



Information Paper

Changes to the Weights of the Price Indexes for the Output of the General Construction Industry

Australia

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Brian Pink
Australian Statistician

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PREFACE

The purpose of this Information Paper is to describe the changes that are being made to the Producer Price Indexes (PPIs) as a result of the introduction of new weights for the price indexes for the output of the general construction industry. The first publication of PPIs with these new weights will be in respect of the December quarter 2007, which will be released on 21 January 2008.

The Australian Bureau of Statistics (ABS) undertakes periodic reviews of its price indexes to ensure that they continue to meet users' needs and reflect current economic conditions. The main objective of these reviews is to update the quantities of goods and services that underpin the value weights of the index but they also provide an opportunity to reassess the scope and coverage of the index.

The current review addressed all weights at and above the published levels of the index and the weights of the index below the published level for Residential building construction n.e.c and Non-residential building construction. The scope of the index has not changed as a result of this review, however, there have been changes to the coverage of prices of Residential building construction n.e.c and Non-residential building construction to take account of contemporary building activity and practices.

This Information Paper describes the broad outcomes of the review. It describes the data used in deriving the weights and presents the updated weighting pattern. It also presents some information on the concepts behind the index and the methods and data used to produce it.

For more information about this review contact Lee Taylor on Canberra (02) 6252 6251, or email <lee.taylor@abs.gov.au>.

Brian Pink
Australian Statistician

ABBREVIATIONS

ABS	Australian Bureau of Statistics
ANZSIC	Australian and New Zealand Standard Industrial Classification
ANZSIC06	<i>Australian and New Zealand Standard Industrial Classification, 2006 Edition</i>
ANZSIC93	<i>Australian and New Zealand Standard Industrial Classification, 1993 Edition</i>
CPI	Consumer Price Index
n.e.c.	not elsewhere classified
PPI	Producer Price Index
SOP	Stage of Production

CHAPTER 1 INTRODUCTION

INTRODUCTION

The ABS first published a price index for the output of the building industry (ANZSIC93 group 411) in the June quarter 2001 issue of *Producer Price Indexes, Australia* (cat. no. 6427.0). This index was an aggregate of the indexes for the three ANZSIC93 classes: House construction (4111), Residential building construction n.e.c. (4112) and Non-residential building construction (4113). A price index for the output of the general construction industry (ANZSIC93 subdivision 41), together with its constituent indexes was published for the first time in the September quarter 2002 issue of cat. no. 6427.0. This series differed from the previous aggregate in that it included a component for Road and bridge construction (ANZSIC93 class 4121). The above indexes had been published only at the national level of aggregation until December quarter 2005 when they were made available on a state basis. An index for the ANZSIC93 class Non-building construction n.e.c. (4122) is not currently produced.

A key reason that these indexes have been developed is to provide suitable deflators for the production of volume measures of capital expenditure in the National Accounts. They also provide an important component of domestic final capital in Stage of Production (SOP) Producer Price Indexes.

This is the first review and reweight of the indexes since they were developed and has been undertaken to reflect current expenditure and practices in the industry and take account of the availability of new weighting data. The review was also conducted in anticipation of the implementation of a new edition of the ANZSIC (ie ANZSIC06).

The review and consequent reweight addressed all published levels of the indexes (at and above the ANZSIC class at the state and national levels of aggregation) plus the whole structure of the indexes for ANZSIC93 classes 4112 and 4113. In addition to a change in the quantities which underpin the value weights of the index, some changes were also made to the index structure, weighting methods, weighting data sources and price samples. The new weights will be implemented in respect of the December quarter 2007.

CHAPTER 2 ABOUT THE CONSTRUCTION INDEXES

GENERAL CONCEPTS

The indexes of general construction are output indexes. That is, they measure change in the prices (revenue) received by businesses undertaking construction. The valuation basis of the output prices measured by the index is basic prices. Basic prices are defined as the revenue received by the producer from the purchaser for a unit of a good or service produced as output, minus any direct tax paid (e.g. GST). For further information on this and other pricing bases used in PPIs refer to *Producer and International Trade Price Indexes, Concepts Sources and Methods* (cat. no. 6429.0).

The general construction price indexes are presented using the ANZSIC industry framework as the indexes cover the principal products produced by the industries. Users should note that value weights of the indexes reflect total product supply rather than total industry outputs. For example, the value weight for non-residential building construction includes not only the values of non-residential buildings produced by the building construction industry, but also the value of non-residential buildings produced by other industries such as the mining industry. Conversely, businesses classified to the non-residential building construction industry produce not only non-residential buildings, but also other construction outputs, construction trade services, property services, and business services. The value weights for non-residential building construction do not cover these additional industry outputs.

The indexes aim to measure outputs of a capital nature, and therefore the scope of the indexes is new construction and alterations and additions. Repair and maintenance is excluded. The cost of land is also excluded.

The indexes cover each State and Territory and Australia. The scope, and therefore the upper level weights, of these indexes is for construction activity in the whole of Australia. This is to take account of the fact that much construction activity is not confined to capital cities. Practicalities do dictate, however, that in the production of lower level weights and the collection of price information, coverage is in some instances restricted to capital cities.

HOUSE CONSTRUCTION (4111)

The house construction index measures price change for the construction of all new houses (single detached dwellings). A representative sample of project homes, matched on the basis of model specifications each quarter to ensure constant quality, is selected to represent the price movements for all house construction in each of the eight capital cities. Prices are collected every month and compiled to produce a quarterly index. Quality adjustments are made when builders offer bonus inclusions or the project home specifications change. The price sample used in this index is also used in the index for house purchase in the *Consumer Price Index, Australia* (cat. no. 6401.0) and in the project homes price index published in *House Price Indexes: Eight Capital Cities* (cat. no. 6416.0). For more information on the differences between these three measures see Chapter 3 below. More information on the project homes indexes can also be found in the ABS publications *Consumer Price Indexes: Concepts, Sources and Methods* (cat. no. 6461.0), and *A Guide to House Price Indexes* (cat. no. 6464.0).

RESIDENTIAL BUILDING CONSTRUCTION N.E.C. (4112) AND NON-RESIDENTIAL

Outputs of the Residential building construction n.e.c. industry include non-house dwellings such as semi-detached, row, terrace or townhouses and flats, units or apartments. Non-residential building construction outputs include shops, offices, factories and hotels. The indexes measure changes in the price of the construction

CHAPTER 2 ABOUT THE CONSTRUCTION INDEXES *continued*

BUILDING CONSTRUCTION (4113)

output of whole structures, and for Residential building construction n.e.c. this would be a block or development of units rather than individual units.

By their nature, these industries tend to produce unique outputs. Consequently it is difficult to measure quarterly price change in comparable completed structures each quarter. The indexes are therefore produced by measuring the price change in a fixed set of components of a number of hypothetical structures. In this method, a set of model buildings are developed to represent in-scope output in each state. Each building is broken down into a set of construction components falling into standard categories based on building elements (e.g. preliminaries, substructure, superstructure, finishes, fittings and services). A set of components are selected to represent all the components in the model buildings. The price movements of this component set are weighted together by their relevant shares of the total revenue notionally received for each building model (taking into account the proportion of building activity represented by each model) to produce indexes for Residential building construction n.e.c. and Non-residential building construction.

The building output which is covered by these components represents work undertaken by a contractor to complete a structure on a prepared site. Components that are not generally covered by a standard construction contract between a client and a builder are excluded, e.g. siteworks (e.g. construction of roads), external services (e.g. external stormwater drainage), design and other related technical services, are excluded. Demolition of pre-existing structures is also excluded, although demolition activities specifically related to alterations and additions are included as they would generally be covered in the contract.

Components are priced as "work in place". Unit rates (the price per unit of quantity for a specified quantity of output) are collected as all inclusive prices which cover material, plant and labour inputs, plus subcontractors' margins and overheads. Although the item being priced may be hypothetical, it is specified in such a way that its unit rate can represent as closely as possible a market price, which can be priced consistently (i.e. to a constant quality) every quarter.

Prices for these indexes are purchased by the ABS from quantity surveyors. In all States and Territories except Queensland, prices are for work in each capital city, as building activity in the city is taken to represent the whole State. For Queensland, prices are also obtained for North Queensland, in addition to Brisbane, to take account of the dispersal of building activity in that State.

Although quarter to quarter pricing covers changes in subcontractors' margins, the prime contractors' margin is set as a fixed percentage of costs. This practice is adopted as the ABS has been unable to develop an accurate and objective method of measuring prime contractors' margins.

ROAD AND BRIDGE CONSTRUCTION (4121)

In a manner similar to that used for Residential building construction n.e.c. and Non-residential building construction, the ABS has broken down Road and bridge construction into a set of components common to a wide range of projects. The broadest categories of these components are: preliminaries; drainage; earthworks; pavement and surface; furniture and landscaping; and bridges. The construction output

CHAPTER 2 ABOUT THE CONSTRUCTION INDEXES *continued*

ROAD AND BRIDGE
CONSTRUCTION (4121)
continued

does not cover land acquisition, design, other related technical services, traffic lights and tunnelling.

The components and their value weights are derived from information relating to a selection of representative main road and highway projects in New South Wales, Victoria, Queensland, South Australia and Western Australia.

Prices for the components are collected on a quarterly basis, mostly via ABS surveys. Prices are ideally collected as work in place (an all inclusive price for a service or output, e.g. including installation), however where this is not possible some components use input prices (labour, materials and plant).

This index sets the prime contractor's margin at a fixed percentage of costs.

NON-BUILDING
CONSTRUCTION N.E.C.
(4122)

This output covers a wide range of civil and engineering construction other than roads and bridges and includes railways, dams, pipelines, telecommunications and electricity related construction. No index is currently produced for this output.

CHAPTER 3 THE REVIEW

THE REVIEW

The review and consequent reweight covered all published levels of the indexes (at and above the ANZSIC class at the state and national levels) plus the entire structures of the indexes for the classes of Residential building construction n.e.c. (4112) and Non-residential building construction (4113). As a consequence of the review, the fixed quantities of goods and services that underpin the value weights of each level of the indexes have changed and the period of time to which they refer (the weighting reference period) has been updated. There has been no change to the index reference base, which remains at 1998–99=100.

Appendix 1 compares the new weighting pattern to the previous pattern for the published index aggregates.

The effect of a new weighting pattern is that price movements will be combined in a different manner in the parts of the index with new value weights. However, a linking process is used to ensure that the transition from one set of weights to another does not create a break in the time series of the index. For more information on this process refer to *Producer and International Trade Price Indexes, Concepts Sources and Methods* (cat. no. 6429.0).

UPPER LEVEL WEIGHTS

The weights at the upper level of the index (ANZSIC class and above at the national level of aggregation) are based on the values of the supply of new construction products in Australia as measured in ABS Input–Output statistics. Input–Output data for 2001–02 has been used to replace existing weights based on 1996–97 values. Input–Output statistics measure the values of the supply of the products: Residential building construction, Non-residential building construction, Road and bridge construction and Non-building construction n.e.c. As the figure for residential building construction includes both houses and other residential building, it was split into House construction and Residential building construction n.e.c. with supplementary data on contracting income by asset type from the ABS Construction Industry Survey and other ABS economic activity survey data.

The 2001–02 value weights have been updated by price movements to September quarter 2007, providing a weighting pattern that in effect represents 2001–02 quantities at September quarter 2007 prices.

A new feature of the index structure is that it will enable the incorporation of an index for the output of the ANZSIC class Non-building construction n.e.c. (4122) should it be developed in future.

Input–Output values for construction for 2001–02 will be also used to reweight the Stage of Production indexes when those indexes are updated.

WEIGHTS AT THE STATE AND TERRITORY LEVEL

The value weights at the national level of aggregation for ANZSIC classes are broken down into State and Territory values using proportions derived from ABS building and construction activity statistics on the value of work done. These State and Territory value weights are used to combine movements of State and Territory indexes at the ANZSIC class level to produce national level indexes. Previous proportions for the ANZSIC classes of 4112, 4113 and 4121 were derived from a 5 year average of values of work done from the years 1994–95 to 1998–99. New proportions for all ANZSIC classes have been derived from the two calendar years 2005 and 2006. This change in method will allow for more

CHAPTER 3 THE REVIEW *continued*

WEIGHTS AT THE STATE AND TERRITORY LEVEL *continued*

frequent reweighting and chaining of the index at the published level, so that it can be more responsive to changes in geographic distributions of activity within the industry, while still maintaining some smoothing of year to year volatility.

WEIGHTS BELOW THE PUBLISHED LEVEL

Value weights at the most basic component level for Residential building construction n.e.c. (4112) and Non-residential building construction (4113) are derived from a set of building models developed by quantity surveyors to represent typical buildings in a range of building function categories contributing most significantly to Australian output. In this review a new set of models were developed to represent the following building function categories: other residential; offices; wholesale/retail trade; industrial; education; health; aged care; accommodation and entertainment. In addition, a model was developed to represent an alterations and additions project. The models were developed to take account of contemporary building (such as environmentally-oriented design elements) and also to take account of differences in State and Territory building practices and building codes. The models were valued with respect to 2006–07 prices and quantities. The review also involved developing a new set of representative components to be priced each quarter.

There have been no changes to the value weights at the component level for the index for Road and bridge construction (4121) as these were out of scope of this review. The value weights continue to be based on quantities relating to a selection of representative main road and highway projects in New South Wales, Victoria, Queensland, South Australia and Western Australia undertaken in the 5 years to 1998–99.

A CHANGE TO THE SOURCE FOR WEIGHTING HOUSE CONSTRUCTION (4111)

There has been a change to the source of weighting House construction (4111). As mentioned above, the price sample used in this index is also used in the index for house purchase in the *Consumer Price Index, Australia* (cat. no. 6401.0) and in the project homes price index published in *House Price Indexes: Eight Capital Cities* (cat. no. 6416.0). Previously the State and Territory percentage contributions to the national index for House construction (4111) were sourced from equivalent capital cities in the CPI. The new source for percentage contributions to the national index for House construction (4111) is building activity value of work done for the two calendar years 2005 and 2006. This change was made to align the weighting source with the other ANZSIC class level construction indexes.

There are three national level new house price indexes produced by the ABS. The three indexes are all conceptually different and have different weighting patterns. Table 1 below summarises the differences between the three published indexes with regards to the approach to weighting and conceptual differences.

CHAPTER 3 THE REVIEW *continued*

TABLE 1: SUMMARY OF DIFFERENCES BETWEEN ABS HOUSE PRICE INDEXES

<i>ABS House Price Indexes</i>	<i>Where published</i>	<i>Weights</i>	<i>Conceptual differences</i>
4111 House Construction	6427.0 Table 16 (PPI)	From December quarter 2007 Input–Output product supply at basic prices for residential building split into house construction and other residential building construction with data on contracting income by asset type from the ABS Construction Industry Survey and other ABS economic activity survey data. State percentage contributions to house construction allocated with value of work done by State for 2005 and 2006 from the Building Activity Collection.	Pricing basis: Basic prices, GST excluded. Scope: Australia, new production (including alterations and additions), land excluded. New houses are represented by project homes.
House Purchase: Weighted average of eight capital cities	6401.0 Tables 7A to 7L (CPI)	The average value of private dwelling completions by capital city published in Building Activity, Australia (cat. no. 8752.0) are applied to the net change in the number of owner occupied households measured by the Population Census. Subsidies paid to first home owners are treated as negative expenditure. Alterations and additions are derived from Household Expenditure Survey data.	Pricing basis: Purchaser prices, GST included, subsidy subtracted from price. Scope: 8 capital cities, net addition to housing stock (new houses plus alterations and additions). Appliances are included. Land is excluded. New houses are represented by project homes.
Project Homes Price Index Numbers: Weighted average of eight capital cities	6416.0 Table 3 (HPI)	Aggregate expenditure on secured finance commitments for the purchase of new dwellings by owner–occupiers in 2004–05 updated with data on housing finance collected by the Australian Prudential Regulatory Authority, with city percentage contributions allocated using data from the Building Activity Survey and Population Census housing data.	Pricing basis: Purchaser prices, GST included, no first home buyer subsidy. Scope: 8 capital cities, household costs to purchase new housing excluding land. Alterations and additions are excluded. Appliances and land are excluded. New houses are represented by project homes.

IMPLICATIONS FOR STAGE OF PRODUCTION (SOP) INDEXES

National level construction price indexes are used in the domestic final capital Stage of Production (SOP) indexes for Building construction (ANZSIC 411) and Non–building construction (ANZSIC 412). Weights for SOP are based on Input–Output product supply and although SOP will now be using the price movements from the reweighted construction indexes it will continue to combine these movements using its existing weighting pattern (based on 1996–97 Input–Output statistics) until a planned reweight using the Input–Output statistics for 2001–02 is undertaken.

ANZSIC06

In the September quarter 2009 the ABS plans to commence publishing its PPIs according to the new edition of the industry classification, ANZSIC06. PPIs are currently published under ANZSIC93. While the effect of the ANZSIC transition in terms of the range of indexes published and their coverage will vary across the PPIs (particularly in the area of services indexes), the continuity of current published general construction indexes at the ANZSIC class level will be maintained. Prior to the implementation of ANZSIC06, the ABS will provide more detailed information to users on the effect this will have on its range of PPIs.

APPENDIX 1 NEW WEIGHTING PATTERN

WEIGHTING PATTERN, OUTPUT OF THE GENERAL CONSTRUCTION INDUSTRY, AUSTRALIA (a)

ANZSIC93 Subdivision/Group/Class	PERCENTAGE CONTRIBUTION TO OUTPUT OF THE GENERAL CONSTRUCTION INDUSTRY, AUSTRALIA	
	September quarter 2007	June quarter 2005(b)
	%	%
GENERAL CONSTRUCTION (41)	100.00	100.00
Building Construction Australia (411)	92.50	91.30
<i>House construction Australia (4111)</i>	<i>44.91</i>	<i>40.25</i>
House construction NSW (4111)	9.68	12.70
House construction Vic (4111)	12.68	11.22
House construction Qld (4111)	10.80	5.88
House construction SA (4111)	3.10	2.85
House construction WA (4111)	6.68	5.13
House construction Tas (4111)	0.99	0.67
House construction NT (4111)	0.37	0.50
House construction ACT (4111)	0.61	1.30
<i>Residential building construction n.e.c. Australia (4112)</i>	<i>15.71</i>	<i>16.21</i>
Residential building construction n.e.c. NSW (4112)	5.24	8.37
Residential building construction n.e.c. Vic (4112)	3.22	2.22
Residential building construction n.e.c. Qld (4112)	4.66	3.55
Residential building construction n.e.c. SA (4112)	0.61	0.31
Residential building construction n.e.c. WA (4112)	1.31	1.13
Residential building construction n.e.c. Tas (4112)	0.08	0.10
Residential building construction n.e.c. NT (4112)	0.21	0.24
Residential building construction n.e.c. ACT (4112)	0.39	0.29
<i>Non-residential building construction Australia (4113)</i>	<i>31.88</i>	<i>34.84</i>
Non-residential building construction NSW (4113)	9.14	13.35
Non-residential building construction Vic (4113)	8.81	8.20
Non-residential building construction Qld (4113)	7.09	7.20
Non-residential building construction SA (4113)	1.80	1.49
Non-residential building construction WA (4113)	3.01	2.67
Non-residential building construction Tas (4113)	0.46	0.43
Non-residential building construction NT (4113)	0.41	0.55
Non-residential building construction ACT (4113)	1.15	0.95
Non-Building Construction Australia (412)	7.50	8.70
<i>Road and bridge construction Australia (4121)</i>	<i>7.50</i>	<i>8.70</i>
Road and bridge construction NSW (4121)	2.51	2.99
Road and bridge construction Vic (4121)	1.81	1.77
Road and bridge construction Qld (4121)	1.72	1.96
Road and bridge construction SA (4121)	0.37	0.54
Road and bridge construction WA (4121)	0.86	1.01
Road and bridge construction Tas (4121)	0.11	0.19
Road and bridge construction NT (4121)	0.08	0.14
Road and bridge construction ACT (4121)	0.04	0.09

(a) Any differences between percentages and totals are due to rounding.

(b) June quarter 2005 is the most recent link period for the old index structure. These weights reflect quantities from the relevant weighting reference period (refer to Chapter 3 above) and June quarter 2005 price levels.

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