator that allows fur such disaggregation (see Box 2). The present report outlines the results of the indicator for the very first time.[2] The 2014 and 2015 calculations are based on DIW Berlin's economic forecasts as well as the findings and estimates from the most recent Joint Economic Forecast compiled in the fall by Germany's economic research institutes under the guidance of DIW Berlin.[3]

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1 See M, Gornig et al,, "Construction in Germany: Structural Data on Production and Employment—2013 Calculations," report commissioned by the Federal Institute for Research on Building, Urban Affairs and Spatial Development (BBSR) as part of the Federal Ministry for the Environment, Nature Conservation, Building and Nuclear Safety's (BMUB) research program, "Future Construction" ("Zukunftbau"), Final Report (DIW Berlin, 2013),

2 See M, Gornig et al,, "The Development of a Refurbishment Indicator for Residential and Non-Residential Buildings," report commissioned by the Federal Institute for Research on Building, Urban Affairs and Spatial Development (BBSR), Final Report, (DIW Berlin, 2014),

3 See F, Fichtner et al,, "Herbstgrundlinien 2014," DIW Wochenbericht, no, 38 (2014): pp, 871-899; Joint Economic Forecast Project Group, Deutsche Wirtschaft stagniert - Jetzt Wachstumskräfte stärken (Berlin: 2014),

Box 1

DIW Berlin's Construction Volume Forecast Methods

The forecast for construction volume is embedded in DIW Berlin's macroeconomic forecast.[1] Accordingly, in an initial stage, construction investment projections are carried out which can be consistently presented in the system of national accounts. Indicator-based statistical models are used for the construction investment forecast. For this purpose, the forecast value, e.g., the volume of commercial construction, is regressed on an autoregressive term and the lagged values of the relevant indicator. The forecast equation then generally takes the following form:

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

where y_t is the forecast value, x_t is the indicator, and ε_t is the error term. The parameters α, β_i, and γ_j are estimated.

The lag lengths n and m (years) are determined using the autocorrelation function and/or the cross correlation function. Furthermore, the different specifications are evaluated using standard information criteria.

The forecasting quality is evaluated using *ex-post* forecasts. The specifications with the lowest square deviation of the forecast values from the actual values are then used for the forecast.

Incoming orders and building permits for residential construction have proven to be suitable indicators for forecasting residential construction, whereas for commercial construction, investment in capital equipment, capacity utilization, and incoming orders and/or building permits for non-residential buildings can be used.[2] Public construction, however, is not determined using indicators but is instead derived from the government accounts forecast which takes into consideration both government revenue and the announced economic stimulus packages.

The individual indicators sometimes produce very different results. Construction investment is also heavily influenced by legal framework conditions—the discontinuation of the home ownership allowance, for example—and these models cannot adequately depict changes in these conditions. Consequently, these statistical procedures can only serve as a reference point for the forecast. In a second step, results for the individual aggregates of construction investment are then aligned with the remaining aggregates of the national accounts.

In a third and final step, the forecast results are transferred to the model for the construction volume calculation. In addition, bearing in mind the specific characteristics of the non-intensive construction services, the demand-side trends in the course of the economic cycle are taken into consideration. So as to differentiate by additional structural features, more detailed information on building permits and current orders is used. This enables us to estimate different developments between the individual producer groups such as the core construction industry and finishing trades.

1 On this method see, for example, D. E. Rapach and M. E. Wohar, "Forecasting the Recent Behaviour of U.S. Business Fixed Investment Spending: An Analysis of Competing Models," Journal of Forecasting, vol. 26 (2007): 33-51.

2 See J. Döpke et al., "Indikatoren zur Prognose der Investitionen in Deutschland," Kieler Arbeitspapier, no. 906 (Kiel: 1999).

Renovation and Refurbishment Gain Momentum

After stagnating at around 182 billion euros for the past two years, the volume of construction on existing buildings increased significantly in 2014 (see Figure 1). DIW Berlin is forecasting 2.6-percent growth which is largely the result of the exceptional start to the year.

Residential construction has provided the strongest impetus with the volume of construction on existing buildings in this sector on a major upward trend for some years now. As there were no restrictions due to weather conditions last winter, construction companies were able to continue working throughout the entire year. In addition to this one-off effect, however, the general conditions for residential construction investment also remain extremely favorable. Although the economic outlook has recently deteriorated slightly, the labor market situation is still likely to remain just as stable as income growth. Interest on construction loans will also continue to remain at historically low levels in future—this is indicated by the expected returns on mortgage bonds which have been steadily declining since the start of 2014.[4] The improved financing conditions are also like-

4 The Bundesbank reports the returns on mortgage bonds differentiated by residual terms, The returns that are relevant here with up to ten years residual term are listed in Bundesbank time series BBK01,WX4260,

Box 2

Projection of Construction Volume on Existing Buildings

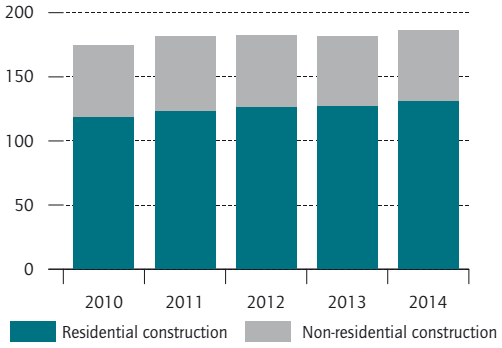
To estimate the volume of construction on existing buildings, data from DIW Berlin's construction volume calculations are combined with data from official statistics. Statistics referring to the number of employees subject to social insurance contributions are used in conjunction with construction industry statistics. Both sets of statistics are published with around a six-month delay, are available on a quarterly basis, and are also broken down into economic sectors. The official statistics provide six different time series per economic sector, which, when combined, describe the economic activity in that particular sector: the number of people employed in the sector, number of hours worked, number of companies, and company turnover.

Since it is not possible to know in advance what economic variables within the sector are particularly suited to approximating the volume of construction on existing buildings, a principle components analysis is conducted to bundle the information about the activities in the relevant economic sectors. This contributes to the robustness of the regressor since one-off effects which only relate to a specific variable but not economic activity *per se*, such as wage increases, for example, are filtered out. Further, the length of the time series used is also insufficient to include a larger number of variables simultaneously as regressors. The principal component analysis circumvents this problem. The missing data for the last two quarters of the current year are extrapolated using the seasonal pattern. As a result, the volume of construction on existing buildings is estimated for the current year. The volume of new construction is calculated as the difference between construction on existing buildings and total construction volume.

ly to provide fresh impetus for investment in construction on existing buildings, which is often less profitable than investment in new construction.

Figure 1

Volume of Construction on Existing Residential and Non-Residential Buildings
In billion euros at the respective year's prices



Source: Construction volume calculations by DIW Berlin.

The value of construction work on existing buildings is expected to increase by over two percent.

The rent cap adopted by the German cabinet, however, is likely to have been a source of irritation for investors, at the very least.[5] For example, the distinction between "deep" and "simple" modernization measures is unclear. In the latter, the rent cap will be applied following modernization; in the former, it will not. The extent to which landlords can pass on the costs of refurbishment onto new tenants in the long term is also uncertain. It is possible that this will reduce the volume of investment in construction on existing buildings from 2015, at least temporarily.

Overall, a significant increase in investment in existing residential buildings was expected in 2014 against the previous year—a forecasted rise of 2.8 percent to almost 131.4 billion euros (see Table 1). However, the dynamic growth recorded during the first half of 2014 is not sustainable: there was subsequently a visible downward trend in the number of orders (see Figure 2).

In *commercial construction,* a considerable increase in the volume of work in terms of financial value on existing buildings was forecast. After a strong start to the year, a negative economic outlook had a dampening effect on companies' investment propensity during the remain-

5 See Draft Law on Attenuating the Rent Increase in Overstretched Property Markets and Strengthening the Purchaser Principle Regarding Estate Agent Services (Mietrechtsnovellierungsgesetz – MietNovG), Draft Law issued by the German government, www.bmjv.de/SharedDocs/Downloads/DE/pdfs/Gesetze/20141001_GesEBReg_Mietpreisbremse_Kab.pdf?__blob=publicationFile, in German only, last accessed on November 10, 2014,

Table 1

Structural Engineering Construction Volume

	2010	2011	2012	2013	2014	2011	2012	2013	2014
	In billion euros at the respective year's prices					Change on the previous year in percent			
New construction volume									
Residential construction	32.90	40.98	44.30	47.07	52.51	24.6	8.1	6.3	11.6
Non-residential construction	27.31	30.24	30.03	31.94	33.70	10.7	–0.7	6.3	5.5
Total	60.21	71.22	74.33	79.01	86.21	18.3	4.4	6.3	9.1
Construction on existing buildings									
Residential construction	118.87	123.86	126.98	127.83	131.40	4.2	2.5	0.7	2.8
Non-residential construction	55.59	57.86	55.55	54.09	55.33	4.1	–4.0	–2.6	2.3
Total	174.46	181.72	182.53	181.92	186.73	4.2	0.4	–0.3	2.6
Total construction volume									
Residential construction	151.77	164.84	171.28	174.90	183.91	8.6	3.9	2.1	5.1
Non-residential construction	82.90	88.10	85.58	86.03	89.03	6.3	–2.9	0.5	3.5
Total	234.67	252.94	256.86	260.93	272.94	7.8	1.5	1.6	4.6

Source: Construction volume calculations by DIW Berlin.

After two years of stagnation, construction on existing buildings is also profiting from the favorable construction economy.

der of 2014. This is illustrated both by industry association reports and by various business climate indicators.[6] The *ifo Institute* business climate index, for example, has been on a steep downward decline since spring 2014 and recently reached its lowest point in two years. The unfavorable business outlook has also had a negative impact on incoming orders which have also been on a downward trend since spring 2014 in both the commercial structural and civil engineering sectors.

In contrast to residential and commercial construction, *public construction* in 2014 had a much more subdued start to the year. However, the volume of construction on existing buildings will also increase in this sector due to the improved financial situation, particularly at municipal level.[7] The municipalities are, therefore, expected to at least start reducing the backlog of investment in construction on existing buildings that has accrued in recent years.[8] Construction measures following the flood damage during the summer of 2013 should have added momentum in the second half of that year.

The bottom line is that the volume of construction on existing non-residential buildings — i. e., in commercial and public construction — was predicted to increase by 2.3 percent to around 55.3 billion euros in 2014.

New Residential Construction Benefits from Favorable External Conditions

In the new construction sector, residential construction is currently profiting the most from the favorable external conditions: as well as the advantageous interest rate environment, another important contributory factor is that Germany has positive net migration, i.e., more immigrants are entering the country than emigrants leaving. This increases the demand for living space, particularly in metropolitan areas and induces increasing rents, which in turn is also an incentive for new construction activity. Furthermore, alternative investments continue to earn low levels of interest. However, the growing shortage of construction land in premium urban locations is increasingly subduing new construction.[9] Nonetheless, after a good six-percent rise in 2013, new residential construction volumes were predicted to grow by over 11.6 percent to a total of around 52.5 billion euros in 2014 (see Figure 3).

The Phasing out of the economic stimulus programs in 2012 had a major dampening effect, particularly in public construction but, since 2013, the volume of non-residential new construction has been recovering. How-

6 See Association of German Chambers of Commerce and Industry (DIHK), "Konjunkturumfrage Herbst 2014, ZEW-Konjunkturerwartungen - Erster Zugewinn seit Jahresbeginn," press release, November 18, 2014; "ifo Geschäftsklimaindex erneut gesunken," press release, October 27, 2014,

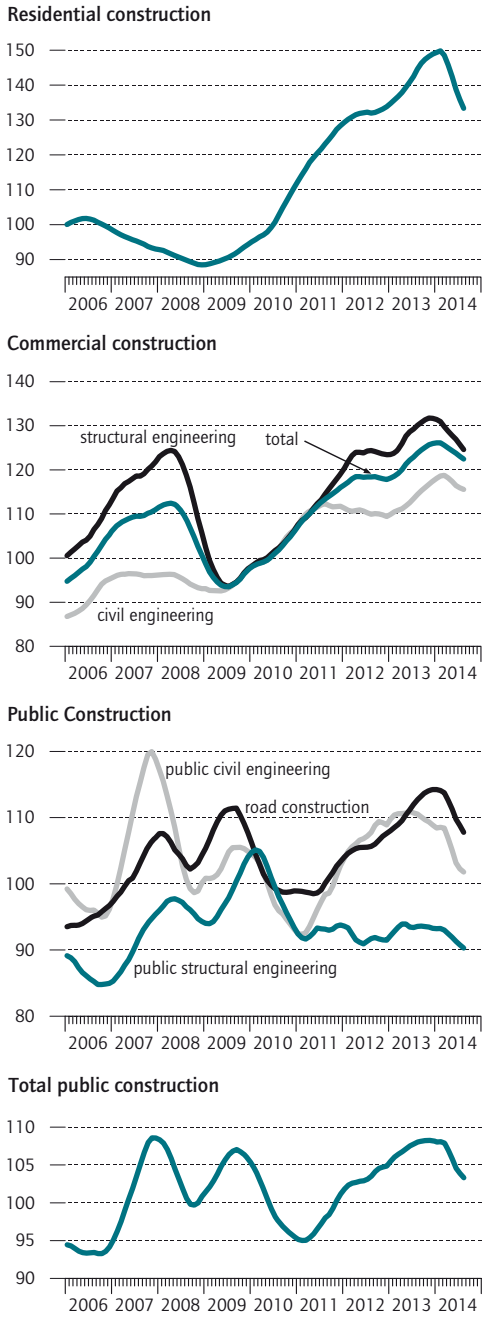
7 Federal Ministry of Finance, "Results of the 145th Session of the Working Group for Tax Revenue Estimates, November 4-6, 2014 in Wismar," press release, no, 46, November 6, 2014,

8 U, Kunert and H, Link, "Transport Infrastructure: Higher Investments Needed to Preserve Assets," DIW Economic Bulletin, no, 10 (2013),

9 This is reflected in the sharply increasing price of construction land in German cities,

Figure 2

Incoming Orders in Core Construction Industry
2005 value index = 100[1], trend components



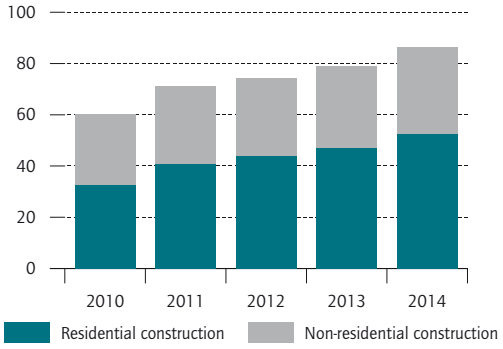
1 Seasonally adjusted according to the Berlin Procedure (BV4)

Sources: Federal Statistical Office; calculations by DIW Berlin.

Incoming orders are currently on a downward trend.

Figure 3

Volume of New Residential and Non-Residential Construction
In billion euros at the respective year's prices



Sources: Construction volume calculations by DIW Berlin.

The volume of new residential construction is currently profiting most from the favorable external conditions.

ever, the volume of new construction approved for 2013 is unlikely to be equaled in 2014. The uncertainty among companies due to the state of economy has had an impact on commercial construction specifically. Consequently, previously approved investment to expand production capacity may have temporarily been deferred. The commitment to providing childcare places, in particular, is also likely to have boosted new construction in the public sector. Overall, in 2014, the volume of new non-residential construction is likely to have increased by approximately 5.5 percent to 33.7 billion euros.

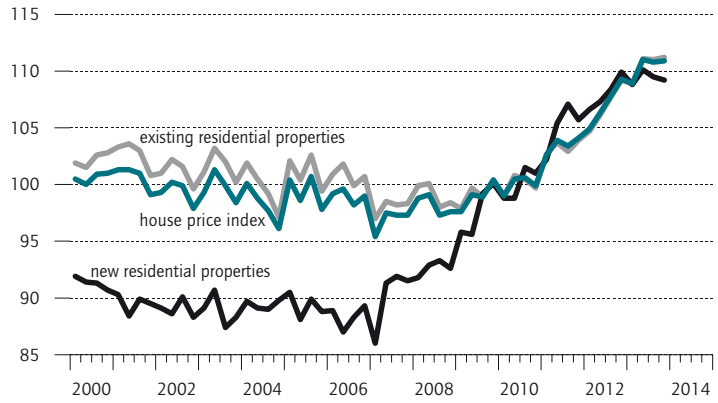
Moderate Growth of Residential Construction Costs

After the turn of the millennium, the German real estate market stagnated. However, the last five years have seen significant growth in property prices in many regions of the country (see Figure 4). This is frequently due to increasing demand—in the metropolitan areas, in particular, there has been considerable population growth. This is reflected in noticeable rent increases, which has made property market policy a popular election campaign issue. A cap on rents has since been endorsed by the German cabinet, with a view to curbing rent growth in overheated property markets.[10] In order

10 For a summary and evaluation of the effectiveness of the regulation, see K, Kholodilin and D, Ulbricht, "Mietpreisbremse: Wohnungsmarktregulierung bringt mehr Schaden als Nutzen," DIW Wochenbericht, no, 15 (2014): 319-327; and C, Michelsen, "Eine Bremse, die nicht bremst," op-ed, Frankfurter Rundschau, September 31, 2014,

Figure 4

Real Estate Prices in Germany
2010 index = 100

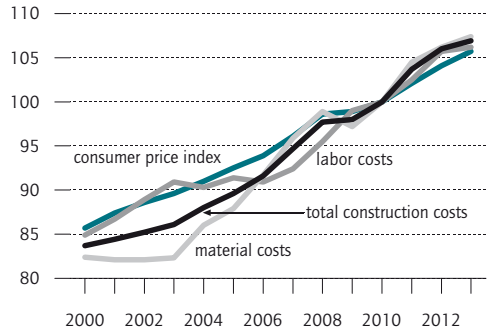


Source: Federal Statistical Office

Property prices have been sharply increasing for some years now.

Figure 5

Construction Cost Indices and Consumer Price Index
2010 index = 100



Sources: Federal Statistical Office; calculations by DIW Berlin.

Only recently construction costs are increasing at a slightly faster rate than consumer prices.

to examine the causes of the housing shortage more closely, the Federal Ministry for the Environment, Nature Conservation, Building and Nuclear Safety (BMUB) established a committee of experts, the Alliance for Affordable Housing and Building. Another committee specifically created for this purpose will also analyze the development of construction costs and establish measures to ensure new construction, particularly in the low- and medium-quality segments. The German government's coalition agreement sees the role of the committee primarily as reviewing "(...) inflationary and excessive standards and cost of materials and processes, particularly in energy-efficient refurbishment."[11]

However, lately, the development of construction costs has, for the most part, been unremarkable. Both material and labor costs have risen but only in keeping with the general price level (see Figure 5). Only recently, due to a significant increase in demand for construction services, costs rose more rapidly than general consumer prices. To cite this as the reason for creating a commission to slow down price inflation is therefore somewhat surprising — particularly because cost increases during an economic upswing, as was the case for residential construction in the last few years, are far from unusual.

One possible reason for this being the subject of political debate could be a selective perception of the cost development of certain construction services. There are actually substantial differences: for example, the cost of specialized construction services has increased much more dramatically, particularly in the fields of metal and glass work, plumbing services, fire prevention, and technical installations. In these fields, average annual cost increases have been significantly above the two-percent mark since the year 2000 — and growth has recently accelerated (see Figure 6). Increases in construction material prices might help explain this. The price of metals, cement, and glass in particular increased sharply until 2010 (see Figure 7). On the other hand, the cost of traditional forms of construction has only increased moderately. The prices of earth moving, structural, masonry and concrete work, carpentry and timber work, as well as finishing work in general have seen only negligible rises since the turn of the millennium with an annual average rate of one to 1.5 percent, which is below inflation (see Figure 8).

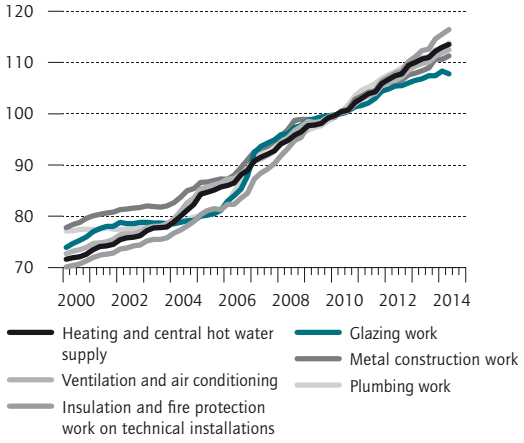
Trend Toward High-Quality Construction

Another factor affecting costs is the change in demand for certain locations and construction quality levels. Recently, estimated construction costs per square meter, in particular, increased much more sharply than the construction cost index for residential buildings. This suggests that investors are focusing on higher quality, especially when it comes to multi-family houses. Urban centers in particular have seen a rise in demand for living space — here, it is typically the small single-person households that dominate the real estate market with their growing demand for high-quality housing in cen-

11 Coalition Agreement (2013),

Figure 6

Price Indices of Selected Construction Services
2010 index = 100

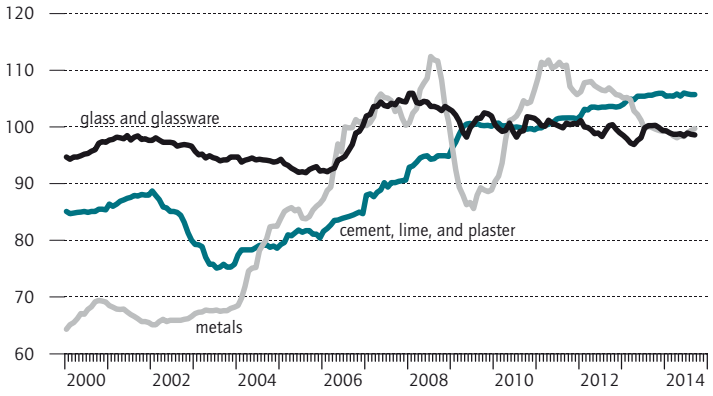


Sources: Federal Statistical Office; calculations by DIW Berlin.

The cost of specialist construction services has increased significantly.

Figure 7

Price Indices of Selected Construction and Raw Materials
2010 index = 100



Sources: Federal Statistical Office; calculations by DIW Berlin.

The price of construction and raw materials has increased sharply since the turn of the millennium.

tral locations.[12] This has also forced land prices up. In the larger towns and cities in particular, the price of construction land has increased considerably over the past five years (see Figure 9). Construction cost indices do not take account of this factor despite its importance for the total cost of an investment.

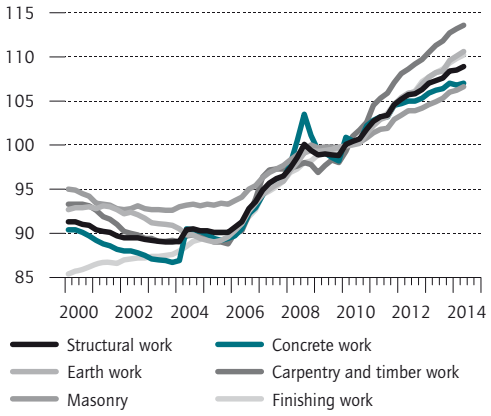
2015 Outlook: Strong Increase in Construction Volume

For 2014, DIW Berlin has forecast a sharp rise in nominal construction volume of almost five percent to around 328.7 billion euros, compared with 2013 (see Table 2). For 2015, the expected growth is forecast to be slightly weaker than 2014 but still substantial at almost four percent, rising to around 341.3 billion euros. Moderate development of building prices is anticipated; in 2014, a 1.5-percent increase was expected and growth in 2015 is unlikely to be any stronger—forecast at less than two percent. The real construction volume—i.e., adjusted for price increases—is therefore expected to increase by 3.3 percent in 2014 and 2.1 percent in 2015. This signifies a slowdown in real growth which nonetheless remains at a comparatively high level.

This trend is further substantiated by the development of the order backlog in the core construction industry which remains high in all construction segments, leading us to assume a continued high level of construction output until the end of 2014. However, there are early indications that incoming orders will follow a downward trend in the long term. The number of building permits issued also signals that con-

Abbildung 8

Price Indices of Selected Construction Services
2010 index = 100



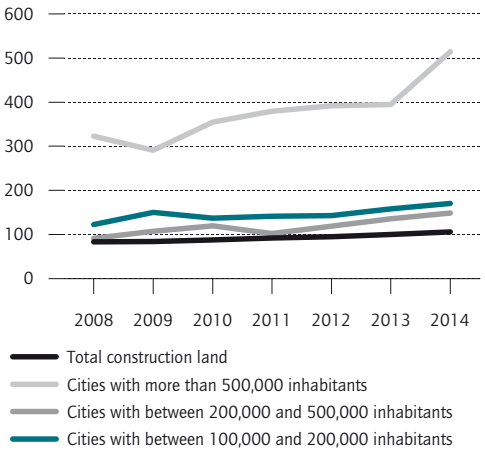
Sources: Federal Statistical Office; calculations by DIW Berlin.

There has only been a moderate increase in the price of many traditional construction services.

12 The demand situation is incisively summarized by the BBSR in a report by R, Müller and M, Waltersbacher, "Wohnungsengpässe in Ballungsgebieten," (Bonn: 2014),

Figure 9

Prices for Construction Land by City Population
In euros per square meter



Sources: Federal Statistical Office; calculations by DIW Berlin.

The cost of construction land in large cities in particular experienced a strong increase following the financial crisis.

struction activity is likely to lose momentum in 2015 (see Figures 10 and 11).

While, as a result of its high starting point at the end of 2014, residential construction is expected to maintain strong growth into 2015 (2.2 percent in real terms), the prospects for commercial construction are much more pessimistic. After recording a decline in construction volume in 2012 and 2013, the segment experienced a 2.7-percent uptick in 2014. However, this upturn is likely to be short-lived; the growth forecast for 2015 is only 0.7 percent. Given the currently less favorable economic outlook, we can expect companies not to remain reluctant to invest until the end of 2015 as a result of the slightly improved export prospects.

Real growth in the value of construction volume in the public construction sector will be more than four percent in 2014. As a result of the additional funds the German government has earmarked for infrastructure, civil engineering, already in a strong position, is also likely to exhibit robust development in 2015. There will also be additional resources from the fund established to address the flood damage which occurred in summer 2013. The recent announcement by the German finance minister that an additional ten billion euros would be provided for investment will have no impact, however, since this has only been approved for 2016 to 2018.[13] Even if specific measures were to be adopted in 2015, they would initially be unlikely to have a positive impact on output. This is evidenced by experience of economic stimulus pack-

13 "Wegen schwacher Konjunktur: Schäuble will zehn Milliarden Euro investieren," Frankfurter Allgemeine Zeitung, November 6, 2014,

Table 2

Key Figures for Development of Construction Volume in Germany

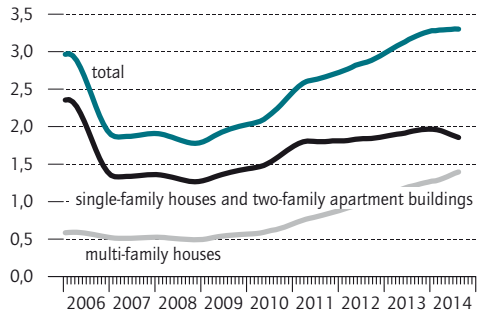
	2010	2011	2012	2013	2014	2015	Change on the previous year in percent				
							2011	2012	2013	2014	2015
In billion euros at the respective year's prices											
Total construction volume	283.30	305.73	309.37	313.60	328.65	341.33	7.9	1.2	–0.5	4.8	3.9
Price development	–	–	–	–	–	–	3.3	2.5	0.0	1.5	1.8
Real, chain index 2005 = 100											
Total construction volume	106.58	111.47	110.06	109.35	112.96	115.28	4.6	–1.3	–0.5	3.3	2.1
By construction sector											
Residential construction	103.44	108.64	109.99	110.26	114.01	116.52	5.0	1.2	0.2	3.4	2.2
Commercial construction	112.97	119.72	117.45	114.73	117.83	118.65	6.0	–1.9	–2.0	2.7	0.7
Public construction	105.76	106.05	96.53	96.13	100.26	104.88	0.3	–9.0	0.5	4.3	4.6
By producer group											
Core construction industry	99.63	107.32	105.30	107.65	111.29	113.85	7.7	–1.9	1.6	3.4	2.3
Finishing trades	115.59	117.43	115.09	112.46	116.22	118.67	1.6	–2.0	–1.9	3.3	2.1
Other construction services	103.04	108.80	109.01	109.02	112.47	114.45	5.6	0.2	0.0	3.2	1.8

Source: Construction volume calculations by DIW Berlin.

Construction volume is also expected to increase significantly in 2015.

Figure 10

Building Permits in New Residential Construction
In billion euros,[1] trend components



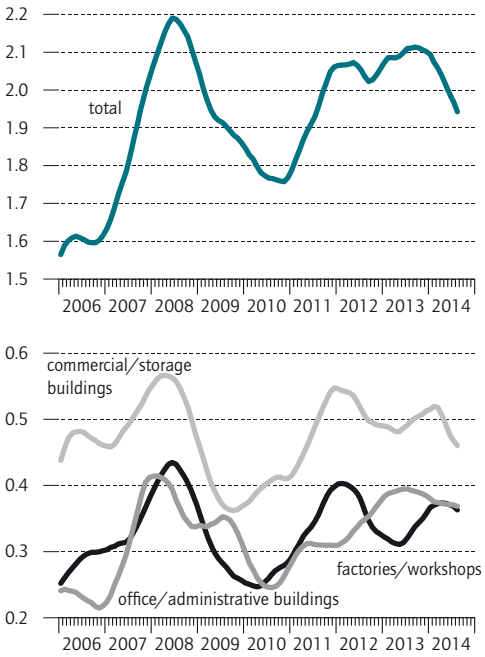
1 Seasonally adjusted according to the Berlin Proceedings (BV4).

Sources: Federal Statistical Office; calculations by DIW Berlin.

The volume of recently approved residential buildings is currently stable.

Figure 11

Building Permits in Non-Residential Construction
In billion euros,[1] trend components



1 Seasonally adjusted according to the Berlin Proceedings (BV4).

Sources: Federal Statistical Office; calculations by DIW Berlin.

Building permits for production, commercial, and storage buildings are currently on an upward trend.

ages implemented in 2009.[14] However, there is expected to be a marked increase in the volume of public construction in 2015: real growth of at least 4.6 percent is forecast.

The various construction segments are likely to benefit in equal measure from the forecasted developments in construction volume. The recovery of construction on existing buildings along with the continued stability of new residential construction figures in particular are evidence of this. In 2014, there is likely to be only one tenth of a percentage point difference between growth rates for the core construction industry and the finishing trades (at a level of over three percent) and in 2015 two-tenths of a percentage point (at a level of over two percent). For other construction services, weaker growth is anticipated as a result of the downward trend in building permits.

14 M, Gornig, H, Hagedorn, and C, Michelsen, "Bauwirtschaft: Zusätzliche Infrastrukturinvestitionen bringen zunächst keinen neuen Schwung," DIW Wochenbericht, no, 47 (2013),

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JEL: E32, E66

Keywords: Construction industry forecast, economic outlook

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Layout and Composition
eScriptum GmbH & Co KG, Berlin

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Sale and distribution
DIW Berlin