

Modelling Construction Statistics Deflators

Kate Davies, Construction and Retail Sales Branch, December 2014

Introduction

Following an announcement by the Department for Business Innovation and Skills to suspend the publication of its construction and price indices¹, the Office for National Statistics (ONS), has used statistical models to create price indices used for the deflation of current price output in the construction and new orders data. This article provides a summary of the methods and the resulting indices for Q4 2014.

Background

The ONS currently uses price statistics to remove the effects of price movements (deflation) from current price estimates of the construction industry. Tender price indices are used to deflate new orders in the construction industry; these tender price indices are then converted by ONS to output price indices, which are used to deflate output in the construction industry.

The tender price indices are supplied to ONS by Aecom under a contract with the Department for Business Innovation and Skills (BIS). When this contract was let in July 2013, Aecom embarked on a programme of change to update and refresh the methodology. Following initial quality assurance of the new indices, BIS has concluded that further investigatory work is needed before they are ready for publication.

Thus in order to continue publishing chained volume measures of output in the construction industry and volume measure of new orders, ONS has created statistical models of the tender and output price indices needed for the deflation of the corresponding current price data for quarter 3, July to September, and quarter 4, October to December, 2014.

Method used

Tender price indices

All tender price indices (TPIs) have been created using automotive identification and modelling RegSARIMA models from the GSS recommended software X-13-SEATS. The results for these TPIs are shown in tables 1a of Annexe A.

Output price indices

Output price indices (OPIs) have been created in two ways. The OPIs for:

- Private housing
- Public housing repair and maintenance
- Private housing repair and maintenance
- Non-housing repair and maintenance

¹ <https://www.gov.uk/government/collections/price-and-cost-indices>

Have been created using automotive identification and modelling RegSARIMA models from the GSS recommended software X-13-SEATS. The results for these TPI's are shown in table 2a of Annex A.

The OPI's for

- Public housing
- Infrastructure
- Public other new work
- Private industrial
- Private commercial

Use the statistically modelled TPIs for this type of work and are then 'grown' using a weighted model of the previously published quarters of the TPIs. The following weighting system is applied.

Table 1. Periodic weights applied to TPIs to calculate OPIs

	Period										
	n	n-1	n-2	n-3	n-4	n-5	n-5	n-6	n-8	n-9	n-10
Public housing	0.07	0.14	0.18	0.2	0.17	0.13	0.08	0.04			
Infrastructure	0.07	0.11	0.13	0.13	0.13	0.12	0.1	0.08	0.06	0.04	0.02
Public non-housing	0.08	0.16	0.2	0.2	0.17	0.12	0.07	0.03			
Private industrial	0.16	0.28	0.27	0.17	0.09	0.05					
Private commercial	0.12	0.2	0.21	0.19	0.14	0.09	0.05				

Quality Assurance

All statistically modelled data has been created and quality assured by experts from the Office for National Statistics Time Series Analysis Branch.

Annexe A

Table 1 – Statistically modelled TPIs, methods and quality information

Series	Transformation	Model	Regression	Forecast	95% CI
Public housing	None	(1,1,1)(0,0,1)	Constant LS2011.2	205.0	(197.9, 212.1)
Infrastructure	Log	(1,1,1)(0,0,1)	Constant	134.6	(130.0, 139.3)
Public non-housing	None	(1,1,1)(1,0,0)	Constant	205.0	(197.5, 212.7)
Private industrial	Log	(0,1,1)(0,1,1)	None	191.5	(173.0, 211.9)
Private commercial	Log	(3,1,1)	AO2013.2	201.1	(187.2, 216.0)

Table 2 – Statistically modelled OPIs, methods and quality information

Series	Transformation	Model	Regression	Forecast	95% CI
Private housing	Log	(0,1,1)(0,1,1)	Constant AO2006.1 LS2009.2	206.9	(204.2, 209.6)
Public housing repair and maintenance	Log	(0,1,0)(1,0,0)	Constant AO2009.1	188.8	(183.0, 197.7)
Private housing repair and maintenance	Log	(1,1,1)(1,0,0)	Constant	382.0	(369.3, 395.2)
Non-housing repair and maintenance	None	(1,1,0)	None	180.5	(174.3, 186.6)