

# Financial Services (Credit Services) in the New Zealand CPI

Helen Stott<sup>1</sup>

**Abstract:** The effect of interest rates has been included in the New Zealand Consumers Price Index throughout its history, but the way in which interest is treated has changed a number of times. The paper reviews the reasons for its inclusion and the history of its treatment. The current treatment of interest in the index is discussed and the issues are highlighted. The impact of the interest component on the CPI in recent times is presented to illustrate its importance to consumer.

## 1. Introduction

This paper focuses on interest in the New Zealand Consumers Price Index, the reasons for including interest and the problems arising from its inclusion. It does not cover insurance services or other financial services.

To give the context for this paper, New Zealand has a review of its methods approximately every six years, when an external CPI revision advisory committee is convened. This Committee last met in 1991. In 1997 one issue to be considered by the committee will be a review of the treatment of interest, since the method was significantly changed in 1993.

The New Zealand CPI takes an acquisitions approach to the index, and the way this is implemented for interest is not used elsewhere. The acquisitions approach has been agreed historically as the most relevant for the range of uses to which the index is put in New Zealand but is also being debated again in the context of the current review. This paper does not aim to provide a full debate on the issue of inclusion of interest, but rather to look at the treatment of interest and the consequences of alternative methods.

The problem with interest is that it is not straight-forward to define what the service is that is being acquired, and there are a variety of ways both the quantity and quality of the service can be defined. This difficulty is illustrated by a review of the history of the inclusion of interest in New Zealand.

This paper aims to provide the background to our current approach to the topic and then to debate this approach in the context of a review of the index. A short section which analyses interest price movements and their effect on the CPI movements is included to illustrate the importance having the appropriate methodology for the calculation of interest.

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<sup>1</sup> Thanks to Tom Woodhouse and other colleagues for assistance with this, but any errors remaining are mine.

## 2. Background

The New Zealand treatment of interest has been relatively controversial over its history. In particular, the methods for dealing with mortgage interest have been modified at virtually every major revision since it was introduced explicitly to the index in 1974.

The most recent major change was the introduction of a separate financial services group. This was introduced when the New Zealand CPI was last rebased in 1993. Interest charges have been fairly extensively represented in the CPI since 1974, but until 1993 these had been included in various different areas within the index regimen. In 1993 interest charges of all forms were brought together within the Credit Services group.

The main reasons for the introduction of the separate financial services group were to separate out interest from housing and to allow the calculation of an analytical series excluding interest. One reason this was done was because the Reserve Bank of New Zealand agreed an inflation target with the government in 1991. The basis of that inflation target is the CPI excluding credit charges<sup>2</sup>. The inclusion of interest in the CPI remains controversial in part because of that inflation target.

## 3. The role of the CPI and the inclusion of interest

The debate about whether or not to include interest charges within a CPI regimen depends very much on the prime use to which the index is to be applied, and hence the conceptual approach taken to the construction of the index. Statistics New Zealand still primarily views its CPI as a price index for measuring the changes in the prices of goods and services purchased by households, rather than a cost of living index. The paper prepared for the 1997 New Zealand Revision Advisory Committee, *What should the CPI measure?* (Statistics New Zealand, 1997), debates this issue more fully.

Whether the index is expenditure, actual outlays or consumption based, there are arguments for the index to reflect the changing price of debt. Debt servicing is a major item of expenditure. At least some component of interest is expenditure related to consumption.

If the emphasis is on a cost of living type index, the amount of debt servicing a household has certainly affects the utility which can be gained from the household's total expenditure.

The methods for dealing with interest under an outlays approach to a CPI are relatively straight forward. The actual outlays on interest define the weight. Where this approach is used the interest is assumed to be a service charge for a debt of set value. The debt is revalued each time the index is calculated in order to maintain its quality (value). An outlays index is often regarded as the most appropriate for indexing wages or pensions, because of the close link to what people actually have to pay each month, and interest is a significant component of outlays.

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<sup>2</sup> The inflation target measure also excludes the effects of price shocks, which are loosely defined. The principal shocks are considered to be significant changes in terms of trade, changes to indirect taxes or government levies, or natural disasters.

For a consumption based index , interest may be included through the measurement of the economic cost of use of durable goods. This most often relates to the measurement applied to the cost of consuming shelter services that are deemed to be generated from owner-occupied housing. The rental equivalence method avoids the explicit use of interest charges related to housing. However, interest rates may have some influence on the rental values. Alternative methods of economic cost of use generally include mortgage interest charges in the measurement of the cost of consuming shelter services.

As mentioned, New Zealand uses the acquisitions approach to the index. Under this approach, to quote Turvey, interest "would be regarded as being paid for the services of allowing the consumer to be in debt". Interest can be regarded as the payment for renting the money, in the same way that one rents a house directly.

It is evident that for central banks that are charged with the implementation of economic policy, particularly with the maintenance of price stability, the inclusion of interest charges introduces unwanted variability, because they are also the main instrument for controlling monetary policy.

However the inclusion of interest is seen as of continued relevance for many uses of the index. In order to meet the needs of a range of users, the grouping of all interest related charges in a separate financial services group enables the simple publication of an index excluding credit services.

#### **4. A history of the treatment of mortgage interest**

Prior to 1974 there were very few credit services in the NZ CPI. Hire purchase costs were included in the costs of home furnishing and motor vehicles, but no other direct interest related costs were included. Housing prior to 1974 was calculated using a variant of the economic cost of use approach, and, prior to 1948, using rental values. In the period from 1948 to 1973, interest rates had some effect on the index through the calculation of return on capital (through the 'economic cost of use' methodology), but were not directly included in the index. Interest was explicitly included in the NZ CPI from 1974. This was as the result of a major review of the concepts and methodology behind the index.

Over the period mortgage interest has been included directly in the index, its weight has grown considerably. This has been due to changes in the method used for calculating the weight as much as to the changes in the proportion of average household expenditure, as illustrated by the table below.

**Table 1. Weights for mortgage interest**

Revision Year	Weight (% of total)	Notes	HES <sup>3</sup> Expenditure as a % of total
1974	1.41	Includes interest, repayment insurance, and compulsory contribution to Housing Corporation Reserve fund	2.51
1977	0.93	as above	3.01
1980	3.11	Interest only	not available
1983	3.99	Interest only	4.14
1988	6.35	Interest only	5.92
1993	5.16	Interest only	5.48

The reasoning behind the introduction of mortgage interest was that housing was considered to be “*primarily purchased to provide shelter, and the investment element therein is sufficiently small to be ignored*”. The cost of mortgage interest was explicitly included as part of the cost of house purchase in the same way that hire purchase charges were for other goods. However the expenditure weight for interest was calculated as “*the commitment for payment of the first full year's amount of interest by those of the index population who raised a loan or mortgage in the reference year*” (Department of Statistics, 1976).

At the major revision of the index in 1980, the weight of mortgage interest was substantially increased “*because it relates to the interest paid on all outstanding mortgages by the index population in the base year*”. The pricing methodology for this period, however, used the average interest rates paid by households, as collected through the Household Economic Survey. The principal cause of rises in the average interest rate being shown in the CPI was not the interest rate adjustments (although this was a factor) but the effect of old, low interest rate mortgages being paid off and new, high interest rate mortgages being entered into. There was, however a 'time to run' stratification with fixed weights to reduce the impact of this.

The problem was, however very obvious. By the late 1980's, variable interest rates for new mortgages had reached levels as high as 22%. Old mortgages, taken out in the 1960's had in contrast fixed interest rates of around 3%.

The value of the mortgage was quality adjusted using a simple revaluation method as outlined in Appendix A below.

## **5. The 1993 index revision changes**

In 1993, the method for dealing with mortgage interest was completely revised. The 1991 CPI Revision Advisory Committee recommended that the debt profile method be adopted, provided that statistical effects that may have arisen solely due to the methodological change could be minimised.

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<sup>3</sup> The Household Economic Survey which collects expenditure data for use in deriving CPI weights.

However a major feature of the debt profile method is that the CPI for the current quarter will be influenced by property prices from earlier years. Analysis of the HES indicated that a debt profile of at least 15 years would be required to cover most mortgages. New Zealand is currently in a period of low inflation, but the adoption of a debt profile method would have re-introduced large property price increases from earlier periods when different economic conditions prevailed. These increases have already been recorded in the CPI once and it would be unacceptable to users of the CPI to record them again in subsequent periods. This problem of double counting made Statistics New Zealand reject the introduction of a debt profile method for the 1993 revision (see Statistics New Zealand, 1995).

This conclusion led to a review of the assumption which underlies both the simple revaluation and the debt profile methods, that the quality of a mortgage is wholly determined by the capacity of the finance to be used to purchase a residential dwelling. The issue that had to be resolved was whether the CPI should measure the interest charge for a real amount of mortgage debt or a fixed dollar value of mortgage debt.

In the index prior to 1993, property prices were applied to the movement in interest rates to ensure that the CPI measured the price of financing a debt which had the same real value to the consumer over time. It was considered that this approach to quality adjustment is no longer appropriate. The following reasons were given in the report of the 1993 revision (Statistics New Zealand, 1995):

- *A mortgage provides a consumer with a service. It enables them to own an asset and receive its associated benefits, which could not otherwise have been purchased. The critical issue is whether the quality of the service received from the mortgage declines as the price of the property purchased with the mortgage increases. For the majority of households with extant mortgages, a decline in the real value of their debt does not cause a loss in the quality of the service they gain from the mortgage. The increase in property prices represents a capital gain and the leverage provided by the mortgage makes it larger. This is in fact a quality improvement for borrowers with extant mortgages in the base period. Their gain will almost certainly outweigh the additional cost to the small proportion of households who borrow for the first time in the base period and face the need for a larger mortgage.*
- *If an increase in property prices is part of general price inflation and the borrower has received an increase in income, the mortgage will be easier to repay. This also represents a gain in quality, albeit one which is almost impossible to measure.*
- *The interests of consumers, who are borrowers in this case, are quite different from those of lenders. A decline in the purchasing power of the debt is of no concern to the borrower who has already purchased a dwelling with the money borrowed. A decline in the real value of the mortgage debt does however concern the lender as it represents a reduction in the value of an asset and a loss of future purchasing power. In the CPI, the quality of goods and services being price surveyed is defined from the point of view of the consumer, so that the loss of purchasing power of the borrower is irrelevant when assessing the quality of the service.*
- *When consumers increase their consumption of a commodity in the index, this is not a reason for making a quality adjustment to the price. Instead the weight for that commodity is recalculated, usually at the following revision. The same principle should apply to mortgage interest. If an increase in property prices causes households to outlay a significantly greater share of their consumption expenditure on mortgage interest, this should be dealt with by an adjustment to the weight for mortgage interest, rather than by making an adjustment to the price. If expenditure on interest proves to be volatile, it may be necessary to change the weights for mortgage interest more frequently than for other components of the index and to use chain-linking methods to maintain continuity in the series.*

- *Under the acquisition approach adopted in the New Zealand CPI, the change in the full purchase price of acquiring additions to the housing stock, including that part which is paid for with mortgage finance is measured in the purchase and construction of dwellings section. Therefore property prices do not need to be included in the mortgage interest component as well. (In countries where the debt profile method is used, the purchase and construction costs of dwellings are not included elsewhere in the CPI, so it is more appropriate that they be included in the mortgage interest component.)*

Other arguments which can be made are:

- Mortgages are used to finance a wide range of purchases, not just housing. Deflation of the debt stock with a house price index would be inappropriate, and determining an appropriate index would be difficult.
- Other indications of change of quality in the mortgage service, such as the flexibility of the loan, the flexibility of repayments, and ability to choose different types of loan, should be included in quality adjustment, if possible.

For the reasons stated above, compounding mortgage interest rates with a property price indicator does not necessarily ensure that the price of a constant quality service is included in the CPI. Therefore the decision was taken that, in the index based on December 1993, the price indicator for mortgage interest would be the movement in the average nominal interest rate, applied to a fixed dollar value of principal, with no adjustment for changes in property prices.

This pricing approach assumed that where significant changes in mortgage interest payments occur, a weight adjustment should be made during the lifetime of the index.

## **6. The Implementation of the current approach to mortgage interest**

There are considerable problems in measuring interest, given the range of mortgage products available. In particular 'revolving credit' facilities, where the mortgage is not necessarily for a fixed amount, are not easily dealt with through traditional methods.

The mortgage finance industry in New Zealand is probably still smaller than in many countries, but the deregulated environment has meant a wide range of new players entering the market, many small overseas based companies, new products and new ways of handling consumer finance. In some ways it has simplified the market however. Historically lawyers trust funds were a major source of mortgage finance, particularly for second or third mortgages. This is no longer a significant source of finance since mortgage money is much more freely available from other sources.

Adopting the approach outlined above to mortgage interest has considerably simplified our price data collection. Instead of the costly supplement to the Household Economic Survey which had to be processed separately from the rest of the survey to meet CPI deadlines, a separate mail survey of major mortgage suppliers is carried out. This survey needs some additional work to maintain a representative coverage of institutions. The outlets covered, and their market shares are updated each year.

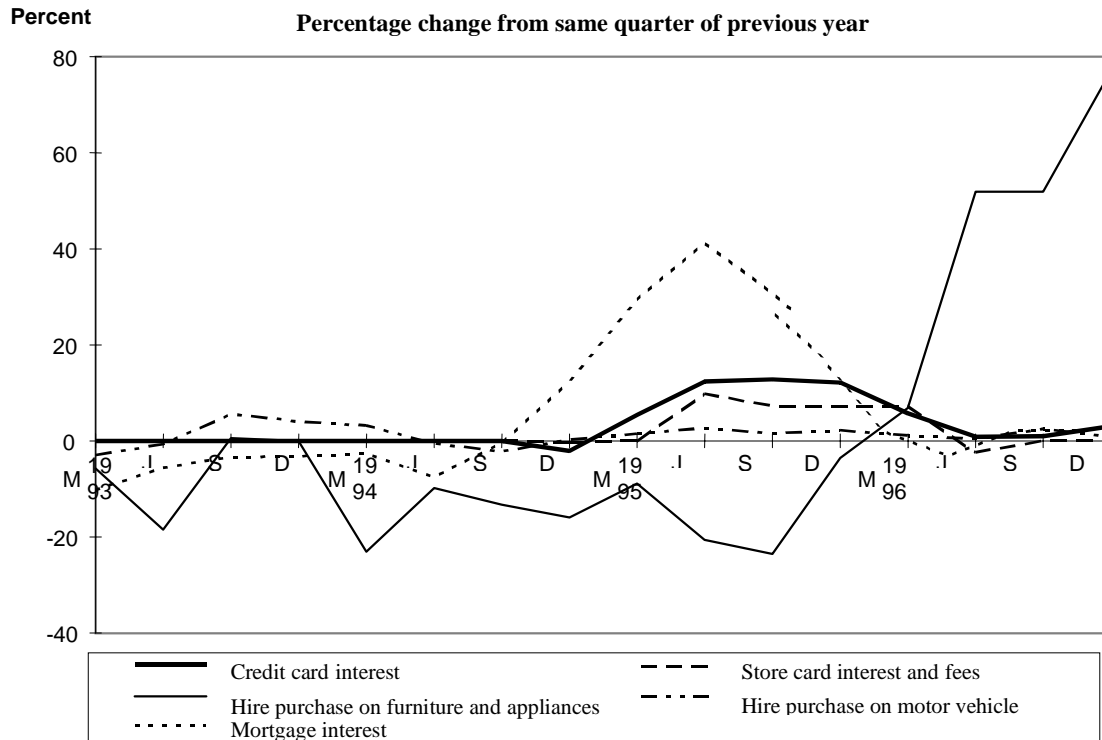
An annual examination of the spending on mortgage interest recorded in the HES is carried out to monitor the changes in mortgage interest expenditure occurring during the lifetime of the index. The

spending on mortgage interest relative to expenditure on other items has varied very marginally since the introduction of this method in 1993, so no adjustment has been made to the weight.

## 7. The credit services group as a whole

Although most of the discussion so far has focused on mortgage interest, the current credit services group also includes a number of other items as specified in Table 2 below. Figure 1 compares the price changes in the CPI for the interest related series included in the group. Note that credit card interest and store card interest and fees were both introduced in December 1993, so the annual percentage change series starts in December 1994 on the graph.

**Figure 1. Various forms of interest**



**Table 2. Weights for credit services, 1993**

<b>Item</b>	<b>Weight</b>
<b>Credit Services</b>	<b>6.50</b>
<b>Credit Cards</b>	<b>0.35</b>
Card Charges and Government Duty	0.14
Interest	0.21
<b>Store Cardst</b>	<b>0.06</b>
Store Card Interest and Fees	0.06
<b>Hire Purchase</b>	<b>0.89</b>
Hire Purchase on Furniture and Appliances	0.29
Hire Purchase on Motor Vehicles	0.60
<b>Mortgages</b>	<b>5.20</b>
Loan Application Fees	0.03
Mortgage Interest	5.16

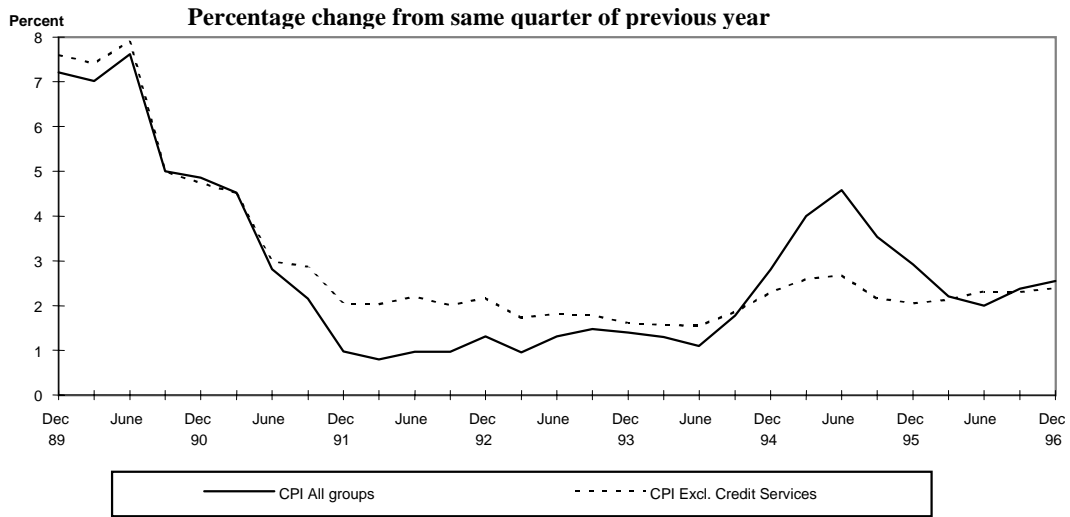
As can be seen, mortgage interest is by far the largest contributor to the series. However the current growth in the level of credit card indebtedness may mean this does not continue to be the case in the future. The relatively low weight may also in part be due to the difficulty of measuring payments of this form of interest to determine the weight. Reserve Bank statistics on outstanding advances on credit cards would imply a much greater growth of interest than the HES statistics have shown, although this also includes growth in business use of credit cards.

**8. The impact of credit services**

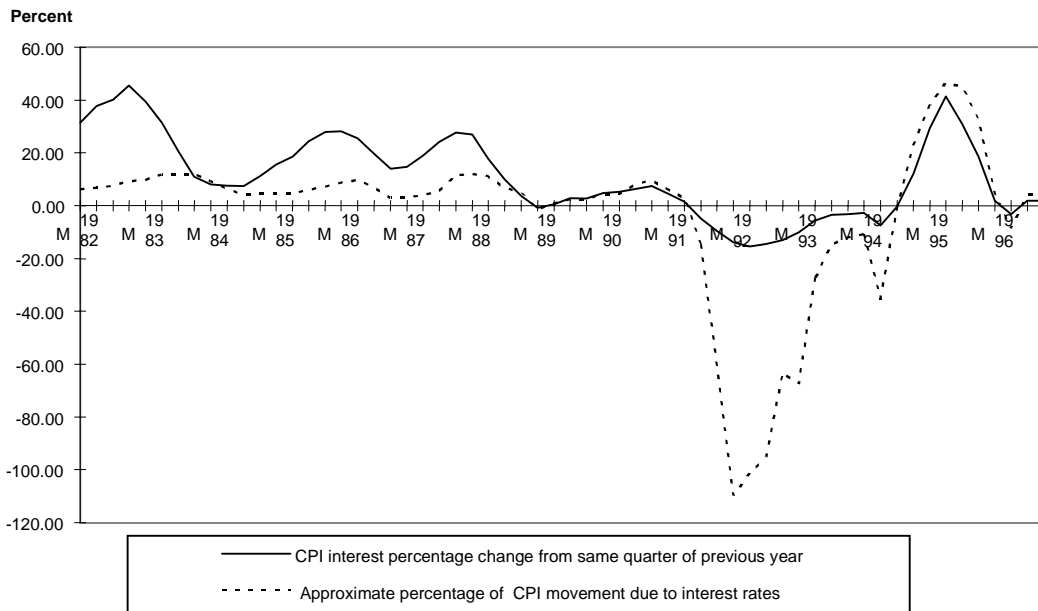
In order to assess the impact of interest rates, it is useful to compare the series including and excluding credit services. Figure 2 shows this. Another indicator of the impact of credit services is given in Figure 3 which shows the contribution of interest to the overall annual percentage change of the CPI since 1981.



**Figure 2. CPI and CPI excluding Credit Services**



**Figure 3. Mortgage Interest Rates and their Impact on the CPI**



These graphs shows the periods where mortgage interest has been moving in a different way to the remainder of the index. Recently, most of the change in mortgage interest has been driven by the Reserve Bank policies to control inflation through control of interest rates.

Despite the relatively small weight, hire purchase charges have been contributing to the impact of interest on the index recently (see Figure 1). The reason for this is competitiveness in the consumer durables market recently lead to a range of 'interest free' payment schemes being offered. In some cases these were complemented by discounts for cash payments schemes. After an investigation of these schemes, the use of the term 'interest free' was ruled to be misleading, and a number of major stores reintroduced

hire purchase interest charges, leading to large changes in this part of the index, as shown. Although the corresponding changes in the cash prices have also been picked up in the index, their impact has been much lower.

## **9. Conclusions**

The next New Zealand CPI revision advisory committee is likely to make a number of recommendations about interest. Despite some considerable debate about the method, we do not think either the simple revaluation method or debt profile method are adequate because of the double counting of the price changes of the items being bought using the credit services. However there does not seem to be a clear consensus as to the best approach to interest, or, when included, its quality adjustment mechanism.

## **References**

- Department of Statistics, 1976. Report on the Consumers Price Index Revision 1974. Wellington, New Zealand
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- Statistics New Zealand, 1997, What Should the CPI Measure? (currently available on SNZ Internet site <http://www.stats.govt.nz> )
- Turvey, R. et al, 1989. Consumer Price Indices: An ILO Manual. Geneva, International Labour Organisation.

**APPENDIX A.** The Simple Revaluation Method for Mortgage Interest - an Example

For the purposes of illustrating the simple revaluation method for quality adjustment of mortgage interest the following example is presented.

Assumptions:

1. The base period mortgage interest charges of \$21,800 consists of the debt servicing costs of four households.
2. Each household has entered into a mortgage to purchase a dwelling in a different year.
3. Each household has a debt to equity ratio of 50:50 at the time that the mortgages were raised.
4. In the base period the percentage of debt remaining for each of the four households (in relation to the purchase price of their respective dwellings):

Age of Mortgage in 1993	% Debt
3 years	42.00
2 years	44.55
1 year	47.50
Current year	50.00

5. In the base period each household is paying the 10 percent per annum on their outstanding mortgage debt.

The following matrix presents relevant mortgage debt outstanding for the four households.

Year	Household			
	#1	#2	#3	#4
1990	\$50,000			
1991		\$55,000		
1992			\$60,000	
1993	\$42,000	\$49,000	\$57,000	\$70,000

Interest charges in 1993

Household	Interest Charges \$
1	4,200
2	4,900
3	5,700
4	7,000
Total	21,800

Therefore the interest charges in the base period relate to \$218,000 of outstanding debt in the base period. This debt is considered to by some ratio of the market value of these dwellings in the base period.

The rationale of the simple revaluation method is to maintain this ratio or fixed real level of indebtedness over subsequent periods.

Therefore in 1994 if dwelling property prices have increased by, say 8 percent from the base period, 1993, it deems that the nominal debt in 1993 would need to be increased by 8 percent. The rationale is that it would require 8 percent more debt to finance the same proportion of the housing stock as in the base period.

The calculation is simply:

$$I = R1/R0 * D1/D0$$

where

I = Change in the mortgage interest service cost in the index

R0 = Average nominal interest rate in the base period

R1 = Average nominal interest rate in the subsequent year

D0 = Average dwelling property price in the base period

D1 = Average dwelling property price in the subsequent year

In the above example assuming a 10 percent change in average nominal interest rates, then the change in the mortgage interest service change would be:

$$\begin{aligned} I &= 1.1 * 1.08 \\ &= 1.188 \end{aligned}$$

In other words it would cost \$25,898.4 ( $\$21,800 * 1.188$ ) to service the same fixed real level of indebtedness in 1994 compared with \$21,800 in the base period, 1993. Even with no change in interest rates, there is an 8 percent change in the costs.

**APPENDIX B.** The Debt Profile Method for Mortgage Interest, an Example

For the purposes of illustrating the debt profile method for mortgage interest the following example is presented.

Assumptions:

1. The base period mortgage interest charges of \$21,800 consists of the debt servicing costs of four households.
2. Each household has entered into a mortgage to purchase a dwelling in a different year.
3. Each household has a debt to equity ratio of 50:50 at the time that the mortgages were raised.
4. In the base period the percentage of debt remaining for each of the four households (in relation to the purchase price of their respective dwellings):

Age of Mortgage in 1993	% Debt
3 years	42.00
2 years	44.55
1 year	47.50
Current year	50.00

5. In the base period each household is paying 10 percent per annum on their outstanding mortgage debt.

The following matrix presents relevant mortgage debt outstanding for the four households.

Year	Household			
	#1	#2	#3	#4
1990	\$50,000			
1991		\$55,000		
1992			\$60,000	
1993	\$42,000	\$49,000	\$57,000	\$70,000

Interest charges in 1993

Household	Interest Charges
	\$
1	4,200
2	4,900
3	5,700
4	7,000
Total	21,800

One year further on : 1994

If each household had entered into the transaction of purchasing their dwelling and raising a mortgage one year later, then the change in mortgage interest charges that would be incurred in the current period (i.e. 1994) would be a function of the change in property prices for the dwellings being purchased and the change in the nominal interest rates.

This method assumes that the percentage of the mortgage debt outstanding in the current period (1993 + 1) remains unchanged.

The matrix representing the debt outstanding for the four households in 1994 is:

Year	Household			
	#1	#2	#3	#4
1991	\$55,000			
1992		\$60,000		
1993			\$70,000	
1994	\$46,200	\$53,454	\$66,500	\$75,000

For simplicity it is assumed the interest rate prevailing in 1994 is still 10 percent per annum.

Interest charges in 1994

Household	Interest Charges
	\$
1	4,620
2	5,345
3	6,650
4	7,500
Total	24,115

This illustrates that it would have cost the four households collectively 10.6 percent more in the current period if they had delayed their purchases and the associated raising of mortgage debt by one year. This is the result solely of an increase in the cost of the dwellings that they purchased resulting in the need to raise larger mortgages, given that they maintained the same debt equity ratios.

The following table indicates annual movements in dwelling property prices.

Dwelling Price Index		
Year	Index	Annual % Change
1990	1000	
1991	1100	10.0
1992	1200	9.1
1993	1400	16.7
1994	1500	7.1

In the case of household #1 the same dwelling purchase transaction in 1991 instead of 1990 includes a 10 percent increase in the dwelling price and a corresponding increase in the debt outstanding in 1994. This translates into an increase of 10 percent in the debt servicing costs for this household despite there being no increase in nominal interest rates.