Office for National Statistics

Article

Construction statistics development: improving the understanding of new orders in the construction industry and the gap between output and new orders

Explanation and analysis as to the possible causes to explain the differences in Office for National Statistics construction output and new orders data. It also attempts to explain why in the most recent periods the difference between the two datasets has started to widen.

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1 . Main points

- Construction output in Great Britain data measure the value of construction work that has already taken place within the construction industry; new orders in the construction industry estimates provide a more forward-looking snapshot of potential future activity in the construction industry in Great Britain.
- Intuitively, it is commonly believed that construction new orders estimates should be higher than construction output, due to the consensus that a proportion of new orders will be cancelled; however, construction output new work data have consistently exceeded construction new orders estimates, with the gap between the two datasets most evident in the housing and private commercial sectors.
- There are various possible reasons for this; in this article we propose potential reasons and explanations relating to new orders in the construction industry.
- As a result of the two datasets having different intended purposes, they have clear conceptual and methodological differences; one notable difference is that new orders estimates exclude construction projects worth less than £100,000, however, these are captured within the construction output data.
- Construction new orders estimates are also unrevised by design, capturing current confidence and potential future construction activity at that exact point in time; as a result, new orders estimates do not capture the value by which projects are finally completed, which is what is captured in the construction output data.
- Evidence suggests that the exclusion of new orders worth less than £100,000 may also be a cause of the widening of the gap, with the number of small projects increasing over time, particularly from 2013 onwards.

2 . Introduction

We produce two main datasets relating to the construction industry in Great Britain. On a monthly basis we produce statistics on the value of Construction output in Great Britain, while on a quarterly basis we produce estimates on the value of New orders in the construction industry, using administrative data provided by Barbour ABI. This article clarifies the intended purposes of the construction output and construction new orders publications, as well as the clear methodological and conceptual differences between both datasets.

Both datasets give an overview of the trends within the construction industry as a whole. Construction output data give an indication of the immediate health and capture short-term movements in the construction industry, measuring the value of construction work that has already taken place. The surveyed results are used to produce seasonally adjusted monthly, quarterly and annual estimates of output in the construction industry at current price and at chained volume measures. In contrast, the new orders in the construction industry dataset provides a more forward-looking snapshot of both confidence and the potential future activity in the construction industry.

As a result of the two datasets having different intended purposes, they also have clear methodological and conceptual differences. Because of these differences, the value of construction output new work estimates have exceeded the value of new orders estimates. As part of our continuous engagement with data users, it is clear there is user demand to know more about the causes behind the widening gap between Office for National Statistics construction output and construction new orders statistics.

The full methodologies used to calculate construction output and new orders can be found in the Construction output Quality and Methodology Information (QMI) and the New orders QMI. In addition, the Quality assurances of administrative data used in construction statistics also highlights the quality assurance carried out on the data supplied by Barbour ABI.

3 . The gap: sector breakdown

We have measured the difference between construction output new work and new orders estimates. This is summarised in Table 1 and also within the following figures.

As shown in Table 1, which shows the average gap between construction output new work and new orders by sector, a gap has always existed between the two datasets. However, between 1997 to 2009, the gap was relatively small in size, averaging £6,798 million at a top level. However, as also shown in Table 1, on average the gap has grown in size from 2010 onwards, with the difference between the two averaging £28,205 million between 2010 to 2017.

Table 1: Average amount that construction output new work exceeds new orders by sector, current prices, non-seasonally adjusted
Great Britain, 1997 to 2017

£ million

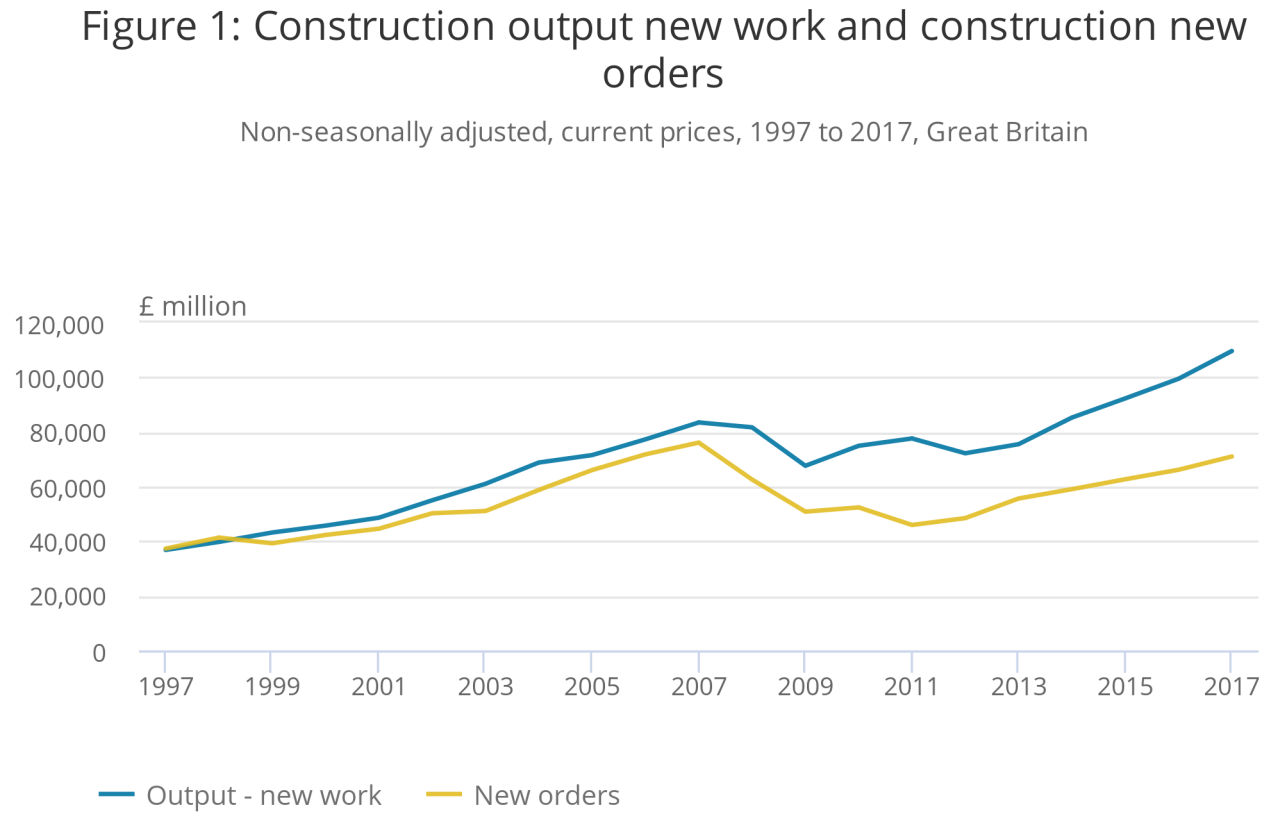
Period	All Sectors	Total Housing	Infrastructure	Public - other new work	Private industrial	Private commercial
1997 to 2009 average	6,798	3,390	2,216	-2,443	208	3,427
2010 to 2017 average	28,205	10,578	3,566	2,380	467	11,214

Source: Office for National Statistics

The divergence between the two datasets from 2010 onwards is also displayed in Figure 1, which depicts how the value of construction output has experienced marked growth since 2010 and again more notably since 2013. In contrast, new orders experienced a slowdown between 2010 and 2012, before increasing from 2013 onwards.

Figure 1: Construction output new work and construction new orders

Non-seasonally adjusted, current prices, 1997 to 2017, Great Britain

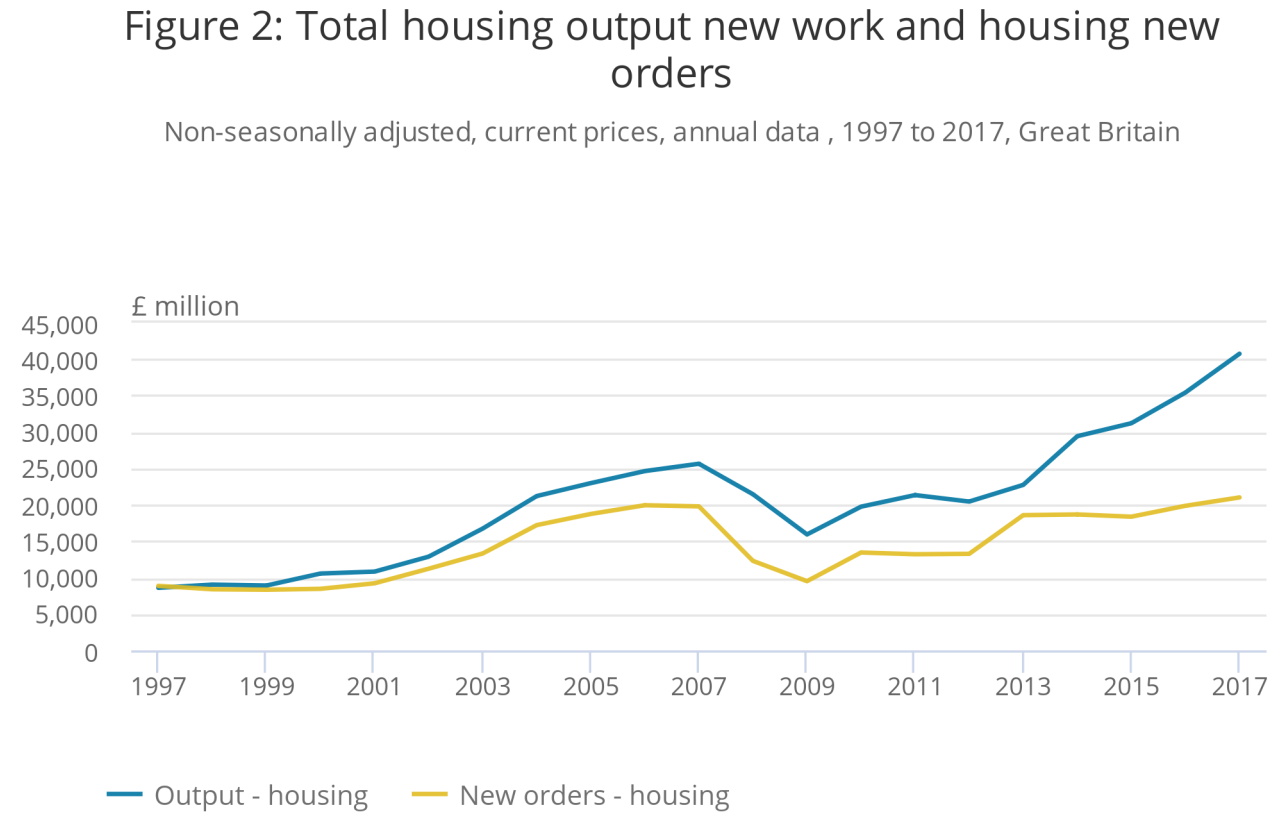


Source: Office for National Statistics

The top-level divergence between construction output new work and construction new orders is broadly mirrored in the housing sector, as depicted in Figure 2, with the value of housing construction output now more than double the value of housing new orders. Despite also being evident in the public housing series, both the existence of the gap and its widening is driven by the substantially larger private housing sector.

Figure 2: Total housing output new work and housing new orders

Non-seasonally adjusted, current prices, annual data , 1997 to 2017, Great Britain

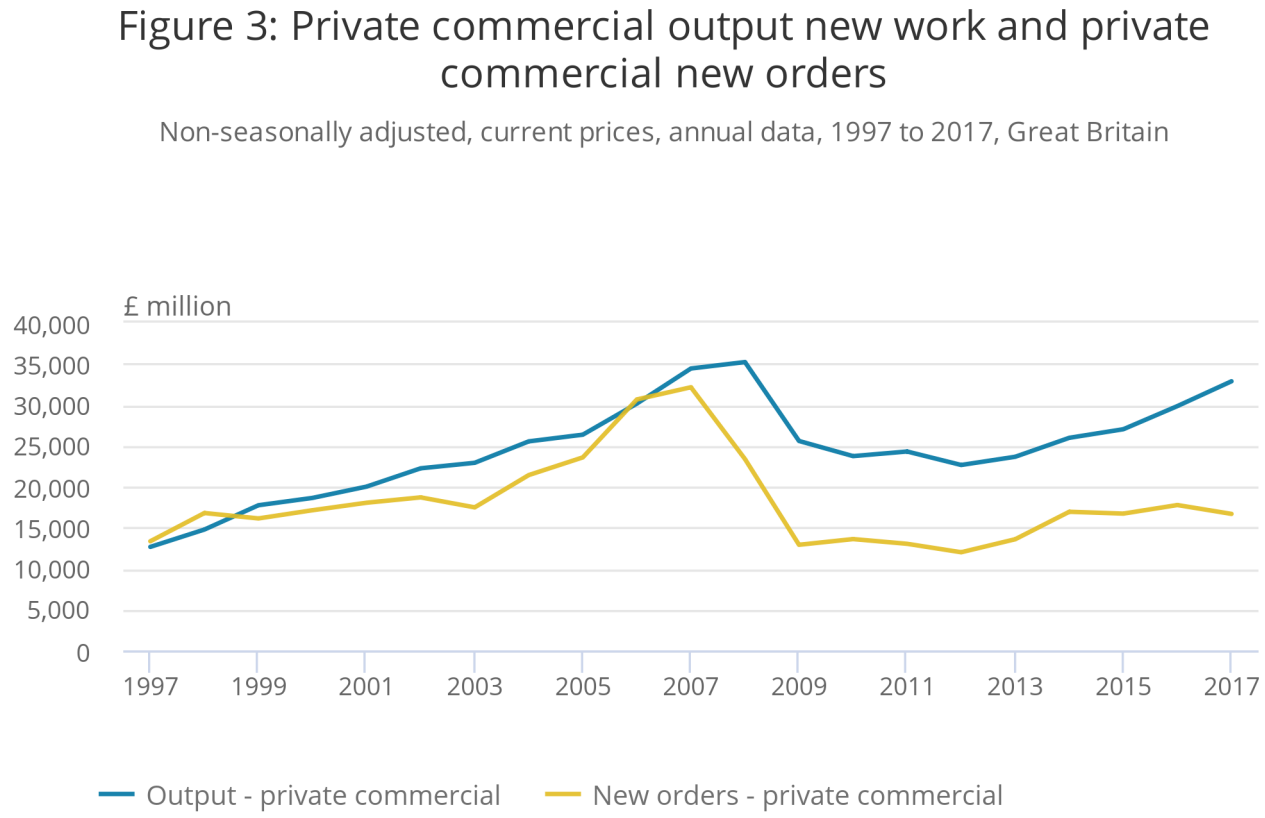


Source: Office for National Statistics

In addition to the housing sector, the gap between construction new work and new orders is also evident in the private commercial sector, albeit to a lesser extent than that seen in the housing sector. The gap between output and new orders in the private commercial sector – which is predominantly made up of entertainment and office construction activity – has also widened since 2010 and then again more noticeably since 2013, as shown in Figure 3.

Figure 3: Private commercial output new work and private commercial new orders

Non-seasonally adjusted, current prices, annual data, 1997 to 2017, Great Britain

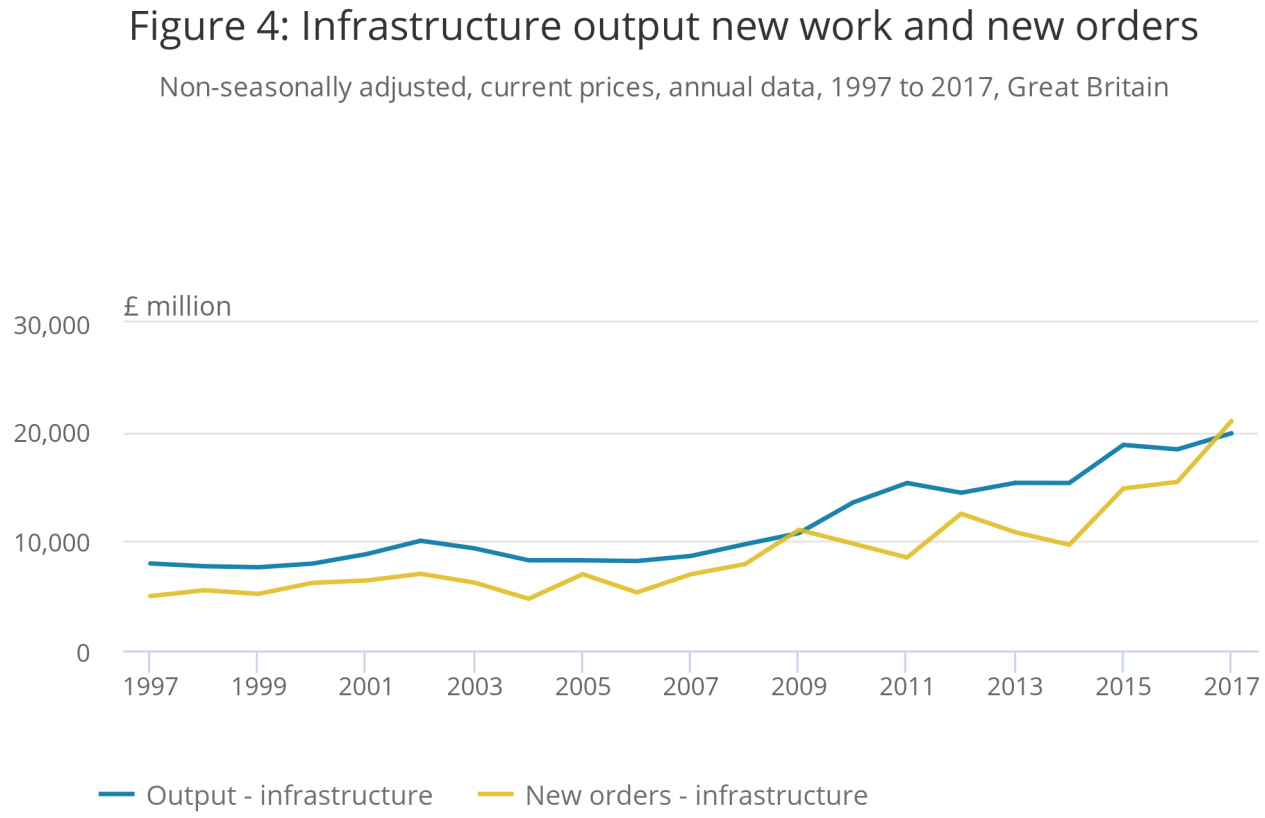


Source: Office for National Statistics

However, despite the gap widening in both the housing and commercial sectors as depicted in Figures 2 and 3, this is not the case across all sectors. For example, in the infrastructure sector – which is the third-largest component of construction output new work – and commonly comprises larger scale, higher value projects, the gap is relatively smaller. As depicted in Figure 4, which shows the gap between infrastructure construction output and new orders, with the exception of the large new orders placed in Quarter 3 (July to Sept) 2017 caused by the High Speed 2 rail construction project, the gap between the two datasets is significantly smaller.

Figure 4: Infrastructure output new work and new orders

Non-seasonally adjusted, current prices, annual data, 1997 to 2017, Great Britain

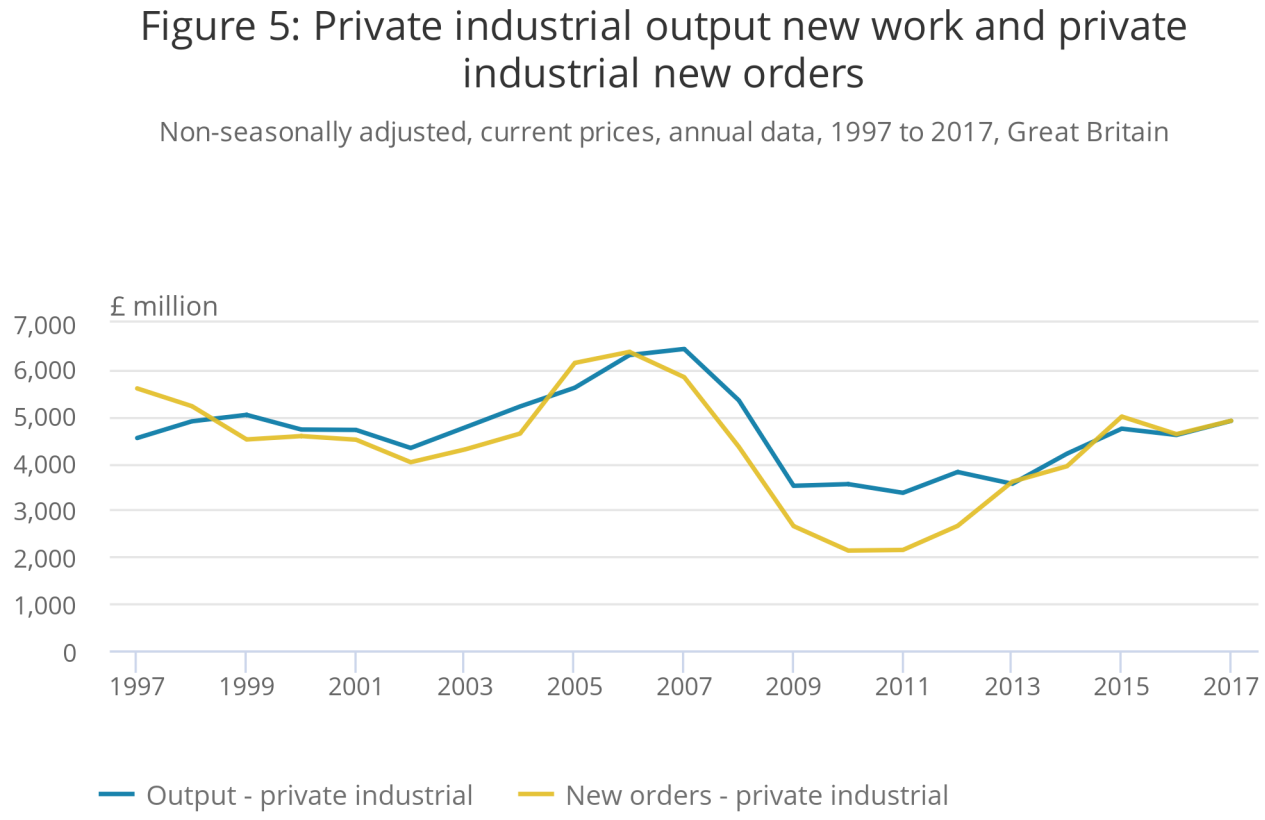


Source: Office for National Statistics

This is also the case in the relatively smaller private industrial sector, as shown in Figure 5, which also most commonly comprises larger-scale projects, such as factories and warehouses. Subsequently, the gap between private industrial construction output and new orders is significantly smaller than that seen in the housing and private commercial sectors.

Figure 5: Private industrial output new work and private industrial new orders

Non-seasonally adjusted, current prices, annual data, 1997 to 2017, Great Britain



Source: Office for National Statistics

Despite the gap between construction output and new orders widening at a top-level, it is evident this is not the case in all sectors. The causes of the gap and also its widening from 2010 onwards (also shown in Table 1), may therefore stem from particular sectors, most specifically the housing and private commercial sectors.

4 . Potential causes of the gap

Within new orders in the construction industry we have identified three potential causes of the gap between construction output and new orders. This section analyses these causes in more detail, using an array of data and anecdotal evidence from both within Office for National Statistics (ONS), from Barbour ABI and from expert members of the construction statistics steering group, which provides a forum for informed discussion and analysis on ONS construction statistics.

In addition to the three factors identified in this section and as part of our Continuous Improvement Development Programme, we will also continue to investigate further potential factors that may have also attributed to the gap and its widening.

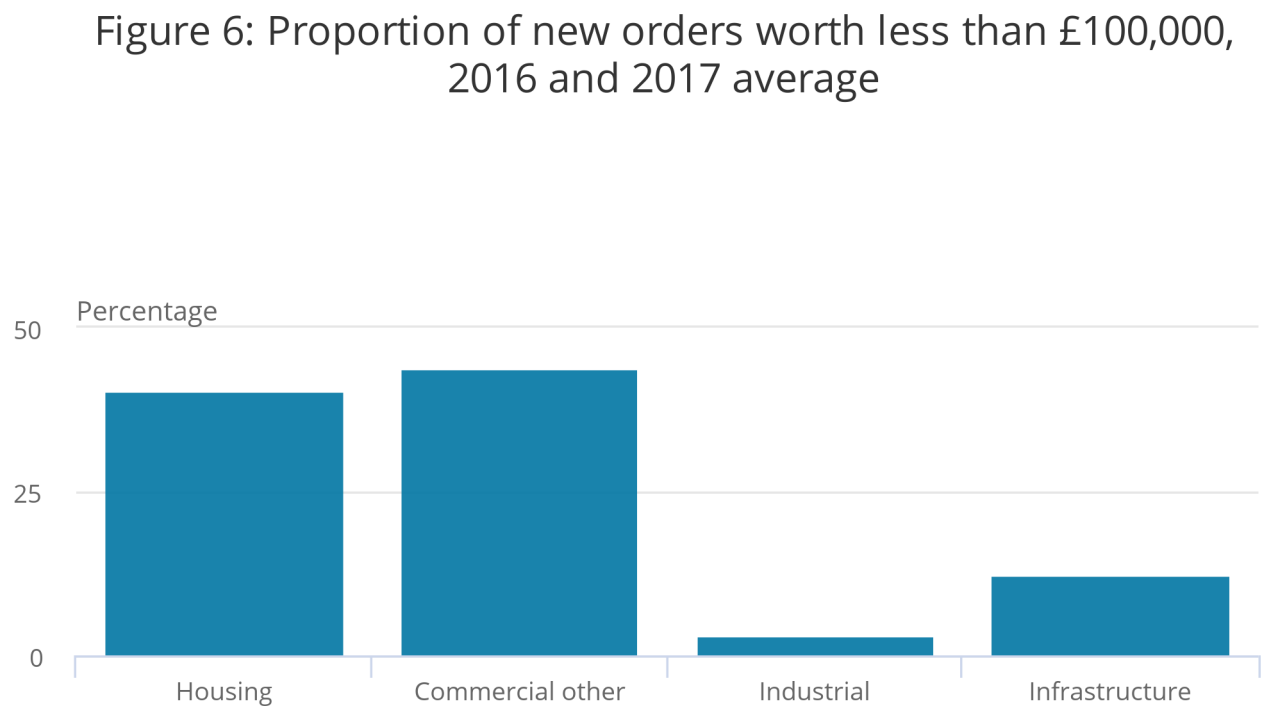
Exclusion of projects valued at less than £100,000 from new orders estimates

As stated in the new orders quality methodology information, ONS new orders estimates do not include projects worth less than £100,000. This threshold was adjusted upwards in Quarter 1 (Jan to Mar) 2010 from £25,000, as part of several improvements to the ONS new orders survey (PDF, 135KB) at that point in time. This adjustment was made to adjust for inflation and to also reduce the burden on survey respondents. As part of the continued improvements being made to ONS construction statistics, the ONS New Orders Survey was discontinued in Quarter 3 (July to Sept) 2013 and we used higher-quality administrative data provided by Barbour ABI. However, when Barbour ABI were awarded the contract to supply ONS new orders data from Quarter 3 2013 onwards, the £100,000 threshold was maintained. It should be noted that Barbour ABI do hold data on projects worth less than £100,000, which they have made available to ONS for further evaluation.

The need for the exclusion of this lower value cohort of projects from new orders estimates arises due to the difficulty in sufficient data collection on the individual project value of these less than £100,000 new orders. However, to further explain the composition of the lower value cohort of projects that are excluded from new orders estimates, Barbour ABI have supplied project count data on all new orders worth less than £100,000 for 2016 and 2017, which are recorded using Barbour ABI's Planning Database. These data have allowed us to understand further the impact of not including projects less than the chosen threshold.

Some significant data cleaning is needed to make Barbour ABI's Planning Database data consistent with ONS data, including the removal of potential repair and maintenance work included in the data, which if included may overestimate the amount of genuine smaller new work projects taking place. Following this data cleaning process, there was an estimated average of 180,000 new orders worth less than £100,000 in 2016 and 2017, with further evidence suggesting the number of the less than £100,000 projects has been rising since 2010.

Figure 6: Proportion of new orders worth less than £100,000, 2016 and 2017 average



Source: Barbour ABI's Planning Database

As can be seen in Figure 6, the majority of the new orders worth less than £100,000 in 2016 and 2017 were concentrated in the housing and commercial other sectors. As shown in Figure 6, the commercial other sector also accounted for a high proportion of the lower value projects in 2016 and 2017, with 43.9% occurring in this sector. In addition, 40.5% of all new orders worth less than £100,000 in 2016 and 2017 occurred in the housing sector, in part due to the often-smaller scale nature of individual new housing orders.

In contrast, very few of the lower value new orders were found to occur in the industrial and infrastructure sectors. Construction activity in these sectors is more commonly associated with larger scale, high value projects. Both the industrial and infrastructure sectors combined contributed an average of just 15.6% of the number of projects with a value of less than £100,000 in 2016 and 2017.

The concentration of these lower value projects, as depicted in Figure 6, offers some explanation as to why and where the gap between construction output and new orders exists. As shown in Table 1, and also Figures 2 and 3, the gap between the two datasets is most evident in the housing and private commercial sectors. This appears to stem from the exclusion of the smaller new orders worth less than £100,000, with over three-quarters of these lower value projects occurring in the housing and commercial other sectors in 2016 and 2017.

In addition to offering some explanation as to where the gap is biggest, the small project data shown in Figure 6 also sheds light on why and where the gap between construction output and new orders is smallest. As shown in Figure 5, the gap between the two datasets is less pronounced in the relatively smaller private industrial sector – as a result of construction activity in this sector being most commonly associated with larger scale projects, with only 3.1% of the lower value projects classed as industrial in 2016 and 2017.

Despite Barbour ABI's Planning Database data providing an indication of the make-up of the less than £100,000 projects that are currently excluded from new orders estimates, attempting to gather a further understanding of the value of this part of the construction industry on a detailed and regular basis is inherently difficult.

Construction new orders exceeding initial budget estimates

As stated in Section 2 of this article, ONS new orders estimates are designed to capture a point in time snapshot of confidence and potential future activity in the industry. As a result of this, new orders estimates published by ONS are unrevised. Therefore, new orders data do not include or account for projects that are cancelled or exceed the initial budgets. However, project overspends would be captured in construction output estimates, which can contribute to a significant proportion of the gap between construction output and new orders.

Projects can exceed initial budgets for a variety of reasons, including optimistic initial budget forecasts, changes in project specification or general project overspend. In order to investigate this further, a sample of 97 completed new orders projects has been provided by Barbour ABI, to enable a detailed analysis on a case by case basis. This sample includes a variety of higher value completed projects, from varying regions and sectors, with original project values between £50 million and £600 million.

Table 2: Sample of completed new orders and their budget outcome, by type of work

Type of work	Projects under budget	Projects completed on budget	Projects exceeding budgets
Hotels	0	1	1
Health	0	3	2
Air	0	0	1
Office	0	0	1
Housing	0	15	2
Miscellaneous	0	4	2
Road	0	2	3
Rail	0	0	3
Electricity	0	10	6
Offices	0	9	5
Universities	0	1	2
Warehouses	3	4	2
Shops	1	2	2
Harbour	0	1	0
Sewerage	1	2	0
Schools	0	2	0
Water	0	1	0
Factories	0	3	0
Total	5	60	32

Source: Office for National Statistics

As Table 2 shows, 61.9% of the projects in the sample were completed on budget, with the actual cost of the project equalling the original reported estimated cost. However, as also shown in Table 2, a significant proportion of the projects were delivered over budget. Within the random sample of projects, 33.0% did exceed initial budget estimates, with a high proportion of these overspends occurring in the housing sector. In contrast, only 5.2% of the sample were found to be completed under budget.

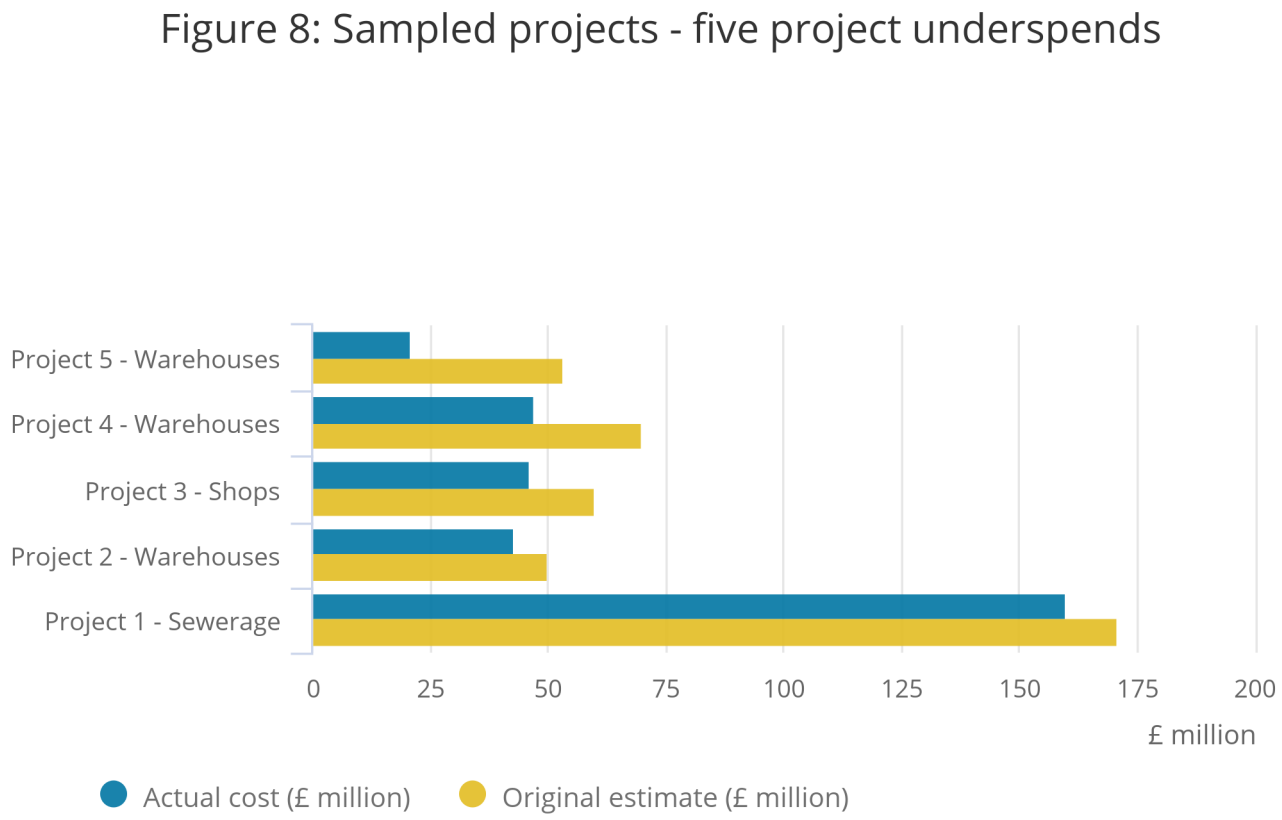
Figure 7 shows some of the individual project data, anonymised and identified only by its sector, which exceeded original budget estimates. The rate at which projects overspend varies by sector, with some projects exceeding original budgets by up to 150%, with the overspends occurring across a variety of sectors.

Figure 7: Sampled individual projects - five project overspends

Source: Barbour ABI

In contrast, as shown in Table 2, a proportion of individual projects are delivered under budget. However, these projects are relatively rare. As seen in Figure 8, only 5 of the 97 sampled projects were completed at a cost lower than the original budget estimate. In addition to being relatively few in number, these underspends are also relatively smaller in size, with project underspends ranging between 6.4% and 60.7%.

Figure 8: Sampled projects - five project underspends



Source: Barbour ABI

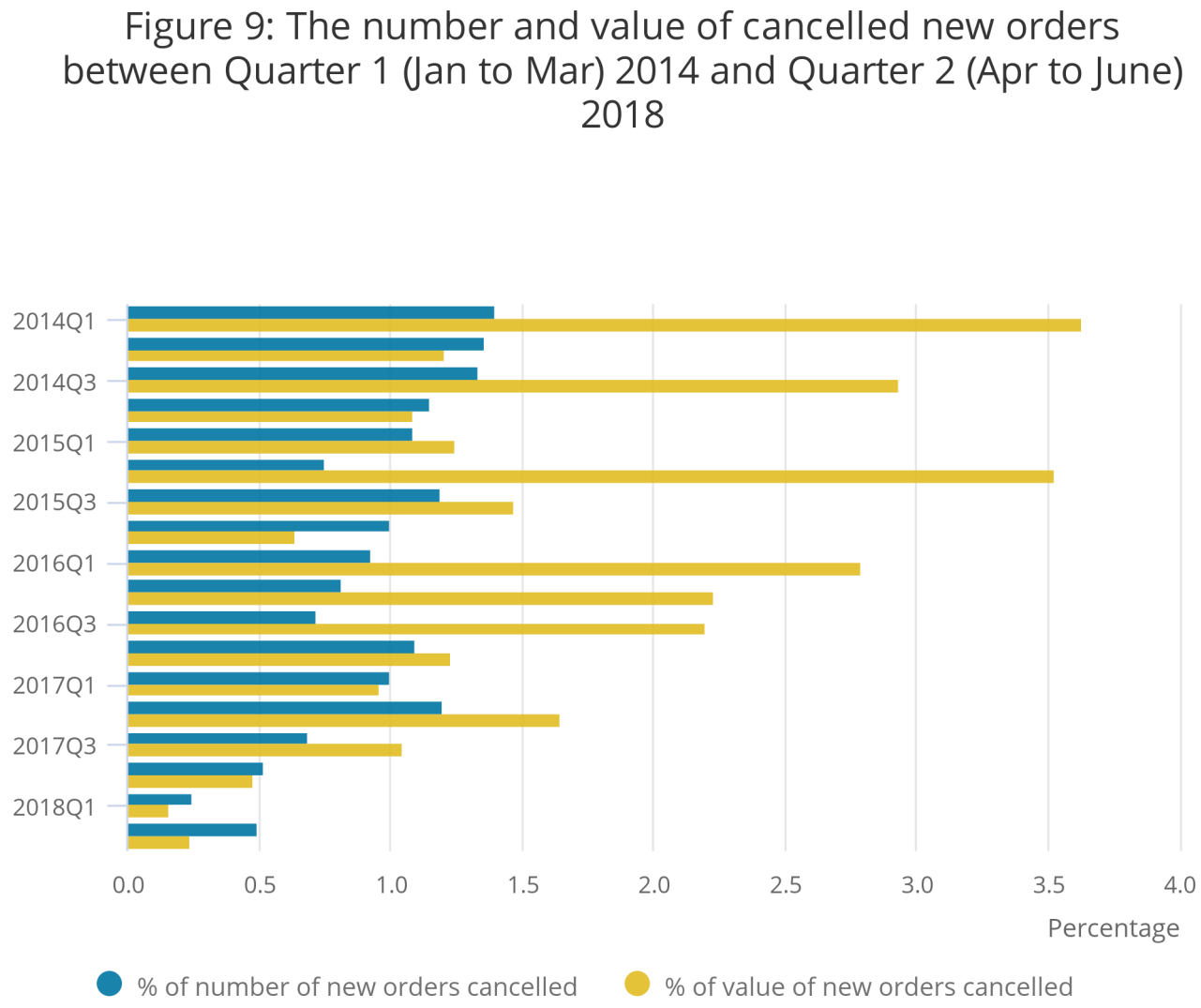
As already stated in this section, we acknowledge this sample of new orders is relatively small relative to the wider construction industry, in part due to the difficult nature of tracking the genuine value of individual construction project values over time. However, this sample highlights how a proportion of projects do exceed budgets, often by considerable amounts. In this sample alone, the average overspends of all projects weighted by project values equates to 7.4%, which would be captured in construction output figures but not reflected in the unrevised published new orders estimates.

Low new order cancellation rate

Intuitively, it is commonly believed that construction new orders estimates should be higher than construction output, due to the consensus that a proportion of new orders will be cancelled, resulting in no construction work ever occurring. However, using data provided by Barbour ABI, it is evident that the rate at which new orders have been cancelled in recent years has been found to be relatively low.

As a consequence of the volatile nature of the construction industry, a substantial proportion of new orders are placed with construction work beginning a considerable time after the contract is awarded. Many new orders are also either delayed, postponed or even cancelled. However, as can be seen in Figure 9, on average in each quarter 1.1% of the number of new orders were cancelled between Quarter 1 (Jan to Mar) 2014 and Quarter 2 (Apr to June) 2018. In terms of the total value of all cancelled new orders, this translates to an average of 1.9% of the total value of new orders across the period.

Figure 9: The number and value of cancelled new orders between Quarter 1 (Jan to Mar) 2014 and Quarter 2 (Apr to June) 2018



Source: Barbour ABI

As also shown in Figure 9, both the number and value of cancelled projects has decreased relatively consistently between Quarter 1 2014 and Quarter 2 2018, with only 0.2% of the total value of new orders in Quarter 2 being cancelled. In comparison, at the beginning of the sampled period in Quarter 1 2014, the value of the cancelled new orders equated to 3.6%.

It must be noted that these figures can still change over time, in particular in more recent periods, where new order cancellations may still occur. It is also expected that the number and value of the cancelled new orders would deviate at different points in the business cycle and may be considerably higher during periods of economic downturn.

5 . Why is the gap widening over time?

As explained in Section 3 of this article, the gap between construction output and new orders has widened since 2010. Working closely with Barbour ABI, we believe that the widening of the gap stems predominantly from the same factors that have caused the gap, outlined in Section 4 of this article.

Using planning application data from the Barbour ABI's Planning Database (also used in Section 4, Figure 6) as well as anecdotal evidence from Barbour ABI, the number of planning applications submitted in the lower value cohort of projects worth less than £100,000, has increased notably from 2010 onwards. This increase stems from the housing sector, one of the sectors in which the gap is largest (as shown in Figure 2).

However, despite some evidence suggesting that activity in the lower value segment of the construction industry is increasing, it is inherently difficult to gather further data on these lower value projects and more specifically to place a value on individual projects. In the future, we plan to continue to work closely with Barbour ABI in order to gain a better understanding of both the type and value of the projects within this lower value cohort.

In addition, as also outlined in Section 4, the rate at which new orders have been cancelled since 2014 has been relatively low and has decreased over time, as shown in Table 3. Part of the widening of the gap may have therefore been caused as a result of the construction industry (and the wider economy) enjoying a period of recovery following the economic downturn in 2008, resulting in fewer new orders being cancelled, with more construction activity eventually taking place.

6 . Next steps and future work

The nature of the construction industry is challenging to measure and recent improvements by Office for National Statistics (ONS) over the last two years, both in the methods used and collection of the data, have improved the quality of the monthly and quarterly estimates to meet user needs and increased demand.

This article has described clear conceptual and methodological differences between the construction output data and new orders estimates, including the data collection of lower value work, completion to budget and cancellation rates.

We have an ongoing continuous development approach to ensure estimates continue to meet user needs. We will continue to work closely with Barbour ABI and the ONS construction statistics steering group. This group provides a forum for us to engage with main users of construction statistics on the development of ONS-published construction statistics, including other government departments, industry experts and academics, to identify the main areas for analysis and improvement.