

Embargoed until 10:45am – 16 July 2010

## Consumers Price Index: June 2010 quarter

### Highlights

In the June 2010 quarter compared with the March 2010 quarter:

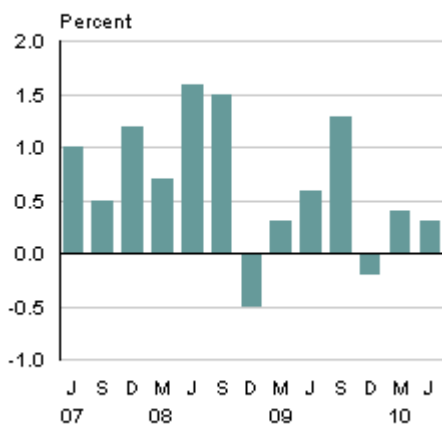
- The consumers price index (CPI) rose 0.3 percent.
- Cigarette and tobacco prices rose 8.7 percent, reflecting an increase in excise duty.
- Transport prices rose 0.9 percent due to higher prices for petrol.
- Housing and household utility prices rose 0.5 percent.
- Recreation and culture prices fell 0.7 percent.
- Food prices fell 0.9 percent.

From the June 2009 quarter to the June 2010 quarter:

- The CPI increased 1.8 percent.

#### Consumers price index

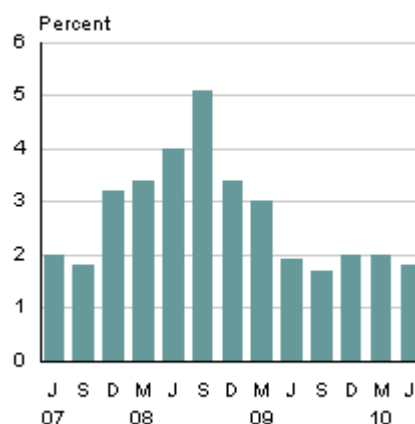
Quarterly percentage change



Source: Statistics New Zealand

#### Consumers price index

Annual percentage change



Source: Statistics New Zealand

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## Commentary

### Consumers price index quarterly movement

The consumers price index (CPI) recorded an increase of 0.3 percent in the June 2010 quarter. This follows an increase of 0.4 percent in the March 2010 quarter and a 0.2 percent decrease in the December 2009 quarter.

Six groups increased, with alcoholic beverages and tobacco (up 3.5 percent), transport (up 0.9 percent), and housing and household utilities (up 0.5 percent), being the most significant contributors.

Four groups recorded decreases with the largest contributions coming from the food (down 0.9 percent), and recreation and culture (down 0.7 percent) groups.

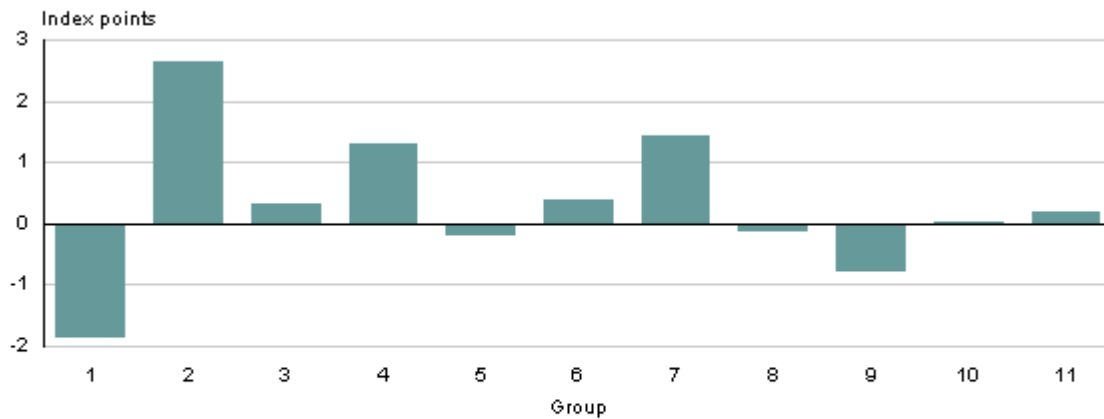
The most significant upward contributions came from higher prices for cigarettes and tobacco (up 8.7 percent), petrol (up 1.4 percent), and second-hand cars (up 2.4 percent). The most significant individual downward contribution came from lower prices for audio-visual and computing equipment (down 4.6 percent).

<b>Consumers price index groups: June 2010 quarter</b>		
<b>Group</b>	<b>Index points contribution to CPI</b>	<b>Quarterly percentage change</b>
Alcoholic beverages and tobacco	2.65	3.5
Transport	1.43	0.9
Housing and household utilities	1.31	0.5
Health	0.39	0.7
Clothing and footwear	0.31	0.7
Miscellaneous goods and services	0.19	0.3
Education	0.02	0.0
Communication	-0.14	-0.4
Household contents and services	-0.19	-0.4
Recreation and culture	-0.80	-0.7
Food	-1.88	-0.9
<b>All groups CPI</b>	<b>3.29</b>	<b>0.3</b>

**Note:** Points contribution may not sum to total due to rounding.

## Index points contribution to consumers price index

June 2010 quarter



1 Food  
2 Alcoholic beverages and tobacco  
3 Clothing and footwear  
4 Housing and household utilities  
5 Household contents and services  
6 Health  
7 Transport  
8 Communication  
9 Recreation and culture  
10 Education  
11 Miscellaneous goods and services

Source: Statistics New Zealand

## Distribution of item-level movements

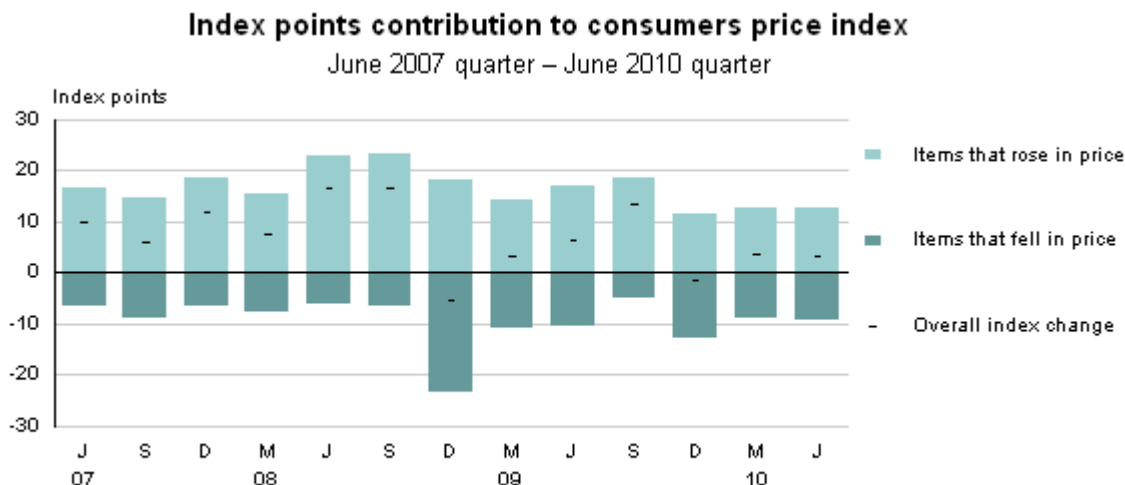
The table below outlines the distribution of price movements in the March 2010 and June 2010 quarters. The CPI has been partitioned into those national item-level indexes that increased, showed no change, or decreased.

Distribution of item-level index movements		
National item-level index movements	December 2009 qtr to March 2010 qtr	March 2010 qtr to June 2010 qtr
Increase in price		
Number of items	305	332
Percentage of all items	43.9	47.8
Percentage of expenditure weight	62.0	63.6
Index points contribution	12.5	12.6
Percentage point contribution	1.1	1.2
Weighted average price increase (%)	1.8	1.8
No change in price		
Number of items	98	90
Percentage of all items	14.1	13.0
Percentage of expenditure weight	9.9	9.6
Decrease in price		
Number of items	291	272
Percentage of all items	41.9	39.2
Percentage of expenditure weight	28.0	26.8
Index points contribution	-8.9	-9.3
Percentage point contribution	-0.8	-0.9
Weighted average price decrease (%)	2.9	3.2

The distribution of item-level movements shows that, in the June 2010 quarter, the weighted average price decrease is larger than in the March 2010 quarter, while the weighted average price increase is unchanged. The number of items that rose in price has increased, while the number of items that fell in price has decreased.

These factors resulted in a 0.3 percent increase in the CPI for the June 2010 quarter, following an increase of 0.4 percent in the March 2010 quarter.

The following graph shows the index points contribution of all items that rose in price, all items that fell in price, and the total index points movement.



Source: Statistics New Zealand

The index points contribution from items that rose in price is similar to the March 2010 quarter, while the slightly larger contribution from items that fell in price has resulted in a slightly lower increase in the June 2010 quarter than in the March 2010 quarter.

## CPI annual movement

The CPI increased 1.8 percent in the year to the June 2010 quarter, following increases of 2.0 percent for the years to the March 2010 and December 2009 quarters.

Seven of the 11 groups in the CPI made upward contributions in the year to the June 2010 quarter. The most significant contribution came from transport (up 6.6 percent). Other upward contributions came from housing and household utilities (up 1.7 percent), alcoholic beverages and tobacco (up 5.3 percent), health (up 3.7 percent), education (up 4.8 percent), clothing and footwear (up 1.2 percent), and miscellaneous goods and services (up 0.6 percent).

The food (down 0.7 percent), household contents and services (down 2.0 percent), recreation and culture (down 0.8 percent), and communication (down 2.0 percent) groups made downward contributions.

The most significant upward contributions came from higher prices for petrol (up 9.5 percent), international air transport (up 16.1 percent), and cigarettes and tobacco (up 9.3 percent).

The most significant downward contribution came from lower prices for audio-visual and computing equipment (down 17.5 percent).

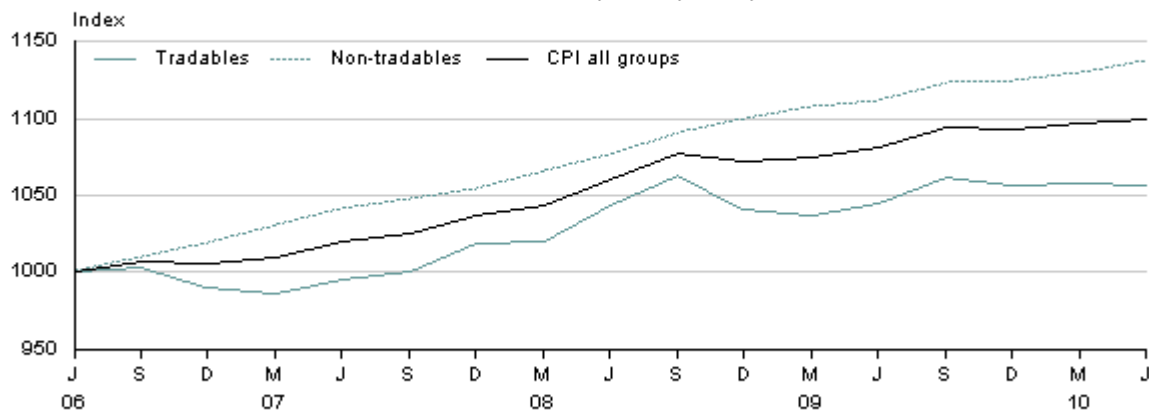
## CPI analytical series

In the June 2010 quarter, the non-tradable component increased 0.6 percent, mainly due to higher prices for cigarettes and tobacco, reflecting an increase in excise duty. The tradable component decreased 0.1 percent. Lower prices for tradable food items and audio-visual and computing equipment were offset by higher prices for petrol and second-hand cars.

For the year to the June 2010 quarter, the non-tradable component increased 2.2 percent. This is now the third quarter in which the annual increase for non-tradables has been no more than 2.3 percent, whereas annual increases were at least 3.0 percent for the previous eight years. The tradable component rose 1.1 percent for the year to the June 2010 quarter due mainly to higher petrol prices.

### Consumers price index

Tradables, non-tradables, and all groups – quarterly indexes  
Base: June 2006 quarter (=1000)

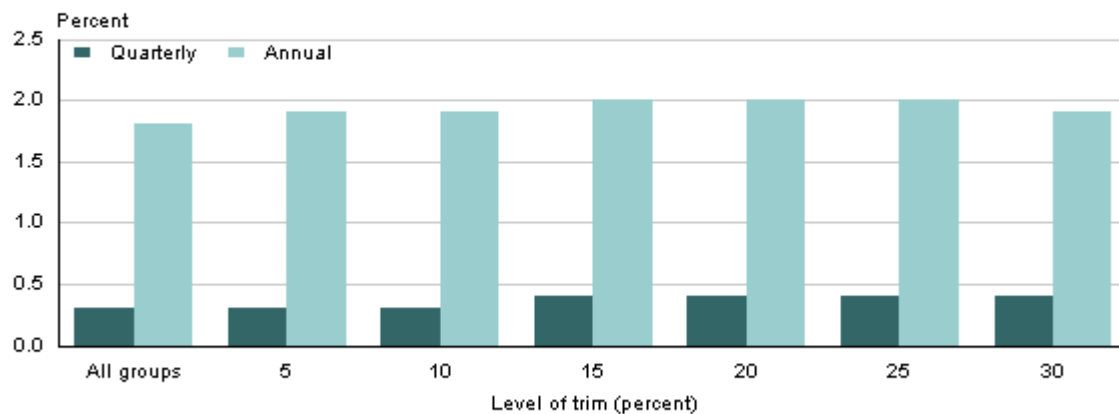


Source: Statistics New Zealand

In the June 2010 quarter, the trimmed mean measures, which exclude extreme price increases and decreases, recorded quarterly increases ranging from 0.3 to 0.4 percent. This indicates that underlying price change for the quarter was in line with the CPI overall. The annual trimmed mean measures recorded annual increases of between 1.9 percent and 2.0 percent, which are slightly above the annual increase in the all groups CPI.

### Trimmed means and all groups

Percentage changes  
June 2010 quarter



Source: Statistics New Zealand

## Alcoholic beverages and tobacco

The alcoholic beverages and tobacco group rose 3.5 percent in the June 2010 quarter, following an increase of 1.3 percent in the March 2010 quarter, and a decrease of 1.0 percent in the December 2009 quarter.

The most significant individual upward contribution came from higher prices for cigarettes and tobacco (up 8.7 percent). Cigarette and tobacco prices were affected by an increase in excise duty at the end of April. The rate of excise on cigarettes rose by 10.0 percent, while excise on tobacco rose 25.4 percent. In May, retail prices for cigarettes rose between 8 and 10 percent, while tobacco prices rose about 20 percent. As the increase in excise duty occurred at the end of April, two-thirds of the impact was shown in the June 2010 quarter CPI. The remainder will be shown in the September 2010 quarter.

The June 2010 quarter rise in cigarette and tobacco prices is the largest since a 10.4 percent rise in the September 2000 quarter, which was also affected by excise duty.

If cigarette and tobacco prices had remained unchanged from the March 2010 quarter, the CPI would have increased by 0.1 percent.

Alcoholic beverage prices also rose in the June 2010 quarter (up 1.2 percent), with alcoholic beverages for consumption off licensed premises rising 1.5 percent.

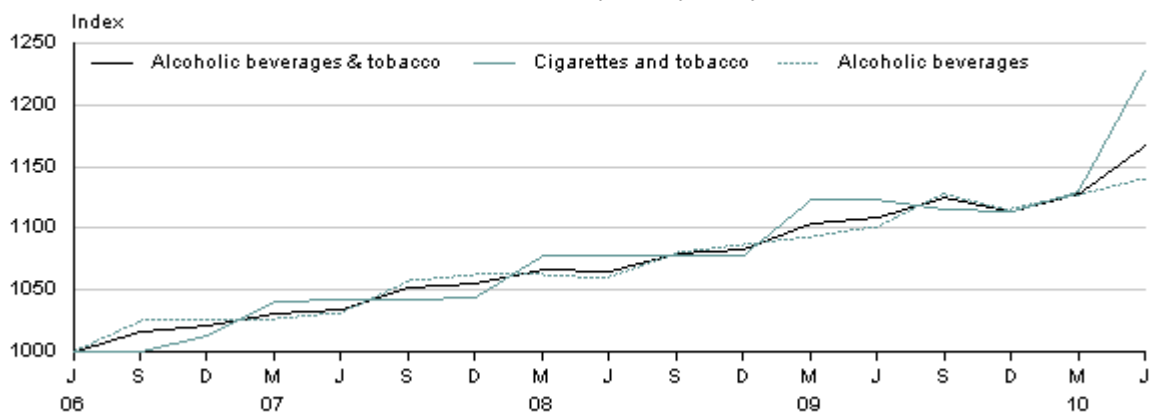
Two new series – 'all groups less alcoholic beverages subgroup' and 'all groups less cigarettes and tobacco subgroup' have been added to tables 3.01, 3.02, and 3.03 of the release. The all groups less cigarettes and tobacco subgroup rose 0.1 percent in the June 2010 quarter.

The alcoholic beverages and tobacco group increased 5.3 percent from the June 2009 quarter to the June 2010 quarter. The most significant increase came from cigarettes and tobacco (up 9.3 percent).

### Alcoholic beverages & tobacco group and selected subgroups

Quarterly indexes

Base: June 2006 quarter (=1000)



Source: Statistics New Zealand

## Food

Food prices fell 0.9 percent in the June 2010 quarter, following a rise of 1.0 percent and a fall of 2.4 percent in the March 2010 quarter and the December 2009 quarter, respectively. If food had remained unchanged from the March 2010 quarter, the CPI would have increased 0.5 percent.

Four of the five food subgroups made downward contributions in the June 2010 quarter, in particular meat, poultry, and fish (down 3.3 percent), and fruit and vegetables (down 2.6 percent). Grocery food (down 0.2 percent) and non-alcoholic beverage (down 0.2 percent) prices were also down. The fall in meat, poultry, and fish prices is the largest since a 3.4 percent decrease for the June 1986 quarter.

Restaurant meals and ready-to-eat food (up 0.5 percent) was the only subgroup to record an increase.

The most significant individual downward contributions came from lower prices for kiwifruit (down 57.7 percent), apples (down 23.4 percent), fresh chicken (down 6.5 percent), and porterhouse/sirloin beef steak (down 7.2 percent). Kiwifruit and apple prices tend to be lower in June quarters, as supply becomes more plentiful.

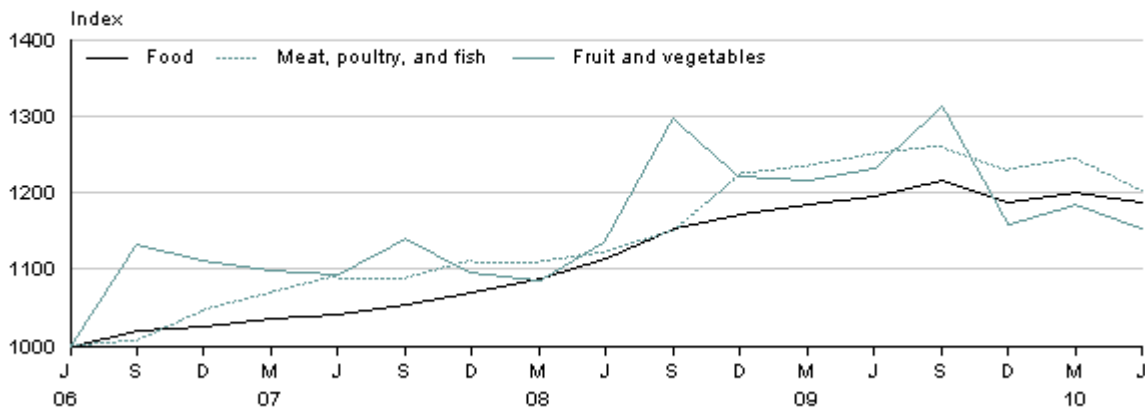
The food group fell 0.7 percent from the June 2009 quarter to the June 2010 quarter. This is the first annual fall in over seven years and the largest since a fall of 0.8 percent in the year to the December 1999 quarter.

In the year to the June 2010 quarter, two subgroups recorded decreases: fruit and vegetables (down 6.3 percent) and meat, poultry, and fish (down 3.6 percent). The other three subgroups, restaurant meals and ready-to-eat food (up 2.1 percent), non-alcoholic beverages (up 2.0 percent), and grocery food (up 0.4 percent), made upward contributions.

### Food group and selected subgroups

Quarterly indexes

Base: June 2006 quarter (=1000)



Source: Statistics New Zealand

## Transport

Prices for the transport group increased 0.9 percent in the June 2010 quarter, following increases of 1.1 percent and 1.5 percent in the March 2010 and December 2009 quarters, respectively.

The most significant individual upward contributions came from higher prices for petrol (up 1.4 percent) and second-hand cars (up 2.4 percent).

Domestic air transport prices fell 1.8 percent in the June 2010 quarter. Prices for domestic air transport have been falling since the March 2009 quarter and have now fallen by a total of 10.9 percent over the past 18 months.

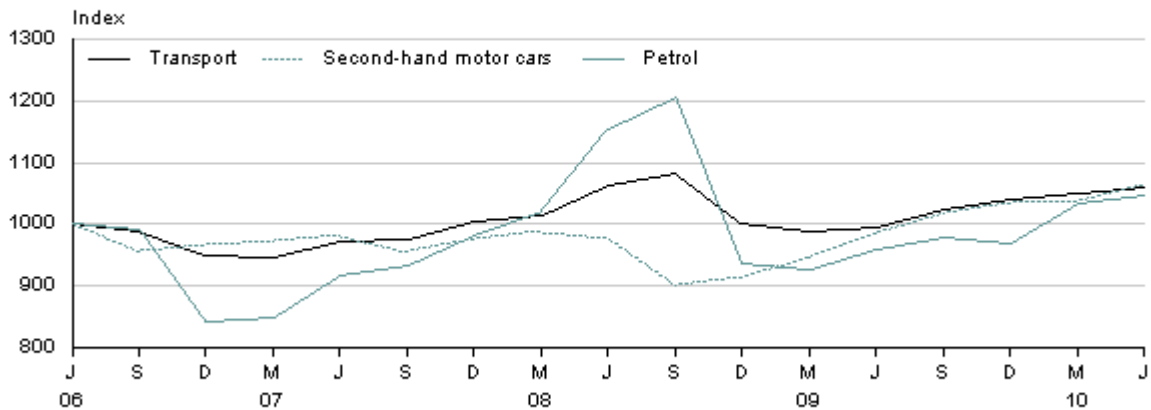
The transport group increased 6.6 percent from the June 2009 quarter to the June 2010 quarter. The most significant individual upward contribution came from higher prices for petrol (up 9.5 percent). If petrol prices had remained constant from the June 2009 quarter to the June 2010 quarter, the CPI would have increased 1.3 percent.

International air transport (up 16.1 percent) and second-hand cars (up 7.7 percent) also increased for the year to the June 2010 quarter. This is the largest annual increase in international air transport since a 17.7 percent increase in the June 1983 quarter, and follows the index reaching a 30-year low in the June 2009 quarter.

### Transport group and selected classes

Quarterly indexes

Base: June 2006 quarter (=1000)



Source: Statistics New Zealand

## Housing and household utilities

The housing and household utilities group increased 0.5 percent in the June 2010 quarter, following increases of 0.3 percent and 0.2 percent in the March 2010 and December 2009 quarters, respectively.

Significant contributions came from higher prices for rentals for housing (up 0.5 percent) and electricity (up 1.0 percent). The increase for electricity includes a small downward correction (with no impact on the overall CPI), made to include a prompt payment discount that had been omitted since the June 2008 quarter. Prices for the purchase of new housing increased 0.4 percent in the June 2010 quarter.

The increases for rentals for housing and purchase of new housing are in line with or greater than the quarterly increases recorded since the December 2008 quarter.

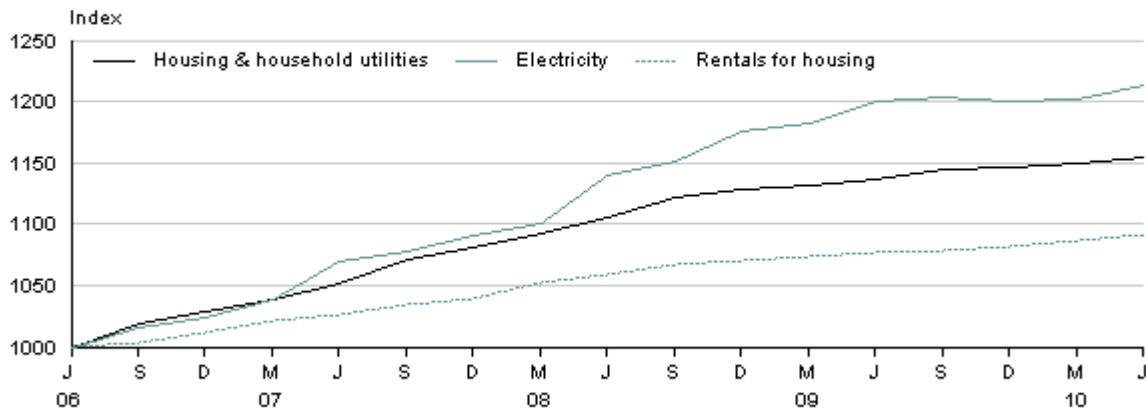
The housing and household utilities group increased 1.7 percent from the June 2009 quarter to the June 2010 quarter.

The most significant upward contributions for the year to the June 2010 quarter came from higher prices for local authority rates and payments (up 5.9 percent) and rentals for housing (up 1.4 percent). The purchase of new housing rose 1.2 percent.

### Housing & household utilities group and selected classes

Quarterly indexes

Base: June 2006 quarter (=1000)



Source: Statistics New Zealand

## Other groups

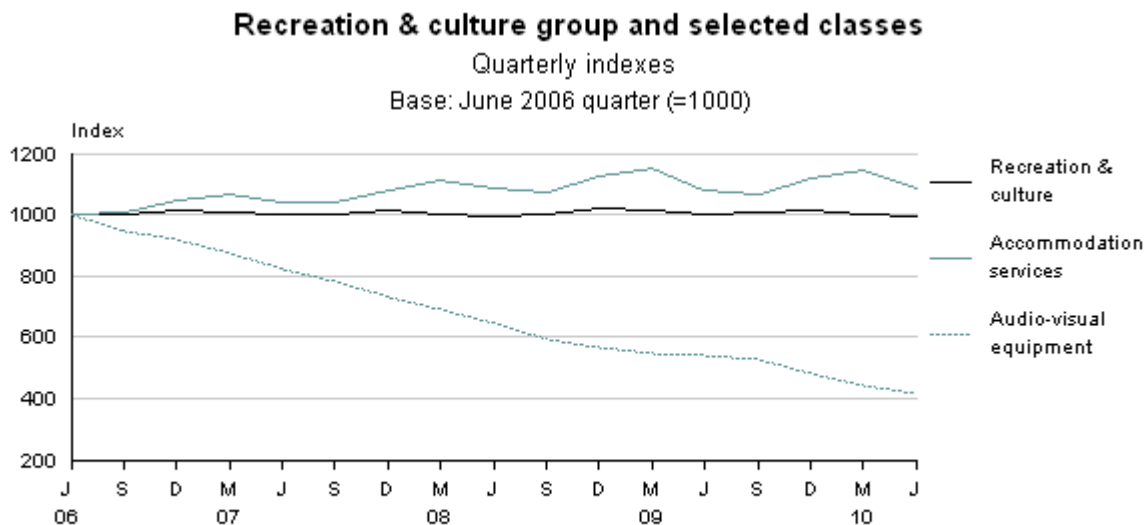
In the June 2010 quarter, upward movements were recorded for the following groups: health (up 0.7 percent), clothing and footwear (up 0.7 percent), and miscellaneous goods and services (up 0.3 percent). Combined, these groups contributed 0.89 of an index point to the overall CPI movement.

The most significant individual upward contribution came from higher prices for medical services (up 1.4 percent), reflecting higher medical specialist fees.

The education group remained unchanged overall during the June 2010 quarter. Early childhood education prices were up 0.6 percent.

In the June 2010 quarter, downward movements were recorded for recreation and culture (down 0.7 percent), household contents and services (down 0.4 percent), and communication (down 0.4 percent). These groups contributed -1.13 index points to the overall CPI movement.

The 0.7 percent fall in recreation and culture reflected lower prices for audio-visual and computing equipment (down 4.6 percent) and accommodation (down 5.3 percent).



Source: Statistics New Zealand

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### Next release ...

*Consumers Price Index: September 2010 quarter* will be released on 18 October 2010.

## Technical notes

### What the consumers price index measures

The consumers price index (CPI) measures the rate of price change of goods and services purchased by households. The CPI all groups index is prepared quarterly. The food group is the only commodity group of the CPI for which an index is prepared each month.

For more information about the design of the CPI, follow the [link](#) from the 'Technical notes' of this release on the Statistics New Zealand website.

### Index series available online

To access more data from the CPI series, go to Infoshare at [www.stats.govt.nz/infoshare](http://www.stats.govt.nz/infoshare), and choose:

Subject category: **Economic indicators**, then choose: **Consumers Price Index**

The time series can be downloaded in Excel or comma delimited format, where percentage movements can be calculated using the following formula:

((Index number for later period minus index number for earlier period) divided by index number for earlier period) multiplied by 100.

More information about Infoshare can be found on our website at [www.stats.govt.nz/about-infoshare](http://www.stats.govt.nz/about-infoshare).

### Expression base

The CPI has an expression base of the June 2006 quarter (=1000). Although the composition and relative importance of the CPI basket was reviewed in 2008, the index will continue to be published on a base of the June 2006 quarter (=1000).

Additions to the CPI basket at the June 2008 quarter have resulted in the publication of two new indexes at the class level of the New Zealand Household Expenditure Classification (NZHEC). These classes are clothing accessories, and other education. Before the review, expenditure on goods and services within these two classes was allocated to other apparel, and education items, respectively. There is also one new subgroup, for other education. As the two classes and one subgroup are new, they will be expressed on a base of the June 2008 quarter (=1000).

### Rounding of index numbers and calculation of percentage changes

Published index numbers are rounded to the nearest index point for all periods following the expression base. The rounding of index numbers takes place as the final step before dissemination. That is, the CPI structure is calculated, class to subgroup, subgroup to group, and groups to all groups, and then after that, rounding of index numbers occurs at each level.

Percentage changes are published to one decimal place and are calculated from index numbers rounded to the nearest index point. For comparisons that cross the expression base, rounded index numbers (for the later period) should be compared to unrounded index numbers (for the earlier period).

## **Information paper on 2008 CPI review**

An information paper, published on 7 October 2008, provides detailed information about the 2008 CPI review.

This information paper includes:

- details of changes made to the basket of representative goods and services
- the new CPI expenditure weights
- details of how these weights were derived
- an analysis of the main changes in the weights.

The information paper, [Consumers Price Index – 2008 Review](#), is available on the Statistics NZ website.

## **Pricing coverage**

Prices are obtained by price collectors from retail outlets in 15 urban areas: Whangarei, Auckland, Hamilton, Tauranga, Rotorua, Napier-Hastings, New Plymouth, Wanganui, Palmerston North, Wellington, Nelson, Christchurch, Timaru, Dunedin and Invercargill. Before 1988, 25 regions were sampled. In 1988 the number was reduced to 20, and in 1991 to 15. The territorial authorities of the 15 regional pricing centres account for about 69 percent of New Zealand's total resident population.

However, the prices of some goods and services are collected by postal questionnaires. In some cases, for sampling and collection reasons, these prices are aggregated to the national level or to broad regions such as Auckland, Wellington, Canterbury, Rest of North Island and Rest of South Island. Items where movements for five broad regions are used include the purchase of second-hand cars, purchase of new housing, and rentals for housing. In these cases, price movements for the five broad regions are used for the corresponding 15 regions.

## **Pricing frequency**

Prices are collected weekly, monthly, quarterly or annually, depending on the expected frequency of price changes exhibited by the good or service. Weekly surveys are conducted for fresh fruit and vegetables, and motor fuels. Monthly surveys are limited to the following commodities: food, non-food groceries, electricity, gas, tobacco, alcoholic drinks, newspapers, Internet, cellphones, rental cars, and domestic and international air travel. Some items are monitored throughout the quarter, eg telephone call charges. Mortgage interest is also surveyed monthly but has been excluded from the CPI all groups calculations following the June 1999 quarter rebase.

## **Expenditure weights**

The main source of information used in the 2008 review was the 2006/07 Household Economic Survey (HES), which collected detailed information on the spending patterns of about 2,600

households. The survey ran from July 2006 to June 2007. The number of private households covered by the HES grew by 5.0 percent, from 1,494,200 for 2003/04 to 1,569,200 for 2006/07.

However, weighting information also came from a range of other sources, including Statistics NZ surveys, government administrative data, retail transaction data and information provided by businesses.

The initial weights for the year to June 2007 (the weight reference period) were 'price updated' to the June 2008 quarter (the price reference period). This updating involved expressing the underlying quantities of the weight reference period in the prices of the price reference period. The initial weights indicated that households spent \$76.831 billion on goods and services covered by the CPI during the year to June 2007 (2006/07). When the goods and services acquired during 2006/07 are expressed in prices that were current at the June 2008 quarter, that spending rose to \$80.982 billion (5.4 percent higher, mainly due to increased housing, transport and food prices since 2006/07).

Table 9 (in the tables section of this release) compares the June 2008 quarter expenditure weights for the 11 CPI groups with the June 2006 quarter weights. Housing and household utilities, and food grew in relative importance. It shows that \$22.75 of every \$100 spent by households on goods and services covered by the CPI is spent on housing and household utilities, compared with \$20.02 in 2006. This reflects increased spending on renting and on purchasing new housing, and higher electricity prices. Food accounts for \$17.83 of every \$100 spent, compared with \$17.38 in 2006. The increase largely reflects an increase of 11.3 percent in food prices from the June 2006 quarter to the June 2008 quarter.

Other groups have shown declines in relative importance, including transport (down from \$17.24 to \$16.18 of every \$100 spent), with lower spending on cars contributing to the fall. However, the relative importance of petrol increased, from \$5.38 to \$5.47 of every \$100 spent.

## Elementary aggregate formula

Regional elementary aggregates are calculated for each of the 15 pricing centres from all prices collected for an item within that region. Since the 2006 Review of the CPI, the geometric mean, or Jevons, formula has been used to calculate the elementary aggregate indexes for items where outlet substitution is possible (eg for groceries and appliances). The Jevons formula is:

$$P_{JE} = \prod_{n=1}^N \left( \frac{P_n^1}{P_n^0} \right)^{\frac{1}{N}}$$

Where:

$P_n^1$  = Price of item n (n=1...N) in period 1

$P_n^0$  = Price of item n (n=1...N) in the base period

In practice, Statistics NZ uses a weighted geometric mean formula, with the weights, where available, representing the relative importance of outlet types, such as department stores to appliance stores.

The 'ratio of arithmetic mean prices', or Dutot, formula will continue to be used for other items where outlet substitution is not possible (eg local authority rates), where prices are subsidised and may fall to zero (eg GPs' fees), for fresh fruit and vegetables (as the first stage of aggregation is across both outlets within each region and across weeks within each month), and where it is not currently practical to adopt the Jevons formula. The Dutot formula is:

$$P_{DU} = \frac{\sum_{i=1}^N \left(\frac{1}{N}\right) P_i^1}{\sum_{i=1}^M \left(\frac{1}{M}\right) P_i^0}$$

Where:

$P_i^1$  = Price of item  $i$  ( $i=1 \dots N$ ) in period 1

$P_i^0$  = Price of item  $i$  ( $i=1 \dots M$ ) in the base period

In practice, Statistics NZ uses a weighted arithmetic mean formula, with the weights, where available, representing the relative importance of outlet types, such as department stores, to appliance stores.

The Dutot formula assumes that households purchase the same quantities at each surveyed outlet in each period. By comparison, the Jevons formula assumes that households spend the same amount at each surveyed outlet in each period. This implies that increased quantities are purchased from outlets showing lower-than-average relative price change, and decreased quantities from outlets showing higher-than-average price change. Use of the Jevons formula is recommended by the International Labour Office for goods and services where households are able to substitute towards outlets showing lower relative price change.

## Use of retail transaction data

From the 2006 CPI Review, substantial use has been made of retail transaction data, obtained from the Nielsen Company in New Zealand and from GfK in Australia. The Nielsen Company collects details of sales of barcoded products that are scanned at checkout counters in supermarkets up and down the country. Aggregate sales information was obtained for about 400 categories, broken down by quarter, leading manufacturer, leading brand and, in some cases, variety.

GfK collects similar information for a range of small and large appliances sold through most of New Zealand's main appliance retailers and department stores. Information was obtained on the volume and value of sales of about 30 different categories, broken down by feature. For example, the information quantifies the relative importance of colour TVs with standard, LCD and plasma displays.

The Nielsen Company and GfK information has been used to help:

- determine the expenditure weights of some goods in the CPI basket
- determine whether expenditure weight adjustments were required to reflect volume changes since the weight reference period and, if so, by how much
- select representative products to survey when price collectors visit retail outlets each month or quarter
- ensure that the mix of brands in the CPI price samples reflect market shares.

The Nielsen Company and GfK data will also be used on an ongoing basis between the three-yearly reweights to assist with keeping product samples, brand shares and weights (below the class level of the NZHEC classification) up to date.

## Determining the effect of a specified change in a lower-level index

As the CPI and Food Price Index (FPI) have been reweighted and re-expressed in the June 2006 quarter, the method used to determine the effect that a specified change in a lower-level index would have on a higher-level index to which it contributes, can be simplified for the September 2006 and subsequent quarters.

The index points effect and percentage contribution on a higher-level index of a specified percentage change in a lower-level index that contributes to the higher-level index can be determined by following these steps:

1. Adjust the lower-level index for the previous period ( $I_{n-1,low}$ ) by the specified percentage change ( $PC_{n,low}$ ) to derive the index number for the current period:

$$I_{n,low} = I_{n-1,low} \times \left( 1 + \left( \frac{PC_{n,low}}{100} \right) \right)$$

2. Calculate the index points effect on the higher-level index of the specified change in the lower-level index:

$$PE_{low-on-high} = \left( \frac{I_{Jun08,high}}{I_{Jun08,low}} \right) \times \left( \frac{W_{Jun08,low}}{W_{Jun08,high}} \right) \times (I_{n,low} - I_{n-1,low})$$

3. Calculate the percentage change in the higher-level index that would be caused by the specified change in the lower-level index:

$$PC_{n,high} = \left( \left( \frac{I_{n-1,high} + PE_{low-on-high}}{I_{n-1,high}} \right) - 1 \right) \times 100$$

Where:

**I** : index

**n** : period n, where n is the September 2008 quarter or a subsequent quarter (CPI), or the July 2008 month or a subsequent month (FPI)

**n-1** : (period n)-1

**Jun08** : June 2008 quarter (CPI) or June 2008 month (FPI)

**low** : lower-level index

**high** : higher-level index

**W** : expenditure weight, expressed as a percentage of the all groups (CPI) or group (FPI) index

**PC** : percentage change

**PE** : index points effect

**low-on-high** : lower-level index on higher-level index

### **Example:**

The effect that a 5.0 percent increase in the petrol index (which has a weight of 5.47 percent in the CPI) from the June 2008 quarter to the September 2008 quarter would have on the all groups CPI index can be calculated as follows:

1. Increase the petrol index for the June 2008 quarter by 5.0 percent to derive the index number for the September 2008 quarter:

$$I_{Sep08,low} = I_{Jun08,low} \times \left( 1 + \left( \frac{PC_{Sep08,low}}{100} \right) \right)$$
$$= 1153 \times \left( 1 + \left( \frac{5.0}{100} \right) \right)$$

2. Calculate the index points effect on the all groups CPI index of the 5.0 percent increase in the petrol index:

$$PE_{low-on-high} = \left( \frac{I_{Jun08,high}}{I_{Jun08,low}} \right) \times \left( \frac{W_{Jun08,low}}{W_{Jun08,high}} \right) \times (I_{n,low} - I_{n-1,low})$$
$$= \left( \frac{1061}{1153} \right) \times \left( \frac{5.47}{100} \right) \times (1210.65 - 1153)$$

3. Calculate the percentage change in the all groups CPI index that would be caused by a 5.0 percent change in the petrol index:

$$PC_{n,high} = \left( \left( \frac{I_{n-1,high} + PE_{low-on-high}}{I_{n-1,high}} \right) - 1 \right) \times 100$$
$$= \left( \left( \frac{1061 + 2.90}{1061} \right) - 1 \right) \times 100$$

## **Treatment of selected items**

### **Fuel discount schemes**

Fuel discount schemes, related to spending at supermarkets and in-store at petrol stations, were launched in late 2006. These new schemes and existing supermarket-related fuel discount schemes were incorporated into the CPI for the first time in the December 2006 quarter. Information on the volume and value of discounts attributable to private households is being used to adjust surveyed petrol and diesel pump prices. Further schemes, related to spending at other types of retail outlets, were added to the CPI in the March 2007 quarter.

## **Method of aggregating monthly collected prices from the monthly level to the quarterly level**

Prices are collected monthly for the food group and a number of non-food items in the CPI, including electricity, cigarettes and tobacco, alcoholic drinks and air travel. These prices are averaged over the quarter for inclusion in the CPI.

The method for calculating these averages is to obtain monthly regional average prices for the item by outlet-weighting the prices collected at different outlets within each region. The monthly regional average prices are used to calculate quarterly regional average prices by weighting

each monthly regional average price by the number of days in the month in which it was collected. This is called day weighting. All the regions are aggregated to obtain the New Zealand quarterly index by weighting together regional price movements from the base (ie June 2008) quarter to the current quarter, using the regional population weights.

Petrol and diesel prices are collected weekly, usually on Fridays. The CPI petrol price index measures price changes of 91 octane petrol and 95/98 octane petrol. Within each CPI region, an average price per 10 litres of each fuel is calculated from the prices surveyed each week from individual service stations. Monthly regional average prices for each fuel are then calculated as the simple averages of the averages for the weeks within each month. Quarterly regional average prices for each fuel are then calculated as the day-weighted averages of the averages for the three months within the quarter. Regional price movements from the base (ie June 2008) quarter to the current quarter are then weighted by the regional population-weighted share of the national expenditure weight, to calculate the national petrol and diesel price indexes for the current quarter.

Since petrol and diesel prices are collected either 12 or 13 times within each quarter, a price change that occurs after the first price collection of a quarter is reflected only partly in that quarter, with the remainder being reflected in the following quarter. This is also the case for commodities that are priced monthly, such as cigarettes and tobacco.

## Distribution of item-level index movements

The Distribution of Item-level Index Movements table in the Commentary section of this release gives additional information on the distribution of price movements for the current quarter's CPI. The analytical statistics in the table give an indication of how widespread price changes are, and their relative magnitude when compared with previous quarters.

The weighted average price increase and decrease uses unrounded index numbers for the previous and current periods to calculate item-level price movements from the previous period, and these are weighted using previous period expenditure weights. The previous period expenditure weight for an item is calculated by updating base period expenditure weights by the price change for the item from the base period to the previous period.

Movements based on unrounded index numbers are used to determine whether items have increased, showed no change or decreased in price. Previous period expenditure weights are used to indicate the proportion of the expenditure weight that has increased, showed no change or decreased.

## Standard and non-standard series

CPI series that contribute to the hierarchical structure of the overall CPI are known as standard series. For example, the clothing index, combined with the footwear index, contributes to the clothing and footwear index, which in turn contributes to the all groups index. Components of this pyramid-like structure are known as standard index series. In addition, a selection of non-standard series is published in the Hot Off the Press release tables, and additional series can be accessed free of charge from the online Infoshare database, available at [www.stats.govt.nz/infoshare](http://www.stats.govt.nz/infoshare). Consumers price index series can be found under the following category in the **Browse** screen:

Subject category: **Economic indicators**, then choose: **Consumers Price Index**

Examples of these non-standard series include:

- All groups CPI less food
- All groups CPI plus interest
- Interest.

The CPI is published at the following levels: group, subgroup, and class – all at the national level.

## Availability of regional indexes

Until the June 2006 quarter, indexes were published for 15 regions. These series were not considered 'fit for purpose', as price movements from national or broad-region price collection have been used in their compilation.

However, in their stead, series for five broad regions are produced: Auckland, Wellington, Canterbury (encompasses Christchurch and Timaru), Rest of North Island and Rest of South Island. These series are considered to be fit for purpose and make less significant use of national pricing indicators in their compilation. The 15 region series continue to be calculated and are available only upon request.

## Tradable and non-tradable non-standard series

The tradable and non-tradable component series that appear in table 1 allow users to decompose CPI goods and services into two components: one contains goods and services that are imported or in competition with foreign goods, either in domestic or foreign markets (tradables); and the other contains goods and services that face no foreign competition (non-tradables). Movements in the tradables component (tradable inflation) demonstrate how international price movements and exchange rates are impacting on movements in consumer prices. The non-tradables component shows how domestic demand and supply conditions are affecting consumer prices.

The June 2008 quarter expenditure weight of the tradables component is 45.78 percent, compared with 46.32 percent in 2006. The June 2008 quarter weight of non-tradables is 54.22 percent, compared with 53.68 percent in 2006.

The June 2008 quarter tradable/non-tradable weights at the group, subgroup and class levels of the NZHEC classification are included in table 3 of the supplementary tables with the web version of this release.

An information paper on the methodology for the tradable and non-tradable series, [Consumers Price Index Tradable and Non-tradable Series](#), is available on the Statistics NZ website.

## Trend measures of price-level change

The CPI captures the broad pattern of price change over the long term, but over shorter horizons the trend in price change may be masked by one-off events. In particular, the CPI:

- can be subject to temporary influences, such as adverse climatic conditions affecting the prices of fresh fruit and vegetables
- is influenced by other supply disturbances, which, while they affect the cost of living, do not directly affect the underlying inflationary pressures in the economy. For example, supply disturbances for petrol or electricity can have a large impact on the CPI in the short term
- includes some items that are subject to seasonality, such as international air fares and rental car hire, which may induce volatile short-term price behaviour.

In order to provide an indication of the trend in the CPI over time, alternative statistics, sometimes known as trend measures of price-level change, are calculated in an attempt to isolate the more persistent component of general price-level changes.

Several series are constructed to give a good guide to the trend in price-level change (5, 10, 15, 20, 25, and 30 percent trims), and a weighted median measure (the 50th percentile) is produced. Four other weighted percentile measures are also available (the 10th, 25th, 75th, and 90th weighted percentiles), primarily to highlight the distribution of price changes within a particular time period. Where the distribution of price movements is positively skewed, the weighted median movement will tend to lie below the CPI movement. Where the distribution of price movements is negatively skewed, the weighted median movement will tend to lie above the CPI movement.

For detailed information regarding the methodology and compilation of trimmed means and weighted medians, an information paper titled [Trend measures of price level change](#) is available on the Statistics NZ website.

## **Annual trend measures spanning a reweighting period**

When the CPI is reweighted, as happened at the June 2002 quarter and again at the June 2006 quarter, there is a transition period during which the percentage changes used to calculate the annual trimmed mean and weighted percentile measures span the price reference period. The annual measures are calculated by directly weighting annual percentage changes, rather than by aggregating the four relevant quarterly percentage changes.

As the June 2006 quarter reweight resulted in some significant relative changes in expenditure weights (such as for petrol and the purchase of new housing), Statistics NZ made two sets of annual trimmed mean and weighted percentile measures available during the transition across the June 2006 quarter reweight. The two sets of figures were based on:

- 'price-updated' June 2002 quarter expenditure weights
- 'price-backdated' June 2006 quarter expenditure weights.

Two sets of figures were released for the September 2006, December 2006 and March 2007 quarters. From the June 2007 quarter onwards, only the June 2006 quarter expenditure weights are used.

Statistics NZ considers that the transition across the June 2006 quarter reweight has resulted in a structural break in the annual trimmed mean and weighted percentile time series. For this reason, the annual time series based on the June 2002 quarter expenditure weights, and on the June 2006 quarter expenditure weights, will be presented as separate time series, with an overlap period of three quarters. The annual series based on the June 2002 quarter expenditure weights cease at the March 2007 quarter. The annual series based on the June 2006 quarter expenditure weights commence with figures for the September 2006 quarter and will be updated on an ongoing basis.

A similar approach has been taken for the transition across the June 2008 quarter reweight.

An information paper titled [Transition across reweights for trimmed means and weighted percentiles](#) is available on the Statistics NZ website.

## **Central and local government charges non-standard series**

The central and local government charges index, which appears in tables 3.01, 3.02, and 3.03, made up 9.52 percent of the CPI in the June 2008 quarter. It includes items such as Housing New Zealand and local authority rentals, land transfer registration fees, local authority rates, water supply and part of refuse disposal, electricity, prescription charges and oral contraception, general practitioner fees, vehicle relicensing fees, road user charges, driver licensing fees, postage, State and integrated schools, tertiary education, other education, cheque duty, and official passports, licences and certificates.

## **Goods and services non-standard series**

The goods and services component series that appear in tables 3.01, 3.02, and 3.03 allow users to decompose CPI into its goods and services components, respectively. The goods component made up 62.55 percent, and the services component 37.45 percent in the June 2008 quarter.

The goods component comprises: the food group (except restaurant meals); alcoholic beverages and tobacco group; clothing and footwear group (except clothing services); purchase of new housing, property maintenance materials, water supply, household energy, household contents and services group (except repair and hire of household appliances, hire of major tools and equipment, and other household services); medical products, appliances and equipment; dentures; purchase of vehicles, vehicle parts and accessories; petrol, other vehicle fuels and lubricants; telecommunication equipment; recreation and culture group (except recreational and cultural services, accommodation services and package holidays); and the miscellaneous goods and services group (except hairdressing and personal grooming services, jewellery and watch repair, insurance, credit services and other miscellaneous services). The services component comprises all items not in the goods component.

## **Average retail prices in the CPI**

Included in this Hot Off the Press is a selection of average retail prices for the current and previous quarter. The weighted average prices are calculated by applying index movements to weighted average prices for the June 2006 quarter CPI, with the exception of printer paper where prices were first collected in the June 2008 quarter. They are not statistically accurate measures of average transaction price levels, but do provide a reliable indicator of percentage changes in prices.

As part of the CPI review, the selection of items appearing in the tables has been reviewed, and the items have been grouped under their corresponding group headings.

With the adoption of the Jevons elementary aggregate formula as part of the 2006 review, the average prices in these tables are calculated differently for some items. For some items, a weighted arithmetic mean price is calculated for each of the 15 pricing centres. The weights reflect the relative importance of sampled outlets. These regional arithmetic mean prices are then weighted by the population weights assigned to pricing centres (see table 6) to calculate a national weighted arithmetic mean price. For other items, a weighted geometric mean price is calculated for each of the pricing centres. The weights reflect the relative importance of sampled outlets. These regional geometric mean prices are then weighted by the pricing centre population weights to calculate a national mean price using a weighted arithmetic mean formula.

For any given set of prices, a geometric mean price is less than or equal to an arithmetic mean price. This means that the June 2006 quarter average prices for items where the Jevons formula was adopted will in many cases be lower than those that appeared in the June 2006 quarter CPI

Hot Off the Press. Other factors that will cause the quarterly average prices to differ from ones published prior to the June 2006 quarter include:

- the sample of retail outlets has been updated
- the relative importance of sampled outlet types (eg department stores and appliance stores) has been updated
- the mix of surveyed brands, varieties, and sizes has been updated
- the reference size in the 'unit' column of the tables has changed for some items.

## **Detailed contribution information tables**

Tables 8.01 and 8.02 include supplementary analytical information for group, subgroup, and class contributions to the overall change in the all groups CPI. The contribution information is given as index points, percentage points, and percentage contributions from the previous quarter and from the same quarter of the previous year. These tables have been included to provide a broader perspective of the categories contributing to the movement in the all groups CPI. In cases where there is only one class within a subgroup, the class is omitted to avoid unnecessary duplication.

The index points, percentage points, and percentage contribution information contained within tables 8.01 and 8.02 is calculated from unrounded index numbers. Percentage changes have been calculated from index numbers rounded to the nearest index point (see 'Rounding of index numbers', above). As such, the sum of each of the group, subgroup or class percentage point contributions may differ from the overall percentage change in the CPI all groups.

Index points contribution measures the contribution of each group, subgroup, and class to the overall quarterly and annual change in index points in the all groups CPI.

Percentage point contribution measures the contribution of each group, subgroup, and class to the overall quarterly and annual percentage change in the all groups CPI. For any particular level of the CPI classification, such as the group level, percentage points contribution add to the overall percentage change in the all groups CPI.

Percentage contribution measures the relative contribution of each group, subgroup, and class to the overall quarterly and annual index points (or percentage) change in the all groups CPI. For any particular level of the CPI classification, such as the group level, percentage contributions add to 100 percent.

While the contribution information is given to different decimal places for index points effect, percentage point contribution, and percentage contribution, all three measures have a similar level of accuracy.

## **Calculating scenarios for holding prices constant**

One analysis often contained within the commentary of this release is an examination of hypothetical quarterly and annual percentage changes in the all groups CPI, or tradable or non-tradable components, if prices for a particular class or item under consideration had remained unchanged. These scenarios are constructed by removing the index points contribution of the class or item under consideration from the CPI all groups index number. This assumes that the item remains in the basket of goods and services, but its price remained unchanged over the period of comparison. As such analyses use unrounded index numbers, the final step is to round the new hypothetical CPI all groups index number to the nearest index point before calculating percentage changes.

These scenarios can be calculated using information contained within tables 8.01 and 8.02. This can best be done by subtracting the percentage point contribution of a class from the total CPI all groups percentage change (calculated from unrounded index numbers). Note that this is approximating the method used above and results may differ slightly to those contained within the commentary of this release, due to the final step of rounding the new hypothetical index numbers to the nearest index point.

Note that the analysis of holding prices constants differs from an analysis that excludes the class or item from the basket.

## **International comparisons of consumer price indexes**

To provide a better basis for international comparisons, the Seventeenth International Conference of Labour Statisticians adopted a resolution that called for countries to "if possible, compile and provide for dissemination to the international community an index that excludes housing and financial services" in addition to the all items index. Table 4 presents the CPI less housing and household utilities group, and credit services class series. Data for other international statistics offices is calculated by the Australian Bureau of Statistics from information supplied by the source countries.

## **Treatment of fresh fruit and fresh vegetables – removal of seasonal adjustment**

Prior to the June 2006 quarter, fresh fruit and fresh vegetable items that exhibited a seasonal pattern were adjusted to remove the effect of normal seasonal change. This treatment was used to reduce the influence of normal seasonal price fluctuations. However, the treatment did not completely eliminate the effects of seasonal fluctuations if shifts in seasonal patterns occurred.

From the June 2006 quarter onwards, the CPI incorporates seasonally unadjusted prices for fresh fruit and fresh vegetables. This is in line with a recommendation made by the 2004 CPI Revision Advisory Committee.

The ongoing, fully unadjusted CPI is linked at the June 2006 quarter to the previously published CPI, which is partly seasonally adjusted. As such, annual movements calculated over the annual period encompassing the June 2006 quarter will be based on fully unadjusted index numbers for the latest quarter, compared with partly adjusted index numbers for the same quarter of the previous year. However, analytical time series provided annual movements on a fully unadjusted basis during the year-long transition of the official CPI, during which annual movements are based on fully unadjusted index numbers for the latest quarter, compared with partly adjusted index numbers for the same quarter of the previous year.

## **More information**

For more information, follow the [link](#) from the 'Technical notes' of this release on the Statistics New Zealand website.

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## **Timing**

Timed statistical releases are delivered using postal and electronic services provided by third parties. Delivery of these releases may be delayed by circumstances outside the control of Statistics NZ. Statistics NZ accepts no responsibility for any such delays.

## Tables

The following tables are printed with this Hot Off the Press and can also be downloaded from the Statistics New Zealand website in Excel format. If you do not have access to Excel, you may use the [Excel file viewer](#) to view, print, and export the contents of the file.

1. Consumers price index, tradables, non-tradables, and all groups – index numbers and percentage changes
  - 2.01. Consumers price index, groups and subgroups – index numbers
  - 2.02. Consumers price index, groups and subgroups, percentage change from previous quarter
  - 2.03. Consumers price index, groups and subgroups, percentage change from same quarter of previous year
- 3.01. Consumers price index, selected groupings – index numbers
- 3.02. Consumers price index, selected groupings, percentage change from previous quarter
- 3.03. Consumers price index, selected groupings, percentage change from same quarter of previous year
4. International comparisons of consumer price indexes, excluding housing and household utilities group and credit services class – index numbers and percentage change
5. Consumers price index, weighted average retail prices of selected items
6. Consumers price index, expenditure weights
7. Consumers price index, population weights
- 8.01. Consumers price index, groups, subgroups and classes, contribution to all groups and percentage change from previous quarter
- 8.02. Consumers price index, groups, subgroups and classes, contribution to all groups and percentage change from same quarter of previous year
9. Consumers price index, expenditure weights, groups, subgroups, and classes
10. Consumers price index, COICOP divisions – index numbers and percentage changes
11. Consumers price index, trimmed means and all groups
12. Consumers price index, weighted percentiles and all groups