



economics

Note to:

Society of Local Government Managers and Local Government New Zealand

FORECASTS OF PRICE LEVEL CHANGE ADJUSTORS – 2011 UPDATE

Prepared by
Dr Ganesh Nana
Wilma Molano

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Forecasts of Price Level Change Adjustors

2011 Update

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1 Introduction

These notes have been prepared for the Society of Local Government Managers (SOLGM) and Local Government New Zealand (LGNZ).

This document contains provisional updates of forecasts for price level change adjustors for local authorities (LAs) to use in their budget processes consistent with their Long-term Council Community Plans (LTCCP). It incorporates the latest actual data to June 2011 and forecasts the adjustors to June 2022.

Our earlier reports (2005, 2006, 2007, 2008, 2009 and 2010) outlined the approach and methodology, and discussed alternative adjustors and reasons why the particular adjustors were chosen for forecasting.

The forecasts provide a medium-term view of the likely movement of the adjustors, rather than movement over the next year or two. There will always be unexpected reasons why individual costs might rise faster or slower in a particular year. However, this does not necessarily mean that the medium-term forecast will, or should, be adjusted. There will always be regional differences in the rate of change for a particular adjustor.

These adjustors are therefore forecasts at the national level and councils may need to consider if they have further information to show why a difference might occur at the regional level.

BERL has forecast one adjustor for each of the following nine categories for the period to 2022:

1. roading and transports costs
2. property, reserves and parks costs
3. water - clean and dirty - including pipeline costs
4. staff costs
5. energy costs
6. other – adjustor for local government costs
7. pipeline costs (a sub-component of water costs)
8. earthmoving costs (a sub-component of property, reserves and parts costs)

9. private sector wage costs (a sub-component of categories 1,2,3, and 5).

These notes also contain forecasts for an overall cost index for local authorities (LGCI). This index has been developed by BERL and is reported in 'A Local Government Cost Index for New Zealand', BERL reference #4877. The LGCI is based on the cost structures of local authorities and includes operating expenditure and capital expenditure variables.

The operating expenditure of the LGCI includes:

1. purchases of goods and services, grants and donations, and all other expenditure
2. employee costs, which includes wages and salaries
3. interest paid, which includes interest paid on local government debts and is covered by the mortgage interest component of the CPI.

The capital expenditure of the LGCI includes:

1. transport, which spending on transport projects, in particular roading
2. three waters, which includes water supply, wastewater, and storm water.
3. community, which includes capital expenditure on community facilities such as pools, parks and reserves
4. other, which is capital expenditure not capture elsewhere.

1.1 Input or output adjustors, capital and expenditure items

The issue of applying adjustors to costs based on input type and/or to activities based on output groups has been extensively discussed (see earlier reports). Previously, it was agreed that individual LAs should apply the adjustors as they determine appropriate in the light of guidelines provided by SOLGM in the *LTCCP Jigsaw* document and its successor *Piecing it Together*. LAs will also need to consider the most appropriate approach given their own accounting systems and processes.

In this context, the adjustors above do not clearly fall into input or output classes.

It may assist some LAs to view three (staff, energy, and other) of the adjustors as applicable to input costs. A further three (roading, property and water) adjustors have been constructed in order to be applicable to appropriate input categories, where these activities are contracted out by the LA. However, where these activities remain in-house, LAs can use these adjustors for the appropriate output group if they so wish.

The primary focus of the set of adjustors is on operating expenditure. The adjustors may be used on capital expenditure items as the indices include a combined forecast of operating

and capital costs. However, because of this mixture in the composition of these indices, they may understate (or overstate) the change in the prices of capital expenditure items.

Therefore, BERL has also separately forecast the last three adjustors (pipelines, earthmoving and wages) for LAs requiring a more precise adjustor for capital items. These can be applied, as appropriate, to costs based on inputs.

1.2 General price inflation

For comparative purposes, the average level of price inflation over the forecast period is expected to remain consistent with the current Policy Targets Agreement between the Minister of Finance and the Governor of the Reserve Bank. The relevant phrase in this agreement, which target inflation as measured by the Consumer Price Index (CPI), states:

“... the policy target shall be to keep future CPI inflation outcomes between 1 per cent and 3 per cent on average over the medium term.”

2 The economic context

This section outlines the underlying assumptions used in the updated forecasts and our assessment of the New Zealand economy.

2.1 Variables used in forecasting

To generate forecasts for each of the adjustors we estimate relationships based on historic data between price indices and a set of driver economic variables (e.g. GDP, employment, and investment). These estimated equations required forecasts of the core economic variables.

Table 1 lists the path of the economic variables used in the generation of the forecasts for the adjustors. These economic forecasts are BERL's latest assessment of the likely medium-term path of the New Zealand economy. These are derived from a combination of BERL's short-term forecasts published in *BERL Forecasts* and projections over the medium term from BERL's CGE¹ model of the New Zealand economy.

Table 1 Forecast of economic driver variables: % per annum change

Year ending	Nominal GDP	Real GDP	Non-hsg invtmt	Employment	Oil prices	CPI
Jun 11	5.3	1.3	4.3	1.7	8.6	5.3
Jun 12	5.4	1.8	9.8	0.1	2.3	2.8
Jun 13	5.9	3.4	8.4	1.9	2.8	2.4
Jun 14	5.5	3.1	6.2	1.6	2.1	2.4
Jun 15	4.8	2.9	2.9	1.6	2.3	2.4
Jun 16	5.0	2.9	3.2	1.6	2.4	2.4
Jun 17	5.2	2.9	3.4	1.7	2.5	2.5
Jun 18	5.4	2.9	3.6	1.8	2.6	2.5
Jun 19	5.6	2.9	3.8	1.9	2.7	2.6
Jun 20	5.8	2.9	4.1	1.9	2.8	2.6
Jun 21	6.0	2.9	4.3	2.0	2.9	2.7
Jun 22	6.2	3.0	4.5	2.1	2.8	2.6

2.2 Commentary on the macroeconomic forecast

The succeeding two sub-sections present BERL's assessment of the short and medium term prospects for the New Zealand economy, and is taken from the September 2011 edition of the *BERL Forecasts* report, updated with the most recent data.

¹ Computable general equilibrium (CGE).

2.2.1 Macro picture

Many of New Zealand's economic indicators have recovered ground lost during the Global Financial Crisis (GFC). Employment and export revenue are among the indicators that underpin the story that the New Zealand economy has weathered the recession.

In addition, some short-term indicators have also turned positive and so reinforce this story. For example, growth in business investment and the associated capital imports have recently turned positive, as has growth in non-residential building consents, and guest night numbers. Retail spending is also looking promising given data on the value of electronic transactions, and surveyed confidence figures continue to report a positive mood.

However, many of the core activity indicators remain well below pre-GFC levels and belie the argument that the New Zealand economy has weathered the recession. In particular, the overall GDP measure of activity is still below that in December 2007. Further, business investment and residential construction remain well below that of three years earlier, while output from the manufacturing sector has sunk to be below that recorded in 2004.

Looking ahead, global uncertainty arising from potential sovereign debt default in Europe, and a sluggish US economy, continue to impact through volatile financial and currency markets. This uncertainty will remain a feature of the economic environment for some time to come as a combination of economic and political factors suggest there is no quick fix readily available.

Assuming that global factors do not deteriorate markedly, we see modest growth ahead for the New Zealand economy. The largest difference between now and a year ago is the aftermath of the Christchurch earthquakes. The scale of task to re-build Christchurch (in terms of property, communities, infrastructure, and businesses as well as instilling a sense of assurance as to future opportunities) should not be underestimated. Consequently, the impact of this task on New Zealand's economic prospects should also not be underplayed. Acceleration in growth is expected as re-building activity in Christchurch gathers momentum in the latter half of calendar 2012.

The Reserve Bank's forecast, incorporated in its latest Monetary Policy Statement, emphasises the importance of the commodity price windfall currently being enjoyed by certain parts of the export sector. However, longer-term prospects in terms of economic activity in the export sector are more circumspect. Export revenue continues to surge in line with ongoing favourable prices, but significant volume or activity growth is muted given reduced capacity in meat and wood processing. Business investment continues to recover lost ground, taking advantage of the relative cheapness of imported machinery and equipment. The combination of these effects sees little sustained improvement in the current

account balance situation, with the external deficit settling near 5.5% of GDP towards the end of the forecast horizon.

Increasingly loud calls for increases in official interest rates are likely as inflation pressures from abroad accumulate. However, ongoing uncertainty from the global financial situation should stay the hand of the Reserve Bank until well into 2012. Nevertheless, tighter finance markets abroad could well flow through to higher domestic interest rates, irrespective of official rate movements.

A 'game-changing' event abroad in the form of a sovereign debt default, disintegration of the Euro area, or generalised financial upheaval, would lead to a significantly worse outlook for the New Zealand economy.

Our forecasts are founded on the assumption that the global economy continues to operate in a situation of heightened uncertainty, but there is no 'game changer' in Europe that leads to the disintegration of the Euro area and/or significant further upheaval within its member states. If either of these were to eventuate, then we would undoubtedly be led to downgrade New Zealand's economic prospects from those stated here.

2.2.2 Context for the inflation outlook

The other international influence that New Zealand will not be able to escape from will be increasing food and energy prices. Global resource prices – whether they be food, fuels, or raw materials – will be the much sought after products of the near-term, and beyond. Price changes in this regard are a reflection of core economic demand and supply fundamentals.

Over the short term, coupled with recent rounds of 'quantitative easing', stimulus packages and low interest rates, food and energy inflation pressures are set to underpin wider global inflation concerns. In New Zealand, current inflation pressures also revolve around food and energy (petrol and electricity), with the October 2010 GST increase also adding to headline consumer price inflation. Nevertheless, a relatively high NZ\$ exchange rate has acted as a considerable restraint on New Zealand inflation, along with a relatively subdued recovery causing retailers to trim margins to move stock.

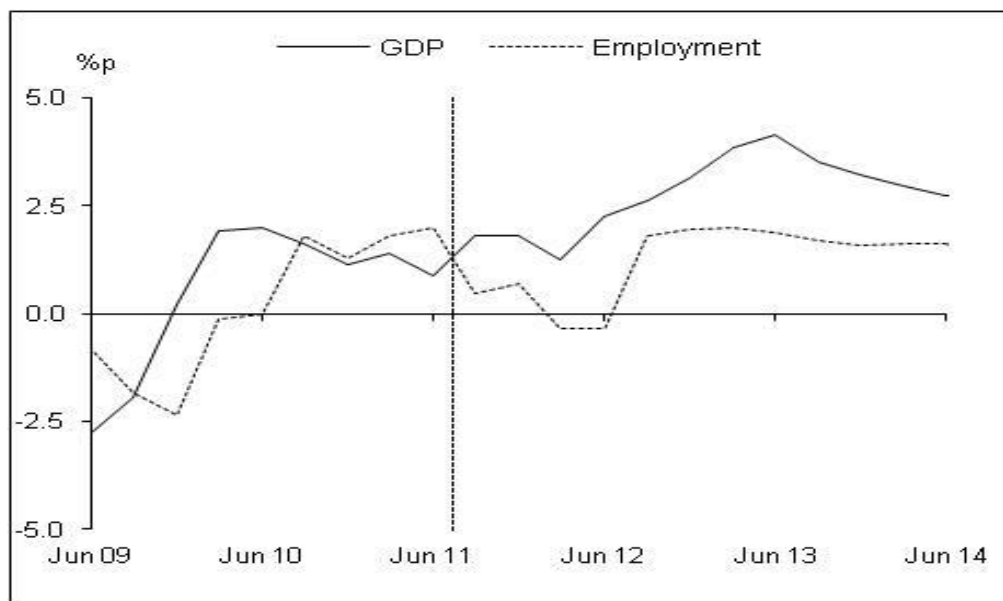
Over the medium term, we expect generalised inflation pressures from abroad to be relatively well managed within New Zealand, through the twin influences of

- the NZ\$ exchange rate remaining relatively high and
- the Reserve Bank of New Zealand standing ready to raise domestic interest rates if inflation threatens to breach the upper end of the target range.

However, more sector-specific inflation pressures are likely to arise in the construction industry as the Christchurch rebuild effort gathers momentum. The resources necessary for this effort are likely to accentuate shortages in other parts of the industry, especially in regard to the skilled construction labour force. This sector-specific inflation is likely to be more difficult to control.

Looking longer term, the shift in the drivers of the global economy towards China, India and south-east Asian economies and demand for food and raw materials, potentially places New Zealand in the 'box seat'. These considerations underpin an ongoing expansion of the New Zealand economy – albeit averaging below 3 per cent per annum over the coming decade.

Figure 1 Annual GDP and employment growth



3 Forecast for adjustors

Table 2 lists the forecast indices for each of the adjustors for the period from the year ended June 2008 to the year ended June 2022. The figures in grey are based on actual data up to the June quarter 2011.

The forecast spike in some of the adjustors over the June 2011/2012 period reflects to varying degrees, the impact of the Emissions Trading Scheme (ETS) and the lifting of Goods and Services Tax (GST) from 12.5 percent to 15 percent.

Table 2 Adjustors: Index Jun 2011 = 1000

Year ending	Road	Property	Water	Energy	Staff	Other	Earthmoving	Pipelines	Private sector wages
	Cost adjustors NZ Index (Jun 2011 = 1000)								
Jun 08	902	924	933	1017	933	921	902	850	937
Jun 09	940	966	954	991	963	962	955	937	966
Jun 10	974	984	964	997	985	974	980	954	982
Jun 11	1000	1000	1000	1000	1000	1000	1000	1000	1000
Jun 12	1043	1039	1045	1055	1026	1036	1055	1057	1026
Jun 13	1082	1069	1089	1106	1052	1060	1099	1112	1051
Jun 14	1115	1100	1131	1159	1077	1094	1137	1160	1075
Jun 15	1155	1132	1171	1214	1103	1129	1169	1203	1099
Jun 16	1191	1166	1214	1275	1131	1167	1204	1249	1126
Jun 17	1226	1203	1261	1340	1161	1207	1244	1301	1154
Jun 18	1266	1236	1305	1402	1188	1248	1288	1359	1180
Jun 19	1310	1271	1351	1465	1216	1290	1337	1425	1206
Jun 20	1358	1309	1403	1539	1247	1333	1391	1499	1236
Jun 21	1405	1352	1460	1621	1281	1380	1452	1581	1268
Jun 22	1454	1396	1520	1708	1316	1429	1516	1671	1301

Table 3 lists the annual percentage change for each of the adjustors. The highest forecasted per annum change are in the pipelines, energy, earthmoving and water adjustors.

Table 3 Adjustors: % per annum change

Year ending	Road	Property	Water	Energy	Staff	Other	Earthmoving	Pipelines	Private sector wages
	% pa change								
Jun 09	4.2	4.5	2.3	-2.6	3.2	4.5	5.9	10.2	3.2
Jun 10	3.6	1.8	1.1	0.6	2.2	1.2	2.6	1.8	1.6
Jun 11	2.6	1.7	3.7	0.3	1.6	2.7	2.0	4.9	1.9
Jun 12	4.3	3.9	4.5	5.5	2.6	3.6	5.5	5.7	2.6
Jun 13	3.8	3.0	4.2	4.8	2.5	2.4	4.1	5.2	2.4
Jun 14	3.1	2.9	3.9	4.7	2.4	3.2	3.4	4.4	2.3
Jun 15	3.5	2.9	3.5	4.7	2.4	3.2	2.9	3.7	2.3
Jun 16	3.1	3.0	3.7	5.0	2.6	3.4	3.0	3.8	2.4
Jun 17	3.0	3.1	3.8	5.1	2.6	3.5	3.3	4.2	2.5
Jun 18	3.2	2.8	3.5	4.6	2.4	3.4	3.5	4.5	2.2
Jun 19	3.5	2.8	3.5	4.5	2.3	3.3	3.8	4.8	2.2
Jun 20	3.7	3.0	3.8	5.0	2.6	3.3	4.1	5.2	2.4
Jun 21	3.4	3.3	4.1	5.4	2.7	3.6	4.3	5.5	2.6
Jun 22	3.5	3.3	4.1	5.4	2.7	3.5	4.4	5.7	2.6

Table 4 lists the total (or cumulative) percentage change from the year ended June 2011 for each of the adjustors. This table can be used to calculate the increase of future year expenses based on 2011 costs.

In general, adjustors for construction-related activities (i.e. pipelines, earthmoving, water and roads) show the greatest cumulative change over the coming 10 years. Much of this occurs over the early-to-middle years of this period, in line with an assumed timing of activity associated with the re-build of Christchurch.

In addition, the energy cost adjustor grows considerably, heavily influenced by expected global pressures. Labour and more general cost adjustors grow at a rate closer to that of overall inflation, held in check by Reserve Bank inflation targeting activities.

Table 4 Adjustors: cumulative % change from June 2011

Year ending	Road	Property	Water	Energy	Staff	Other	Earthmoving	Pipelines	Private sector wages
	cumulative % change from Jun 2011								
Jun 12	4.3	3.9	4.5	5.5	2.6	3.6	5.5	5.7	2.6
Jun 13	8.2	6.9	8.9	10.6	5.2	6.0	9.9	11.2	5.1
Jun 14	11.5	10.0	13.1	15.9	7.7	9.4	13.7	16.0	7.5
Jun 15	15.5	13.2	17.1	21.4	10.3	12.9	16.9	20.3	9.9
Jun 16	19.1	16.6	21.4	27.5	13.1	16.7	20.4	24.9	12.6
Jun 17	22.6	20.3	26.1	34.0	16.1	20.7	24.4	30.1	15.4
Jun 18	26.6	23.6	30.5	40.2	18.8	24.8	28.8	35.9	18.0
Jun 19	31.0	27.1	35.1	46.5	21.6	29.0	33.7	42.5	20.6
Jun 20	35.8	30.9	40.3	53.9	24.7	33.3	39.1	49.9	23.6
Jun 21	40.5	35.2	46.0	62.1	28.1	38.0	45.2	58.1	26.8
Jun 22	45.4	39.6	52.0	70.8	31.6	42.9	51.6	67.1	30.1

4 Forecast for overall LGCI

Table 5 to Table 7 show the forecast annual average percentage change for the LGCI, as well as the OPEX and CAPEX sub-components of the LGCI.

The LGCI has two sub-components – the operating cost index (OPEX LGCI) and the capital expenditure cost index (CAPEX LGCI). Beginning June 2013, the forecasted capex cumulative percent change is higher than opex. This could also be attributed to the expected re-building activities in Christchurch as planned by the government.

Table 5 LG Cost Index, Index value (June 2006 = 1000)

Quarter	LGCI index value (Jun06=1000)		
	LGCI	OPEX	CAPEX
Jun 11	1161	1140	1189
Jun 12	1223	1204	1248
Jun 13	1269	1245	1301
Jun 14	1313	1284	1352
Jun 15	1355	1323	1397
Jun 16	1399	1365	1445
Jun 17	1447	1410	1497
Jun 18	1494	1450	1554
Jun 19	1545	1491	1617
Jun 20	1602	1538	1686
Jun 21	1664	1590	1763
Jun 22	1729	1642	1844

Table 6 LG Cost Index, annual average % change

Quarter	LGCI (annual average % change)		
	LGCI	OPEX	CAPEX
Jun 11	2.34	2.03	2.75
Jun 12	5.34	5.67	4.92
Jun 13	3.79	3.39	4.31
Jun 14	3.46	3.13	3.88
Jun 15	3.17	3.04	3.34
Jun 16	3.27	3.17	3.41
Jun 17	3.42	3.25	3.63
Jun 18	3.26	2.83	3.80
Jun 19	3.38	2.86	4.03
Jun 20	3.69	3.18	4.31
Jun 21	3.89	3.35	4.54
Jun 22	3.90	3.31	4.61

Table 7 LG Cost Index, cumulative % change from June 2011

Quarter	LGCI % change from Jun 2011		
	LGCI	OPEX	CAPEX
Jun 12	5.34	5.67	4.92
Jun 13	9.33	9.25	9.44
Jun 14	13.12	12.68	13.68
Jun 15	16.71	16.10	17.48
Jun 16	20.53	19.78	21.48
Jun 17	24.64	23.67	25.88
Jun 18	28.71	27.17	30.67
Jun 19	33.06	30.80	35.94
Jun 20	37.97	34.97	41.80
Jun 21	43.33	39.48	48.24
Jun 22	48.92	44.09	55.07

These forecasts have been derived from econometric models of major cost components of the LGCI including the general goods and services index, the transport capex index and the three waters capex index. Forecasts for other components have been linked to appropriate economic indicators including interest rates, wage rates, and oil prices.

5 Construction of the indicators

This section outlines how the price level indicators were constructed.

5.1 Cost adjustors

As described in earlier BERL reports, cost adjustors are based on historic data from a combination of selected indices within the Statistics New Zealand data for Producer Prices Index, Capital Goods Prices Index and Labour Cost Index. The specific indices used are listed in Table 8.

Table 8 Indices used for each adjustor

Indices used	SNZ Identifier	Description	Main Drivers
Roading/Transport			
PPI inputs - Road transport	PPIQ.SNI01	Public transport, roading	Transport industry costs
CGI - Transport ways (other construction)	CEPQ.S2CA		
Total Salary and Wage Rates - Private Sector	LCIQ.SG43Z9		
Property, reserves and parks			
PPI inputs - Cultural and recreation services	PPIQ.SNP	Maintenance of public buildings and assets (e.g. sports grounds, parks, arts, recreation)	Repairs and maintenance of buildings; grounds maintenance, recreation services
CGI - Earthmoving and site work	CEPQ.S2CD		
Total Salary and Wage Rates - Private Sector	LCIQ.SG43Z9		
Water			
PPI inputs - Electricity generation and supply	PPIQ.SND01	Drinking water supply and stormwater	Repairs and maintenance of water supply
CGI - Pipelines	CEPQ.S2CB		
Total Salary and Wage Rates - Private Sector	LCIQ.SG43Z9		
Energy			
PPI outputs - Electricity generation and supply	PPIQ.SUD01	Electricity generation, supply	Electricity, gas prices
Total Salary and Wage Rates - Private Sector	LCIQ.SG43Z9		
Staff			
All salary and wage rates - Local govt sector	LCIQ.SG13Z9	Council operations	Staff costs
Other			
PPI inputs - Local government and civil defence*	PPIQ.SNM02	Local government administration services and civil defence	Staff costs and other administration costs
Pipelines			
CGI - Pipelines	CEPQ.S2CB		
Earthmoving			
CGI - Earthmoving and site work	CEPQ.S2CD		
Private sector salary and wage costs			
Total Salary and Wage Rates - Private Sector	LCIQ.SG43Z9		

PPI - Producer Price Index, CGI - Capital Goods Index, SNZ - Statistics New Zealand

* The official sub-industry group title of Local government administration services & civil defence has been abbreviated.

Established relationships between these national indices and national GDP, employment, investment, interest rates are updated with the latest data available (to the June 2011 quarter). These updated relationships are then used to forecast the changes in each cost

adjustor over the coming 10 years, based on BERL's forecasts for the set of national economic driver variables i.e. GDP, employment, investment and interest rates.

Forecasts for the national economic driver variables are from:

- BERL's short-term forecasts of prospects for the national economy from BERL's quarterly publication *BERL Forecasts* and
- the medium-term projections from BERL's model of inter-industry relationships² across the New Zealand economy.

Forecasts for the national CPI are derived from the short-term *BERL Forecasts* combined with the medium-term modelling projections.

Note that the CPI, being a forecast of consumer prices, is inclusive of GST. Consequently, there is a noticeably higher rate of growth in the CPI in the year to June 2011 accounting for the October 2010 increase in the rate of GST from 12.5 percent to 15 percent. Statistics New Zealand estimates that this increase in the rate of GST added 2.2 percent to the CPI.

In contrast, the cost adjustors are not based on consumer prices and hence are exclusive of GST. However, it should be understood that this distinction only impacts on the *level* of each index. That is, this distinction between GST-inclusive and GST-exclusive does not impact on the growth rates or percentage rates of change of the indices or cost adjustors, assuming the rate of GST does not change over the forecast period.

5.2 LGCI composition

The development and construction of the LGCI is detailed in BERL report reference #4877, 'A Local Government Cost Index for New Zealand'.

The LGCI has two sub-components – the operating cost index (Opex LGCI) and the capital expenditure cost index (Capex LGCI).

The Opex LGCI includes:

1. purchases of goods and services, grants and donations, and all other expenditure
2. employee costs, which includes wages and salaries
3. interest paid, which includes interest paid on local government debts and is covered by the mortgage interest component of the CPI.

² BERL's computable general equilibrium (CGE) model identifies the relationships between 59 separate industries, along with 25 export sectors and eight consumer commodities.

The Capex LGCI includes:

1. transport, which spending on transport projects, in particular roading
2. three waters, which includes water supply, wastewater, and storm water.
3. community, which includes capital expenditure on community facilities such as pools, parks and reserves
4. other, which is capital expenditure not capture elsewhere.

We have used Statistics New Zealand LG operational spending data, and the 2007 *Report of the Local Government Rates Inquiry* to construct the LGCI and its relevant weights.

5.2.1 Opex: Purchase of goods and services

This component makes up the largest individual share of the LGCI, at more than 37 percent. It refers to purchases by local governments of consumables necessary to carry out their responsibilities. It is based on a single price index from the producers price index.

Source indices: PPI – inputs, Local government and civil defence: 1.00

Weighting: 0.374

5.2.2 Opex: Employee costs

Employee costs include wages and salaries and are captured by one existing index from the labour cost index (LCI). Employee costs are around one-sixth of total operational and capital spending captured by the LGCI.

Source indices: LCI – All salary and wage rates, local government sector: 1.00

Weighting: 0.166

5.2.3 Opex: Interest paid

Interest paid refers to interest paid on local government debts, and is covered by the mortgage interest component of the CPI. No equivalent series exists in the producers price index.

Source indices: CPI – Mortgage interest: 1.00

Weighting: 0.031

5.2.4 Capex: Transport

This component refers to spending on transport projects, in particular roading. It draws on two price indices – one from the CGI and the other from the PPI. As one of the most financially demanding components of local government expenditure, it accounts for almost one-sixth of the index.

Source indices: CGI – Transport ways (other construction): 0.75

PPI – inputs, Road transport: 0.25

Weighting: 0.156

In other words, we use two existing indices with relative weights of 75 : 25 to construct the Capex: Transport index, which has a total weighting of 15.6 percent of the Overall LGCI.

5.2.5 Capex: Three waters

In many ways this is the most difficult component to weight with any degree of accuracy, and for which to select the most representative indices. Indices included consider the role of pipeline construction and maintenance; irrigation; and river control.

The first of these indices applies to all three waters – supply, waste, and storm. The second applies to water supply only, and the third, to stormwater only.

We therefore took into account the relative spending on each of the three waters as well as the likely split in spending within each to develop this index.

Source indices: CGI – Pipelines: 0.75

CGI – Irrigation and Land Drainage: 0.125

CGI – Reclamation and River Control: 0.125

Weighting: 0.143

In other words, we use three existing indices with relative weights of 0.75 : 0.125 : 0.125 to construct the Capex: Three waters index, which has a total weighting of 14.3 percent of the LGCI.

5.2.6 Capex: Community

Capex: Community refers to capital expenditure on community facilities such as pools, parks and reserves. It covers renewal of existing facilities, increases in capacity, and

improvements in levels of service. It is based on two price indices, one from the PPI and one from the CGI.

Source indices: PPI – inputs, Cultural and recreation services: 0.50

CGI – Earthmoving and site work: 0.50

Weighting: 0.082

In other words, we use two existing indices with equal weights (50 : 50) to construct the Capex: Community index, which has a total weighting of 8.2 percent of the LGCI.

5.2.7 Capex: Other

Capex: Other simply refers to capital expenditure not captured elsewhere. We therefore use the All groups index of the CGI.

Source indices: CGI – All groups: 1.00

Weighting: 0.049

In other words, the Opex: Other index accounts for 4.9 percent of the Overall LGCI.

6 Historical validation

Figure 2 to Figure 13 illustrate the performance of our estimated equations, for each of the adjustors, when compared to the actual data over the period June 1995 to June 2011.

The estimation process is used to develop and then confirm a robust equation that can be used to generate forecasts. The confirmation process tests the fit of the estimated equation with the actual path of the adjustor over a period of time.

In each of the figures below, the dashed line (labelled *predicted*) indicates the estimated path of the adjustor as calculated by our estimated equation. The solid line (labelled *actual*) indicates the actual path of the adjustor as derived from the relevant official Statistics New Zealand data series.

Figure 2 Roding adjustor

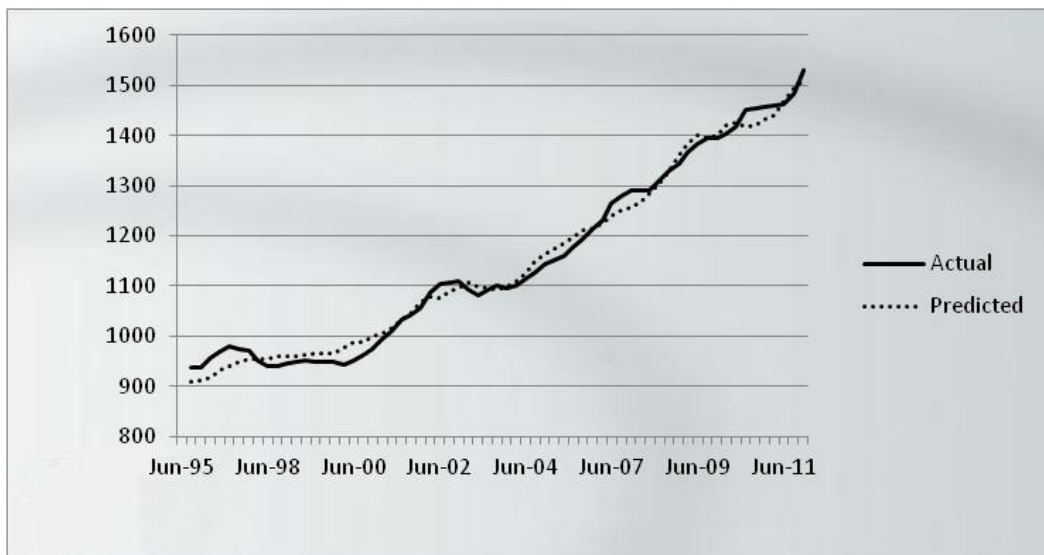


Figure 3 Property adjustor

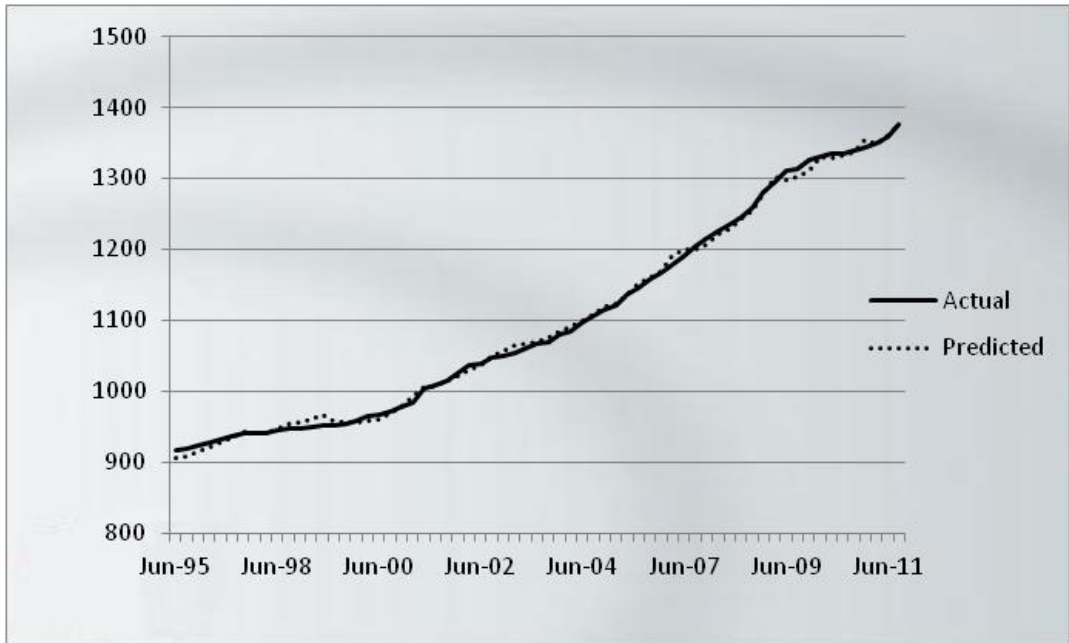


Figure 4 Staff adjustor

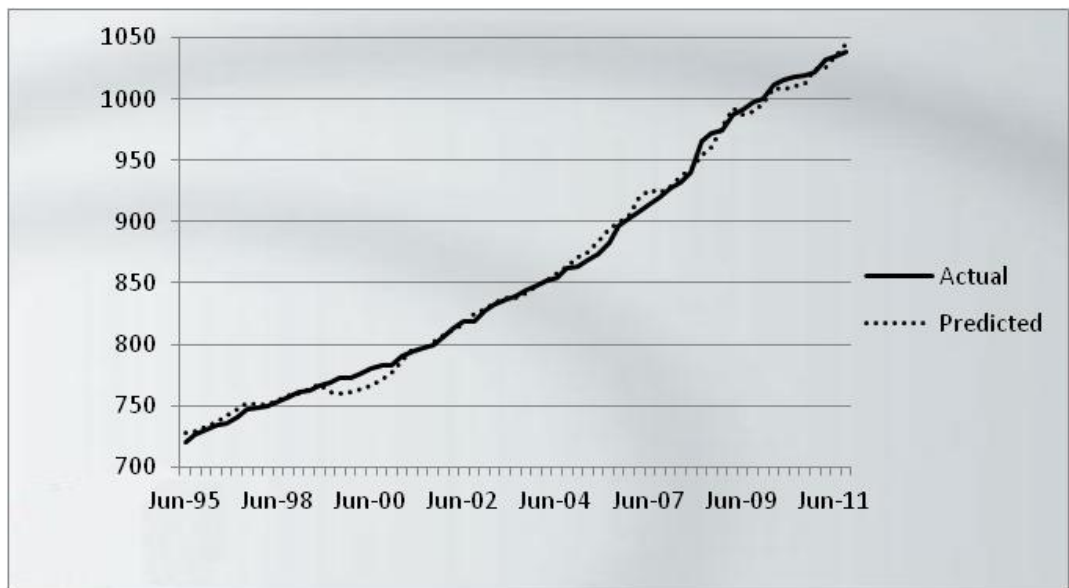


Figure 5 Water adjustor

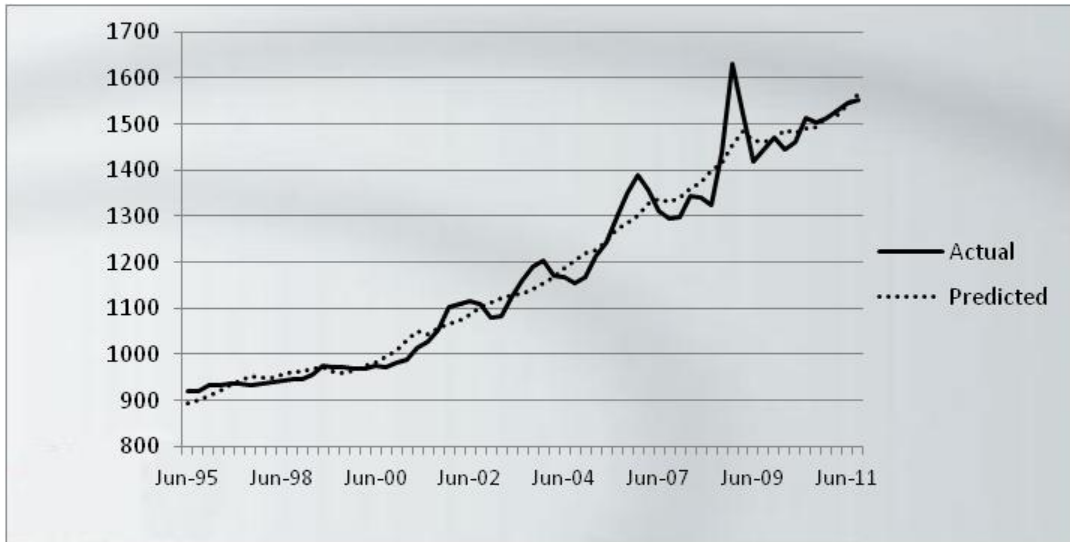


Figure 6 Energy adjustor

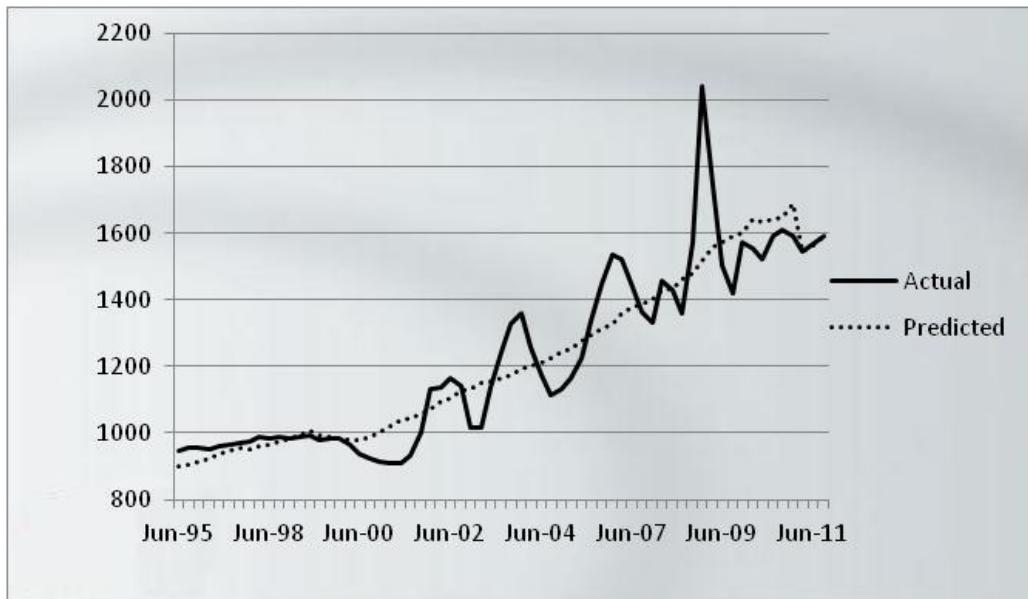


Figure 7 Other adjustor

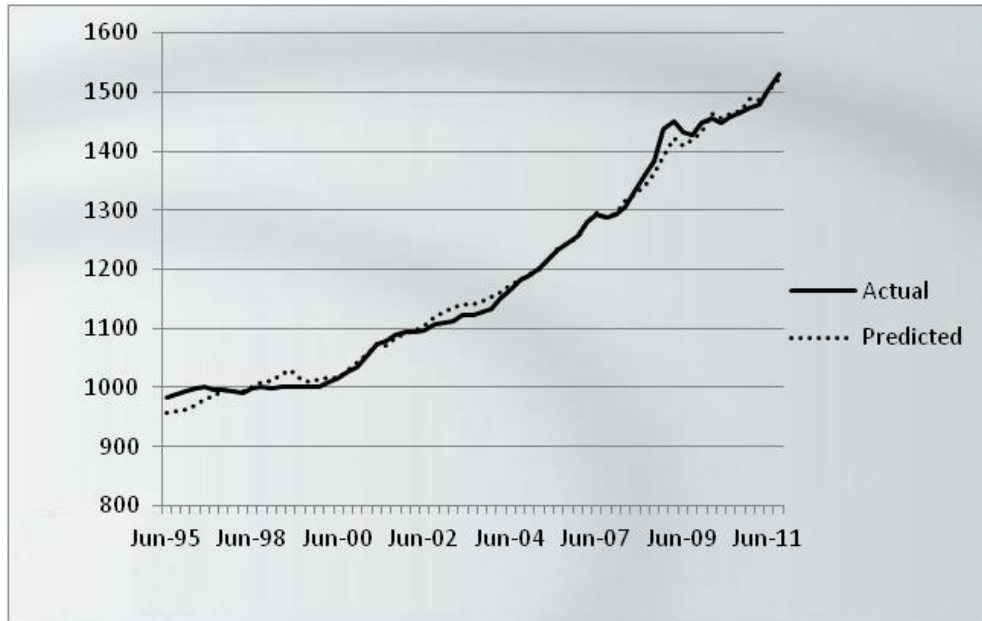


Figure 8 Goods and services index

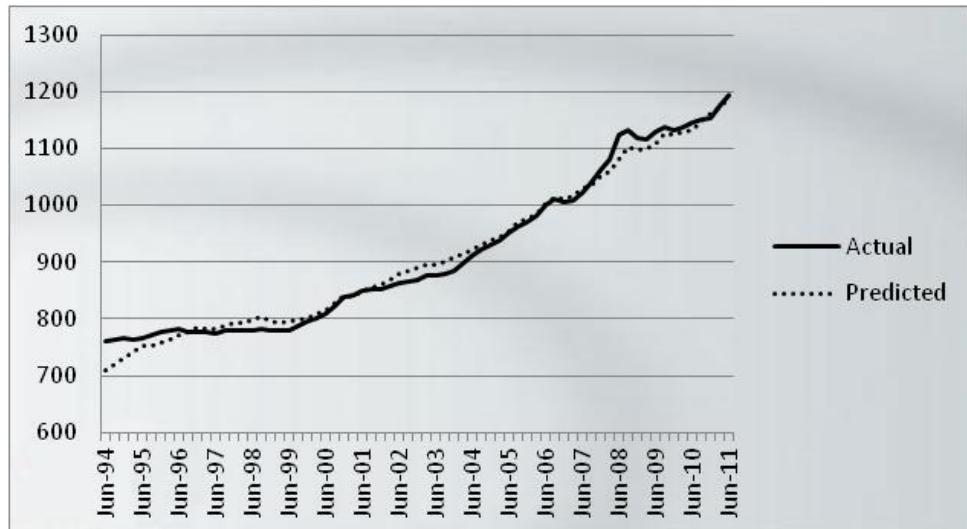


Figure 9 Transport index

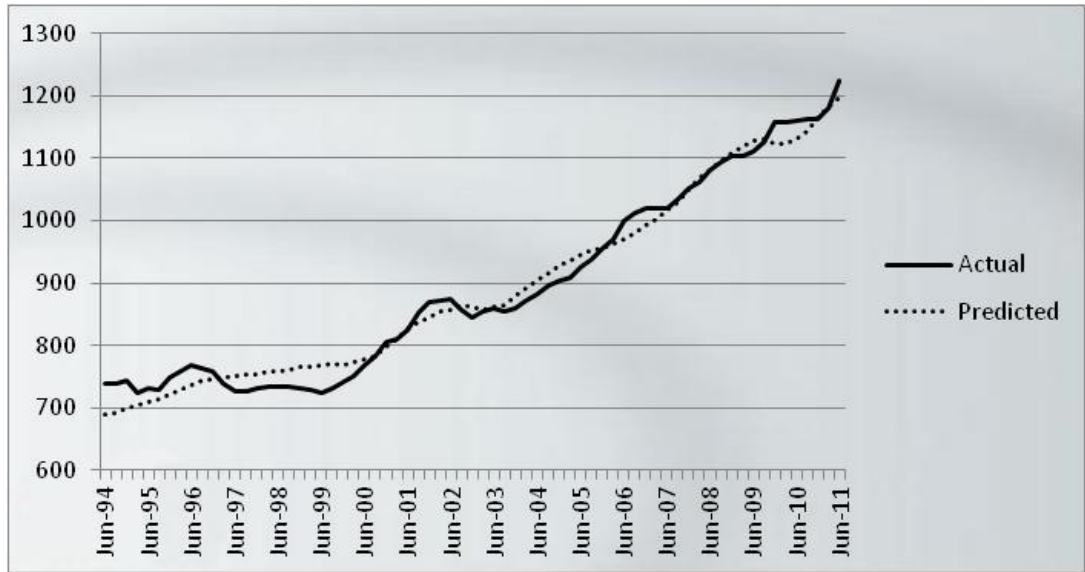


Figure 10 Three waters index

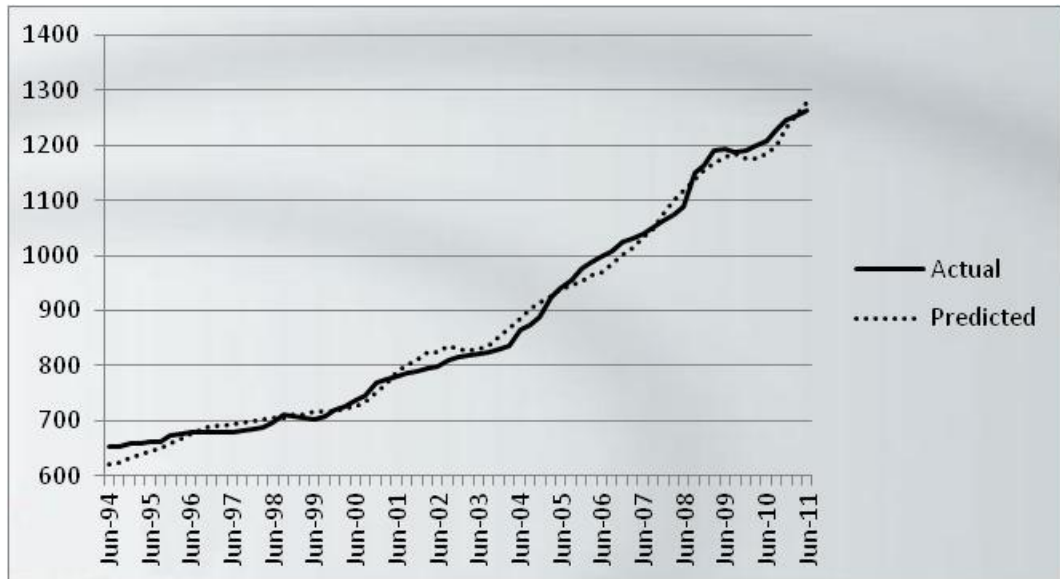


Figure 11 Earthmoving index

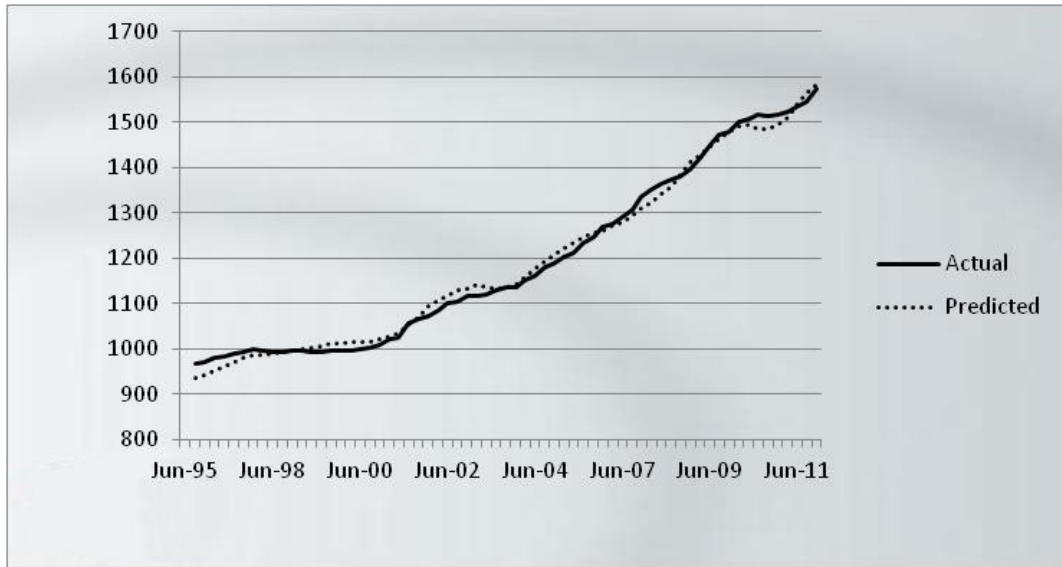


Figure 12 Pipelines index

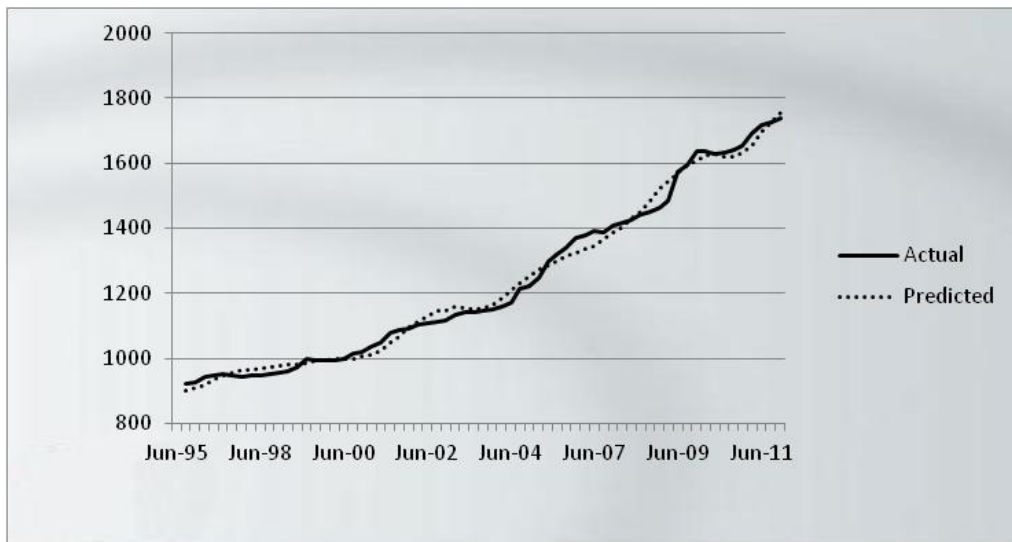
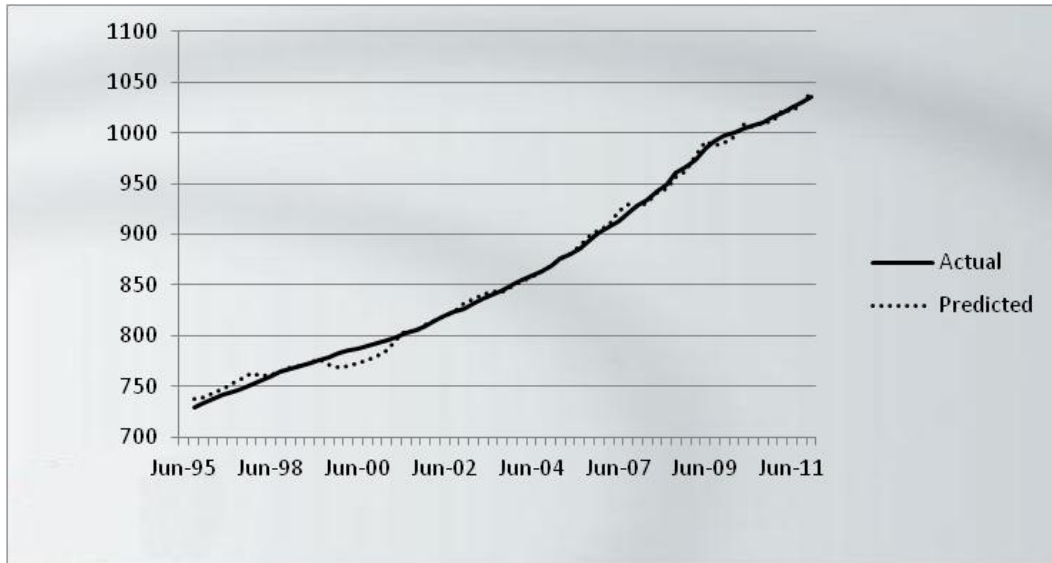


Figure 13 Private sector wage costs index



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