
REPORT OF

**THE CONSUMERS
PRICE INDEX
REVISION ADVISORY
COMMITTEE**

1997

Hon. Maurice Williamson
MINISTER OF STATISTICS

I hereby refer to you the report of the Consumers Price Index Revision Advisory Committee which you set up in May 1997.

A handwritten signature in cursive script that reads "Len Cook".

L.W. Cook
GOVERNMENT STATISTICIAN

November 1997

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■ 1 - *General*

1.1 Committee Composition and Terms of Reference

In May 1997 the Minister of Statistics established a committee to advise him on the next scheduled revision of the Consumers Price Index (CPI). The Revision Advisory Committee was composed of a group considered to be representative of CPI users. The terms of reference of the committee were to:

1. Investigate, review and form recommendations concerning the general nature, form and objectives of the CPI, while covering:
 - i) the range of uses to which the CPI is applied;
 - ii) the appropriate uses of the CPI; and
 - iii) alternative measures that may be appropriate for the range of uses to which the CPI is currently applied.
2. Investigate and form recommendations concerning the general principles which should be appropriately considered in the construction of the revised CPI with specific reference to:
 - i) the range of goods and services and the household population and urban areas covered by the index;
 - ii) the groupings and sub-groupings of goods and services and urban areas in the CPI; and
 - iii) the frequency of supporting price surveys and the calculation and release to users of the index.
3. The committee was required to report by 19 September 1997.

The 19 September 1997 reporting date was subsequently revised to 27 November 1997.

1.2 Committee Membership

Len Cook	Government Statistician (Chairperson)
John Albertson	Retail and Wholesale Merchants Association of New Zealand
Steve Bailey	Ministry of Commerce
Peter Crawford	New Zealand Manufacturers Federation
David Grimmond (alternate John Carran)	The Treasury
Jeremy Harding	Federated Farmers of New Zealand
Grant Hannis	Consumers Institute of New Zealand
Peter Harris	New Zealand Council of Trade Unions
John Jensen	Department of Social Welfare
John Pask	New Zealand Employers Federation
Scott Roger	Reserve Bank of New Zealand
Suzanne Snively	Financial and Economic Consultant, Partner, Coopers and Lybrand
Paul Stewart	New Zealand Bankers Association
Helen Stott	Statistics New Zealand

The Department of Labour was invited to be represented on the committee, but did not wish to participate. Mr. Keith Woolford and Mr. Rob Edwards from the Australian Bureau of Statistics each attended one meeting as observers.

1.3 Public Submissions

All background papers prepared for the Revision Advisory Committee were made available to the public. Submissions were called for in order to assist the committee in its deliberations. The views expressed in the public submissions are incorporated into this report.

1.4 Acknowledgments

The committee would like to thank the staff of Statistics New Zealand who were involved in the preparation of the technical papers, and in the organisation of the committee meetings. The committee would also like to thank the official statistical organisations of those overseas countries which made available technical papers on methodological developments and practical procedures in respect of their consumer price indexes.

1.5 Summary of Findings

The committee reviewed the use, methodology, calculation, and release to users of the New Zealand Consumers Price Index. The committee, in its deliberations, took into account the wide ranging uses of the CPI and, more particularly, the changing economic environment in which it

is used. As a consequence, some fundamental changes in the approach to the Consumers Price Index were recommended. The committee was mindful of the need to maintain public confidence in the CPI and the recommendations for change are intended to do this. Although there are some substantive conceptual changes recommended, the majority of the recommendations reconfirm the essential soundness of the current CPI and the way it is calculated.

The fundamental principle that the CPI should continue to be a price index of goods and services purchased by private New Zealand households was reconfirmed. In particular it was agreed that shelter costs should continue to be represented in the CPI.

The major recommendation for change however was that Statistics New Zealand should move to producing a set of three measures of consumer price change. No single conceptual approach can generate a measure which satisfactorily meets the needs of all users.

Each of the new measures of price change will be constructed on a different conceptual base. The official NZ CPI is recommended to remain an acquisitions based index, but will move to exclude interest costs. The introduction of an outlays based index will retain a measure comparable to the current CPI in the public domain. A new consumption based index will include the application of an imputed rental approach to housing costs.

In conjunction with the new measures of price change, the development of a set of real disposable income indexes is recommended. These index series will address the need for an appropriate and comprehensive measure of changing consumer purchasing power.

Considerable importance was placed on retaining public confidence in the CPI. In order to maintain an ongoing measurement of the impact of price changes on households, the committee also recommended that the CPI should remain in its current form until the new measures, particularly the set of real disposable income indexes, are available.

The committee recognised that changing technology and international research could mean that improvements to methods of collection and processing of the information used in the CPI would be possible in the near future. Several recommendations were made to help focus Statistics New Zealand in its research and implementation of appropriate changes. Recommendations were also made to extend the range of analytical series currently produced to potentially include a series without any seasonal adjustment, series calculated using alternative index formulae, and series for the tradeable and non-tradeable sectors.

The changing retail environment and wide availability of some new items were recognised through a series of recommendations to include new commodities (items) and new purchase sources (outlets) in the index, such as a wider range of telecommunications items and suppliers. Changes were also recommended which would give Statistics New Zealand more flexibility to bring in new items as they gain a significant market share.

The variety of views expressed by committee members on the form of the CPI was more diverse than had occurred in any of the previous five reviews; public submissions reflected the same diversity of views. In reaching the recommendations outlined in this report, the balance of opinion expressed by committee members did not fall strongly in favour of specific direction with regard to any single measure. The mix of measures proposed reflects the form of consensus that was achieved and attention was given to arriving at a position which would be received with confidence by New Zealanders.

1.6 Recommendations

Recommendations on Conceptual Issues

1 The Consumers Price Index should continue to be a price index of goods and services purchased by private New Zealand resident households and should be constructed within a conceptual framework consistent with this aim.

2 Statistics New Zealand should publish a set of three measures of consumer price change, and the Consumers Price Index should be an acquisitions measure which does not include interest.

The other two indexes will be an index of the price change of household outlays and an index of the price change of household consumption

To maintain public confidence in the measurement of price changes affecting households, the new measures will be introduced when a suite of real disposable income indexes is also available.

3 Statistics New Zealand should continue to include home-ownership costs in the Consumers Price Index.

4 The acquisitions variant of the expenditure approach should also be maintained for the treatment of home-ownership.

5 The Consumers Price Index should, in principle, reflect prices paid by New Zealand-resident private households in New Zealand regardless of the location of the supplier.

6 Overdraft interest and interest on student loans should be treated in a manner consistent with other interest charges.

Recommendations Affirming Current Practice

- 7 The calculation of the Consumers Price Index should continue to be based on the Laspeyres price index formula.
- 8 The Consumers Price Index should continue to be published quarterly and the Food Price Index monthly.
- 9 Statistics New Zealand should continue to make available the Consumers Price Index regimen at the level of detail published following the 1993 Revision.
- 10 The current target population for the Household Economic Survey (New Zealand-resident private households living in permanent dwellings) is appropriate for the Consumers Price Index.
- 11 Statistics New Zealand should survey the expenditure of private households as frequently as required to construct suitable weighting patterns for household price indexes.
- 12 The geographic sample for the Consumers Price Index should not be reduced below the current fifteen urban areas.
- 13 Statistics New Zealand should continue to seasonally adjust fresh fruit and vegetable items in the Consumers Price Index.

Recommendations on Improvements to Current Practice

- 14 Statistics New Zealand should take all reasonable steps to manage and reduce bias in the Consumers Price Index. This could include:
 - a) reviewing the Consumers Price Index pricing mechanisms and rebasing the expenditure weights (at the fixed level), every three years;
 - b) changing the outlets surveyed and commodities priced on an ongoing basis, between three-yearly revisions;
 - c) fixing the expenditure weights at the section level, to allow for changes in expenditure weights at the item level of the regimen between three-yearly revisions;
 - d) introducing new items into the Consumers Price Index between major revisions, during the course of the index, when appropriate;
 - e) applying, as appropriate, alternative quality adjustment techniques such as hedonic regression, for those goods and services where quality involves a variety of features that are at least partly measurable.
- 15 Statistics New Zealand may reduce the number of quotes for priced commodities where this would not compromise the quality of the Consumers Price Index.

- 16 Credit Services should include bank account maintenance charges, bank transaction charges and other bank fees.
- 17 Regional population weights should be updated annually when population estimates are available, from the time of the next revision.
- 18 Statistics New Zealand should not view the refinement of the research index Superannuitants Price Index as a higher priority than the substantive changes proposed in this report.
- 19 Statistics New Zealand should publish documentation on sources and methods used in the Consumers Price Index.

Recommendations on Development of New Series

- 20 Statistics New Zealand should consider the publication of an analytical series, retrospectively calculated using a superlative index formula, whenever the index is re-based.
- 21 Statistics New Zealand should investigate calculating a consumer price index without seasonal treatment for use as an analytical series.
- 22 Statistics New Zealand should investigate the calculation of analytical series for the tradeable and non-tradeable sectors.

Recommendations on Improved Relevance of Index

- 23 Overseas package tours and accommodation expenses prepaid in New Zealand should be included in the Consumers Price Index, provided a robust methodology can be developed.
- 24 Statistics New Zealand should review the definition and the pricing of central and local government charges in the Consumers Price Index.
- 25 Telecommunications services should be established as a separate section within the Consumers Price Index regimen.
- 26 The credit services sub-group should be sub-divided into bank fee and interest charges sub-categories. The analytical series excluding credit services should only exclude interest charges.
- 27 The Committee judged that the predominant motive for gambling is entertainment and thus conceptually it would be included in the Consumers Price Index. However Statistics New Zealand should not include gambling in the index until acceptable price indicators and weights have been developed.

Recommendations on Improved Statistical Methods

- 28 Statistics New Zealand should give significantly more emphasis to measurements of the accuracy in the Consumers Price Index, given the requirements for policy setting in the current low inflation environment, international confidence and debate in price indexes, and increased user expectations.
- 29 Statistics New Zealand needs to maintain sufficient research activity to ensure that it can investigate the application to New Zealand data of new index methods such as geometric means, where overseas studies indicate such methods demonstrate potential improvements in accuracy, and implement them where appropriate.
- 30 Statistics New Zealand should review the imputation techniques it uses to estimate prices for commodities when they are temporarily unavailable, and implement them where appropriate.
- 31 Statistics New Zealand should investigate the potential of new data sources, such as from the Internet and scanner data, to improve the cost efficiency and quality of the index.
- 32 Statistics New Zealand should continue to accept the use of purposive sampling for the selection of outlets and price-surveyed items but should move to statistical sampling where an appropriate sampling frame is available and it can be applied at reasonable cost.
- 33 Statistics New Zealand should investigate the practicability of extending the methods of seasonal adjustment in the Consumers Price Index to other commodities that exhibit a seasonal pattern.

■ 2 - *Index Issues*

2.1 Introduction

The current review of the New Zealand Consumers Price Index was preceded by several years of extensive comment and criticism both in New Zealand and in relation to similar indexes overseas. There is now a greater divergence of views as to the appropriate form the CPI should take. The task of reviewing the CPI has also attracted more media interest than any previous review. The Revision Advisory Committee thus had the difficult task of examining a wide range of options and opinions, but has come to a majority view about the future form of the CPI.

This report was prepared in the midst of that diversity of views and as such reveals the consequent difficulty in arriving at a consensus among the communities of interest. It recommends a number of significant changes to the CPI. These recommendations were not all unanimous and some may be controversial. One area where the committee was unanimous was in the requirement for a range of indexes of inflation as it affects households and the economy in general. The committee saw wider measures of inflation across the whole economy as outside its terms of reference. Development of the recommendations made in this report took account of the need to measure the wider impact of, and exposure to, inflation across the economy.

The nature of the changes to the CPI will mean that some further consultation may need to be undertaken. The impact of the changes to the index on the economy needs to be examined so that they can be introduced at a time, and in a way, that will minimise any methodologically induced effect on the index. Some specific areas where a change in the CPI could have an impact are in the cost of indexing superannuation and other benefit payments and on the index linked bond market. The potential effects on private sector contracts also need to be considered.

2.2 Conceptual Issues

2.2.1 General Nature of Consumer Price Indexes

■ The Changing Economic Environment

Since the last Revision Advisory Committee met in 1991 there have been significant changes in the national and international context which have led to a reconsideration of the nature of consumer price indexes. Considerable discussion has ensued on the subject of what it is that price indexes should be measuring and to which uses such measures can suitably be put.

The two dominant domestic factors which have led to this reconsideration are the Reserve Bank Act 1989, and the Employment Contracts Act 1991. In addition, New Zealand is now experiencing an economic environment with low levels of inflation and there have been some changes in the use made of the CPI for benefit adjustment. The greater variety of approaches to income adjustment adopted in recent years acts to compound existing difficulties of measuring changes in economic well-being by price level change alone.

Internationally, pressures to ensure consistency in statistical measures of economic change have increased and there has been a considerable increase in focus on consumer price indexes. Some major contributors to these pressures have been:

- moves to monetary union in the European Community and the consequent attempts to harmonise inflation measures;
- the IMF Special Data Dissemination Standards and their focus on openness of statistical methodology;
- the US Boskin¹ report on bias in consumer price indexes which has created ripples internationally.

Members of the Revision Advisory Committee were cognisant of international practice with regard to both the conceptual approach and the construction of price indexes. Matters were complicated by the fact that international practices vary significantly.

■ The Uses of the Consumers Price Index

The uses currently made of the Consumers Price Index in New Zealand reflect a broad range of interests. Previous Revision Advisory Committees concluded that the CPI should be designed as a general measure of inflation as it affects households, based on the goods and services that they actually purchase. It is this purpose that has directed the form of the CPI rather than reference to a single specific, theoretical model.

The conceptual basis chosen for a consumers price index depends on its main uses. The main applications of the CPI in New Zealand are as:

- a measure of inflation as it effects households;
- a general measure of inflation;
- an adjustment factor for indexation of prices, wages and other payments;
- a deflator to derive series in “real” terms from series measured in nominal terms; and
- a surrogate for a cost of living index.

¹ Boskin M et al (1996) “Towards a More Accurate Measure of the Cost of Living: Final Report to the Senate Finance Committee from the Advisory Commission to Study the Consumer Price Index.”

The precision with which a measure of inflation can be derived is limited. The concept of inflation is not precisely and unambiguously defined and purposes for which a broad measure of price change might be produced ideally require different conceptual bases.

An important focus of current economic policy lies in reducing the exposure of the New Zealand economy to inflation and leaving market-determined incomes unadjusted in most situations. The acceptance of the CPI in its current monetary policy role is pragmatic; the current index series is readily available, has a high credibility with the public and is timely.

Legislation and practice relating to the setting of wages and salaries has undergone considerable change in recent years as has the approach to the adjustment of benefits. Nevertheless, the adjustment of some incomes for changes in consumer prices continues to be a significant use of the current index. An index used primarily for this purpose would need to measure the effects of price change on the amount of money that households must outlay each period for access to the specified basket of commodities. A more appropriate measure would recognise the combined impact of price change as well as tax and benefit changes on the standard of living of consumers. In making use of a consumer price index as an indicator of changing purchasing power, consideration should be given to the extent to which the basket of goods and services used to derive the index is representative of the expenditure patterns of target socio-economic groups.

Consumer price indexes are frequently associated with the concept of cost of living. The construction of a true cost of living index remains problematic and the current CPI diverges conceptually in several respects from such a measure. The view was held by some members of the committee that, in constructing a consumer price index, the primary intention should be to provide the best estimate possible of changes in consumers' cost of living. This position has significant implications for the conceptual basis on which the index is constructed.

Comments made in public submissions expressed support for the full range of views discussed by the committee on the uses of the CPI. The committee recognised the importance of all the uses made of the CPI and acknowledged the implications of these uses for the conceptual basis of the index. Although unable to choose a single primary use for the CPI, there was general agreement amongst members that it should continue to be a measure of changes in the price levels of goods and services purchased by private New Zealand households.

Recommendation:

The Consumers Price Index should continue to be a price index of goods and services purchased by private New Zealand resident households and should be constructed within a conceptual framework consistent with this aim.

■ The Conceptual Approaches for Consumers Price Indexes

The conceptual basis on which a consumers price index is compiled should ideally be determined by the main purpose for which the index will be used. A consumers price index can either be based on the expenditure incurred in purchasing goods or services, or on the cost of goods and services consumed. For many items there are no practical differences between these options; a large proportion of the goods and services used by households are purchased, at full market cost, and fully consumed in the same time period. Major differences do arise however for durable goods (such as housing, large home appliances and motor vehicles) and for those services which are subject to some level of government subsidy (ie purchased in whole or in part on behalf of households by government).

1. Consumer Approach

Under the consumption approach the weight for any commodity is the amount of that good or service consumed during the base period. The emphasis is on the value of the commodity consumed rather than on the amount of money paid for it or when it was acquired.

Taken to its logical conclusion, the consumption approach would need to include some measure of the cost of commodities produced by the household for its own consumption (such as home-produced foods) or services provided to the household by its own members (such as gardening, cleaning and cooking). In practice, national statistical offices that produce consumer price indexes based on the consumption approach make no attempt to estimate the cost of such items. The consumption approach does require the estimation of the cost of the service generated by durable goods (such as housing, large home appliances and motor vehicles) and the full cost of subsidised government services consumed by households. A notional measure, based on imputed values, of the amount consumed in the relevant time period must be determined. Such prices not only present considerable difficulties in practice but also create problems in ensuring that the index retains its public credibility.

Some members of the committee argued that an index of this sort comes closest to measuring the utility provided to households by the goods and services they use and so provides the best approximation for a cost-of-living index. Another argument offered for adopting a consumption approach in constructing consumer price indexes lies in the compatibility of this method with the concepts used for deriving

measures of gross domestic product. An index compiled on this basis would be a better fit for use in macro-economic analysis and forecasting. Some members of the committee also held the view that a consumption-based index would be preferable to alternative approaches for the purposes of monetary policy and income adjustment. Most members were not of the view that this approach was a suitable option for the New Zealand Consumers Price Index.

2. Expenditure Approach - Actual Outlays

Preference for an expenditure rather than a consumption approach arises from the view that inflation is a monetary phenomenon and as such should measure change in actual money transactions. In addition, an expenditure approach has the advantage that it does not involve determining prices for notional transactions.

The actual outlays variant of the expenditure approach is also referred to as the payments or money outlays approach. It measures the change in money outlays by households as a result of price changes. Expenditure is defined in terms of payments for access to goods and services, without regard for the time period in which the goods and services were actually acquired or consumed.

The actual outlays approach was favoured by some members of the committee. It was recognised as being the most appropriate method for measuring price change when the purpose is the adjustment of wages, benefits or other payments to households. This preference arises from the understanding that the intention in adjusting payments to households is to compensate the recipients for past changes in the amounts actually paid out by household members for the goods and services they purchase.

3. Expenditure Approach - Acquisitions

The acquisitions variant of the expenditure approach defines expenditure as the value of the goods and services which households purchase at the time those goods or services are actually acquired (when the contract becomes binding or the price is set). The timing of the actual money payments or when the commodity is consumed is of no relevance. Prices for notional transactions are also not required in this approach. The acquisitions approach was accepted by the committee as the most appropriate method to adopt for a general measure of inflation as it affects households.

Committee members were in agreement that the use to which a price index is to be put should dictate the conceptual basis from which it is derived. In fulfilling its function of representing the interests of a broad range of users, the committee could not reach a consensus on a single index that addressed all uses or on any one appropriate underlying conceptual approach.

■ The Treatment of Mortgage Interest and Credit Services

Considerable debate surrounds the inclusion of debt service payments in the construction of consumer price indexes. Provision can be made for the inclusion of such payments under either the acquisitions variant or the actual outlays variant of the expenditure approach. When a rental equivalence method is used to determine shelter costs for owner-occupied housing, the inclusion of mortgage interest is clearly inappropriate as mortgage interest payments would be reflected in the imputed rent estimate.

The costs of debt servicing may be regarded as monetary outlays incurred by households as part of the cost of access to goods and services. As such they would be included in an index constructed using the actual outlays variant of the expenditure approach.

An alternative view sees debt service payments as the cost of bringing purchases forward in time and their inclusion in, or exclusion from, the index calculation turns on whether the facility to bring purchases forward in time is seen as a service which is being acquired. A variant of this argument underlies the current New Zealand approach which views the household as acquiring a credit service which is provided by a mortgage or other loan finance. This service is then acquired for a further period each time the household makes an interest payment.

Justification for the exclusion of debt service payments from an index based on the acquisitions variant of the expenditure approach can be made by regarding such payments as costs incurred solely for the financing of purchases by borrowings. The total amount of debt service payments incurred in any period is thought to bear no direct relationship to actual quantities of specific goods and services acquired by households during the period. On this view debt servicing cannot be readily related to the acquisition of goods and services in the base period. As a payment made in relation to past acquisitions rather than current acquisitions, the costs of debt servicing have no place in an acquisitions index in the same way that down-payments for future acquisitions have no place in such an index.

Similarly, debt service payments would be excluded from a consumption based index on the basis that nothing is actually consumed when interest payments are made. The costs of debt servicing do not belong in a consumption based index because the method of financing consumption is not material. What matters is the price of what is consumed.

The appropriateness of including debt service payments in a measure of consumer price change can be debated quite apart from issues associated with the underlying conceptual approach or with varying perceptions of what interest represents. Changes in the costs faced by households for debt servicing, while showing long term stability, are

highly volatile in the short term. The use of interest rates as the prime tool in monetary policy in New Zealand seems to exacerbate this. It can be argued that it is an undesirable practice to make available for general use a price index which captures this short term volatility. Movements in interest rates, as reflected in the CPI, result in a volatility in the index that does not represent the actual outlays experience of households.

Debate also surrounds the appropriate way to measure the amount households spend on debt service costs. Using a net approach to interest payments, similar to that used in some other areas of the CPI, was discussed by the committee along with the possibility of using the interest margin as a price indicator. That interest payments are both received and paid by the household sector means that the effect on individual households and on the household sector as a whole are at variance.

The above arguments can be used to explain a variety of positions on the treatment of debt service costs. In conjunction with recent changes in emphasis on the uses made of the CPI, the balance of the arguments has shifted in favour of an official measure of consumer price change which excludes the cost of servicing debt. Some members were opposed to this change but the committee was able to reach an understanding on how changes to the treatment of debt service costs would be possible. It was considered possible to exclude such costs from the CPI as long as a range of other measures of price change and purchasing power were also developed. This would ensure that public confidence was maintained in the available measures of the impact of price change on households.

■ **An Alternative Measure of Consumer Purchasing Power**

The committee recognised that the exclusion of interest payments from the CPI could raise issues of public credibility. The perception that the CPI is primarily an indicator of the changing purchasing power of consumers is widespread and it is clearly relevant to include debt service costs in such a measure. To address this need the committee noted that it would be appropriate for Statistics New Zealand to develop a measure more suited to measuring purchasing power. Comments made in submissions from the public were also in support of such a development.

A real disposable income index focuses on the impact of market changes in income and prices, and government policy decisions, on households' ability to maintain a standard of living. It incorporates changes in prices, interest rates, wages, income taxation and benefit levels to derive a measure of changing disposable income.

A family of real disposable income indexes for households would allow for changes in purchasing power and in the distribution of income to be

monitored for groupings of households characterised by factors such as income level, prime income source and labour market attachment. Because of its ability to capture change in income as well as price, a real disposable income index provides a more complete measure of household well-being than a cost of living index.

The committee was in agreement that the development of a suite of real disposable income indexes was a desirable step in providing users with suitable measures of changing purchasing power, and that interest should not be excluded from the CPI until they are available.

■ A Range of Consumer Inflation Measures

The variety of uses made of the current Consumers Price Index and the consequent range of conceptual approaches that could be adopted place considerable demands on a single measure. In addition, difficult issues are raised by the debate surrounding the appropriate treatment of debt service costs and of owner-occupied housing (see Section 2.2.2).

The committee was unable to reach a consensus on these matters and recognised that a workable solution lay in the development of a set of inflation measures, constructed within a coherent conceptual framework. Given the current balance of user needs, a set of three measures of consumer price change was considered desirable. Each measure is to be based on one of the three conceptual approaches outlined above. In adopting the more common of international practices, debt service costs would then be included in the actual outlays measure alone.

A major concern arising out of this development is the need to clarify which single measure would continue to be publicly regarded as the CPI. An appropriate nomenclature for all three measures would be required to avoid unnecessary confusion.

The committee agreed that the index series which would retain the name CPI should continue to be an acquisitions based index but should exclude interest payments. This decision was justified, in part, by the view that maintaining public confidence in the CPI required that the index be based, as far as possible, on real rather than notional transactions. This has been a consistent theme of successive Consumers Price Index Revision Advisory Committees. The acquisitions approach is further justified by the growing importance of the use of the CPI as a measure of inflation rather than of changing purchasing power. This decision is supported by increasing concerns about maintaining international comparability.

Some members of the committee expressed a strong preference for retaining debt service costs within the official CPI. The acceptability of moving to a CPI without interest payments lay in the condition that other, more appropriate, measures would be developed to meet the needs of all users.

The committee concluded that, given the range and significance of uses to which a measure of consumer price change is currently put, and the difficulties of arriving at a single measure suitable for those uses, it is appropriate that a range of measures be developed. The range of consumer price measures would include three index series:

- an acquisitions based index excluding interest payments which would be regarded as the official CPI,
- an actual outlays series which would include interest payments, and
- a consumption based series.

In conjunction with the development of the range of consumer price indexes, real disposable income measures will be required to provide users with a more appropriate indicator of the changing purchasing power of households.

Until such time as these developments are in place, the official measure of consumer price change would continue to be based on the acquisitions variant of the expenditure approach and would also continue to include interest payments.

Recommendation:

Statistics New Zealand should publish a set of three measures of consumer price change, and the CPI should be an acquisitions measure which does not include interest.

The other two indexes will be an index of the price change of household outlays and an index of the price change of household consumption.

To maintain public confidence in the measurement of price change affecting households, the new measures will be introduced when a suite of real disposable income indexes is also available.

2.2.2 Other Conceptual Issues

■ The Treatment of Housing Costs in Consumer Price Indexes

There is general agreement that shelter costs should be included in the construction of a consumer price index as they represent a real cost to consumers. However there is no generally accepted practice for the treatment of owner-occupied shelter costs and the methods chosen by national statistical offices vary widely.

Debate surrounds the extent to which the purchase of a home by a private individual for their own occupation represents an investment. Were it assumed that it is at least in part an investment decision to purchase a home, there remain serious practical difficulties in separating the investment from the shelter costs.

There are three usual approaches for dealing with the costs associated with owner-occupied housing.

1. Exclusion of Owner-occupied Housing

Items purchased solely for investment purposes are excluded when goods and services are selected for the construction of a consumers price index. This principle provides the basis for excluding owner-occupied housing from the index coverage. If expenditure on the acquisition of a property is seen purely as an investment, all costs associated with owner-occupied housing, including maintenance costs, should be excluded. Such costs would then be recoverable in the form of a capital gain when the property is sold.

2. Notional Measures of Shelter Costs

Economic cost-of-use measures for shelter attempt to estimate the value of the shelter consumed by a household. This approach fits a consumption based consumer price index. On this view a dwelling is an asset purchased to provide the household with a continuing flow of shelter services. There is an opportunity cost to the consumer for this flow of services but transactions do not actually occur during the time period that the shelter is being consumed. An implicit cost must be estimated for the purposes of a consumers price index.

To determine a notional measure of shelter costs either a rental equivalence or other economic cost-of-use variant can be adopted. The rental equivalence approach employs rents of equivalent quality tenanted dwellings as a measure of the costs of shelter for owner-occupied dwellings. This approach was favoured by some committee members although it was agreed that there are technical difficulties in the New Zealand situation given the relatively small size of the private rental sector². Most committee members did not accept that the use of notional measures of shelter cost was the appropriate approach for the New Zealand Consumers Price Index.

3. Actual Expenditure Measures of Shelter Costs

Notional measures are not used in either variant of the expenditure approach. The shelter component of housing costs is regarded as inseparable from the investment component so that owner-occupied dwelling purchases must be fully included or fully excluded from the index. The inclusion of the full cost of owner-occupied dwellings is justified by regarding the principal motivation of home purchasers to be the desire to obtain security of tenure and the unencumbered use of

² The 1996 Census of Population and Dwellings shows that 71 percent of private households own their own homes and 18 percent are in homes which are rented from private sector landlords, the remaining 11 percent are rented from non-private landlords or are provided rent free.

the property. The purchase of vacant land can be more readily regarded as purely an investment expense. The committee debated whether the purchase of vacant sections should be excluded from the index but no firm conclusion was reached on this issue.

Under the acquisitions variant of the expenditure approach, the expenditure weight is the net purchase of dwellings in the base period. The full price of the dwelling is taken to be the amount paid by the purchaser to the vendor; any mortgage or other credit obtained to finance the payment is viewed as a separate transaction.

The committee was divided on the appropriate treatment of housing costs with some members remaining in favour of adopting a notional measure. Most members held the view that notional transactions, including the use of a rental equivalence measure for owner occupied housing, were hypothetical prices which are not a component of inflation and thus have no place in a price index intended to measure inflation.

The lack of consensus was largely resolved by the decision to move to three measures of price change. The actual expenditure method could then be used in the acquisitions and the outlays indexes and a rental equivalence approach for the consumption index.

Until the development of three separate measures has been carried out it was decided to continue with the current acquisitions variant of the expenditure approach. Public submissions on this issue reflected the full variety of views presented by committee members.

Recommendation:

Statistics New Zealand should continue to include home-ownership costs in the Consumers Price Index.

Recommendation:

The acquisitions variant of the expenditure approach should also be maintained for the treatment of home-ownership.

■ **Geographic Location of Supplier**

An increasing number of goods and services is being offered for sale to New Zealand consumers by way of overseas mail order and via the Internet. Although the suppliers may not be located in New Zealand, the committee agreed that the commodities are, in effect, purchased in New Zealand and hence should, in principle, be incorporated in the CPI. Implementation of this recommendation may be constrained by practical difficulties.

Recommendation:

The Consumers Price Index should, in principle, reflect prices paid by New Zealand-resident private households in New Zealand regardless of the location of the supplier.

■ Interest on Student Loans and Overdrafts

The student loan scheme was introduced since the last Revision Advisory Committee was convened in 1991, and is an area of expenditure which is growing significantly. Interest payments on student loans for the year ended June 1996 amounted to \$24.5 million, an increase of more than 80 percent over the previous year.

Some members of the committee expressed the opinion that student loans relate to an investment, and hence interest on student loans falls outside the scope of the CPI. However there was general agreement that all interest payments, including interest charges on student loans, overdrafts, mortgages, credit cards, store cards and hire purchase should be treated in the same manner. Further discussion on the inclusion of mortgage interest can be found in Section 2.2.1.

Recommendation:

Overdraft interest and interest on student loans should be treated in a manner consistent with other interest charges.

2.3 Methodological Issues

2.3.1 Index Formula

■ Formula Used

Index numbers to measure price level changes can be calculated in a variety of ways. The different types of formulae and their comparative features were reviewed by the committee.

The New Zealand CPI is calculated using a base-weighted Laspeyres-type index formula. It measures the changing cost over time of purchasing the basket of goods and services which was purchased by private, New Zealand-resident households in the index base period.

The advantages of using the Laspeyres index formula lie primarily in the considerations of cost and timeliness. A Laspeyres index is also relatively straightforward to interpret, as it measures changes in the cost of purchasing a fixed basket of goods and services. The committee discussed alternative price index formulae and agreed that the positive features offered by the alternatives were outweighed by their disadvantages. For these reasons, the committee decided to endorse the continued use of the Laspeyres-type index formula in the New Zealand context. The Laspeyres-type formulae are widely used by

other national statistical agencies in the calculation of consumer price indexes.

Recommendation:

The calculation of the Consumers Price Index should continue to be based on the Laspeyres price index formula.

■ **Superlative Formulae**

Other formulae such as the Fisher Ideal and Tornqvist formulae attempt to arrive at a superlative or “ideal” index. Superlative indexes are closer approximations to a cost of living index than Laspeyres or Paasche indexes. Superlative formulae are considered to produce a closer estimate of the true cost of living. However, as they require current weights, they present timeliness and cost issues similar to those of Paasche indexes. In fact the Fisher Ideal index is the geometric average of a Paasche and Laspeyres indexes.

The use of ideal or superlative indexes for calculation of consumers price indexes is being considered by overseas statistical agencies. The Boskin report recommended that the US Bureau of Labor Statistics adopt a superlative index. In light of this background the committee discussed the use of superlative indexes, and suggested that an analytical series using a superlative formula be produced.

The production of such an analytical measure would take place after the forthcoming re-base of the official measure. Thus a long-term superlative inflation measure would be produced every three years. This would be of use for research purposes and would provide an indication of the net impact of commodity substitution bias in the official measure.

Recommendation:

Statistics New Zealand should consider the publication of an analytical series, retrospectively calculated using a superlative index formula, whenever the index is re-based.

2.3.2 Index Weighting

■ **Level of Fixed Weights**

Expenditure weights in the CPI are currently fixed at item level, and weight changes to the existing published regimen have only ever been made at the time of a revision. It is generally recognised that this practice can result in delays in maintaining the relevance of expenditure patterns.

The committee discussed changing the level of the index at which expenditure weights are fixed. This would allow greater flexibility in

dealing with on-going changes such as the introduction of new goods, and commodity substitution. There was general agreement that expenditure weights should be fixed at a higher level in the index structure. Changes in expenditure patterns at the detailed level could then be reflected in the index more quickly. Higher level weights would be kept constant between major revisions in accordance with the principles of a base-weighted Laspeyres price index. However more flexibility would exist to change weights and items at the item level between revisions. (See Section 2.3.7).

■ Source of Expenditure Weights

An index designed to reflect the price-paying experience of individual households requires a weighting pattern which reflects the pattern of expenditure on goods and services actually incurred by the household population. To facilitate this, an annual household expenditure survey, the Household Economic Survey (HES), has been in place since 1973/74 to collect expenditure data required to determine the base weights for the CPI. Typically, the most recent year's data, complemented by supplementary data from other sources, is used to determine the base period weights.

The committee agreed that the expenditure weights of the CPI should continue to be based on the acquisitions variant of the expenditure approach and reviewed the use of HES annual data for the determination of the index weights. It agreed that HES data from more than one year of the survey should be used, if required, to ensure that the expenditure weights are truly representative of the expenditure patterns of New Zealand households.

In line with this, the committee expressed some concern at any possible change to the frequency of the HES, urging Statistics New Zealand to view with caution any reduction in the frequency of the Household Economic Survey. Such a change could increase the possible risk of aberrant weights being allocated in the base year, and decrease the information available to monitor expenditure weights below the fixed level. To ensure that the expenditure weights are truly representative, data showing unusual inter-year expenditure trends, high relative expenditure growth or apparently falling purchasing levels must be investigated.

It was also noted that a reduction in the frequency of the HES could compromise the ability to carry out seasonal adjustments or investigations into chain linking.

Recommendation:

Statistics New Zealand should survey the expenditure of private households as frequently as required to construct suitable weighting patterns for household price indexes.

2.3.3 Commodity Coverage

■ Introduction of New Items

All goods and services purchased in New Zealand by private New Zealand Households should, in principle, be covered by the index. In the past few years, New Zealand consumers have been offered a range of new commodities such as cell phones, subscriber television, and Internet services. To maintain the relevance of the CPI, it is important that new items be introduced in a timely manner.

It is current policy to bring new items into the regimen during revisions, ie every five years. This means that the timing for adding or removing items may not accurately reflect current expenditure patterns. The committee agreed that new items should be introduced between major revisions, provided reliable expenditure and price indicator data are available (see Section 2.3.7).

■ Index Exclusions

As the CPI is a statistical measure of the changing price levels of goods and services *purchased* within New Zealand for consumption by private New Zealand households, consumption from a household's own production, goods received as income in kind, and goods and services supplied free of charge, are outside the scope of the index. Direct taxation "expenditure" is also considered to be outside the scope of the index, as it is not a payment for a service for which the quality is subject to statistical definition and measurement and is therefore not capable of being price-surveyed in a manner appropriate for a CPI.

Some commodities are excluded because they represent pure savings and investment. These are the purchase of shares, debentures and bonds; precious metals; payments to superannuation funds and friendly societies; purchase of annuities; life insurance (except life insurance incidental to taking out a housing mortgage); and savings. Antiques and some other collectors' items tend to be unique articles not subject to consistent-quality pricing or else predominantly viewed as investment. Donations to charitable organisations, churches and civic groups, maintenance payments, and traffic offence and court fines are also excluded because they are not considered to be expenditure on goods or services providing household/consumer utility.

Certain areas of expenditure also have to be excluded, not because they fall outside the conceptual coverage of the index, but because movements in the level of their prices cannot be directly or satisfactorily measured, nor can the price movements of any other related or associated commodities which could be priced-surveyed be used as a surrogate for them. These areas are all one-of-a-kind purchases such as works of art; pets and other livestock; some gambling services; illicit drugs; some legal expenses; payments made to

baby-sitters, casual gardeners, etc; registration costs for reunions, jubilees and conferences; and catering and other service charges for private receptions and parties. For these commodities the assumption is made that their price movements are likely to be in line with the overall movement of the CPI.

■ Possible Extension of Commodity Coverage

The committee considered a number of areas where the extension of the commodity coverage of the current CPI is possible. The basic principle on which decisions have been based is that all purchased goods and services from which householders derive some value should be covered by the index.

Gambling

The 1991 CPI Revision Advisory Committee recommended that net expenditure on Lotto and Instant Kiwi, and TAB betting on horse and greyhound racing, not be included in the index, as appropriate and acceptable price indicators had not been developed. It also recommended that Statistics New Zealand continue to investigate alternative methods of monitoring quality control of public gambling services. Since then, the Auckland and Christchurch casinos have opened, TAB sports betting has been introduced and the Lotteries Commission has extended the range of Instant Kiwi and Lotto games available. As more types of gambling are made available, the number of people participating in the activity, and the overall expenditure, could well increase.

Statistics New Zealand presented a possible method for the calculation of an expenditure weight for gambling in the technical paper entitled *Services in the CPI*, but noted there are still problems with respect to developing and implementing robust price indicators.

The committee reviewed the conceptual issues concerning the inclusion of gambling in the CPI. It concluded that while gambling in New Zealand can be viewed as predominantly a form of entertainment, and as such should be included in the CPI, the problems of developing and implementing robust price indicators make its inclusion difficult. Some support was expressed by public submission for the inclusion of the entertainment component if this could be determined. An alternative view, that gambling expenditure is not relevant and effort should not be wasted on devising reliable weighting and pricing methods, was also expressed. The committee did not see further work in this area as a priority.

Recommendation:

The committee judged that the predominant motive for gambling is entertainment and thus conceptually it would be included in the Consumers Price Index. However Statistics New Zealand should

not include gambling in the index until acceptable price indicators and weights have been developed.

Telecommunication Services

The telecommunications industry is a particularly dynamic one, with new providers and new products and services appearing quite frequently. For this reason it is considered that this area of the current index is under-represented both in terms of the relative weight in the index and the range of items in the published regimen that are price-surveyed.

New Zealand has one of the highest rates of per capita growth in the usage of cellular phones. There has been a major drive to get consumers to use cellular phones - incentives including cutting the price of the equipment and special packages that are more price competitive. Evidence suggests that the pricing influences of cellular compared to non-cellular services differ, and consequently the prices of the two will move differently. They cannot be represented by one item or price in the CPI regimen.

The committee agreed that given the rapid rates of change in telecommunications, this is an area which needs careful monitoring to ensure that the price specifications and relative weights adequately represent the changes in the prices of such goods and services. The committee also reviewed the current classification of telecommunications, and agreed that a separate section for telecommunications services should be formed (see Section 2.3.8).

Prepaid Overseas Package Tours and Accommodation Expenses

Expenditure incurred overseas is excluded from the calculation of the index. The 1991 Revision Advisory Committee recommended that overseas travel and accommodation expenses prepaid in New Zealand be included in the CPI providing that price data could be obtained on a consistent ongoing basis. This recommendation was not implemented because an adequate price indicator could not be developed.

The current CPI measures the price movements of goods and services actually purchased, although not necessarily consumed, in New Zealand. Therefore, any consideration given to including overseas travel costs is limited to those commodities which can be prepaid and price-surveyed in New Zealand. The only overseas travel commodity currently included in the CPI is the airfare component of overseas travel.

The committee agreed that the case for the separate pricing of package tour and overseas accommodation costs prepaid in New Zealand is now stronger than before, as the relative expenditure on these items continues to increase. However the problem of developing an adequate

pricing and weighting procedure, as well as quality controlling the price, still exists. It was noted that as the Australian Bureau of Statistics currently includes costs on these items in its CPI, the development of a robust methodology for their inclusion was considered feasible. Currently the weight for prepaid overseas airfares and accommodation is included in the weight for international airfares because airfares and accommodation are usually the most significant part of a package holiday.

A public submission on this subject was at variance with the committee's view. The prepaid costs of overseas trips, which ultimately convert to overseas currency, were not seen as an expense that should be part of the New Zealand CPI.

Recommendation:

Overseas package tours and accommodation expenses, prepaid in New Zealand should be included in the Consumers Price Index, provided a robust methodology can be developed.

Bank Charges

Although the CPI currently covers some financial services, there are none that represent the services relating to the operation of bank accounts. The 1991 Revision Advisory Committee recommended that charges on store accounts and bank accounts should be included in the CPI once appropriate weighting and pricing methodologies could be developed. This recommendation was partially implemented in 1993 when store accounts were introduced to the CPI regimen. Charges on bank accounts continued to be excluded because of problems in developing reliable and workable weighting and pricing methodologies.

It is now possible to obtain base weights for bank charges from the Household Economic Survey. There remains some difficulty in pricing bank charges due to the considerable variation in the types of charges made for banking services. The committee agreed that, where possible, expenditure on bank maintenance charges, bank transaction and other bank charges should be included in the Credit Services group. Note that "bank charges" do not include interest payments. Public submissions were in agreement with the committee's view.

Recommendation:

Credit services should include bank account maintenance charges, bank transaction charges and other bank fees.

2.3.4 Population and Geographic Coverage

■ Target Population

The survey population of the Household Economic Survey, from which CPI weighting data and the regimen commodities are derived, includes all private resident households³ in the two main islands, including those in small towns and rural areas. Apart from residents of a few remote rural areas and off-shore islands, there are no exclusions on the grounds of geographical location.

Many countries produce consumer price indexes reflecting the expenditure patterns of, and prices paid by, restricted population groups, such as those residing in the main urban areas or wage and salary earners. The geographic coverage of the New Zealand CPI is also much wider than that of many other western countries. The committee agreed that the CPI should continue to provide the current level of comprehensive coverage in order to be a measure of price change relevant to all private resident New Zealand households.

Recommendation:

The current target population for the Household Economic Survey (New Zealand-resident private households living in permanent dwellings) is appropriate for the Consumers Price Index.

■ Population Weighting

Price movements for the 15 urban areas are aggregated using population weights. The current practice is to only update population weights when the five-yearly CPI revision is implemented. Because the five-yearly revision does not necessarily coincide with census year, CPI population weights tend to be based on estimates. The current CPI, for example, uses 1993 population estimates based on the 1991 Census of Population and Dwellings adjusted for births, deaths and migration.

The committee discussed the relevance of this current population weighting method, and agreed that the population weights in the CPI should reflect the current population distribution. As more frequent population weight updates would reflect changes in regional populations between CPI revisions more accurately and would also allow for the inclusion of final census figures every five years, the committee recommended a move to annual updates of population weights.

³ A private household is defined as either:

- i. a single person living in a dwelling who makes his or her own housekeeping arrangements, or,
- ii. a group of people living in or sharing a dwelling and who participate in some measure at least in the consumption of food purchased for joint use by the group or who contribute some portion of their income towards the provision of the essentials of living for the household as a whole.

Eligibility also depends on residency in New Zealand for at least 12 months.

Recommendation:

Regional population weights should be updated annually when population estimates are available, from the time of the next revision.

■ Regional Coverage

As mentioned above, the geographic coverage of the New Zealand CPI is much wider than that of many other western countries. The weighting base of the index is the average expenditure of all private resident New Zealand households.

A similar broad geographic base is used for CPI price surveys. This ensures that both commodity weights and prices, the two data sets used in the calculation of the CPI, are approximately applicable to the same population. Exact matching of price and weighting data is not possible, however, because limitations on availability of resources preclude conducting price surveys in all centres of population in New Zealand. Instead a representative sample of the larger urban areas is surveyed. Each of the 15 price-surveyed urban areas is assumed to be representative of the price movements in surrounding smaller urban areas.

For some commodities the surveys are extended beyond these 15 urban areas through postal surveys. For example, hotel, motel, and camping-ground tariffs are surveyed in a representative sample of all holiday locations that are popular with New Zealand households.

The committee discussed the extent of regional coverage in the CPI. There was general agreement that the current regional coverage of 15 urban areas should be seen as the minimum, and any further reduction in regional coverage should be avoided.

Recommendation:

The geographic sample for the Consumers Price Index should not be reduced below the current 15 urban areas.

2.3.5 Price Collection**■ Commodities and Outlets Priced**

It was recognised that price indexes are far more responsive to price changes than to weight changes. Prices are likely to be more volatile, increasing or decreasing more frequently, than changes in the level of expenditure on goods and services (ie the weights). The committee acknowledged the importance of ensuring that the outlets from which the prices are collected are representative, and that the prices themselves are representative, accurate and timely.

Statistics New Zealand currently prices over 700 items. Most of these prices are collected by interviewers throughout the country. The frequency of price collection for an item depends on the volatility of the price and the weight assigned to the item in the CPI. If the price tends to fluctuate or the item has a significant weight in the CPI, the price is measured more often. Fresh fruit and vegetable prices, for example, are collected weekly.

At times, commodities priced are not available as they may be temporarily out of stock or permanently removed from stock. If a commodity is removed from sale from an outlet, then it is priced, where possible, in a similar outlet. When it is no longer available, or another item is clearly more popular, it is replaced with a similar item.

Changes to the outlets priced can occur for a number of reasons. The most common instances are when an outlet closes or is taken over, when stocks are run down, or the item priced is no longer available on a regular basis. If an outlet needs to be replaced, then another outlet of the same or similar type and in the same area, is chosen. New outlets (but of an existing type) are introduced wherever reliable and timely data is available, and where its use can be expected to significantly improve the accuracy of the index.

Currently new outlet types are not usually introduced into the CPI between major revisions, and only minor or necessary changes are made to the outlet sample outside five-yearly revisions. It is recognised that the introduction of new outlet types in a more timely manner would facilitate the collection of more accurate price data. Careful monitoring of the impact of new outlet types on consumer behaviour would be required and would depend on the level of detail available from the point of purchase data collected by the Household Economic Survey (see Section 2.3.7).

■ Out of Stock Items

As mentioned above, commodities priced are sometimes not available as they may be temporarily out of stock or permanently removed from sale. If an item is temporarily out of stock the price is carried forward from the previous period for a limited time. This is currently the only imputation method used for the estimation of prices when acceptable prices are not available.

The committee felt that other imputation techniques should be investigated to ensure that the most appropriate methodology is applied.

Recommendation:

Statistics New Zealand should review the imputation techniques it uses to estimate prices for commodities when they are temporarily unavailable, and implement them where appropriate.

■ Number of Price Quotes Collected

For most items price-surveyed, a number of price quotes are collected in each of the 15 price-surveyed regions. Quotes for specific items are then weighted and aggregated to produce a weighted average regional price. Where the price of an item is controlled by a national authority and the same price applies to the whole of New Zealand, a single “national price” is collected. This reduces the requirement for price collection in every region and currently occurs, for example, in the collection of motor vehicle registration fees.

As price collection is both time consuming and expensive, the committee recognised the advantage of extending the collection of national prices to other price-surveyed items provided Statistics New Zealand was certain that the national price applied in all 15 urban areas surveyed. Prices from, for example, franchised fast-food outlets with a national distribution, could be collected in this way. There was general agreement that the number of quotes for priced commodities could be reduced where appropriate as long as the integrity of the CPI was maintained.

Recommendation:

Statistics New Zealand may reduce the number of quotes for priced commodities where this would not compromise the quality of the Consumers Price Index.

■ New Data Sources

An increasing proportion of expenditure by consumers is recorded somewhere on a computer database. Bar code scanners, for example, are now used in most supermarkets and some variety stores to read product numbers. These product numbers can be used to identify the price of the commodities charged at the particular outlet and collect volume data on sales.

Accessing these databases provides an opportunity for developing new techniques in the production of the CPI. If a scanner database is comprehensive, it can be used as an alternative pricing source. It can also be used to monitor expenditure on items and hence as a means of selecting items to be price-surveyed. Scanner databases could also be used as a frame for probability sampling, and in quality adjustment.

A number of issues remain unresolved, such as confidentiality, before scanner data can be used to any great extent. However, the committee

agreed that in future this will be an invaluable source of information that should be investigated.

Recommendation:

Statistics New Zealand should investigate the potential of new data sources, such as from the Internet and scanner data, to improve the cost efficiency and quality of the index.

■ Sampling Techniques

There are two general approaches used to select both outlets and commodities to be priced - purposive sampling and probability (statistical) sampling.

Purposive Sampling

Within each group of the CPI, the approximate number and general characteristics of the commodities to be price surveyed are identified. The number selected depends on the importance of the group, the expected variation in price movements and the variety available for the product. These commodities, mostly selected using the Household Economic Survey, are assumed to represent the price movement of all items within the group.

A range of outlets is surveyed for each group of commodities in the CPI regimen. The Household Economic Survey and retail trade data are used as a guide to determine the proportions of different types of outlets to be surveyed for particular commodity groups. Outlets from which prices are collected are selected on the basis of recommendations of price survey interviewers. The selection process takes into account the range of commodities sold by an outlet, the market share represented by that outlet and its outlet type, the variability of price movements for the commodities purchased at that outlet, and the cost-effectiveness and ease of sampling.

Purposive sampling uses information from a wide variety of sources and its representativeness is dependent on the judgment of the statistician, rather than as a result of the randomisation that occurs with probability sampling. Purposive sampling provides no basis for the calculation of sampling errors, without which assessments of accuracy cannot be made. Purposive sampling needs to be validated to ensure that samples are not biased.

Probability Sampling

In probability sampling each outlet/item has a known chance of being selected. This method ensures that selection is not subjective, and allows for the calculation of sampling errors. It is currently difficult to establish and maintain a comprehensive sample frame, although as mentioned above, information on purchases from outlet or national databases is seen as a useful potential source of data.

There was discussion on the method used for the selection of price surveyed items and outlets in the CPI. There was general agreement that the current use of purposive sampling was acceptable given the difficulties and potential costs associated with alternative methods. It was also acknowledged that data sources such as scanner databases could in future provide suitable sampling frames for probability selection of price surveyed items and should be investigated.

Recommendation:

Statistics New Zealand should continue to accept the use of purposive sampling for the selection of outlets and price-surveyed items but should move to statistical sampling where an appropriate sampling frame is available and it can be applied at reasonable cost.

■ **Central and Local Government Charges**

Central government and local government provide householders with a wide range of goods and services. For the purposes of the CPI, a government charge is considered to be any charge that could be subject to government intervention. The committee considered that this definition should be subject to review.

Members of the committee indicated some concern about the current treatment of government charges. It was suggested that as the overall quality and quantity of a government good or service is often unknown, the validity of interpreting a change in government charge as a pure price change is questionable. The committee agreed that Statistics New Zealand should review the pricing of central and local government charges.

Recommendation:

Statistics New Zealand should review the definition and the pricing of central and local government charges in the Consumers Price Index.

2.3.6 Quality Control

■ **Identifying Changes in Quality**

The quality of an item is determined by the quantity and standard of service or satisfaction it will provide to the consumer. A Laspeyres index assumes that the quality of items in the basket of goods and services priced remains constant over time. In reality this does not occur so changes in quality must be adjusted for in order to keep the quality of the basket constant. By doing this, the index remains a measure of pure price change, rather than a measure of quality and price change.

Ensuring that the index is not affected by anything except genuine price changes is not an easy task as the characteristics of goods and services sold in the market place change over time. The exact service or commodity price-surveyed in one period is often not available in the next period.

The first step in ensuring satisfactory quality control is to determine specifications for each index regimen commodity so that, where possible, the same make, model, grade and size of item is priced on each occasion. The number of commodity substitutions is kept to a minimum by selecting commodities that are popular and, where appropriate, are likely to be available over the life of the index.

A quality change is usually accompanied by a price change. Often, it is through price changes that quality changes can be identified and quantified. However this is not always the case, hence surveyed items are continuously monitored for changes in price and characteristics. Any change in characteristic of a good or service is reported by pricing staff. Further checks are then made using information from retailers and manufacturers.

■ **Quality Adjustment**

Methods currently employed by Statistics New Zealand include direct adjustment and estimation. These are standard techniques used by most statistical agencies.

Direct adjustment involves assigning a monetary value to the quality difference and then adjusting the price for this difference. Assessments made by both pricing staff and analytical staff are used in this process. Estimation involves imputing the effect of a quality adjustment using price information. Price changes for comparable types of products are used to estimate the quality change. It is assumed that the difference in quality of two goods is reflected in their prices. By removing any price difference, any quality change is removed.

■ **Other Methods of Quality Control**

The committee acknowledged that New Zealand uses standard internationally recognised techniques of quality adjustment. However, they were keen to see more research into techniques such as hedonic regression.

The use of hedonic regression requires the assumption that the price of different models or varieties of a particular commodity is related to the quality characteristics of the item. Statistical models then provide a way of estimating the price change which would be related to changes in particular qualities. The technique can be used to estimate the proportion of the price change which is due to the change in quality and thus the amount of price change which should be reflected in the index.

2.3.7 Accuracy of the Index

■ Measurement Limitations

The committee acknowledged that the publishing of the Boskin Report in the United States had raised user concerns regarding the accuracy of price indexes. Given the low inflation environment in New Zealand, and the various economic applications to which the CPI is put, the committee agreed that Statistics New Zealand should take steps to ensure that the CPI is the most accurate measure possible, and that a high priority should be given to index methodology which results in minimal calculation bias.

Fixed-based indexes like the Laspeyres index have a number of possible measurement limitations, or theoretical biases:

Commodity Substitution Bias

Commodity substitution bias occurs when a change in consumer preferences is not captured in the index, as some commodities or products are substituted for others.

Outlet Substitution Bias

This type of bias can occur when there is a change in the type of outlets from which consumers purchase goods and services, but the change is not captured in the index.

New Good Bias

New goods generally enter the market at higher prices and display relative price decreases following their introduction. These price movements are not immediately captured in the price index. This can produce a bias if they are not included in the index from the time the items have an impact on the pattern of household expenditure.

Elementary Index Bias

One of the first steps in constructing a price index is to combine individual prices for a particular commodity collected within a specific geographic region. This process is known as elementary aggregation, and any bias resulting from the process of averaging prices at this lowest level is referred to as elementary index bias.

Quality Adjustment Bias

Quality adjustment bias can occur when an item being priced is replaced by a new version or model or where items undergo a change in quality for which a full adjustment is not made.

The committee recognised that the main types of bias likely to occur in the New Zealand CPI were quality adjustment bias, outlet substitution bias and commodity substitution bias. The magnitude of these can be

limited by the use of such methods as frequent re-selection and re-weighting of the CPI basket of goods and services; frequent reviews of the outlets used to collect prices; probability sampling for outlet substitution; and the application of alternative methods of quality adjustment. Public submissions were in agreement with the committee's view.

Recommendation:

Statistics New Zealand should take all reasonable steps to manage and reduce bias in the CPI. This could include:

- a) reviewing the Consumers Price Index pricing mechanisms and rebasing the expenditure weights (at the fixed level), every three years;
- b) changing the outlets surveyed and commodities priced on an ongoing basis, between three-yearly revisions;
- c) fixing the expenditure weights at the section level, to allow for changes in expenditure weights at the item level of the regimen between three-yearly revisions;
- d) introducing new items into the Consumers Price Index between major revisions, during the course of the index, when appropriate;
- e) applying, as appropriate, alternative quality adjustment techniques such as hedonic regression, for those goods and services where quality involves a variety of features that are at least partly measurable.

The merit of undertaking a study into the level of bias or other measurement limitations in the CPI was discussed. While the general consensus was that such studies would be of considerable value, some committee members expressed concerns that there were other measures produced by Statistics New Zealand which also needed development. Issues raised by public submission were fully consistent with the committee's recommendation.

Recommendation:

Statistics New Zealand should give significantly more emphasis to measurements of the accuracy in the Consumers Price Index, given the requirements for policy setting in the current low inflation environment, international confidence and debate in price indexes, and increased user expectations.

■ **Index Research**

The committee also recognised that current high levels of international interest in index methodology were leading to a range of new developments. The committee urged Statistics New Zealand to monitor international research, and consider investigating and introducing any methods which have the potential to improve accuracy of the CPI.

Of particular interest to some of the members of the committee, were investigations into the use of a geometric mean formula. Both the US and Australia are considering the use of such a formula in an attempt to reduce elementary index bias. Public submissions were consistent with the committee's view.

Recommendation:

Statistics New Zealand needs to maintain sufficient research activity to ensure that it can investigate the application to New Zealand data of new index methods such as geometric means, where overseas studies indicate such methods demonstrate potential improvements in accuracy, and implement them where appropriate.

2.3.8 Index Structure

■ **Regimen Level**

Separate indexes are calculated and published for each of nine commodity groups, 20 commodity sub-groups and for all groups combined. Within sub-groups, commodities are classified into sections.

It was agreed that the CPI regimen should continue to be made available at the existing level. The committee recognised that difficulties may arise for some users as a result of changes to weights at this level during the life of the index (see Section 2.3.2).

Recommendation:

Statistics New Zealand should continue to make available the Consumers Price Index regimen at the level of detail published following the 1993 Revision.

■ **Telecommunication Services**

At present, telecommunication services are classified to the section entitled "Household Services". The committee reviewed this classification, and agreed that a separate section for telecommunication services including cellular and non-cellular telephone rentals and services, cellular and non-cellular telephone purchases, Internet charges, cable television fees, television subscriptions and public broadcasting fees should be formed. Formation of this new section will facilitate the expansion of price-surveyed telecommunication services.

Recommendation:

Telecommunication services should be established as a separate section within the Consumers Price Index regimen.

■ Credit Services

The committee had difficulty reaching a consensus on the treatment of interest costs (see Section 2.2.1) The discussion concluded with an agreement to exclude interest from the acquisitions index when the intended set of three measures of price change, and the real disposable income series, become available. Until that time, in accordance with Recommendation 2, interest costs will continue to be represented in the CPI.

It was agreed that, as an interim measure, until a consumers price index excluding interest is publicly available, it would be useful to rearrange the Credit Services group into two subgroups - fees and interest. This would facilitate the production of an additional analytical series excluding interest.

Recommendation:

The credit services sub-group should be sub-divided into bank fee and interest charges sub-categories. The analytical series excluding credit services should only exclude interest charges.

2.3.9 Treatment of Seasonal Commodities

■ Definition of Seasonal Commodities

A seasonal commodity is a good or service with seasonal fluctuations in the quantity purchased and/or price. These fluctuations can be due to changes in demand or in the availability of the commodity.

The main reason for seasonal variations is climate. Changes in climate and the cycle of seasons can affect the supply of some commodities (eg fresh fruit and vegetables, or lamb), or the demand for them (eg firewood, winter and summer clothing). Calendar events can also create seasonal commodities, for example the effect of holiday times and climate on expenditure on overseas airfares.

■ Seasonal Adjustment

Seasonally fluctuating price levels can lead to seasonal fluctuations in the price index. Different commodities may have different patterns in their seasonal price movements. These different patterns may be cancelled out, or exaggerated, when all items are aggregated for the total CPI.

The statistical technique for removing the seasonal pattern from these prices, or from the resulting price index, is called seasonal adjustment.

Seasonal adjustment methods usually assume that the data is influenced by three factors:

- the underlying trend of the series - the steady long-term movement and shorter-term movement;
- regular seasonal fluctuations that occur at the same time every year; and
- irregular movements which can be due to one-off events such as a drought, or may be random fluctuations due to the collection of survey data from a sample of outlets.

Seasonal adjustment procedures involve decomposing the index, or the price series, into these three components and then removing the seasonal factor from the original series.

Some countries publish a consumer price index with seasonal adjustment as well as an index without seasonal adjustment. This allows users to choose the most relevant index series for their needs. The committee briefly discussed the merits of publishing a consumer price index without seasonal treatment for use as an analytical series. It was agreed that this should be investigated (see Section 2.3.10).

■ **Seasonal Adjustment of Fresh Fruit and Vegetables**

Fresh fruit and vegetables are the only commodities in the CPI which are seasonally adjusted. The prices for fresh fruit and vegetable items that show a regular seasonal pattern are seasonally adjusted before the CPI is calculated. The factors used to remove seasonality from the prices are calculated annually, to be used for the appropriate months of the following year. Each item has a different factor for each month.

Prices for fresh fruit and vegetables are collected throughout the year, or for as much of the year as the item is available in sufficient quantity and quality. The price of any item which cannot be gathered throughout the year is imputed by carrying forward the last seasonally adjusted price until the season starts again.

The committee briefly discussed seasonal adjustment, and agreed that seasonal adjustment of fresh fruit and vegetables should continue to be carried out.

Recommendation:

Statistics New Zealand should continue to seasonally adjust fresh fruit and vegetable items in the Consumers Price Index.

■ **Seasonal Adjustment of Other Items**

It is known that commodities other than fresh fruit and vegetables are seasonal in price, including overseas airfares to specific destinations such as London and Fiji, hotel accommodation, clothing, footwear, garden supplies, and toys. No seasonal treatment is currently performed on these commodities, although it would be possible to do so. There are other items which have seasonal fluctuations in expenditure as a result of change in supply, and still others which have seasonal fluctuations in purchase patterns as a result of change in demand.

The committee acknowledged that the treatment of seasonal commodities in the CPI is not a straightforward matter and that there is no defined international “best practice.” It agreed that investigations should be carried out into extending the methods of seasonal adjustment to other commodities which exhibit a seasonal pattern.

Recommendation:

Statistics New Zealand should investigate the practicability of extending the methods of seasonal adjustment in the Consumers Price Index to other commodities that exhibit a seasonal pattern.

2.3.10 Publication

■ **Frequency of Publication**

The current Consumers Price Index and Weighted Average Retail Prices of Selected CPI Items are released quarterly. The Food Price Index (FPI) and Weighted Average Retail Prices of Selected Food Items are published monthly.

The committee discussed the possibility of publishing a monthly CPI or a monthly indicator series. It was suggested that by releasing data more frequently, markets would be more aware of price movements and hence able to react more quickly to changes. It was also acknowledged that a monthly CPI tends to be more volatile than a quarterly index, perhaps instigating unwarranted reaction in money markets. Increases in both respondent burden and cost were also considered and as a result, the committee agreed that the CPI should continue to be published on a quarterly basis, and that a monthly series was not seen as a priority.

Recommendation:

The Consumers Price Index should continue to be published quarterly, and the Food Price Index monthly.

■ The Superannuitants Price Index and Other Population Sub-group Indexes

In 1995, a research index for superannuitant households was first published. This followed demand for a price index more closely related to costs facing the elderly who tend to spend proportionally more on food, housing, household operation (eg electricity) and health care. Since the September 1996 quarter, the Superannuitants Price Index has been published at the same time as the CPI.

The committee considered that there was a case for measurement of well-being for population sub-groups. This need provided at least part of the justification for developing measures of real disposable income. It was also recognised that the current Superannuitants Price Index needs further methodological and conceptual refinements but that specific development work on the Superannuitants Price Index was not a high priority.

Some of the public submissions were at variance with the committee's recommendation. Views were expressed in submissions both for and against the development of specific indexes to meet the needs of sector groups. Attention was drawn by public submission to the requirement to include items that represent the particular purchases of population sub-groups. This would be done under current practice if these items were to show divergent price movements, or have a significant weight.

Recommendation:

Statistics New Zealand should not view the refinement of the research index Superannuitants Price Index as a higher priority than the substantive changes proposed in this report.

■ Analytical Series

Analytical series are currently published quarterly as follows:

- All Groups CPI excluding Food
- All Groups CPI excluding Housing
- All Groups CPI excluding Household Operation
- All Groups CPI excluding Apparel
- All Groups CPI excluding Transportation
- All Groups CPI excluding Tobacco and Alcoholic Drinks
- All Groups CPI excluding Personal and Health Care
- All Groups CPI excluding Recreation and Education
- All Groups CPI excluding Credit Services
- All Groups CPI excluding Home Ownership
- All Groups CPI excluding Housing and Credit Services
- Central and Local Government Charges
- All Groups CPI excluding Central and Local Government Charges
- All Groups CPI - Goods Component
- All Groups CPI - Services Component

The committee discussed issues surrounding central and local government charges (see Section 2.3.5), credit services (see Section 2.3.8) and the publication of an All Groups CPI without seasonal adjustment, as well as tradeable and non-tradeable analytical series.

All Groups CPI Without Seasonal Adjustment

Some countries publish a CPI with seasonal adjustment as well as a CPI without seasonal adjustment, allowing users to choose the most relevant form for their needs. (Refer to Section 2.3.9 for more information on treatment of seasonal commodities.)

The committee briefly discussed the merits of publishing a consumer price index without seasonal treatment for use as an analytical series. It was agreed that this should be investigated.

Recommendation:

Statistics New Zealand should investigate calculating a consumer price index without seasonal treatment for use as an analytical series.

Tradeable and Non-tradeable Sectors

The tradeable sector refers to goods and services whose prices are primarily determined in international markets, while the non-tradeable sector refers to those goods and services whose prices are primarily determined in domestic markets.

Price movements for the tradeable and non-tradeable sectors are not currently published as part of the New Zealand CPI release. Although there can be difficulties in determining exactly which goods and services are non-tradeable (health services, for example, are a combination of tradeable and non-tradeable), the committee agreed that this was an area of some importance. The Reserve Bank currently produces its own series for these sectors and the committee considered it to be appropriate that an official measure be produced. Sectoral break downs of the CPI suggested in public submissions were broadly in agreement with the committee's view.

Recommendation:

Statistics New Zealand should investigate the calculation of analytical series for the tradeable and non-tradeable sectors.

■ Publication of Sources and Methods

The committee felt that Statistics New Zealand should be more proactive in bringing issues to public attention, and that the release of more information to the public was needed. The CPI retains its relevance in a changing and more complex context by continuous improvement in its methods. It was agreed that Statistics New Zealand should demystify the CPI. This could be done by reassuring the public on the robustness of the CPI through the use of defensible transparent methods open to public scrutiny.

Recommendation:

Statistics New Zealand should publish documentation on sources and methods used in the Consumers Price Index.

■ *Appendix A: Glossary of Terms*

Actual-outlays approach (payments or money outlays approach)

A conceptual base in which the expenditure weight for a commodity is based on payments made for the commodity in the weighting base period, regardless of when the commodity was actually acquired or consumed.

Acquisition approach

A conceptual base in which the expenditure weight for an item is based on the actual cost of a good or service acquired by households in the weighting base year, regardless of when the good is consumed or paid for.

The New Zealand CPI has been acquisition based since the 1974 revision.

Base period

The period at the beginning of the lifetime of a price index. The base period for the CPI is December 1993 quarter.

Basket of goods and services

The selection of goods and services represented in the CPI. The basket of goods and services selected for the New Zealand CPI is essentially fixed, ie the goods and services are selected in the base year, and remain more or less constant for the life of the index.

Chain linking

Chain linking is the linking of a chain of short-term inter-temporal independent indexes into a long-term series. The linking consists of calculation of overlap indexes on the old and new baskets. The index on the old base is divided by the index on the new base to generate a linking factor. This linking factor is applied to all previous indexes.

Consumption approach (or economic cost of use)

A conceptual base in which the weight of a commodity is the amount of a good or service consumed in the base period, regardless of when it was acquired or when payment was made. When dealing with housing, there is a variant of this consumption approach referred to as rental equivalence.

Cost of living index

An index measuring the changing cost of purchasing a varying set of commodities which will provide a fixed level of consumer satisfaction in line with changing householders' tastes.

Economic cost of use

See consumption approach.

Economy-wide measure of inflation

A measure of inflation that would encompass all aspects of an economy. It would include prices paid by households, producers, private non-profit organisations, government sector for goods and services including capital purchases.

Expenditure approach

A conceptual base in which a price index is based on expenditure (rather than consumption). There are two basic variants of the expenditure approach - actual outlays and acquisitions.

Expenditure weight

Each item included in the basket of goods and services making up the CPI regimen is weighted according to its relative importance. These weights are based on expenditure information collected by Statistics New Zealand.

Final consumption

All goods and services that are consumed (used up) in the New Zealand economy. Final consumption excludes goods that are intermediate inputs to some final product (ie raw materials) and capital formation (ie acquisition of plant or machinery). Services are assumed to be consumed at the time of production.

Fisher-ideal Index

See Ideal Index.

Hedonic regression

A method for calculating the value of the quality change of an item by a regression technique. This involves assigning values to each of its main characteristics. For example, with respect to motorcars it may include engine size, passenger capacity, fuel type and fuel consumption.

Household Economic Survey (HES)

Previously called the Household Expenditure and Income survey (HEIS). An annual survey carried out by Statistics New Zealand which collects information on the spending patterns of private New Zealand households.

Ideal index

Any price index which meets a range of tests or axioms which have been identified as important for indexes are termed ideal indexes. The most well known ideal index is the Fisher 'Ideal' Index, which is the geometric mean of the Paasche and Laspeyres indexes.

Imputation

The estimation/calculation of a unknown quantity based on relevant available information.

Index population (or reference population or target population)

The population covered by a price index. For the CPI, the index population is private households resident in New Zealand.

Inflation

An increase in the general or average level of prices of goods and services over a period of time.

Item substitution

The replacement of an item in the basket of goods and services by another commodity when the original item is no longer available .

Item weights

Estimates of the overall significance of each of the different items in the price index basket of goods and services.

Laspeyres Index

A price index measuring the changing cost over time of purchasing the same basket of commodities purchased in some historical period (the base period).

The Laspeyres index formula is given by:

$$\text{Index} = \frac{\sum (P_{it} Q_{io})}{\sum (P_{io} Q_{io})} \times 1,000$$

Where P_{it} = Price of item i ($i = 1, \dots, m$) in period t

P_{io} = Price of item i ($i = 1, \dots, m$) in the base period

Q_{io} = Quantity of item i purchased in the base period

An alternative Laspeyres index formula, used by Statistics New Zealand in the calculation of the CPI is given by the formula:

$$\text{Index} = \frac{\sum \left(E_{io} \frac{P_{it}}{P_{io}} \right)}{\sum E_{io}} \times 1,000$$

Where P_{it} = Price of item i ($i = 1, \dots, m$) in period t

P_{io} = Price of item i ($i = 1, \dots, m$) in the base period

E_{io} = Expenditure on item i purchased in the base period

= $P_{io} Q_{io}$

National price

The average price of a good or service which is not aggregated up from regional prices. Motor vehicle registration, for example, is the same price nation-wide, ie it is a national price.

Non-sampling errors

Any error not resulting from the collection of information from a sample, rather than the whole population. The main non-sampling errors of interest to the reliability of the CPI are under-coverage; non-represented consumption; non-response and the practical limitations of collecting certain data.

Notional transaction

A transaction which does not actually occur. The concept is used where the price of a service which is not directly occurring in markets needs to be estimated.

Outlet

An individual, organisation or business enterprise from which goods or services may be purchased by householders and which can be price-surveyed.

Outlet sample

The outlets from which prices are collected. The sample may be selected purposively or by probability sampling.

Outlet type

A group of outlets which, for pricing purposes, is regarded as relatively homogeneous.

Outlet weights (or storetype weights)

A measure of importance (or weight) given to a particular type of shop (outlet) based on national expenditure patterns. For example, many consumers tend to buy dairy products from supermarkets rather than other outlet types, hence a supermarket will have a higher outlet weight for cheese than a dairy. Outlet weights are applied to food and non-food groceries in the CPI.

Paasche Index

A price index which compares the cost of purchasing the current basket of goods and services with the cost of purchasing the same basket in an earlier period.

The Paasche Index formula is given by:

$$\text{Index} = \frac{\sum (P_{it}Q_{it})}{\sum (P_{io}Q_{it})} \times 1,000$$

Where P_{it} = Price of item i ($i = 1, \dots, m$) in period t

P_{io} = Price of item i ($i = 1, \dots, m$) in the base period

Q_{it} = Quantity of item i purchased in period t

Population weighting

A measure of importance of a particular CPI region based on the population of that region compared with the overall population. Population weights are used when combining regional information.

Price change measure

A measure of the changes in the prices of a set of items. This set of items could be all household expenditure as in the case of the CPI All Groups, or of a set of distinct transactions such as telecommunication charges.

Pricing centre

One of the 15 urban areas from which prices are collected for the calculation of the CPI.

Price deflators

Factors that, when applied to a related time series of values, allows a valid comparison of the true underlying change free from the influence of price movements.

Price index

A numerical index indicating how a set of prices has changed between time periods.

Probability sampling

A statistical selection of items in which each item has a known chance (probability) of being selected.

Purchasing power measure

A measure of how much a set amount of money will purchase, usually expressed in 'real dollar' terms.

Purposive sampling

The selection of items to price using information from a variety of sources including interviewers and field testing. It usually involves an element of judgement in the selection process.

Quality change

Any perceived difference in quality by the consumer for a good or service.

Rebasing

Each time the CPI is revised, the new series is calculated using a new regimen and a new set of expenditure weights. This is linked to the old series to form a continuous long-term series by chain-linking. The new index is given a base value of 1000, and all index numbers based on the superseded regimen are scaled to the same base as the new (revised) index. For example, if in the rebase year the existing index was 1350,

then this figure would be reset to 1000 by multiplying it by $1000/1350$. All existing index numbers based on the superseded regimen would be adjusted by this same link factor.

Reference population

See Index Population.

Regimen

The selection of goods and services for which prices are surveyed for the purpose of compiling a price index. The goods and services covered by the CPI are classified into nine groups, 20 subgroups and 69 sections covering over 300 items.

Relevance

How well the index approximates the concept desired to be measured, ie the difference between what is attempted to be measured and what is wanted to be measured. Relevance is determined by how closely the most reliable price index will approximate the concept desired.

Rental equivalence approach

A variant of the consumption conceptual approach in which it is assumed that the costs associated with the consumption of shelter services are equivalent to the rent that could be charged for the property if it were rented to the household occupying it.

Sample frame

A comprehensive list of all existing outlets (shops) from which a statistical sample can be selected.

Sampling error

Any error resulting from the collection of information from a sample, rather than the whole population.

Seasonal adjustment

A statistical technique to remove the seasonal pattern from prices or from the resultant price index so that the series is free from fluctuations due to seasonality. There are two methods of seasonal adjustment - concurrent seasonal adjustment and forward factors.

Seasonal commodity

A good or service with seasonal fluctuations in the quantity purchased throughout the year. These commodities may also, but not necessarily, have seasonal fluctuations in their price during the year.

Seasonal fluctuations (of a series)

Regular fluctuations that occur with the same magnitude at the same time every year.

Shelter Costs

The cost of obtaining shelter, either by the purchase or rental of a dwelling, or by other means. Shelter costs exclude that part of the cost of purchasing a dwelling which is considered to be for investment purposes.

Statistical sampling

Any sampling technique based on a statistical selection of items. Probability sampling is an example of statistical sampling.

Storetype weights

See Outlet Weights.

Superannuitants Price Index (SPI)

An index measuring price movements for goods and services for superannuitant households.

Target population

The population which a survey aims to represent (eg private households resident in New Zealand).

Theoretical index bias

The cumulative difference, in one direction, between the actual level of price change experienced by consumers and the published CPI result, due to the construction of the price index. There are five types of theoretical bias: commodity substitution bias, outlet substitution bias, new goods bias, elementary index bias, and quality adjustment bias.

Tornqvist Index

See Ideal Index.

Trend (of a series)

The steady underlying long-term movement and shorter term movements in a series.

Under-coverage

A form of non-sampling error which occurs when the sample frame does not completely cover the population of interest.

Underlying inflation

A measure of the prevailing level of price change in an economy excluding major price shocks, factors beyond New Zealand control, effects of government charges, and effects of credit services.

■ *Appendix B: Public Submissions*

Public submissions were received from:

B Atkinson, Grey Power

C Blake, Ministry of Housing

D Bolger, Ministry of Agriculture

R Davison, NZ Meat & Wool Board's Economic Service

Fraser Jackson, Victoria University of Wellington

G Howell, Wellington

RL Kerr, New Zealand Business Roundtable

Steve Marshall, New Zealand Employers Federation

F Moloney, Grey Power, Levin

Reserve Bank of New Zealand

L Robertson, National Council of Women

PA Verry, Auckland.