Towards a Better Understanding of the Consumer Price Index

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The findings of this Study are the personal responsibility of the authors and, as such, have not been endorsed by Members of the Economic Council of Canada.

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Preface

The Centre for the Study of Inflation and Productivity (CSIP) was established in June 1978, as an agency of the Economic Council of Canada, following a request by First Ministers, to analyse and monitor price and cost developments in the Canadian economy.

A major part of the mandate involved the undertaking of a comprehensive research program. The program was designed to inform and educate the public on a number of issues affecting the course of inflation and productivity in Canada.

On March 2, 1979, CSIP was terminated. However, as part of the wind down of its activities, the Centre was asked to complete the research program begun under its auspices.

The results of the program will be published in a series of discussion papers. These papers are not intended as original contributions to methodology or theory. Rather, they have the more limited objective of presenting to interested individuals or institutions a summary and synthesis of the issues involved.

This paper was prepared under contractual arrangements with the Economic Council of Canada and has benifited from comments submitted by independent outside experts who were asked to referee an earlier version of the manuscript.

Acknowledgement

This paper has been through several drafts, with its initial focus on description and technical details redirected to increased emphasis on the uses and abuses of the Consumer Price Index (CPI). Throughout this period, we have received full co-operation from Denis Desjardins of Statistics Canada and helpful criticism from several readers at the Centre for the Study of Inflation and Productivity (CSIP) and the Economic Council of Canada.

The preparation of this final version was greatly assisted by the writing skills of Jennifer Lewington. It is hoped that the paper will be comprehensible by all readers; any errors or omissions are the responsibility of the authors.

1 Introduction

Every month, the incomes of most Canadians depend to some degree on the work of 115 people. They are the faces behind the Consumer Price Index (CPI) which, for better or worse, has become a high-profile exercise in taking the pulse of the Canadian economy each month. It is a ritual which is poorly understood by many, even though the CPI is a widely quoted yardstick for telling Canadians about the speed and direction of price changes in consumer products and services.

Growing interest in the CPI stems naturally from its ever-wider application as an adjuster for inflation. Increases in the index automatically can trigger quarterly or annual increases in:

- the basic exemption for income taxpayers;
- Canada Pension Plan payments to those over 65 years;
- disability pensions paid to war veterans and survivors;
- family allowance payments (though index-related increases were waived for 1979);
- family incomes eligible for the child tax credit;
- alimony payments;
- labour contracts;
- business contracts;
- annuity payments to retired members of the federal public service, Royal Canadian Mounted Police and armed forces;
- rental agreements;
- war veterans' allowances;
- guaranteed income supplement and old-age security allowance payments.

It hasn't always been this way. The first Consumer Price Index in 1915 simply published information on food, fuel, light, and rent. But, with sustained high levels of inflation since the early 1970s, Canadians and elected officials have looked for ways to protect incomes from the ravaging effects of ever-rising prices. They have turned to the Consumer Price Index as the nearest approximation of inflation because it gives a timely picture of retail price movements each month. If incomes are tied to index changes, Canadians hope they will be no worse off in the presence of fast-moving price increases.

Now that so many individual and business incomes are linked to the CPI, it is easy to lose sight of the index itself. After all, it is only one — albeit handy — attempt to measure what Canadians experience as consumers. As one indicator of price changes from month to month in a selected group of retail products and services, the index can never match what individuals buy in the same period. But few people are in a position to design their own index, so the CPI is the closest, if at times overburdened, guide for those who want protection from inflationary developments in the economy. Company planners look to the CPI as one sign of what price increases to charge or expect in future; the CPI is also a benchmark for assessing the effectiveness of government policy.

Is too much expected of the CPI? The answer depends on whether consumers, business, labour and politicians understand the limitations of the index. It is not, for instance, a measurement of consumers' "cost-of-living." To create such an index — as yet no one has succeeded — one would measure how consumers adjust to price increases while getting the same level of satisfaction or use out of the goods and services they purchase. Satisfaction is, however, an ill-defined concept which varies with each person, making such a measurement impossible in an index. Still, it's attractive to consider a cost-of-living index since it could show whether consumers actually pay higher prices when costs increase. They may not; by substituting one product for another as prices change, consumers may be able to adjust and still get the same satisfaction as before from their total purchases.

Quite aside from theoretical considerations, the concept of cost-of-living is much broader than that of the CPI. The two are not synonymous. The CPI shows only one part of inflation's effect on consumers. For instance, Canadians collectively pay for a host of goods and services which are not counted in the CPI "basket"; some of these are health, education, and some public services. On the credit side, consumers receive benefits from living in society, such as improved job opportunities and more leisure time, which are not included in the "basket." By not considering all of society's costs and benefits, the CPI tends to overstate the income losses apparently suffered when prices rise.

Nevertheless, the CPI has its uses. By side-stepping the difficult issue of creating a cost-of-living index, the CPI turns instead to what practically can be monitored. As a result, the index gives focus to one facet of consumer costs and, consequently, serves as one guide to price trends in the economy.

2 One Measure of Inflation

Though only one gauge of price changes in the economy, the CPI is certainly the most convenient. It is, for example, a representative survey of retail cost changes for certain goods and services. It is also timely — always released a few weeks after the end of the month under review. The index value for the month is final, since survey information need not be revised. For analytical purposes, price indexes are released simultaneously for the seven major components: food; clothing; housing; transportation; health and personal care; recreation, reading and education; and tobacco and alcohol.

In constructing the CPI, its designers at Statistics Canada make several assumptions. For instance, once weights are assigned to the elements in the "basket," they remain the same from month to month; the same is true for the quantity priced. Thus, only shifts in prices are recorded in the CPI. In addition, the CPI covers only those urban Canadians who live in the 59 cities with 30,000 or more people.

Having made its assumptions with a view to building a workable index, Statistics Canada sends staff and part-time employees out on their difficult price-checking mission each month. They visit stores to obtain prices of commonly purchased brands and, where necessary, price a variety of models. In other cases, such as air fares, rent, utility rates and dental care, surveyors go to the relevant authority or company. Retail sales tax and property tax, as part of consumers' final costs, are included in the index, but income tax and savings are not since they are not purchased.

In all, the surveyors take 110,000 price quotations on 375 items a month. Prices for everything in the survey are taken in the 15 cities for which separate indexes are published but elsewhere, particularly in the smaller centres, prices may be imputed instead. And, depending on the importance played in family spending, only some parts of the "basket" are measured every month, such as food, household products, clothing, and housing. Cars are not in every consumer's budget and as a result

prices are checked nine times a year. Similarly, dry cleaning, tobacco, and alcohol prices are surveyed four times a year and property tax changes are sampled annually. Once it appears that those items surveyed less frequently are rising in price faster than expected, surveyors sample more often.

The work of the price gatherers is far from simple or easy. Although Statistics Canada has rules and procedures to guide the surveyors through their monthly pricing dilemmas, they nevertheless have an unenviable task. No two brands of beans, for instance, are exactly the same and price variations may be a result of quality differences. Which one to choose for pricing purposes? Statistics Canada opts for the most commonly purchased brand but a strike may mean that the brand usually priced is not available. Obviously, the surveyor needs a price record of other brands in order to have a next-best alternative in the survey. Price checkers are continually confronted with situations which threaten Statistics Canada's objective of creating a representative "basket" which does not change in quantity and quality. Though questions of quantity do not usually pose problems, holding quality constant from one month to the next can be difficult. For example, one model of refrigerator may be replaced by another with new features, such as an automatic icemaker. The price gatherer must calculate what portion of the price change is due to the new gadget; only the change caused by inflation is recorded in the CPI. Faced with a constellation of prices — and circumstances — the surveyors clearly rely more on a good judgment than mechanical procedures. Such is the human element of the CPI.

Price information about the numerous products and services of the "basket" is just one of a series of complex steps in calculating the index. With prices in hand, Statistics Canada puts a value — or weight — on the contents of the "basket" according to their importance in consumer budgets. Currently, Statistics Canada's principal guide in assigning weights is its 1974 Family Expenditure Survey of what urban Canadians buy and how much they spend on their purchases. By using such a survey, Statistics Canada need make no assumptions either about future spending changes or about "necessities" or "luxuries."

The most recent survey in 1974, for instance, reflects the buying surge for jogging shoes and, in the reweighted CPI following September 1978, Statistics Canada introduced a new category, "athletic shoes," which helped give a bigger weight to men's shoes in the CPI. Consumers are spending more money on pet care according to the spending survey; accordingly, the most recently revised CPI gives it a higher weight. People are also buying more of their own food away from home so the latest revisions to the CPI reduce the importance of at-home food costs and increase the importance of restaurant and take-out meals.

The changing demands of society show up over time in the CPI. Based on 1967 spending patterns, for instance, deodorants and garbage bags were given a weight for the first time; lard and lamb were dropped. Now using 1974 spending information, Statistics Canada has added extensively to its coverage including among others, cablevision, dishwashers and fresh strawberries.

As incomes and tastes continue to change, the next revision will undoubtedly introduce new weights for the contents of the "basket." Some items may be added for the first time — such as lottery tickets — and some which are gradually disappearing from consumer budgets — such as girdles — may be dropped in future.

The pace of change in the CPI is dictated by the frequency of Statistics Canada's Family Expenditure Survey. Until recently, the survey had been taken every 10 years or so, but, owing to the magnitude of price changes in the early 1970s, a new spending survey was used in 1974, several years ahead of schedule. There is usually a lag of several years between the spending survey and reweighting of the CPI. Results of the 1967 survey were implemented in 1973 and the 1974 weights were brought in for the period following September 1978.

CPI revisions are, like consumer buying tastes, evolutionary in nature so that significant shifts in habits show up best when looking at the CPI over a lengthy period. Food, for example, is playing an increasingly less important role. In 1957, it accounted for 27 per cent of the CPI and now accounts for 21.5 per cent of the "basket"; in 1957, housing, the largest component, represented 32 per cent of the basket and now has a weight of 34 per cent.

3 The Current Revisions

Once Statistics Canada assigns weights to the many items of the CPI, the weights do not change until the index is revised on the basis of new family spending surveys. Thus, between revisions, the CPI "basket" always measures the same quantity of whatever is surveyed, giving it the same importance, to make valid comparisons of price change over time. By holding the quantity and importance of individual items "constant" — necessary for the sake of comparability — the CPI assumes that consumers do not reallocate the elements of their budgets in response to price changes. Such an assumption breaks with reality, of course, but all consumer price indexes in the industrialized world give up a little realism in the interest of creating a useful measurement which give comparisons over time. The risk, naturally, is in losing touch with reality and for that reason Statistics Canada makes revisions, based on family spending surveys, to catch up with events and incorporate them into the CPI.

In making its revisions, Statistics Canada maintains comparability from an "old" index to a "new" index through a complex process which effectively links the indexes. In this way, there is only one official CPI.

The most important difference between the current index — weighted to 1974 spending patterns — and the previous one — weighted to 1967 patterns — is the new values for the contents of the "basket." The importance of food has decreased from 24.8 per cent in the 1967-weighted CPI to 21.5 per cent in the current index, not because consumers are spending less on food in the absolute, but because other items in their budget are increasingly significant. The trend to a shorter working week and the corresponding increase in leisure time has forced Statistics Canada to increase the weight for recreation, reading and education to 8.3 per cent of the total "basket" from 6.9 per cent in the 1967-weighted "basket."

While the importance attached to the ingredients of the "basket" shifts with each revision, new weights will not alter consumers' general perceptions about inflation trends. Consumers will know if food prices are rising

quickly, and the increases will show up in the CPI regardless of a reweighting for the food component.

Another modification to the current CPI is its wider coverage of the population. Up until 1978, when Statistics Canada made its eighth major revision to the CPI since its introduction in 1915, only 40 per cent of Canadians had been in the sample. But though there are no longer any limits on family size or income, the current CPI is still consistent with previous indexes. Like weighting changes, increased coverage does not affect the underlying trends but simply adds an extra measure of credibility.

In a similar vein, Statistics Canada has expanded the geographic scope and size of its price sample. Now, new methods are used to calculate the national CPI by directly gathering information from 51 cities instead of 34. Separate indexes now are published for 15 centres — one more than before — so that at least one city per province has its own index. For analytical purposes, the information gathered for the city indexes is compatible to, and released with, the national CPI. Of the numerous indexes which can be derived from the CPI, the national index is most reliable because it is based on the largest number of price quotations. For the same reason, individual components — such as food and housing — are more reliable than city indexes. And, because price changes may be more dramatic in one period of the year than another, month-to-month indexes may not give a good view of the final index for the year.

In the current revision, Statistics Canada has made adjustments to eliminate an underestimation of actual costs for shelter and to give a more reliable picture of costs in the city indexes. In addition, a new housing price index has been introduced to upgrade the quality of data gathered for replacement of housing and input costs.

No doubt, future modifications to the CPI will continue to be made with a view to improving flexibility and accuracy. Nevertheless, the index will never tell the full story of an *individual's* experience with price changes. Spending patterns not only vary between groups of different incomes, age, and family size, but within those groups as well; variations from one individual to another can be enormous relative to the so-called "average." For example, the housing component averages price changes for owner-occupied and rental housing, although few people both own and rent primary accommodation. At best then, the CPI or any other index will be only an approximation of the impact of price changes on a particular person.

4 Some Problems

Like all indexes, the CPI is the result of compromise between the need for realism and the need for a workable measurement. Statistics Canada's assumptions, necessary for the sake of practicality, ultimately lead to divergences from actual consumer spending habits. But by recognizing there is often a difference between what the CPI reports and what consumers really are doing, one has a better frame of reference for the CPI.

One difficulty inherent in the CPI is that it has no scope for substitution once weights are assigned to the contents of the "basket." However, consumer buying habits are continually in flux as technology improvements and taste changes bring new products on the market and as incomes rise or fall. The faster these permutations in spending patterns, the more the CPI drifts away from reality. Trends such as eating more convenience foods are only incorporated at the time of revision — and then are held constant in the basket until the next revision. In the meantime, incomes tied to changes in a "fixed" CPI will be overcompensated if, in practice, they have substituted cheaper products and services. The CPI measures rising energy prices but does not recognize until the next revision that consumers may be using less energy through conservation or cheaper alternatives; as a result, consumers may have more income left over than what appears from a reading of the CPI.

A related difficulty is in pricing items which are purchased seasonally. The availability of winter parkas and bathing suits, for example, vary with the season and Statistics Canada assumes no price change occurs until, when normal purchasing resumes, the full increase is recorded.

Another difficulty arises with changes in product or service quality which occur between index revisions. For example, between the spending surveys of 1967 and 1974, emission controls and seat belts had become standard features on cars. Where frequent quality changes take place, especially with cars, clothing, and household appliances, Statistics Canada has to identify what portion of the new price is a result of quality

changes. For instance, prices of canned vegetables may hold steady but new can sizes may be smaller so a price increase is recorded by Statistics Canada. But no real price change takes place if a new hair dryer costs more because it offers a wider selection of attachments. Statistics Canada has to deduct the cost of the new feature in order to derive the actual price.

Still another dilemma contained in the CPI is how to price things purchased infrequently. Unlike food, which is bought and used almost at once, clothes, cars, television sets, and stereos are purchased and consumed over months and years. Conceptually, Statistics Canada views these purchases not as products *per se* but as services which are bought and used over time. Thus, for pricing purposes, the CPI assumes that the purchase price is much the same as the service received. But in establishing a weight for less-frequently purchased items, the new price may not be representative since only some consumers are making a purchase at any one time. As a result, Statistics Canada estimates net purchases to derive a weight for longer-life items in the CPI. In considering the replacement price of these assets, the CPI does not account for financing costs.

Measuring housing prices and giving a weight to such expenditures are even harder to accomplish because accommodation has an even longer life and higher value than household appliances and cars. Were housing given a weight solely on the basis of expenditures alone, the CPI would give an inaccurate picture since only some consumers are making purchases at any one time. Thus, Statistics Canada needs a way of valuing the cost of accommodation as a service, rather than a product, used over time. Consequently, the index reflects price-related changes associated with using a certain stock of housing over time.

Rental accommodation, as a service which can be purchased monthly, can be evaluated from a monthly index of a stock of rental housing. As well, the CPI imputes associated costs from indexes for tenant repairs and insurance, using weights based on information in the 1974 Family Expenditure Survey.

More complex, however, is owned accommodation. Since net new purchases account for such a small portion of all owner-occupied housing, the weight assigned must be correspondingly small. Other components such as interest charges, property taxes, maintenance costs and others must be incorporated and priced according to a variety of indexes available to Statistics Canada. Throughout, the approach is to establish a price and weight for *user costs* of the *stock* of all owner-occupied dwellings.

For instance, if one assumes a stock of 1,000 owned homes, the costs considered in the shelter component in a given year would recognize that:

— 20 homes are replaced at current market value;

— 20 per cent of mortgages are refinanced at current interest rates;

— insurance values are adjusted for changes in the rates for the 1,000 houses and the value of the structures for all 1,000 houses.

By establishing a composite picture of rental and owned accommodation, the CPI attempts to reflect the user's cost of consuming a fixed quantity and quality of housing. In so doing, the index presents price changes more gradually and tends to underestimate price changes experienced by consumers when market prices for accommodation are rising quickly. However, the changes — even if more muted than reality — will eventually show up in the CPI; but such a compromise is the necessary result of approximating housing costs over time.

Statistics Canada's treatment of housing in the CPI still does not solve the controversial issue — for index purposes — of housing as an asset whose value is changing. But as the CPI measures only price changes in consumption, increasing capital values can be ignored. Certainly this may not be true for individual owners who sell their houses and make a capital gain, but the purpose of the CPI is to reflect — not speculate on — changes in consumer prices.

5 Uses and Abuses

Though the best-known indicator of inflation, the CPI is often taken for something it is not. Misconceptions about the role and scope of the CPI have been compounded, particularly since the late 1960s when, with mounting anxiety over continued high rates of inflation, many turned to the CPI in their search for solutions to, and protection from, rapid price escalation.

A prevalent — and still controversial — application of the CPI links increases in income payments and prices to increases in the index. This process of locking in changes — known as "indexing" — adjusts the payments and prices, within limits, to percentage increases in the CPI. Other forms of indexing may be more complicated, such as basing this year's payments on a combination of last year's level and last year's CPI increase.

Indexing has become a pervasive phenomenon in Canada, especially in the past six years. Before then, payments were altered from time to time to account for past rates of inflation, or contracts were signed in expectation of some future price increases. Occasional adjustments were satisfactory while inflation rates remained moderate and predictable. Once that changed, pressure mounted for more effective means of protection from sharp price rises. Indexing, as one alternative, allows for the explicit provision in contracts and payments for adjustments linked to changes in price indexes like the CPI.

Government transfer payments — pensions and welfare allowances for example — are indexed so that recipients do not experience an actual loss of benefits simply because of inflation. By serving as an automatic mechanism of adjustment, the CPI eliminates the need for continual legislative amendments to compensate inflation-eroded transfers and, in addition, ensures that beneficiaries — many of whom are on fixed incomes — are better able to maintain their share of the economic pie.

Virtually all federal transfer payments are linked to the CPI. In 1977, total payments for family and youth allowances and family assistance

were $1.9 billion, covering 7.2 million children. That year, indexing provisions increased payments by 8.1 per cent; the same is true for old age security pensions and guaranteed income supplements for the elderly poor. All Canadians who pay provincial (with the exception of Quebec) and federal taxes have their basic personal exemption and tax brackets indexed to the CPI.

In the absence of indexing the personal income tax, for example, government revenues would be embarrassingly high since the extra government income would be a direct result of inflation. To eliminate windfall gain, the federal government and provinces except Quebec allowed for indexing from 1974. Especially during periods of rapid inflation, governments face high costs associated with indexing. In 1979 alone, for example, indexing of the personal income tax will lower federal revenues by $1 billion and provincial revenues by $410 million, according to the Budget Papers of the Department of Finance, November 16, 1978. Some of the apparent losses will be recovered by governments since, with more after-tax income, consumers will spend more and as a result pay more indirect taxes — such as those on retail sales.

But in the absence of formal indexing, governments would still need to implement measures to offset the debilitating effects of inflation on taxpayers' pocket-books. As a result, governments might still spend the equivalent of indexing on temporary tax cuts to stimulate consumer spending and revive a slow-moving economy. With indexing, so the theory goes, consumers automatically pocket the extra income which would have gone into government revenues and, other things equal, would spend the extra money on a variety of goods and services which keep the economy rolling. Unfortunately, theory does not translate neatly into reality. And, though cushioned by indexing, consumers do not seem to respond as positively as they do with tax cuts. Recent experience suggests that, instead, the potentially stimulative effects of indexing are dissipated through the economy and, unlike the psychological lift of tax cuts, are not easily identified by consumers. As a result, governments have less revenue — as a consequence of indexing — just when they need it to stimulate consumer spending in the economy. Indexing of one payment often leads to indexing of others. For instance, increases in benefits and contributions associated with unemployment insurance are tied to increases in an index of average weekly wages and salaries.

In the private sector, indexing linked to the CPI or some other index may be found in adjustments to private pension plans, engineering and construction contracts, and long-term leasing. In addition, when labour and management cannot agree on future rates of inflation, cost-of-living allowance (COLA) clauses are an equitable way of reaching a settlement.

Often, wage adjustments are tied directly to the CPI and, with a given increase in the index, workers receive an automatic supplement. But even with indexing, workers are not fully protected from inflation. The use of time lags, trigger points and index ceilings invariably result in COLA increases lower than those occurring in the CPI. In 1974, when inflation was 10.8 per cent, COLA clauses compensated manufacturing workers for 42 per cent, and all industry workers for 35 per cent, of increases in the CPI.

Nevertheless, COLA clauses are attractive to workers. In 1975, prior to the imposition of wage and price controls, about 40 per cent of employees in all contract negotiations had COLA clauses; virtually all were for two or more years. Of the remaining employees without COLA clauses, about half had negotiated settlements for 18 months or less, tantamount to indexing. Data for more recent years is distorted by Anti-Inflation Board rules on wage settlements but the same general pattern is visible: COLA clauses are associated with contracts of longer duration than those without the escalator. The presence of COLA clauses in union settlements ripples through the unorganized labour sector as well and affects provincial and federal minimum wage standards and settlements of non-union workers and professionals whose salaries are tied, directly or indirectly, to union contracts.

Interest in COLA clauses on the part of wage negotiators appears to be a *reaction* to rapid inflation. COLA clauses appeared after World War I, died out in the late 1920s, reappeared after World War II, and virtually disappeared again until the early 1970s. With fast-moving changes in prices, workers look for some protection from the cost of being wrong about future rates of inflation; COLA clauses alleviate some of that concern.

Index-tied labour contracts are attractive to both worker and employer. Without COLA clauses, negotiators may settle for shorter-life contracts or agree to reopen bargaining if inflation rises above a certain level. And, certainly, some settlements occur this way. But they may result in more frequent strikes and lockouts, producing instability for both management and union.

The CPI is valuable to both parties in a collective agreement as a timely, well-constructed index which is not recalculated once published. Used with other statistical data, the CPI helps reveal fundamental trends which may have a bearing on, for example, future rates of inflation.

But, in spite of these attributes, is the CPI the appropriate tool for wage bargaining and cost-of-living adjustments? The CPI is not, after all, a complete reflection of inflation's effect on families or individuals, whose

consumption patterns will never match the CPI "basket." While city CPI indexes reflect some of the regional differences in the national "basket" — such as varying rates of provincial sales taxes and public transportation costs — individual employees will still have different expenses. Thus, at any point, CIP-linked wage adjustments will over-compensate some workers and undercompensate others.

Obviously, every wage settlement cannot be tailored to compensate for individual differences in spending habits. Therefore, during the wage negotiation process, employers, and employees need to recognize the limitations of the CPI in providing individuals with full protection against inflation. When the economy can't protect itself from a real drop in income, for example with a currency devaluation, then individuals cannot expect to be compensated fully for price increases which result from devaluation. If everyone is compensated by COLA clauses and government indexing, there will be a continual spiral of inflation and devaluation, a pattern which creates the illusory picture of people receiving more income — but losing it to higher prices. In fact, the CPI would be only one of several references for determining wage rates.

While the CPI has been used, increasingly, as a mechanism to protect incomes, salaries and business contracts from inflation, the CPI is also a widely used standard against which to develop economic policies and analyse their performance. In the creation of government policies to fight inflation, for instance, the CPI's performance has been of central concern. In 1975, the Anti-Inflation Board took the CPI as its policy target and used the rates of 8 per cent, 6 per cent, and 4 per cent for the three-year program as starting points for allowable wage increases, while leaving room for adjustments for productivity and previous performance.

Single-minded use of the CPI leads to hazards, too. As the CPI includes imported goods and services, increases may be due to foreign sources of inflation over which a domestic government has no control. If increased imports by the private sector or increases in United States interest rates — activities all beyond the scope of the Canadian government to control — cause a depreciation of the Canadian dollar, the CPI will rise. Of course, the Bank of Canada could take some steps to moderate the dollar's fall. Accordingly, unless interpreted with care, an overall reading of the index may produce misleading conclusions about the state of the *domestic* economy.

A case in point is the experience with food prices during controls. Neither farm gate prices nor food imports were covered by the AIB and, in 1976, the first year of controls, food prices decelerated and rates of increase were much lower than other components in the CPI. Consequently, it appeared as if the controls program was working better than its

targets; such was not the case. In 1977 and 1978, the targets were again missed and, having produced a false signal from the overall CPI in 1976, food prices again began to rise quickly. By then, the other components continued their upward march, in part because of the dollar's depreciation, leaving the AIB powerless to control rapid increases in import prices.

Government policies, such as regulated energy prices and retail sales taxes, may cause the CPI to rise or fall even though such is not the principal goal. By contrast, increases in income taxes or medical insurance premiums, though they may be government programs which have a significant influence on consumer incomes, are not recognized as consumer expenses. As a result, they are not incorporated into the CPI. Owing to such variables, examination of the CPI may produce misconceptions about government policy goals and performance. Therefore, those who use the CPI to judge public policy must include other performance indicators in their analysis.

Another widely used application of the CPI is as a tool to calculate "real" income, which provides a view of what happens once the effect of inflation has been removed. Use of the CPI as a "deflator" enables analysts to determine retail sales figures, average weekly wages, and personal expenditures with the inflation factor removed. But there are risks in using the CPI as a "deflator" because, in some circumstances, it may present an inaccurate picture. For example, some but not all taxes are included in the CPI and it may be inappropriate to use the index as a "deflator" for pre-tax wages. Because income tax is not included in the CPI, it is not affected by any changes which may occur in income tax payments. As a result, the CPI is best equipped to deflate after-tax income.

Using the CPI to deflate other concepts of wage income may introduce biases. If governments choose to decrease sales taxes (included in the CPI) and increase income taxes (excluded from the index), then there appears to be an increase in real wages even though the consumer is no better off in real terms than before. In a similar vein, deflation of retail sales may produce incomplete conclusions about what appears to be happening in the economy. If, for instance, increases in energy prices drive up the CPI, it would appear to deflate retail sales even though energy may not be a significant component of those sales. Thus, the CPI as a "deflator" would overcompensate for changes which had not occurred in retail sales.

The caveats which accompany the CPI serve as reminders that the index is defined narrowly and certainly is a much more limited concept than "cost-of-living." Changes in costs of public health care, public education, and other services — such as parks — which are used by

individuals but paid for out of public taxes, lie outside the CPI "basket." Consequently, the CPI represents only part of consumers' living costs.

Finally, can the index predict future price changes? Expectations about future inflation rates, in part conditioned by the performance of the CPI, are built into wage demands which, if fulfilled, lead to higher prices. If prices for goods and services are adjusted higher, in the belief that current rates of inflation will continue, a new spiral of price increases begins: such are the roots of inflationary psychology. Nevertheless, it is still difficult to assess whether extensive use of the CPI sustains higher inflation. Whatever the precise answer, the fact that so many interest groups and observers are preoccupied with the index puts a heavy burden on it. Some of the pressure is eased when these interest groups use a broader set of indicators to form their expectations about future price increases. In specific cases, such as wage bargaining on a regional level, city CPI indexes may be more useful than the national index in reflecting special local conditions, such as high energy costs in the Maritimes, the absence of retail sales tax in Alberta or the permanent reduction of the sales tax in British Columbia.

6 Performance

When prices rise quickly, as they have in the 1970s, it is easy to think of inflation as potent and intractable. This has not always been so, an observation borne out by looking at the CPI over several decades. Indeed, Canada has gone through lengthy periods of low rates of inflation, particularly in the 1950s and 1960s, when unit labour costs remained low and trade and productivity grew well. The average annual rate of change in the CPI was 2.5 per cent over the period 1950-55 and only 1.9 per cent over the period 1955-60. And, unlike current experiences with prolonged high levels of inflation, previous periods covered by the CPI show slower price increases have followed bouts of strong inflation and, for 1953, the CPI actually declined.

By separating the components of the CPI, they reveal the forces which make the 1970s a new period of inflation for Canadians. Certainly, the 1970s have been atypical since inflation has been both high and sustained, relative to the past, creating a sense of inevitability about the prospects for continued inflation. The proliferation of collective bargaining, increased industrial concentration, and more extensive social security provisions are only some of many developments which have made the economy of the 1970s so different from the past.

The value in isolating the major components from an overall reading of the CPI is not to ignore the others but to help identify sources of inflation. For that reason, Statistics Canada publishes information which tracks the record not only of the CPI but also of the seven basic building blocks of the consumer "basket." Food, for instance, has been a troublesome source of inflation throughout the 1970s, ever since shortages of world protein supplies caused prices to sky rocket in 1972-74. After only a 1 per cent increase in the food component in 1970, prices jumped by 14.5 per cent in 1973 and 16.3 per cent in 1974. Even more importantly, food accounted for about 40 per cent of the increase in the CPI in 1974, even though it represented less than 25 per cent of the CPI "basket." Since food is such an important and volatile factor in the CPI, it is essential to know whether

food-led increases in the CPI, are the result of temporary price aberrations or fundamental economic upsets. A sudden escalation — as occurred in the mid-1970s — of the international price for sugar, a basic ingredient in so many food products, has far larger repercussions on consumer prices than a seasonal shortage of U.S. lettuce. Thus, without dissecting the causes and effects of price changes in the food component, policy-makers cannot make an adequate response.

Housing, another major component of the CPI, has shown rapid rates of increase in the 1970s as well. But because the housing components represent a composite picture of shelter costs for new and existing housing and rental accommodation, the pace of inflation recorded in the CPI is more muted than that experienced by those who bought new homes in the middle years of the decade.

Although energy is not one of the seven major components of the CPI, individual products, such as gasoline, home heating oil, and natural gas, are measured directly and appear under different components. In addition, the CPI measures the indirect impact of changes in energy costs on all other items in the index. However, the energy index derived from the CPI only records price changes of directly consumed energy products. This index enables analysts to isolate the direct effects of energy price changes on the CPI, an exercise particularly relevant throughout the 1970s. Since 1973, when the Organization of Petroleum Exporting Countries (OPEC) jolted the world economy with dramatic increases in oil export prices, energy costs have been rising more quickly than the general CPI. In 1974, the index of directly consumed energy prices rose by 15.1 per cent while the overall CPI increased by 10.8 per cent. A similarly large increase occurred in 1976 when the CPI increased much less rapidly — 7.5 per cent.

The ripple effect of higher energy costs began in 1974 and flowed through to other components in the index. The transportation index, for example, rose by only 2.6 per cent in 1973 but accelerated by 9.9 per cent the following year. Though increased transportation costs are caused by a number of factors, higher fuel costs filtered through to the manufacturing and maintenance of cars and public transit.

The role of government policy in setting prices — and contributing to inflation — is important in other components of the index. Provinces have jurisdiction over the sale of alcoholic beverages but both federal and provincial governments levy "luxury" taxes on tobacco and spirits. Through the 1970s, prices have accelerated, taking an especially large jump of 12 per cent in 1975, though increases in the tobacco-alcohol component in other years of the decade has been less than the changes in the overall index.

Figure 1

Weights and Contributions to Change of CPI Aggregates

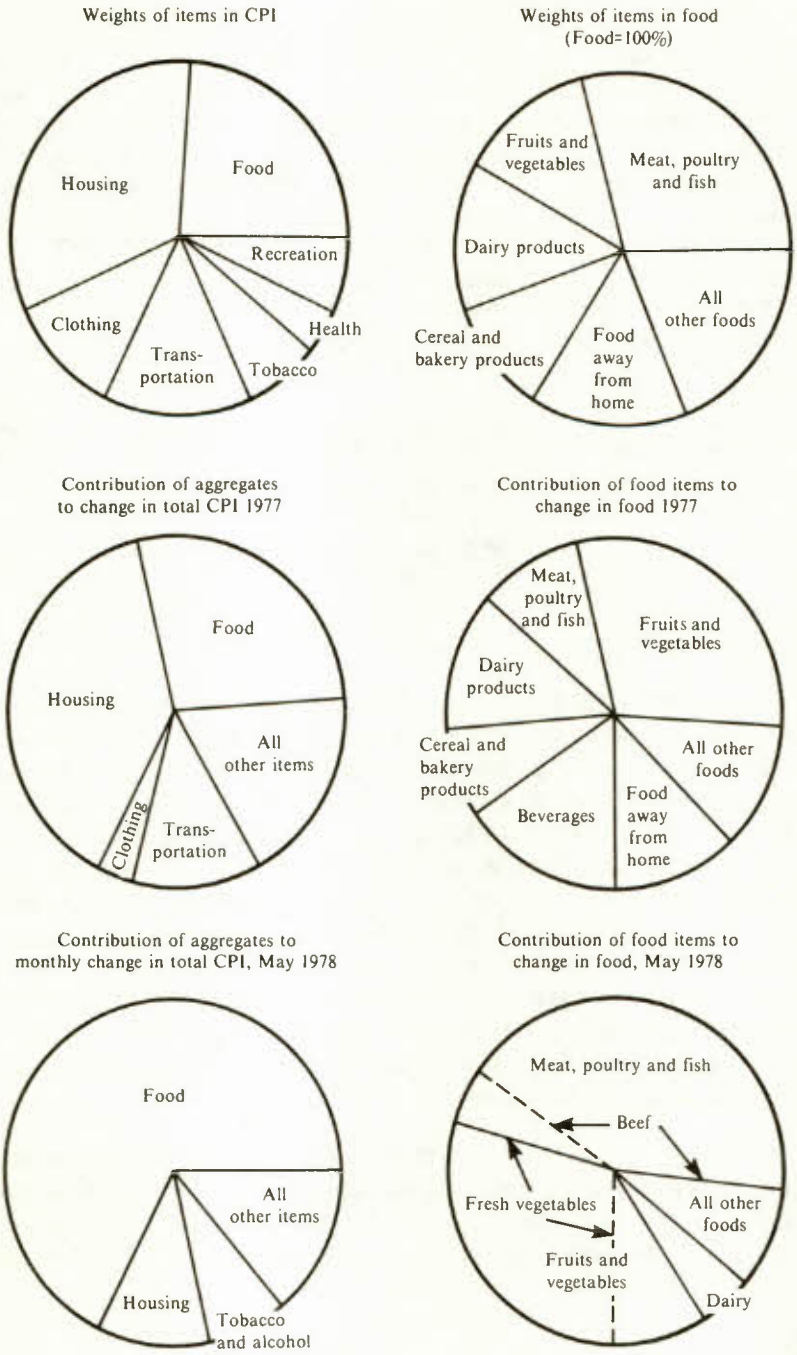


Table 1

Major Components of the CPI (1971=100.0)

	1971	1972	1973	1974	1975	1976	1977	1978
All Items	100.0	104.8	112.7	125.0	138.5	148.9	160.8	175.2
Percentage change	2.84	4.77	7.61	10.86	10.81	7.51	7.99	8.96
Food	100.0	107.6	123.8	143.4	161.9	166.2	180.1	208.0
Percentage change	1.04	7.65	14.58	16.31	12.89	2.70	8.35	15.49
Housing	100.0	104.7	111.4	121.1	133.2	148.0	161.9	174.1
Percentage change	4.55	4.64	6.47	8.72	9.98	11.11	9.37	7.54
Clothing	100.0	102.6	107.7	118.0	125.1	132.0	141.0	146.4
Percentage change	1.49	2.57	4.96	9.63	5.97	5.56	6.77	3.83
Transportation	100.0	102.6	105.3	115.8	129.4	143.3	153.3	162.2
Percentage change	4.03	2.67	2.62	9.91	11.76	10.80	6.98	5.81
Health and personal care	100.0	104.8	109.8	119.4	133.0	144.3	155.0	166.2
Percentage change	2.07	4.78	4.84	8.66	11.40	8.35	7.44	7.23
Recreation, education, reading	100.0	102.8	107.1	116.5	128.5	136.2	142.7	148.2
Percentage change	3.32	2.82	4.16	8.78	10.34	6.00	4.71	3.85
Tobacco and alcohol	100.0	102.7	106.0	111.8	125.3	134.3	143.8	155.5
Percentage change	1.72	2.68	3.14	5.53	12.07	7.15	7.11	8.14
Energy	100.0	102.8	112.1	129.1	146.6	169.2	189.7	207.5
Percentage change	N/A	2.80	9.05	15.16	13.56	15.42	12.11	9.38

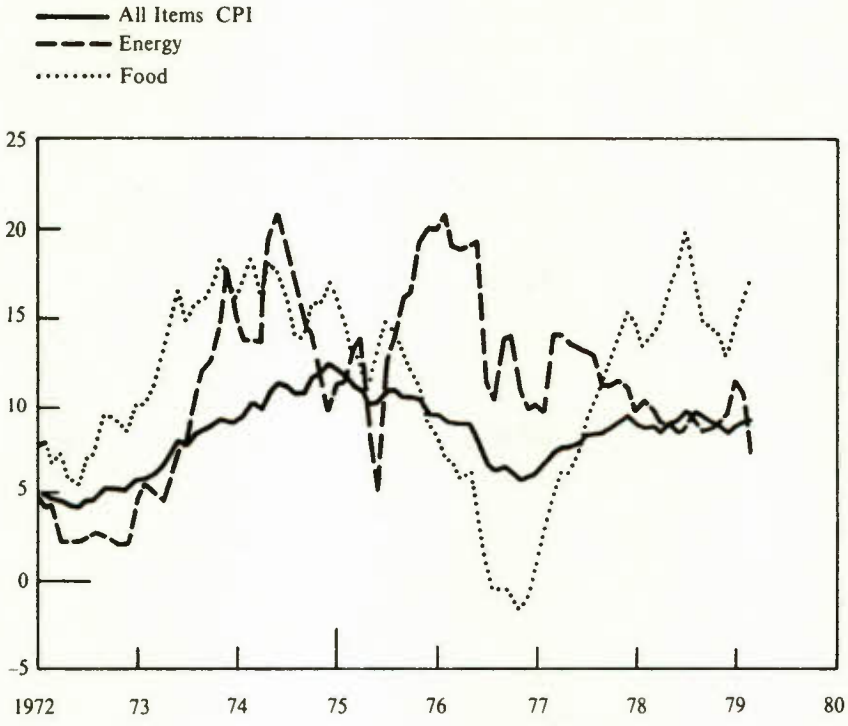
Source: Statistics Canada.

Two other sub-groups of the index — personal and health care, as well as recreation, education and reading — provide insights into some of the inflationary trends experienced by consumers at home or in their leisure hours. Higher incomes, shorter working hours, and more women in the labour force have all contributed to the increased value which consumers attach to their free time. Accordingly, the CPI has increased the weights it gives to some of the items in the two sub-groups to better mirror changing consumer tastes. New patterns are emerging about consumer preferences and their contribution to inflation; pet care, stereos, and food away from home have larger weights in the latest revisions to the CPI. However, though these items might have been considered "luxuries" by past standards, the CPI makes no such distinctions and simply reflects the new consumer purchasing pattern.

Other CPI components have, in the same period, partly offset sustained increases in energy and less-frequent, though severe, jumps in food prices. Price changes in clothing, health and personal care as well as in recreation, reading, and education have been less rapid than the CPI during most of this decade.

Chart 1

Food and Energy in CPI Year to Year Percentage Change, Monthly



7 Other Measures of Inflation

Like skinning the proverbial cat, there's more than one way to measure inflation. The principles remain the same — creating a single index for a selected group of prices — but the focus changes according to the type of commodity and its stage of production.

One commonly used inflation measure is the implicit price index of Gross National Expenditure (PGNE). The index measures price trends of goods and services actually produced in the Canadian economy as well as the changes which occur in the physical amount of items consumed. In that way, the PGNE shows the adjustment which producers and consumers make to the effects of price changes. While the CPI may overestimate the level of inflation experienced by individuals — by not allowing for changes in component weights — the PGNE may underestimate inflationary effects since it reflects the full amount of adjustment which takes place.

The attraction of the PGNE is that it is more comprehensive than the CPI; the overall index includes personal consumption, exports, investment by government and business, government spending, and inventory changes with imports removed from the final calculation. Comparisons between the PGNE and various import price indexes could show, for example, Canada's domestic price performance relative to the cost of imports that reflect developments in other countries.

However, the PGNE is published only four times a year and when new data on the PGNE come in, the index has to be revised for the period last covered. Thus, the PGNE is not a workable alternative for those who need timely measures which are not updated.

The information produced by both the CPI and PGNE, not surprisingly, shows much the same trends since their samples overlap one another. The pace of change may be different. For example, in 1973 and 1974, the PGNE accelerated more quickly than the CPI because of rapid increases in export prices, particularly for energy, grain, and other basic commodities.

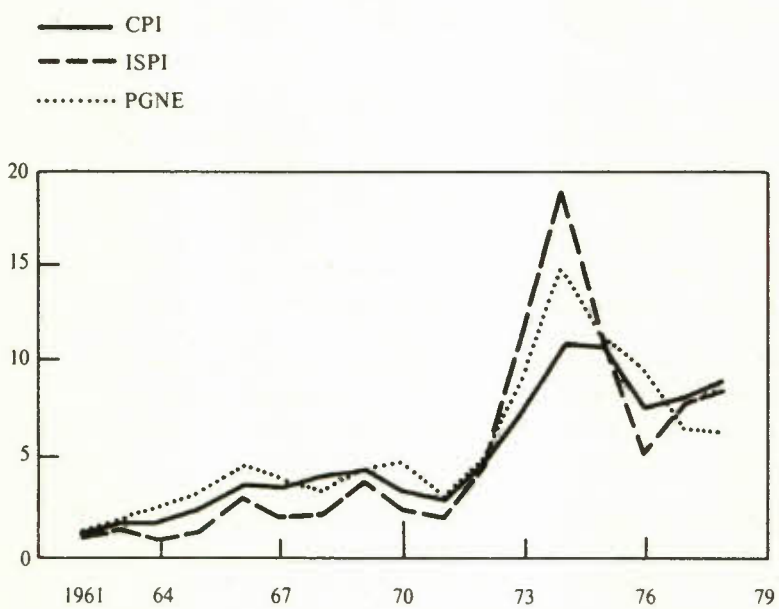
These shifts showed more dramatically in the PGNE because raw material prices directly influence PGNE, whereas the CPI only measures goods and services purchased by consumers. In addition, domestic energy prices have been kept below world prices through regulations and subsidies.

Another CPI alternative, the monthly industrial selling price index (ISPI), looks at price changes of manufactured goods leaving the factory gate. In this way, the ISPI excludes the impact of federal and provincial sales and excise taxes, transportation costs and distributors' margins and provides an account of what is happening in about 25 per cent of the economy.

As a broad measure of industrial prices, the ISPI gives an early indication, particularly for manufactured goods, of what may eventually show up in the CPI. Like the PGNE-CPI comparison, trends may be similar but the performance of the indexes is not identical as they do not contain exactly the same items. Up until 1979, analysts had a third option for measuring inflation — the Wholesale Price Index — which has been replaced effectively now by the ISPI.

Chart 2

Price Indexes Year Over Year Percentage Change, Annual



8 International Comparisons

Like Canada, other countries try to measure changes in consumer prices and usually run into many of the same difficulties deciding what items to include and how to measure their price movements. Although Canada's major trading partners use a variety of methods in constructing their CPIs, they are all based in some way on surveys of family spending. And, owing to the close relationships of industrialized economies, trends in prices from one country to another are also related. In 1974, the year of the sharp increases in energy prices, all major industrialized nations experienced an extra spurt of fuel-based inflation. Japan, for example, highly dependent on energy imports, received a greater shock (a 24.3 per cent increase) than countries like Canada which, because of government subsidies and domestic supplies, experienced a less dramatic rise of 10.9 per cent.

Methods of index-building vary among countries and may affect the outcome in some degree. For instance, Britain, France, and Sweden revise their weighting system annually, a policy which reveals changes in consumer spending habits faster than in less-frequently adjusted indexes in Canada, the United States, and Japan. The principal difficulty for statisticians in all countries is how to account for housing costs. Germany and Japan, for example, simply impute a cost for rent while Canada and the United States prefer more extensive coverage and include payments for interest and taxes.

Though the CPI may appear to be an attractive measurement of common inflationary trends among countries, the index is at best only a gross indicator of international competitiveness. After all, the CPI from one country to another looks only at price changes in consumer goods and services, only some of which are internationally traded, such as food and energy. Therefore, a country largely dependent on foreign sources of food and fuel will see what contribution these important imports have on price trends domestically.

Even though the CPI measures price trends only for final products and not raw materials, the index has some use as an indicator of shifts in international competitiveness. For instance, in the mid-1970s, when Canadian prices — as measured by the CPI — rose more quickly than those of other world competitors, Canadian exporters lost some of their share of international markets. And as Canada is dependent on exports for a large share of its national income, a decline in world competitiveness reported by international price shifts — and other indicators — created economic difficulties for many sectors of the economy.

Of course, international comparisons of national CPIs show relative rather than absolute price changes. No comparison of national CPIs shows if one country is more expensive than a neighbour, just as it is impossible to compare actual city costs in Canada using the city CPIs. Complicating the picture on international comparisons, even looking only at rates of change, are the variety of differences in wage rates, incomes, social security benefits, and price policies.

9 Conclusions

A little knowledge, they say, is dangerous. This may be especially true in the murky world of economics where one is still groping for the right questions to ask, let alone answer. The phenomenon of inflation, for all its pervasiveness in modern industrial economies, is only partly understood. More information is needed not only about the time lags of wage and price adjustment and their effects on the economy, but also on the size and direction of bias in the various measurements of inflation.

The CPI, as one of these guides, is just that: one tool in gauging price shifts. Its focus on retail price changes tells only one facet of what, using a number of restrictive assumptions, is taken as an approximation for consumer experience with inflation.

The index tells only of the rate of change, not of absolute price increases and will never match any one person's monthly shopping basket. However, as a guide to inflation at one level of prices, the CPI is a convenient and useful tool for all the economic partners: government, business, labour and consumers. In their search for an equitable arbitrator for inflation, they have turned to the CPI because its features lend easily to annual or quarterly adjustments for inflation. As a result, however, the CPI increasingly is assumed to be the final word about inflation when, in fact, it is only one word.

The responsibility for existing inflation lies with all four economic partners. What complicates the picture, however, is that at any one time individuals may be represented by each of the partners. Consumers may be workers; workers may be employers; and everyone, in effect, is government. But as long as each person knows he or she cannot be protected from inflation as a right, he or she may take a greater responsibility for resisting price change. Collectively, however, the interest groups in an economy may opt for "safety nets" to ease the adverse effects of inflation or, alternatively, introduce taxation measures which remove windfall gains of rapid price changes.

Protection against rising prices ultimately depends on reducing inflation. Part of that admittedly difficult task also depends on understanding inflation and the tools in measuring its performance. In that way, a little more knowledge will add to the fight against inflation.

Above all, the CPI does not tell the full story of inflation:

- it is not a cost-of-living index;
- it does not record absolute levels of price;
- it cannot compare absolute price changes between cities or between countries;
- it does not show the effects of inflation on any one individual or group;

But the CPI does tell some of the inflation story:

- it measures price change over a wide range of consumer products and services;
- it is timely, with reports issued monthly, so that it serves as a benchmark against which to assess government policies;
- its value does not change after publication and, consequently, is a convenient tool to use when compensating for inflation;
- it is broken down by major components and cities, thereby making it appropriate for a number of analytical purposes.