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Your Guide to the Consumer Price Index

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Statistics Canada
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Your Guide to the Consumer Price Index

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Note of appreciation

Canada owes the success of its statistical system to a long-standing co-operation involving Statistics Canada, the citizens of Canada, its businesses, governments and other institutions. Accurate and timely statistical information could not be produced without their continued co-operation and goodwill.

This publication was written for the general public interested in obtaining a brief non-technical introduction to the Consumer Price Index (CPI). It poses and answers some of the more frequently asked questions relating to the construction, interpretation and use of this index.

This publication, prepared by **Gail Logan** and **Heather Pearl**, relates to the 1992 basket and the 1986 time base. The work was carried out under the direction of:

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Table of Contents

	Page
What is the CPI?	1
Misconceptions About the CPI	2
How the CPI Relates to You	3
The Goods and Services Contained in the CPI Basket	4
The Relative Importance of Commodities in the CPI Basket	5
Updating the CPI Basket	5
Collecting Prices	5
Dealing with Quality Change	7
Calculating Indexes	7
The CPI Time Base	8
Calculating Percentage Changes	9
Using the CPI to Adjust Payments	10
Using the CPI to Compare Dollar Values Over Time	10
CPI and Other Related Publications	12
Glossary of Terms	13

Inquiries relating to all aspects of the CPI should be directed to the Client Services Unit in Prices Division of Statistics Canada, or to a Statistics Canada Regional Reference Centre. The telephone numbers of these offices are listed on the inside cover of this booklet.

TABLE - 1

The Consumer Price Index and Major Components,
(Not Seasonally Adjusted), Canada, 1986=100

	Indexes			Percentage change May 1996 from	
	May 1996	April 1996	May 1995	April 1996	May 1995
All-items	135.7	135.3	133.7	0.3	1.5
Food	127.8	128.3	126.8	-0.4	0.8
Shelter	134.2	134.1	133.9	0.1	0.2
Household operations and furnishings	124.0	123.9	121.6	0.1	2.0
Clothing and footwear	131.5	132.0	131.7	-0.4	-0.2
Transportation	144.9	143.1	138.8	1.3	4.4
Health and personal care	136.7	136.7	135.9	0.0	0.6
Recreation, education and reading	145.7	144.0	142.5	1.2	2.2
Alcoholic beverages and tobacco products	146.3	145.5	143.6	0.5	1.9
Goods	129.4	128.9	127.4	0.4	1.6
Services	143.6	143.2	141.4	0.3	1.6
All-items excluding food and energy	137.8	137.6	135.8	0.1	1.5
Energy	135.0	130.8	130.2	3.2	3.7
Purchasing power of the consumer dollar expressed in cents, compared to 1986	73.7	73.9	74.8		
All-items (1981=100)	179.7				

What is the CPI?

The Consumer Price Index (CPI) is a measure of the rate of price change for goods and services bought by Canadian consumers. It is the most widely used indicator of price changes in Canada.

The Canadian CPI began with a study conducted by the Department of Labour in the early 1900's. The study was based on a hypothetical family budget that represented weekly expenditures of an urban working class family of five. Retail prices of 29 food items and five fuel and lighting items were collected in approximately 60 cities. In addition, information was obtained on the rent for a representative worker's dwelling. Since then, the CPI has grown in comprehensiveness and detail to keep pace with increases in its use. Today, the CPI directly or indirectly affects nearly all Canadians. Consider the following:

- Old Age Security pensions, Canada Pension Plan payments, and other forms of social and welfare payments are adjusted periodically to take account of changes in the CPI.
- Rental agreements, spousal and child support payments and other forms of contractual and price-setting arrangements are frequently tied in some manner to movements in the CPI.
- **Cost-of-living adjustment (COLA) clauses** link wage increases to movements in the CPI. Labour contracts governing the wages of many Canadian workers include COLA clauses.

The CPI is relevant to all those who earn and spend money. When prices rise, the purchasing power of money drops. When prices drop, it means the purchasing power of money increases. The CPI is frequently used to estimate the extent to which this purchasing power of money changes in Canada. For these reasons, it is a widely used measure of **inflation** (or **deflation**).

Think of the CPI as a measure of the percentage change over time in the average cost of a large basket of goods and services purchased by Canadians. The quantity and quality of the goods and services in the basket remain the same. Therefore, changes in the cost of the basket over time are not due to changes in the quantity and/or quality of the goods and services observed.

The CPI is defined, more precisely, as an indicator of the changes in consumer prices experienced by Canadians. It is obtained by comparing, through time, the cost of a **fixed basket** of commodities purchased by Canadian consumers in a particular year. Since the basket contains commodities of unchanging or equivalent quantity and quality, the index reflects only **pure price movements**.

The Consumer Price Index for a given month is usually published in the third week of the following month, and it is not revised once it has been published. This makes it suitable for users who must have timely and final data.

If you are concerned with everything in the CPI basket, you would use the All-items index. If you are looking for something more specific, you may choose from the many index series available. These range from indexes for individual items to those for groups of items. Examples include series for potatoes, food purchased from stores, gasoline, operation of automotive vehicles, goods, services, and energy.

Detailed CPIs are published simultaneously for Canada, the ten provinces, Whitehorse and Yellowknife. Whitehorse represents the Yukon, and Yellowknife, the Northwest Territories. In addition, some information is available for sixteen cities across Canada. If there is no CPI for, say, your home town, you can choose a provincial index or the Canada index. Your choice will depend on your needs.

Seasonally adjusted data for selected series provide an additional source of useful information for certain analytical purposes. To meet this specialized need, Statistics Canada calculates a limited number of monthly consumer price indexes from which seasonal influences are removed to provide a better indication of trends in price changes. These series are subject to revision. Seasonally adjusted series are **not** recommended for use in indexation.

Misconceptions About the CPI

The Consumer Price Index is often perceived as the only measure of the rate of price change. This is a common misconception. The CPI is one of many price change measures available to the public. It reflects the experience of Canadian consumers buying consumer goods and services. Statistics Canada publishes a number of measures of price change for different target groups, for different products, and using different methodologies. Take the evolution of gasoline prices as an example. Depending on the circumstances, it might be more useful to examine the price of gasoline at the gas pump (from the CPI), the price of gasoline as it leaves the refinery (from the Industrial Product Price Index), or world crude oil prices (from the Raw Materials Price Index).

■ the Industrial Product Price Indexes

measure the changes in prices received by Canadian manufacturers for goods as they leave the factory gate. Indirect taxes, transportation, wholesale and retail costs are not included in the price. Almost 1300 basic indexes are available.

■ the Raw Materials Price Indexes

measure price changes for the purchase of raw materials by Canadian industry. The term "raw material" refers either to a commodity that is sold for the first time after being extracted from nature, or a substitutable recycled product (e.g. metal scrap).

■ the New Housing Price Indexes

measure changes over time in the contractors' selling prices of new residential houses.

■ the Machinery and Equipment Price Indexes

measure price changes for investment in machinery and equipment by industry of purchase. Price indexes are calculated for industries, major groups of industries, the total for all industries, as well as for commodities.

■ the Non-residential Building Construction Price Indexes

measure contractors' selling price changes of new non-residential construction (i.e., commercial, industrial and institutional). The indexes relate to both general and trade contractors' work and exclude the cost of land, design and real estate fees.

■ the Farm Input Price Indexes

measure price changes of a basket of goods and services purchased by Canadian farmers for use in agricultural production.

■ the Farm Product Price Indexes

measure the change through time in the prices received for agricultural commodities at the first transaction point.

■ the Price Indexes of the National Accounts

measure the price change of broad categories of goods and services making up the Gross Domestic Product (GDP).

The Consumer Price Index is not a measure of price levels, although people sometimes misinterpret the CPI figures as actual prices. Price indexes show the rate at which prices change between two periods. For example, consumer price indexes for January 1995 were as follows: oranges, 100.5, and apples, 117.9 (1986=100). From these numbers, we cannot conclude that the price of apples was higher than the price of oranges. The indexes show that orange prices rose 0.5% since

1986 while apple prices rose 17.9%. What we can conclude is that, on average, apple prices rose more than orange prices between 1986 and January 1995.

Similarly, in June 1995, the All-items CPI for Newfoundland was 127.8 and for British Columbia it was 137.2 (1986=100). We cannot conclude that prices as a whole were lower in Newfoundland than in British Columbia. What we can say is that, on average, prices increased more in British Columbia than they did in Newfoundland between 1986 and June 1995. The actual prices in Newfoundland could very well be higher than those in British Columbia.

If you are looking for actual prices or price level comparisons, some information is available in the **Consumer Prices and Price Indexes** quarterly publication ([Catalogue No. 62-010-XPB](#)). Table 5 carries average retail prices at the Canada level for certain goods (mostly food items). Table 10 compares price levels between eleven Canadian cities for a number of commodity groups. Table 11 contains average retail prices for gasoline and fuel oil for sixteen Canadian cities. Table 15 compares price levels in Ottawa with those of thirteen foreign cities.

The CPI is not a **cost-of-living index**, though people frequently call it this. In theory, the objective behind a cost-of-living index is to measure price changes experienced by consumers in maintaining a constant standard of living. The idea is that consumers would normally switch between products as the price relationship of goods changes. If, for example, consumers get the same satisfaction from drinking tea as they do from drinking coffee, then it is possible to substitute tea for coffee if the price of tea falls relative to the price of coffee. The cheaper of the interchangeable products may be chosen.

We could compute a cost-of-living index for an individual if we had complete information about that person's taste and consuming habits. To do this for a large number of people, let alone the total population of Canada, is impossible. For this reason, regularly published price indexes are based on the **fixed basket** concept rather than the cost-of-living concept.

How the CPI Relates to You

Every month, the news media report the CPI figures to the Canadian public. Some people question these figures because their personal experience does not seem to match what is being reported. It is important, however, to understand that the CPI measures the *average* change in retail prices encountered by all consumers in Canada. It cannot, and should not, be expected to reflect the price change experience of any particular household or person. The CPI basket contains an extensive list of goods and services. Each consumer buys a different combination of these goods and services, and it would be unlikely for any consumer to buy everything on the list at one point in time. For instance, it would be highly unusual to find a consumer using both fuel oil and natural gas for home heating. However, both fuels are included in the CPI since both are important in the spending pattern of Canadian consumers as a whole.

Information on the spending habits of Canadian households is obtained periodically from family expenditure surveys. In one survey, households selected from a random sample are asked to keep a detailed diary of food expenditures over a two-week period. In the other survey, the randomly-selected households are asked to provide detailed information on what goods and services were purchased in the previous calendar year together with the amount of money spent on these items.

No two households are exactly alike in their spending habits. By combining the information from many households, it is possible to develop a broad picture of the spending patterns of the whole population. The expenditure data used as **weights** in the CPI represent the spending habits of households situated in the ten provinces, Whitehorse and Yellowknife.

For many years, the CPI related to the spending behaviour of the population in urban centres of 30,000 or more. This accounted for about 75% of total consumer spending in Canada. In January 1995, the 1992 expenditure weights were introduced into the CPI. Since then, the CPI weights have reflected the spending behaviour of nearly all Canadian urban and rural private households.

The Goods and Services Contained in the CPI Basket

The goods and services included in the CPI basket are those considered to be consumer items. They must be associated with a retail price. This retail price is the sum of money that a consumer must pay to purchase a specific quantity and quality of a good or service. Examples of excluded items are income taxes, charitable donations, contributions made to pension plans, and consumer savings and investments. Income taxes are excluded because it is impossible to associate a specific amount of tax paid with a specific quantity of services received. By definition, the other excluded items are not considered to be consumer items.

No attempt is made to differentiate between “luxuries” and “necessities”, and nothing is omitted on the basis of moral or social judgement. Some people may regard the use of tobacco and alcohol as socially undesirable. However, these products are included in the CPI basket because they make up a notable proportion of the expenditures of Canadian families and individuals.

The goods and services are organized according to a classification system. Every product has a unique place in this classification. Products are grouped with other items either because they have a common end-use or because they are considered substitutes for each other. These families of products are joined together at different levels in the classification system to form a hierarchy. The lowest level is called a **basic class** while the highest level, before the “All-items”, is known as a **major component**. The goods and services in the CPI basket are grouped into 182 basic classes.

A product like toothpaste belongs to the basic class “Oral-hygiene products”, which in turn, comes under the larger group “Personal care supplies and equipment”. The latter group falls under “Personal care”. When “Personal care” and “Health care” are combined, they make up the major component called “Health and personal care”.

HEALTH AND PERSONAL CARE¹

Personal care (+ Health care)

Personal care supplies and equipment

Oral-hygiene products²

Toothpaste³

Indexes are computed for each of the basic classes found in the classification system. They are aggregated following the hierarchy of the classification to arrive at eight major components, and finally, the “All-items”.

ALL-ITEMS, CPI

1. Food
2. Shelter
3. Household operations and furnishings
4. Clothing and footwear
5. Transportation
6. Health and personal care
7. Recreation, education and reading
8. Alcoholic beverages and tobacco products

Index makers can combine categories in different ways to meet specific needs. One long-standing combination is the “All-items excluding food and energy” index which, in the opinion of some policy makers, is a better indicator of underlying trends in overall price movements than the All-items index. Other well-known combinations include “Goods”, “Services”, “Energy” and “All-items excluding tobacco products”.

¹ Major component.

² Basic class.

³ Product for which a price is collected.

The Relative Importance of Commodities in the CPI Basket

The spending associated with each **basic class** in the CPI basket is compared to the total spending in Canada. These proportions indicate the relative importance, or **weight**, of a commodity in the CPI basket. Weights determine the impact that a particular price change will have on the overall consumer budget. For example, a 5% rise in the price of milk would have a much greater impact on the average budget of consumers than a 5% increase in the price of tea, because people spend on average more money on milk than they do on tea. The weight for Canada assigned to milk (0.69%) is greater than that of tea (0.06%). Without weights, price changes for all commodities in the CPI basket would be given equal importance in the calculation of the All-items index.

Computing the weight for a given commodity is a relatively simple matter. To illustrate, take consumers' spending on gasoline. The average spending per household in a given province⁴ is multiplied by the estimated number of households in that province to arrive at the total expenditure for gasoline. The total expenditures are added up across provinces to arrive at the estimated total expenditures on gasoline for Canada. The proportion of this estimate to the grand total of spending on all goods and services in the CPI basket becomes the expenditure weight for gasoline in the Canada CPI.

The eight major components of the CPI appear in [Figure A](#) on page 6. The weight for each component is represented as a proportion of the total expenditures for the 1992 CPI basket. These are expressed in December 1994 prices.

⁴ The term "province" also includes the cities of Whitehorse and Yellowknife which represent the Yukon and Northwest Territories, respectively.

Updating the CPI Basket

The content of the CPI basket is reviewed and updated periodically to ensure that it remains relevant. A major part of this review involves replacing existing **weights** with those obtained from the family expenditure surveys of a more recent period. Changes in spending patterns reflect changes in such factors as the composition and distribution of the population, the quality and availability of goods and services, personal incomes, wealth, and consumer taste.

In recent years, the CPI weights have been based on family expenditures for 1974, 1978, 1982 and 1986. The current set of weights refer to household expenditures for 1992, and were introduced into the CPI in January 1995.

Basket updates also provide the opportunity to review CPI methodology, concepts and procedures, and to implement changes. The purpose of these modifications is to make the CPI a better indicator of consumer price movements at the national and provincial levels.

Collecting Prices

Since the Consumer Price Index is designed to measure price changes experienced by Canadian consumers, the prices used in the CPI are those that any consumer would have to pay on the day of the survey. This means that if an item is on sale, the sale price is collected. Because sales taxes are part of the price paid by the consumer, they are included in the final price used in the calculation of the CPI.

Prices are collected for over 600 separate goods and services. They range from ground beef to haircuts and from spark plugs to property taxes. It is neither practical, nor necessary, to price all the items that consumers buy since many items show similar price movements. By carefully selecting representative items, we can reflect price changes for a much wider range of products than those observed directly.

Most commodities are priced once a month. Some items, such as haircuts and dry-cleaning services are priced each quarter. Property taxes and tuition fees are monitored once a year. Generally, the more often prices change, the more often they are collected. In cases where goods appear on the market seasonally, prices are collected during the season when they are available. Also, when prices change outside the scheduled time of collection, a special price collection may be carried out to ensure that such changes are reported in the CPI in a timely fashion.

The pricing cycle starts in the first week of each reference month and extends to the third week of the month. The indexes that result from this price collection activity represent the entire month. Some users ask for the index for a particular day of the month, like April 1, June 15 or December 31. This information is not available, and users have to decide which month's index best meets their particular requirements.

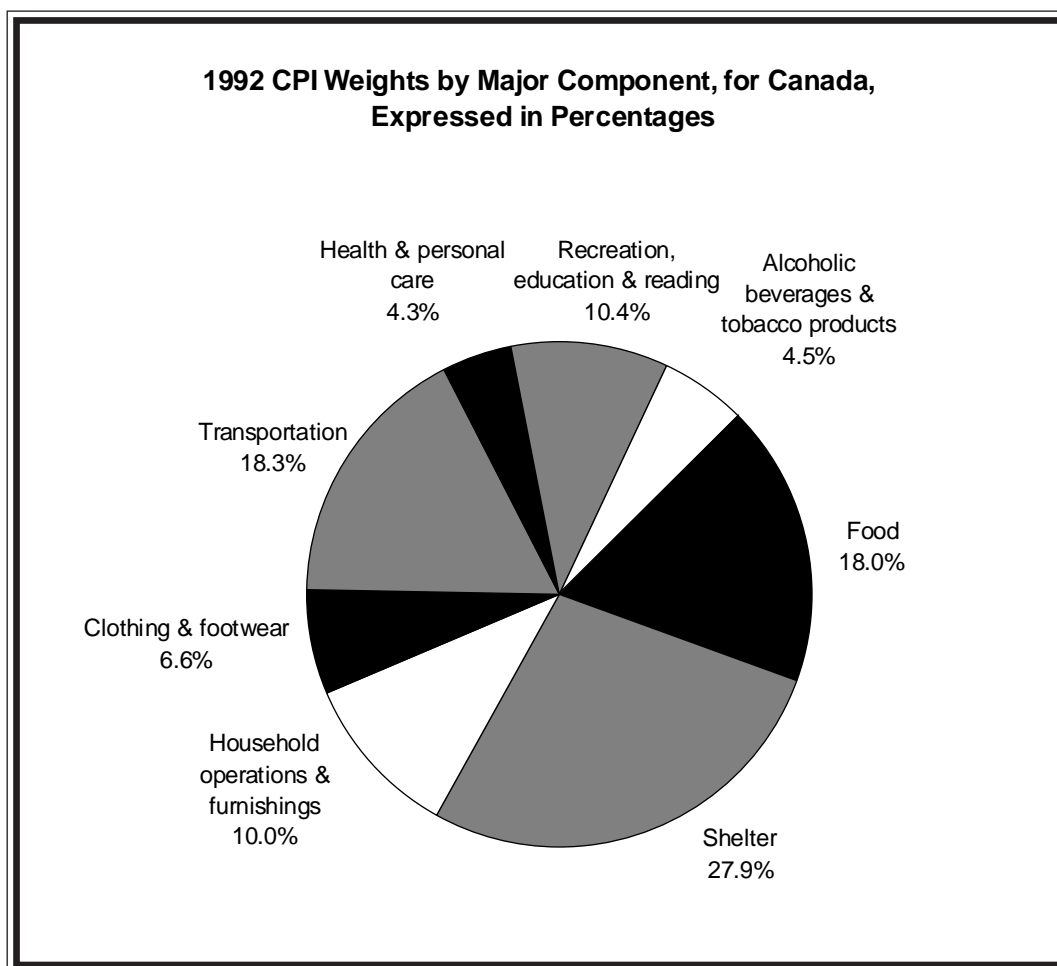


Figure A

The price collection activity takes place all across Canada. It is carried out in outlets from which consumers normally buy. The sample of outlets includes supermarkets, specialty shops, department stores, garages, dental offices, hairdressing salons, etc. Bus, rail and air fares, electricity and gas rates, telephone charges, and property taxes are collected from the appropriate local and regional authorities. Information on rental charges for living accommodation is obtained from a monthly survey of thousands of tenants.

Over 60,000 price quotations are collected each month by skilled interviewers operating out of the regional offices of Statistics Canada. To ensure that price movements reflect the experience of most of the population, the interviewers follow the prices of the brands and varieties which sell in the greatest volume. Interviewers also try to obtain reasons for significant price changes. This information is used in verifying the data and in explaining the overall results.

Dealing with Quality Change

The objective of the Consumer Price Index is to measure pure price change. As a result, the quantity and quality of the goods and services included in the CPI basket have to be held constant. In the real world, however, the quality of goods is continually changing as new models and varieties replace earlier ones.

Price increases that are due to an improvement in the quality of a product are not treated as pure price changes. A common adjustment technique is to determine which feature of a product causes the quality to change. If, for example, air conditioning becomes a standard feature in the newer model of a certain car, then we would price models with that feature. To compare the prices of the older and newer models, however, they must first be put on an equal footing. The estimated value of air conditioning is therefore added to the price of the older vehicle. The prices of the two vehicles can now be compared because the price of the air conditioning equipment is included in both. Other

adjustment techniques are described in the **Consumer Price Index Reference Paper** ([Catalogue No. 62-553](#)).

The problems encountered in adjusting prices for quality changes are complex and sometimes impossible to solve in a fully satisfactory manner. This is especially true in evaluating the quality change in services. For example, it is fairly easy to monitor changes in bus ticket prices. But, how would you attach a dollar value to the changes in the frequency or punctuality of the bus service? A change in the quality of that service may well have contributed towards a change in the bus ticket prices.

Calculating Indexes

Once price quotations are gathered, they undergo a careful screening. This is to ensure the validity of the data that will be used in the CPI calculations. The checking procedure involves close scrutiny of items for which prices are collected in the current month to make certain that they are equivalent to those for which prices were collected in the previous month.

The calculation of the monthly All-items index starts with the measurement of the price change for a particular product. Price indexes for the products are combined following the hierarchy of the classification, with the appropriate **weights** being applied along the way. For instance, the price indexes for milk, butter, cheese, and other dairy products are combined to form an index for dairy products. Similarly, the various price indexes for ladies' clothing are combined to obtain a women's wear index. These group indexes are then further combined to come up with **major component** indexes, in these cases, "Food" and "Clothing and footwear". Finally, the major component indexes are combined to arrive at the All-items index.

The first step in calculating a price change is to obtain an average price for a product in both the given month and the previous month. As an illustration, consider the price change of cheese in Nova Scotia between January and February. The prices

collected in February are reviewed to ensure that they refer to the same quantity and quality of cheese, and were collected in the same stores, as in the previous month. Average prices for Nova Scotia are then calculated for January and February using this **matched sample**.

The second step is to compute a monthly **price relative**. This is the ratio of February's average price to January's average price. If the average prices for January and February were \$2.80 and \$2.86 respectively, then the price relative for February would be:

$$\frac{\$2.86}{\$2.80} = 1.021$$

This ratio indicates a 2.1% increase in the average price of cheese in Nova Scotia from January to February.

The third step is to calculate the price index for cheese in Nova Scotia for the month of February. This is obtained by multiplying the index level for January by the price relative for February. If the index for January was 119.8 (1986=100), the February index would be:

$$119.8 \times 1.021 = 122.3 \text{ (1986 = 100)}$$

Price indexes for cheese for February are calculated similarly for all provinces across Canada. To obtain the cheese index for Canada, you must first calculate a Canada price relative. This relative is obtained by applying the appropriate weights to the provincial price relatives. The February cheese index for Canada is then calculated by multiplying the Canada index level for January by the Canada price relative for February.

Often, people want to combine index series into new aggregates that are tailored to serve their particular purposes. Special procedures have to be used when aggregating indexes across provinces and across commodities. When reconstructing or re-aggregating published CPI series, the changes

in weights and the **linking procedures** must be taken into account. For a description of the methodology required to perform these tasks, see the **Consumer Price Index Reference Paper (Catalogue No. 62-553)**. Alternatively, please contact the representatives of the Client Services Unit of Prices Division (see inside cover) who can advise you on how to calculate these types of indexes, or, for a fee, can calculate them on your behalf.

The CPI Time Base

The **time base**, or **base period**, of an index is the period in which the index is given a value of 100. At present, the CPI time base is 1986. The standard practice, when quoting an index level, is to ensure that the base period is also quoted. For instance, the CPI All-items for Canada for the month of January 1995 was 132.1 (1986=100). This means that consumer prices were 32.1% higher in January 1995 than in 1986. Statistics Canada will always quote the CPI figures from the current time base, unless the client specifies otherwise.

The CPI time base is updated periodically to coincide with the change in the time base of other major statistical series at Statistics Canada. Starting with the indexes of January 1983, the CPI time base was changed from 1971 to 1981. The 1986 CPI time base came into effect with the release of the CPI for June 1990. Historical series have been converted to the 1986 time base.

To ensure continuity and ease of use, it is practical to use indexes that are on the most current base year (time base). If you need to convert data to a different time base, rebasing is achieved by either multiplying or dividing the series by a factor. The Client Services Unit of Prices Division, or any Statistics Canada Regional Reference Centre, can advise you on the proper procedures for accomplishing this task.

Converting a time series from one time base to another merely changes the level of the indexes. The percentage changes calculated between the same two periods do not change from one time series to another, other than because of rounding.

Rounding may become a factor when the CPI is used for indexation. Statistics Canada recommends that the parties to a contract use the most current time base to reduce ambiguity or uncertainty.

Calculating Percentage Changes

To illustrate the most frequent calculations done with price indexes, we shall use data from [Table 2](#) in the centre of the booklet. Table 2 has three sections. In the first section, the index levels for the All-items CPI for Canada are given by month. These monthly indexes are averaged over the twelve calendar months to arrive at the annual average index. The three most frequently requested percentage changes are those:

- (a) between a given month and the preceding month;
- (b) between a given month and the same month of the previous year; and
- (c) between the annual average index of a given year and that of the previous year.

The second and third sections of Table 2 feature these percentage changes. They are calculated from the indexes in the first section.

To illustrate (a), the percentage change in the index between September and October 1994 is calculated as follows:

$$\frac{(130.7 - 130.9)}{130.9} \times 100\% = -0.2\%$$

The result of this **month-to-month price change** calculation tells us that from September to October 1994, prices dropped by an average 0.2% in Canada.

Many people consider the equivalent formula more convenient:

$$\left[\frac{130.7}{130.9} \times 100 \right] - 100 = -0.2\%$$

All cases that follow will employ this formula.

To illustrate (b), the percentage change in the index between December 1994 and December 1995 is calculated as follows:

$$\left[\frac{133.9}{131.6} \times 100 \right] - 100 = 1.7\%$$

In this case, the **price change over 12 months** is positive, which tells us that prices rose 1.7% on average between December 1994 and December 1995 in Canada.

To illustrate (c), the percentage change in the annual average index between 1994 and 1995 is calculated as follows:

$$\left[\frac{133.5}{130.7} \times 100 \right] - 100 = 2.1\%$$

The result of this calculation tells us that prices in Canada rose 2.1% on average between the years 1994 and 1995.

You may calculate percentage price changes over any two periods. To do these calculations, always remember to divide the more recent index by the older index, multiply by 100, and then subtract 100.

Care must be taken to distinguish between changes expressed in index points and changes expressed as percentages. Changes expressed in index points will vary depending on the **base period** of the indexes. Statistics Canada recommends using the percentage change approach because percentage changes are independent of the level of the index.

Using the CPI to Adjust Payments

When the Consumer Price Index is used as an escalation tool, a clause is written into a contract by which a sum of money to be paid in the future is automatically adjusted by changes in the CPI. This type of clause is called an **escalation clause**. In many contracts, they are called **cost-of-living adjustment** or **COLA clauses**. Here are some examples.

Example 1

Assume a separation or divorce agreement contains the following clause: "The basic child support payment is \$300 per month effective May 1, 1994. Every May 1 thereafter, payments will be adjusted by the percentage change over 12 months in the March All-items CPI for Canada".

This contract clause means that the child support payments will be adjusted at whatever percentage change the index shows between March 1994 and March 1995, then again between March 1995 and March 1996, and so forth. From [Table 2](#) (in the centre of the booklet), we see that the All-items CPI for Canada increases were 2.2% in the first year and 1.4% in the second.

On May 1, 1995, the monthly support payment would increase by \$6.60, which is 2.2% of \$300, equalling \$306.60. On May 1, 1996, the monthly payment would increase by \$4.29, which is 1.4% of \$306.60. The resulting payment would be \$310.89.

Example 2

Old Age Security (OAS) pensions are adjusted every January, April, July and October using the All-items CPI for Canada. OAS payments are adjusted using the average index levels for the CPI reference months, as shown:

January → August, September and October
April → November, December and January
July → February, March and April
October → May, June and July

The average of the indexes for August, September and October 1995 equals 133.8 while the average of the indexes for November 1995, December 1995 and January 1996 is 134.1. If we take the basic payment of \$394.76, in effect between January and March 1996, we obtain the adjusted OAS payment for April 1, 1996 by doing the following calculation:

$$\left[\frac{134.1}{133.8} \times 100 \right] - 100 = 0.2\%$$

This means that the OAS payment of \$394.76 will increase by 0.2% or \$0.79 on April 1, making the adjusted payment \$395.55.

Example 3

Canada Pension Plan (CPP) payments are indexed once a year in January. The CPP formula averages the indexes for twelve consecutive months, divides the result by the average of the preceding twelve months, multiplies by 100, and then subtracts 100. The observed twelve months refer to the period from November of one year to October of the next. As an example, take a hypothetical CPP payment of \$450 a month. The average of the indexes for November 1993 to October 1994 is 130.7, and the average for November 1994 to October 1995 is 133.1. The Consumer Price Index increased by 1.8% between these two periods. The CPP payment would therefore increase by \$8.10 to \$458.10 in January 1996.

Using the CPI to Compare Dollar Values Over Time

Most people can identify with the phrase "A dollar just doesn't stretch as far as it used to". When prices rise, a dollar buys fewer goods and services. Because the CPI measures changes in the general price level, it is often used to estimate changes in the purchasing power of the Canadian dollar.

In [Table 1](#) at the beginning of the booklet, we see that the CPI for May 1996 is 135.7. For 1986, the base year, it is 100.0. From these numbers, we

can readily conclude that consumer prices rose 35.7% between 1986 and May 1996.

To find out how much money in 1986 had the same purchasing power as \$1.00 did in May 1996, the calculation is:

$$\left[\frac{100.0}{135.7} \right] \times \$1.00 = \$0.737 \text{ or } 73.7 \text{ cents}$$

This means that, in May 1996, \$1.00 had the same value as 73.7 cents did in 1986.

Each month, Statistics Canada calculates the purchasing power of the dollar, using the above method, by comparing the monthly All-items index for Canada to the current **base period** (1986=100) of the CPI. However, you can compare the purchasing power of money between any two periods.

For instance, if you wanted to know how much money in July 1995 had the same purchasing power as \$1,000 did in January 1977, you would use the CPI indexes for these two months (the January 1977 index is 49.1, and the July 1995 index is 134.0), and perform the following calculation:

$$\left[\frac{134.0}{49.1} \right] \times \$1,000 = 2.729 \times \$1,000 = \$2,729$$

Conversely, if you wanted to know how much money it would have taken in January 1977 to equal the purchasing power of \$1,000 in July 1995, you would do the following calculation:

$$\left[\frac{49.1}{134.0} \right] \times \$1,000 = 0.366 \times \$1,000 = \$366$$

Usually, dollar figures are expressed in **current dollars**. This means that the dollar values are expressed at the prices prevailing during the period being referred to. In the table that follows, a family's annual expenses are examined. We show that the family spent \$20,000 in 1985 current dollars, \$25,000 in 1990 current dollars, and \$30,000 in 1995 current dollars.

These figures cannot be compared directly to one another because a dollar in 1985, in 1990, and in 1995 was not worth the same amount. To compare dollar figures over time, we must convert the current dollar values to **constant dollar** values. This means that the current dollar figures are all re-expressed in terms of the value of the dollar at a specific time. The CPI is often used to do this conversion, and here, we show how it is done.

	(1) Expenses in Current Dollars	(2) All-items CPI (1986=100)	(3) Expenses in Constant 1986 Dollars
1985	\$20,000	96.0	\$20,833
1990	\$25,000	119.5	\$20,921
1995	\$30,000	133.5	\$22,472

The figures in Column (1) include the effects of price changes. These expenses are converted into constant 1986 dollars by dividing them by the corresponding 1986-based indexes shown in Column (2), and multiplying the result by 100 (the index of the base year). The results in Column (3) show the expenses for all three years with the effects of price changes removed. These constant dollar values provide a better indication of real expenditures, and can now be compared to one another.

Many people believe that a "real" increase (or an increase after removing the effects of **inflation**) is the difference between the percentage change in the current dollars and the rate of inflation. This is an incorrect way to estimate real value increases. In the above table, expenditures rose by 50% between 1985 and 1995, while prices increased by 39.1%. These percentages were obtained by doing the following calculations:

$$\left[\frac{\$30,000}{\$20,000} \times 100 \right] - 100 = 50.0\%$$

and

$$\left[\frac{133.5}{96.0} \times 100 \right] - 100 = 39.1\%$$

According to the method mentioned in the previous paragraph, the increase in expenditures would be 10.9%. However, the actual increase is 7.9%.

Incorrect $50.0\% - 39.1\% = 10.9\%$
Correct $\left[\frac{\$22,472}{\$20,833} \times 100 \right] - 100 = 7.9\%$

Some CPI data are also available in:

- **The Canadian Economic Observer**, (Monthly), [Catalogue No. 11-010-XPB](#), a compendium publication.

Information regarding the latest Family Expenditure Surveys is contained in two volumes:

- **Family Food Expenditure in Canada, 1992**, [Catalogue No. 62-554](#); and
- **Family Expenditure in Canada, 1992**, [Catalogue No. 62-555](#).

To find out how to obtain these or other Statistics Canada publications, please see the inside front cover of this booklet.

Educators will find the **E-STAT CD-ROM**, which includes teaching materials, a useful tool for introducing the CPI to their classes. Please contact the Statistics Canada Regional Reference Centre nearest you for more details.

CPI and Other Related Publications

Data and analysis on the Consumer Price Index are available in printed form in:

- **The Consumer Price Index**, (Monthly), [Catalogue No. 62-001-XPB](#); and the
- **Consumer Prices and Price Indexes**, (Quarterly), [Catalogue No. 62-010-XPB](#).

Detailed information on the methodology and concepts of the CPI is contained in:

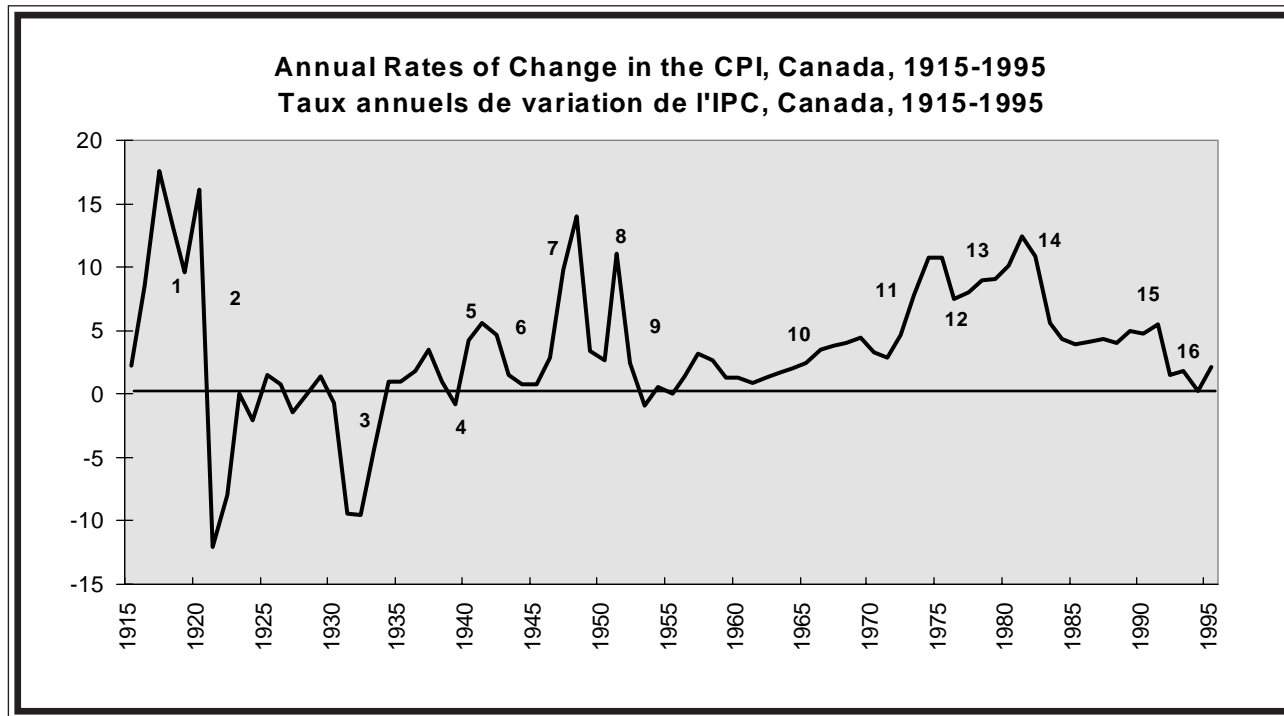
- **The Consumer Price Index Reference Paper, Update Based on 1992 Expenditures**, (Occasional), [Catalogue No. 62-553](#).

Glossary of Terms

Base period	- A synonym of the time base of an index.
Basic class	- The lowest-level aggregates of commodities for which a set of weights is available (normally derived from the family expenditure surveys) that is consistent with the fixed-basket concept of the CPI.
Constant dollars	- A valuation in constant dollars is expressed at the prices prevailing during some fixed reference or base period.
Cost-of-living adjustment clause (COLA)	- A clause written into a contract which links wage increases to movements in the CPI.
Cost-of-living index	- In theory, the objective behind a cost-of-living index is to measure price changes experienced by consumers in maintaining a constant standard of living. The idea is that consumers would normally switch between products as the price relationship of goods changes.
Current dollars	- A valuation in current dollars expressed at the prices prevailing during the period being referred to.
Deflation	- A downward movement in the average level of prices.
Escalation clause	- A clause written into a contract which stipulates that a sum of money to be paid on a regular basis will automatically be adjusted by changes in a price index.
Fixed basket	- A set of commodities with specified and unchanging quantitative proportions among its constituent goods and services.
Fixed-basket price index	- A ratio of the cost of a specified basket in the observed period to its cost in the base period.
Inflation	- An upward movement in the average level of prices.
Linking procedure	- A procedure for connecting, in a certain link period, two price index series for a given aggregate, each of them associated with a different fixed basket; indexes of a new series whose time base is the link period are multiplied by the corresponding index of the old series for the link period.
Major components	- The eight major components of the CPI basket are "Food", "Shelter", "Household operations and furnishings", "Clothing and footwear", "Transportation", "Health and personal care", "Recreation, education and reading", and "Alcoholic beverages and tobacco products".
Matched sample	- A sample that refers to items of the same quantity and the same, or equivalent, quality in the two compared months.
Month-to-month price change	- A price change between one month and the preceding month.
Price change over 12 months	- The price change between one month and the same month of the previous year.
Price relative	- The ratio of the price of a commodity in the observed period to its price in the period used as a base for comparison.

Glossary of Terms (concluded)

Pure price movement	- Price movement that is not attributable to changes in either the quality or the quantity of a given good or service.
Time base	- The period whose prices serve as a base for comparing the observed period prices; in other words, the period in which an index is 100 in percentage form or 1 in ratio form.
Updating of fixed baskets	- The replacement of a basket by one that is more recent.
Weight	- The value assigned to each basic class, which indicates its importance in the fixed basket. In the computation of a specific weighted average of price indexes, to obtain an aggregate price index, the weight of each basic class is multiplied by the corresponding price index. Therefore, the weight determines the degree of influence exerted by the price change of each basic class on the corresponding aggregate price index.



- | | | | | | |
|-----------|---|------------------------------|-----------|---|---|
| 1 | - | World War I | 1 | - | Première guerre mondiale |
| 2 | - | Recession | 2 | - | Récession |
| 3 | - | Great Depression | 3 | - | Grande dépression |
| 4 | - | Recession in the U.S.A. | 4 | - | Récession aux États-Unis |
| 5 | - | World War II | 5 | - | Deuxième guerre mondiale |
| 6 | - | Price Controls | 6 | - | Contrôles de prix |
| 7 | - | Explosion of Pent-up Demand | 7 | - | Expansion de la demande refoulée |
| 8 | - | Korean War | 8 | - | Guerre de Corée |
| 9 | - | Credit Controls | 9 | - | Contrôles de crédit |
| 10 | - | Period of Sustained Growth | 10 | - | Période de croissance soutenue |
| 11 | - | First Oil Crisis | 11 | - | Première crise du pétrole |
| 12 | - | Anti-inflation Board | 12 | - | Commission de la lutte contre l'inflation |
| 13 | - | Second Oil Crisis | 13 | - | Deuxième crise du pétrole |
| 14 | - | Wage Controls and Recession | 14 | - | Contrôles des salaires et récession |
| 15 | - | Goods and Services Tax (GST) | 15 | - | Taxe sur les produits et services (TPS) |
| 16 | - | Cigarette Tax Reduction | 16 | - | Réduction des taxes sur les cigarettes |

TABLE - 2

TABLEAU - 2

**The Consumer Price Index for Canada, All-items
(Not Seasonally Adjusted), 1972-1996, 1986=100**

**Indice d'ensemble des prix à la consommation pour le
Canada, (non désaisonnalisé), 1972-1996, 1986=100**

	January	February	March	April	May	June	July	August	September	October	November	December	Annual average ¹
	Janvier	Février	Mars	Avril	Mai	Juin	Juillet	Août	Septembre	Octobre	Novembre	Décembre	Moyenne annuelle ¹
Indexes													Indices
1972	32.7	32.8	32.9	33.0	33.1	33.1	33.5	33.8	33.9	33.9	34.0	34.2	33.4
1973	34.5	34.7	34.8	35.2	35.4	35.8	36.1	36.6	36.8	36.9	37.2	37.4	36.0
1974	37.7	38.1	38.4	38.7	39.4	39.9	40.1	40.6	40.8	41.2	41.6	42.0	39.9
1975	42.2	42.5	42.7	43.0	43.4	44.0	44.6	45.0	45.1	45.5	45.9	46.0	44.2
1976	46.2	46.5	46.6	46.8	47.2	47.4	47.6	47.8	48.0	48.3	48.5	48.7	47.5
1977	49.1	49.5	50.1	50.4	50.8	51.1	51.6	51.8	52.1	52.6	52.9	53.3	51.3
1978	53.5	53.9	54.5	54.6	55.4	55.8	56.6	56.7	56.6	57.2	57.6	57.8	55.9
1979	58.2	58.8	59.5	59.9	60.5	60.8	61.3	61.5	62.0	62.5	63.1	63.4	61.0
1980	63.8	64.4	65.0	65.4	66.2	66.9	67.4	68.1	68.7	69.3	70.2	70.5	67.2
1981	71.5	72.2	73.1	73.7	74.3	75.5	76.1	76.7	77.3	78.0	78.7	79.1	75.5
1982	79.6	80.6	81.6	82.0	83.2	84.0	84.4	84.8	85.3	85.8	86.4	86.4	83.7
1983	86.2	86.6	87.5	87.5	87.7	88.7	89.0	89.5	89.5	90.0	90.0	90.3	88.5
1984	90.8	91.3	91.5	91.8	91.9	92.3	92.8	92.8	92.9	93.1	93.7	93.7	92.4
1985	94.1	94.7	94.9	95.3	95.5	96.1	96.4	96.5	96.7	97.0	97.4	97.8	96.0
1986	98.3	98.6	98.9	99.0	99.5	99.6	100.4	100.7	100.7	101.2	101.7	101.9	100.0
1987	102.1	102.6	103.0	103.5	104.1	104.4	105.1	105.2	105.2	105.6	106.0	106.1	104.4
1988	106.3	106.7	107.3	107.6	108.3	108.5	109.1	109.4	109.5	110.0	110.3	110.3	108.6
1989	110.9	111.6	112.2	112.5	113.7	114.3	115.0	115.1	115.3	115.7	116.1	116.0	114.0
1990	117.0	117.7	118.1	118.1	118.7	119.2	119.8	119.9	120.2	121.2	121.9	121.8	119.5
1991	125.0	125.0	125.5	125.5	126.1	126.7	126.8	126.9	126.7	126.5	127.0	126.4	126.2
1992	127.0	127.1	127.5	127.6	127.8	128.1	128.4	128.4	128.3	128.5	129.1	129.1	128.1
1993	129.6	130.0	129.9	129.9	130.1	130.2	130.5	130.6	130.7	130.9	131.5	131.3	130.4
1994	131.3	130.3	130.1	130.2	129.9	130.2	130.7	130.8	130.9	130.7	131.4	131.6	130.7
1995	132.1	132.7	133.0	133.4	133.7	133.7	134.0	133.8	133.9	133.8	134.1	133.9	133.5
1996	134.2	134.4	134.9	135.3	135.7	135.6	135.6	135.7	135.9	136.2			

	January	February	March	April	May	June	July	August	September	October	November	December	Annual average ¹
	Janvier	Février	Mars	Avril	Mai	Juin	Juillet	Août	Septembre	Octobre	Novembre	Décembre	Moyenne annuelle ¹

Monthly percentage changes

Taux mensuels de variation

1982	0.6	1.3	1.2	0.5	1.5	1.0	0.5	0.5	0.6	0.6	0.7	0.0
1983	-0.2	0.5	1.0	0.0	0.2	1.1	0.3	0.6	0.0	0.6	0.0	0.3
1984	0.6	0.6	0.2	0.3	0.1	0.4	0.5	0.0	0.1	0.2	0.6	0.0
1985	0.4	0.6	0.2	0.4	0.2	0.6	0.3	0.1	0.2	0.3	0.4	0.4
1986	0.5	0.3	0.3	0.1	0.5	0.1	0.8	0.3	0.0	0.5	0.5	0.2
1987	0.2	0.5	0.4	0.5	0.6	0.3	0.7	0.1	0.0	0.4	0.4	0.1
1988	0.2	0.4	0.6	0.3	0.7	0.2	0.6	0.3	0.1	0.5	0.3	0.0
1989	0.5	0.6	0.5	0.3	1.1	0.5	0.6	0.1	0.2	0.3	0.3	-0.1
1990	0.9	0.6	0.3	0.0	0.5	0.4	0.5	0.1	0.3	0.8	0.6	-0.1
1991	2.6	0.0	0.4	0.0	0.5	0.5	0.1	0.1	-0.2	-0.2	0.4	-0.5
1992	0.5	0.1	0.3	0.1	0.2	0.2	0.2	0.0	-0.1	0.2	0.5	0.0
1993	0.4	0.3	-0.1	0.0	0.2	0.1	0.2	0.1	0.1	0.2	0.5	-0.2
1994	0.0	-0.8	-0.2	0.1	-0.2	0.2	0.4	0.1	0.1	-0.2	0.5	0.2
1995	0.4	0.5	0.2	0.3	0.2	0.0	0.2	-0.1	0.1	-0.1	0.2	-0.1
1996	0.2	0.1	0.4	0.3	0.3	-0.1	0.0	0.1	0.1	0.2		

Annual percentage changes

Taux annuels de variation

1982	11.3	11.6	11.6	11.3	12.0	11.3	10.9	10.6	10.3	10.0	9.8	9.2	10.9
1983	8.3	7.4	7.2	6.7	5.4	5.6	5.5	5.5	4.9	4.9	4.2	4.5	5.7
1984	5.3	5.4	4.6	4.9	4.8	4.1	4.3	3.7	3.8	3.4	4.1	3.8	4.4
1985	3.6	3.7	3.7	3.8	3.9	4.1	3.9	4.0	4.1	4.2	3.9	4.4	3.9
1986	4.5	4.1	4.2	3.9	4.2	3.6	4.1	4.4	4.1	4.3	4.4	4.2	4.2
1987	3.9	4.1	4.1	4.5	4.6	4.8	4.7	4.5	4.5	4.3	4.2	4.1	4.4
1988	4.1	4.0	4.2	4.0	4.0	3.9	3.8	4.0	4.1	4.2	4.1	4.0	4.0
1989	4.3	4.6	4.6	4.6	5.0	5.3	5.4	5.2	5.3	5.2	5.3	5.2	5.0
1990	5.5	5.5	5.3	5.0	4.4	4.3	4.2	4.2	4.2	4.8	5.0	5.0	4.8
1991	6.8	6.2	6.3	6.3	6.2	6.3	5.8	5.8	5.4	4.4	4.2	3.8	5.6
1992	1.6	1.7	1.6	1.7	1.3	1.1	1.3	1.2	1.3	1.6	1.7	2.1	1.5
1993	2.0	2.3	1.9	1.8	1.8	1.6	1.6	1.7	1.9	1.9	1.9	1.7	1.8
1994	1.3	0.2	0.2	0.2	-0.2	0.0	0.2	0.2	0.2	-0.2	-0.1	0.2	0.2
1995	0.6	1.8	2.2	2.5	2.9	2.7	2.5	2.3	2.3	2.4	2.1	1.7	2.1
1996	1.6	1.3	1.4	1.4	1.5	1.4	1.2	1.4	1.5	1.8			

¹ The annual index level is the average of the 12 individual monthly indexes. The percentage change for a given calendar year is calculated using the annual average indexes.

¹ Le niveau de l'indice annuel est la moyenne des 12 indices individuels mensuels. Le pourcentage de variation pour une année civile donnée est calculé en utilisant les indices de la moyenne annuelle.