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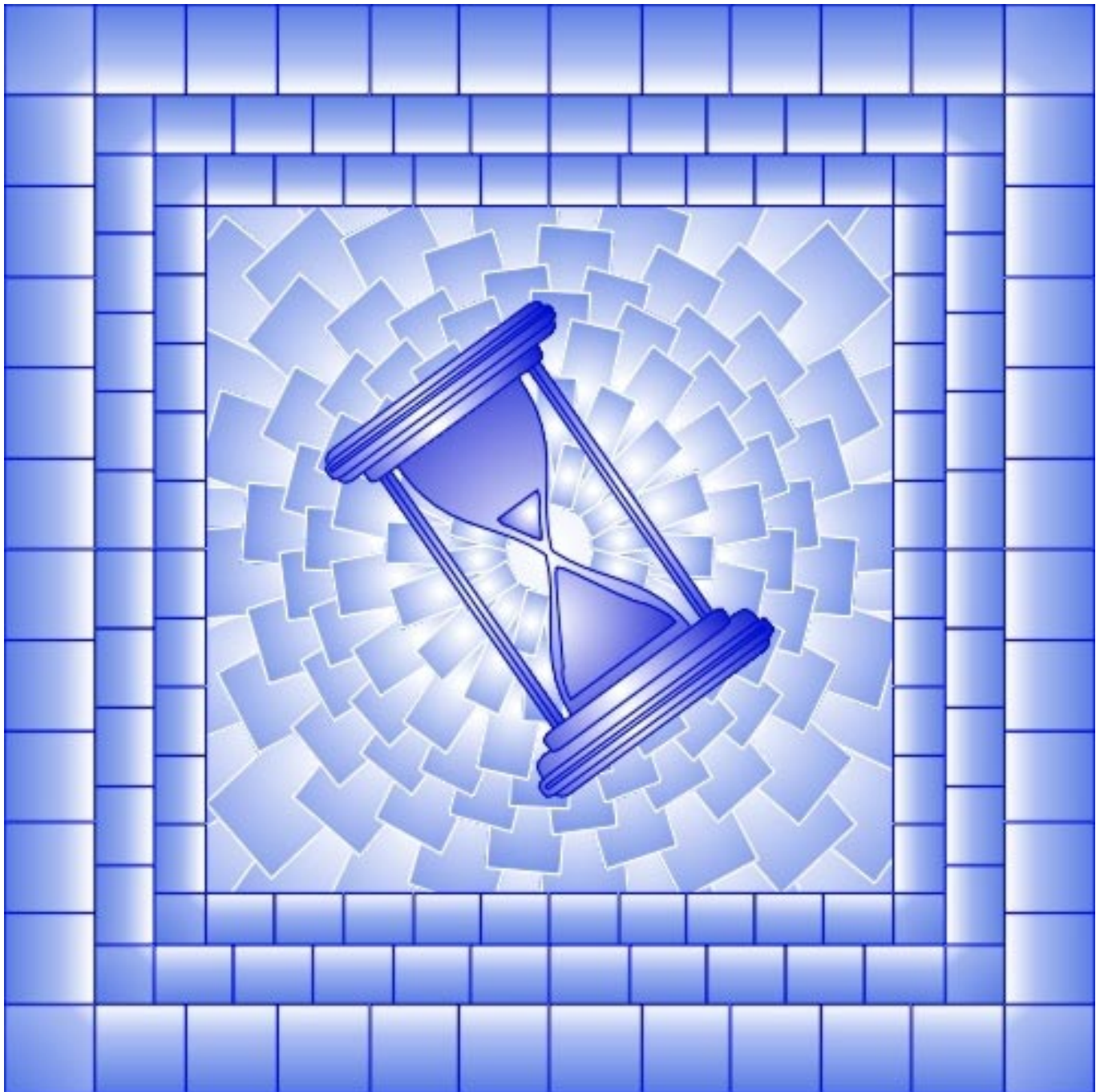
Analytical Series

Prices Division

*The Impact on the CPI of Not Surveying House Prices
in Rural Regions: A Sensitivity Analysis*

By Terri Markle

No.8



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***The Impact on the CPI of Not Surveying House Prices in Rural Regions:
A Sensitivity Analysis***

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Preface

Prices Division first started publishing the Analytical Series in December 1996 as a means to convey conceptual and applied research undertaken by its staff, and at times, by other persons from within or outside Statistics Canada on the subject of price indexes.

All papers are reviewed by a panel of experts from within Statistics Canada or outside the agency. Views expressed in the papers are those of the authors and do not necessarily reflect those of Prices Division or Statistics Canada.

The purpose of the series is to disseminate knowledge and stimulate discussion. Questions and comments on any aspect of the papers are welcome and can be forwarded to either the Director, Louis Marc Ducharme (Internet email: ducharl@statcan.ca; telephone (613) 951-0688), or the Chief of Quality Assurance, Robin Lowe (Internet email: lowerob@statcan.ca; telephone (613) 951-9495), Prices Division, Statistics Canada, Ottawa, Ontario, K1A 0T6.

Abstract

In light of a recent change in population coverage, this study was initiated to determine whether the integrity of the Consumer Price Index (CPI) should be questioned on the grounds that it does not explicitly take into account rural house price movements. An attempt is made here to quantify the potential impact, using various regimes of artificial data to represent house price movements for rural regions. The regimes were manufactured in a way that allowed the analysis of differences between urban and rural regions in terms of the evolution of house prices, as well as differences in their cumulative price index levels. Three provinces were considered: Newfoundland, Saskatchewan, and British Columbia, all of which have large rural populations. The study results were monthly indexes for the time period January 1986 to December 1994. The general conclusion was that house prices in rural regions would have to move very differently from those in urban regions to affect the overall level of the CPI. However, in the case of lower-level aggregates the failure to include rural house prices could be having an important effect. In addition, even when cumulative house price movements for rural and urban regions are similar, differences in their evolution tend to have an effect on the trend of the CPI, especially in the case of lower-level aggregates. While it is tempting to conclude that the current CPI methodology is robust enough to apply to the expanded population, this would be based purely on conjecture about the nature of movements in rural house prices. Hence, a second phase of this study will be initiated, whose purpose will be to develop a methodology to construct price indexes for rural regions.

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1. Introduction¹

Simultaneous with the most recent updating of the Consumer Price Index (CPI) basket, the CPI population coverage was expanded to include the rural and small urban population of Canada. Previously, the target population included those living in urban centres of 30,000 or more. Concern has been expressed that provincial CPI estimates for house prices are no longer representative of the population to which they pertain. This claim is valid only to the extent that price movements in rural regions, which are not actually captured, differ from those in urban regions.

House price movements are measured by the New Housing Price Index (NHPI) series. These data enter into the CPI calculations through three of its components: mortgage interest cost, replacement cost, and insurance cost. No such NHPI series exist for rural regions.²

The main objective of the current study is to quantify the potential impact on provincial CPI estimates of not explicitly taking into account the movements in new house prices in rural regions.³ In order to fulfill this objective, various different scenarios of house price change in rural regions were established. Subsequently, synthetic NHPI series were created for the rural regions to correspond to each scenario being considered. These synthetic NHPI data were then used to produce a “simulated” CPI that represents the entire population (rural and urban). Simulations were conducted for three provinces: British Columbia, Saskatchewan, and Newfoundland, using the monthly indexes (1986=100) for the period January 1986 to December 1994. This time period covers only one CPI basket, and was chosen to avoid the added complications of linking.

While there are many interesting questions that could be posed in connection with the central theme of this study, the focus here is limited to answering some very specific questions. The major concern was to get some idea about how dramatic the differences would have to be between house price movements in urban and rural regions before the representativeness of the CPI, as it is currently defined, should be questioned.

¹ *The author would like to gratefully acknowledge the contributions of Neil Willems, who designed a sophisticated set of software to produce the results of this study, and Hugh Scobie, who provided valuable background information. Also appreciated were the very useful comments and suggestions received on a previous draft of this paper from Louis Marc Ducharme, Yoon Hwang, Gaston Levesque, Gail Logan, Robin Lowe, Margaret Parlor, Marc Prud'homme, and Bohdan Schultz. The author assumes full responsibility for any errors.*

² *Indeed, NHPI series are not produced for several urban cities (e.g. Kingston, Ontario), and hence, rural regions in the context of this paper shall be understood to include these cities as well.*

³ *An earlier version of this paper was presented at the Price Measurement Advisory Committee Meeting, Statistics Canada, May 13-14, 1996.*

The content of this document will be presented in the following order. The next section will give a brief description of the basic methodology used to generate the simulated CPI series, including a description of the way the expenditure weights were derived, as well as how the component indexes were calculated. Section 3 will describe the general approach used to derive the synthetic NHPI series under the various assumptions. The nature of the simulations will be explained in Section 4. The results and some of their implications will be presented in Section 5. Section 6 will conclude the paper.

2. Methodology

The basic approach for carrying out the simulations starts with the simplifying assumption that a province has two strata: one that encompasses all urban regions, and another that encompasses all rural regions. Three versions of the CPI corresponding to this geographical breakdown could then be produced: an **urban** index, a **rural** index, and a **total** index for the province as a whole. Table 1 lists all of the commodity categories whose price movements were explicitly used in the index calculations. For the purpose of this paper, price movements in urban regions, $P_{t/86}^{\text{urban}}$, are defined as the official unlinked CPI price movements. Price movements for the rural strata, $P_{t/86}^{\text{rural}}$, were imputed as being identical to those of the urban strata for all commodity groups except Mortgage Interest Cost and Replacement Cost. For these latter components, the indexes for the rural strata were calculated using synthetic NHPI data.

Table 1: Source of Price Movements Used in Index Calculations

Commodity Category	Urban Index ($P_{t/86}^{\text{urban}}$)	Rural Index ($P_{t/86}^{\text{rural}}$)
Food	official	imputed from urban
Housing:	--	--
Shelter:	--	--
Principal accommodation:	--	--
Rented private accommodation	official	imputed from urban
Owned accommodation:	--	--
Repairs and maintenance	official	imputed from urban
Condo charges	official	imputed from urban
Property taxes	official	imputed from urban
Insurance premiums	official	imputed from urban
Mortgage interest cost	official	simulated
Replacement cost	official	simulated
Other expenditures	official	imputed from urban
Water, fuel, and electricity	official	imputed from urban
Other accommodations	official	imputed from urban
Household operations	official	imputed from urban
Household furniture, equipment, etc.	official	imputed from urban
Clothing	official	imputed from urban
Transportation	official	imputed from urban
Health and personal care	official	imputed from urban
Recreation, education, and reading	official	imputed from urban
Tobacco and alcohol	official	imputed from urban

The aggregate indexes (e.g. Owned Accommodation, All-items) for the rural and urban strata are direct Laspeyres indexes, given by (1) and (2).

$$\text{Rural:} \quad \hat{P}_{t/86}^{\text{rural}} = \sum w^{\text{rural}} \cdot P_{t/86}^{\text{rural}} \quad (1)$$

$$\text{Urban:} \quad \hat{P}_{t/86}^{\text{urban}} = \sum w^{\text{urban}} \cdot P_{t/86}^{\text{urban}} \quad (2)$$

Summation is over all commodity groups shown in Table 1, with the exception of Housing, Shelter, Principal Accommodation, and Owned Accommodation, which are there strictly for ease of reference.

The expenditure weights, w^{rural} and w^{urban} in (1) and (2), were derived according to (3) from the values in the Appendix Table 1, which shall be denoted by v^{rural} and v^{urban} . The latter values were compiled from the 1986 Family Expenditure Survey, and are broken down by commodity for both the rural and urban regions in the Appendix Table 1. The value for Replacement Cost deserves special mention, as this value was estimated for the rural region in an analogous way to the one that is typically derived for the official CPI.⁴

$$w^{\text{rural}} = \frac{v^{\text{rural}}}{\sum v^{\text{rural}}} \quad \text{and} \quad w^{\text{urban}} = \frac{v^{\text{urban}}}{\sum v^{\text{urban}}} \quad (3)$$

where w^{rural} (w^{urban}) represents the share of one rural (urban) expenditure in terms of the total rural (urban) expenditure. These shares can be found in the columns labelled "urban" and "rural" of the Appendix Table 2, for each of the three provinces.

So, for the province as a whole, we have the following direct Laspeyres index:

$$\text{Total:} \quad \hat{P}_{t/86}^{\text{prov.}} = \frac{\sum (w^{\text{rural}} \cdot \hat{P}_{t/86}^{\text{rural}} + w^{\text{urban}} \cdot \hat{P}_{t/86}^{\text{urban}})}{\sum (w^{\text{rural}} + w^{\text{urban}})} \quad (4)$$

As this formulation implies, the total provincial index is calculated as a weighted average of the rural and urban indexes, given by (1) and (2). Here again, summation is over all of those components appearing in Table 1 for which sources of price movements are specified.

⁴ First, the 1986 value of expenditures on homes owned is estimated. The values reported on the Family Expenditure Survey (conducted in February 1987) are deflated by the NHPI movement from 1986 to February 1987. This is done to compensate for the fact that survey respondents typically think in terms of current dollars. Next, in order to exclude the cost of land, the estimated value of homes owned is multiplied by the ratio "house: house and land" for the province. Based on data from urban cities, the ratios for British Columbia, Newfoundland, and Saskatchewan are: 60.44, 82.08, and 82.04, respectively. Finally, assuming that houses depreciate in a constant rate declining-balance fashion over their life span of one hundred years, Replacement Cost is estimated as two percent of this value.

The formulations for the expenditure shares in (4) are specified as:

$$W^{rural} = \frac{v^{rural}}{\sum (v^{urban} + v^{rural})} \quad \text{and} \quad W^{urban} = \frac{v^{urban}}{\sum (v^{urban} + v^{rural})} \quad (5)$$

where W^{rural} (W^{urban}) represents the share of one rural (urban) expenditure in terms of the total rural and urban expenditure. These shares can be found in the columns labelled "urban" and "rural" of the Appendix Table 3, for each of the three provinces.

As previously mentioned, $P_{t/86}^{urban}$ and $P_{t/86}^{rural}$ are assumed to be identical for the urban and rural strata in each province for all components except for Mortgage Interest Cost and Replacement Cost. The price movements for these latter components were calculated using synthetic rural NHPI series, while adhering as closely as possible to the official CPI methodology. The **Replacement Cost Index** relates to that portion of an owner-occupied dwelling that is assumed to have been consumed. It is simply the NHPI series exclusive of land. While the NHPI (house and land) series is a large determinant of the movements in the **Mortgage Interest Cost Index**, its methodology is somewhat complicated and requires a slightly more detailed explanation.

The Mortgage Interest Cost Index, $C_{t/b}$, is calculated as follows:

$$C_{t/b} = I_{t/b} \cdot H_{t/b} \quad (6)$$

where $I_{t/b}$ is the mortgage interest index, $H_{t/b}$ is the dwelling price index, and the subscripts t and b represent the current and base periods, respectively. The calculation of the mortgage interest index, $I_{t/b}$, involves primarily data on conventional mortgage interest rates.⁵ In this study, the mortgage interest index for the "urban" population will be taken to be identical for the "rural" population. The dwelling price index, on the other hand, is formulated as a 300-month (or 25-year) moving average of dwelling prices.

$$H_{t/b} = \frac{\sum_g \bar{p}_{t-g} \cdot q_g / \sum_g q_g}{\sum_g \bar{p}_{b-g} \cdot q_g / \sum_g q_g} = \frac{\sum_g \bar{p}_{t-g} \cdot q_g}{\sum_g \bar{p}_{b-g} \cdot q_g} \quad (7)$$

where the \bar{p} s represent average dwelling price levels in the corresponding time periods, q_g represents the proportion of mortgage principal outstanding that is g months old, and g is the age of the mortgage debt in months (where the oldest mortgage debt is 25 years prior to the base period), ranging from 1 to 300.

⁵ For further information on the methodology of the Mortgage Interest Cost Index, please see *The consumer price index reference paper (Update based on 1986 expenditures)*, Catalogue No. 62-553.

In the official CPI methodology, a separate $H_{t/b}$ index was calculated for each urban stratum over the course of the study period. The average dwelling price levels, the \bar{p} s, were based on NHPI data for the corresponding urban city. As for the weights, there were five different sets of q_g s produced with the 1986 updating of the CPI: one for each of five economic regions.

In the current study, a single $H_{t/b}$ was calculated for the rural population in a given province, using a single set of synthetic NHPI data. The weights, or q_g s, are the same as those that were derived for the urban population in a given province.

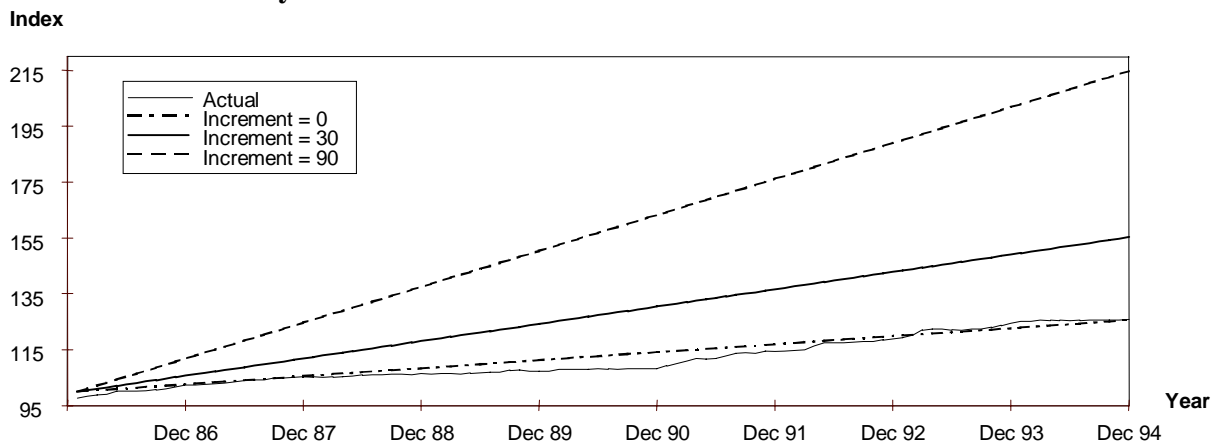
3. Deriving the Synthetic New Housing Price Index (NHPI)

In spite of the many economic relationships that exist between urban and rural house prices, this study was not an exercise in economic modeling. The movements in the synthetic NHPI series were therefore derived from mathematical relationships rather than economic ones. The starting point for deriving the synthetic series for the rural stratum in a given province was to look at the corresponding NHPI series for the urban population in that province.

In general, there were two attributes of the urban NHPI series that were manipulated to produce the synthetic rural NHPI series: 1) the cumulative amount of growth as of December 1994 in comparison with the urban NHPI series; and 2) the paths taken by the index over the study time period. Four different paths were chosen for the synthetic NHPIs: 1) a constant rate of growth; 2) an increasing rate of growth; 3) a decreasing rate of growth; and 4) a “benchmark” pattern. The reason for experimenting with different patterns is that the study results could be influenced not only by the absolute amount of divergence between the urban and synthetic rural NHPIs, but also by the degree to which their respective paths differ.

The manner in which changes in the cumulative growth were made is illustrated below in Figure 1.

Figure 1: Actual NHPI (House and Land) Series for Saskatchewan Contrasted with Synthetic "Constant-Rate-of-Growth" NHPI Series



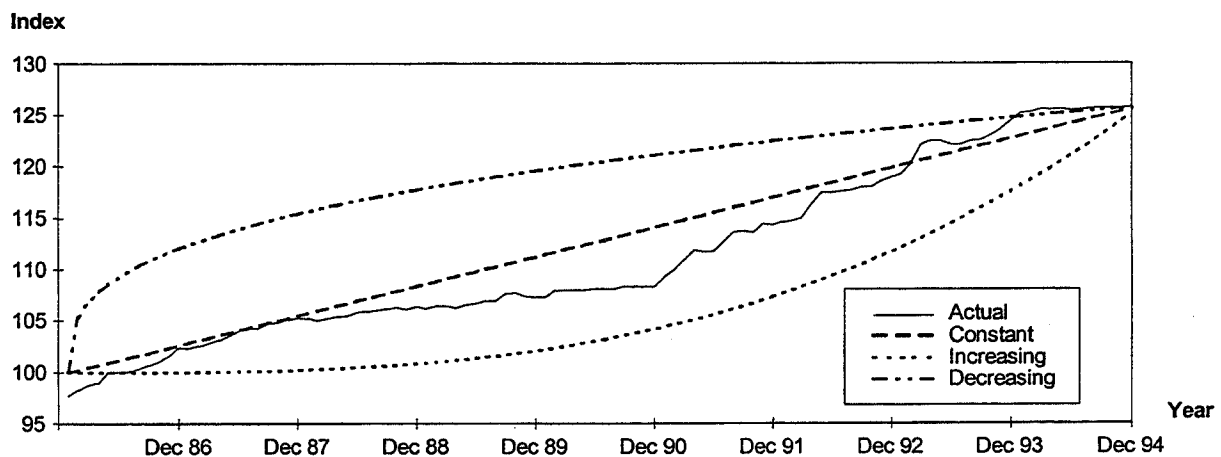
The first series to notice in Figure 1 is the actual NHPI (house and land) for Saskatchewan, or the benchmark series, which reached a final December 1994 level of 125.8. Each of the remaining three synthetic NHPI series was derived by first establishing their final levels, by adding increments of 0, 30, and 90 index points, respectively to 125.8 (the final level achieved by the actual NHPI). Then, assuming a starting index value of 100, and that all monthly movements were equal, the synthetic series could be generated by (8).

Constant:
$$P_{t/86}^{rural} = 100 + \Delta \cdot \left[\frac{t}{T} \right] \quad (8)$$

where Δ is the total amount of cumulative growth achieved by the index by the end of the study period⁶, t ranges over the months in the study period from 0 to T , and T corresponds to the total number of months in the study period minus one. (In this case, $T=108-1=107$.)

As far as the path of the index is concerned, an index with a steadily increasing rate of growth represents one extreme, where the price movements are very negligible at the beginning of the period and become increasingly larger as we move towards the end of the period. The other extreme is represented by an index with a steadily decreasing rate of growth, where the price movements are very dramatic at the beginning of the period and become more and more negligible as we move towards the end of the period. The following graph shows the urban NHPI (house and land), or benchmark, series for Saskatchewan, along with some corresponding synthetic NHPIs that are associated with the remaining three growth rate assumptions. In this example, it is assumed that all synthetic NHPIs have the same value in December 1994 as the urban NHPI, and hence, all four series intersect at a value of 125.8 in the final month.

Figure 2: Actual NHPI (House and Land) Series for Saskatchewan Contrasted with Synthetic Series Produced Under Various Growth Rate Assumptions



⁶ In the case of Figure 1, Δ was assigned the values 25.8, 55.8, and 85.8 corresponding to the increments 0, 30, and 90, respectively.

In order to generate the index series with a constant rate of growth, the only choice for a prototype was a straight line. Similarly, there was only one clear choice for the benchmark prototype, which was the urban NHPI series. In contrast, for the increasing, and decreasing, rate of growth series a broad range of prototypes existed. The main constraint was that the series exhibiting an increasing (decreasing) rate of growth had to be derived from a function with a positive (negative) second derivative. In addition, these series had to intersect the benchmark series (and, hence, the series with a constant rate of growth) in January 1986 and December 1994. A fairly arbitrary decision was made, in the sense that numerous functions could have satisfied these two constraints, to use the functions $f(x) = x^n$ and $f(x) = \sqrt[n]{x}$ as prototypes. The specific formulas used to generate the synthetic NHPI series with respectively increasing and decreasing rates of growth are given by (9) and (10).

$$\text{Increasing:} \quad P_{t/86}^{\text{rural}} = 100 + \Delta \cdot \left[\frac{t}{T} \right]^n \quad (9)$$

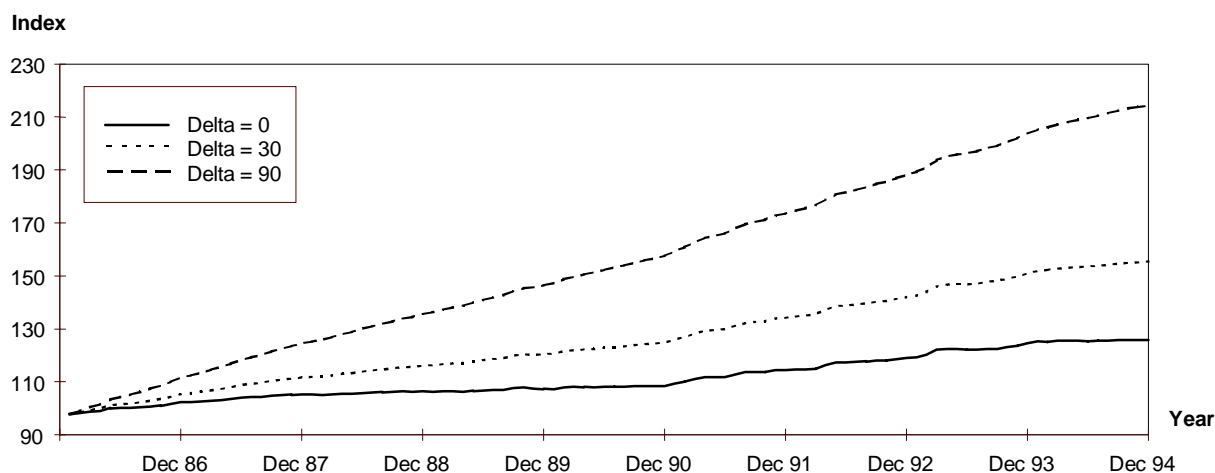
$$\text{Decreasing:} \quad P_{t/86}^{\text{rural}} = 100 + \Delta \cdot \left[\frac{t}{T} \right]^{\frac{1}{n}} \quad (10)$$

In this study, the parameter n appearing in the preceding two formulas was arbitrarily assigned a value of three. This seemed like a middle-of-the-road value to choose, which generates reasonably shaped contours, as can be seen in Figure 2 for Saskatchewan.

Finally, the synthetic NHPI series that were based on the benchmark pattern were generated according to (11).

$$\text{Benchmark:} \quad P_{t/86}^{\text{rural}} = P_{t/86}^{\text{urban}} + \Delta \cdot \left[\frac{t}{T} \right] \quad (11)$$

The assumption here is that the vertical distance between the synthetic rural NHPI series and the urban NHPI series increases by a constant increment each month, until December 1994 when the rural NHPI level exceeds the urban one by Δ . In the case that Δ takes on a value of zero, the synthetic rural NHPI is identical to the urban NHPI. Figure 3 shows the synthetic rural NHPI series generated by (11) when Δ takes on values of 0, 30, and 90, respectively.

Figure 3: Benchmark Rural NHPI (House and Land) Series for Saskatchewan

4. Description of Simulations

Once again, there were two hypothetical NHPI series that could potentially be manipulated to produce indexes for the rural strata: 1) the NHPI (house and land) series, which impacts on the Mortgage Interest Cost Index; and 2) the NHPI (house) series, which impacts on the Replacement Cost Index. Each simulation involved using an altered version of these two urban NHPI series to represent the rural stratum in each province.

The first step was to run a benchmark test. This basically consisted of performing the index calculations on the redefined population using the NHPI data series that were used in the actual production of the CPI (i.e. the urban NHPI) as a proxy for the rural strata. In other words, the series were generated by formula (8) in the specific cases where Δ takes on a value of zero. Theoretically, this test should have yielded identical results for Mortgage Interest Cost and Replacement Cost indexes for the rural and urban strata in each province. At higher levels of aggregation, differences in the resulting rural and urban indexes would be due to the differences between their weighting structures (by commodity), since identical price movements were being assumed for the two strata. The objective here was just to have some benchmark so that the differences found in subsequent simulations could be put into perspective. Variations on this first benchmark test included tests where the overall NHPI movement was held constant for the synthetic rural series, but the monthly rates of growth were varied.

The remaining simulations were aimed at responding to the following questions: 1) How different does the synthetic rural NHPI (house and land) series have to be from its urban counterpart to make an impact on Mortgage Interest Cost for the province as a whole? 2) How different does the synthetic rural NHPI (house only) series have to be from its urban counterpart to make an impact on Replacement Cost for the province as a whole? 3) In the answers to questions 1) and 2), does the pattern of growth assumed for the synthetic rural NHPI series matter, or is it predominantly just the absolute difference in the final index levels that matters?

4) Do the answers to the preceding questions vary by province? 5) How do the impacts of different synthetic rural, and urban, NHPIs tend to diminish at higher levels of aggregation?

Given the very large volume of results that were produced for each set of simulations conducted over the course of this study, only a subset will be presented in this report. They can be classified into four types, which appear in Table 2.

Table 2: Portrayal of the Four Types of Simulations Used

Synthetic Series			Pattern of Growth Assumed			
Type	NHPI 1986-1994 (house and land)	NHPI 1986-1994 (house only)	Benchmark	Constant	Increasing	Decreasing
1	x	x	x			
2	x	x		x		
3	x	x			x	
4	x	x				x

In all cases, both NHPI series are varied simultaneously. Furthermore, the amount of absolute divergence that was postulated between the urban NHPI series and their rural counterparts was always assumed to be the same for the NHPI (house and land) series and the NHPI (house only) series.⁷ The patterns assumed for the two synthetic NHPI series constructed for each simulation were also taken to be identical. This approach seemed most reasonable, given the very strong tendency for these two series to exhibit similar trends, as can be seen in Figures 4, 5, and 6.⁸

⁷ Taking, for example, the case of British Columbia, where the NHPI (house and land) and the NHPI (house only) levels stood at 148.3 and 129.2 in December 1994, respectively, then a simulation with a postulated increase of 90 index points would mean that the hypothetical NHPI series used for the rural region would have stood at 238.3 and 219.2, respectively.

⁸ The two NHPI series for British Columbia exhibit more dissimilarity than do the series for the other two provinces. This is due mainly to the market conditions that prevailed in Vancouver over the study period.

Figure 4: NHPI Series for British Columbia, 1986=100

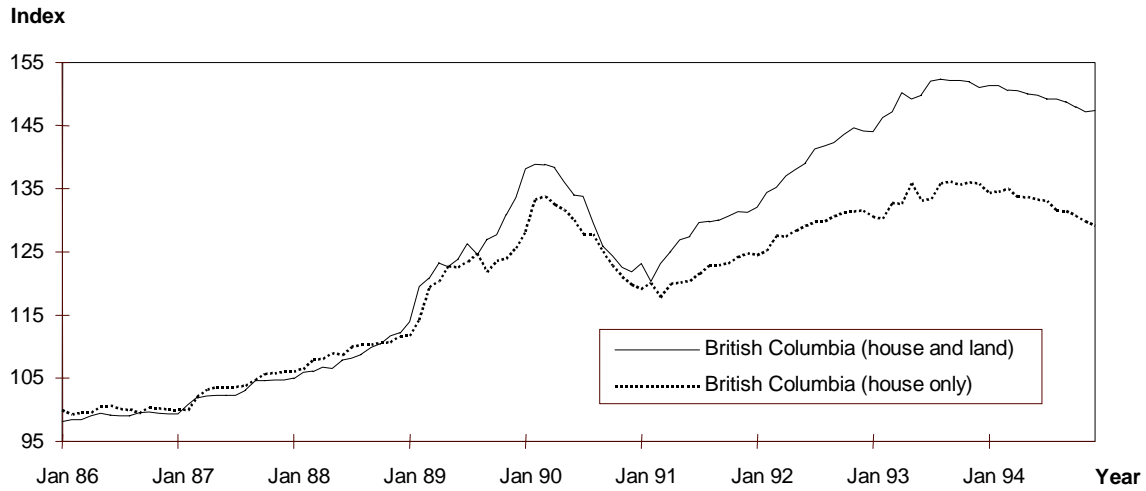


Figure 5: NHPI Series for Newfoundland, 1986=100

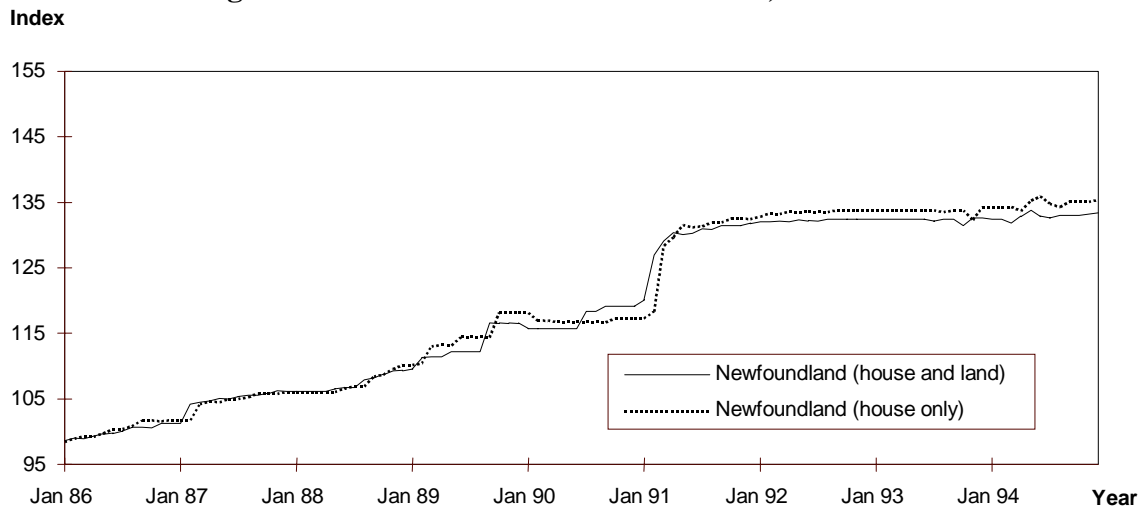
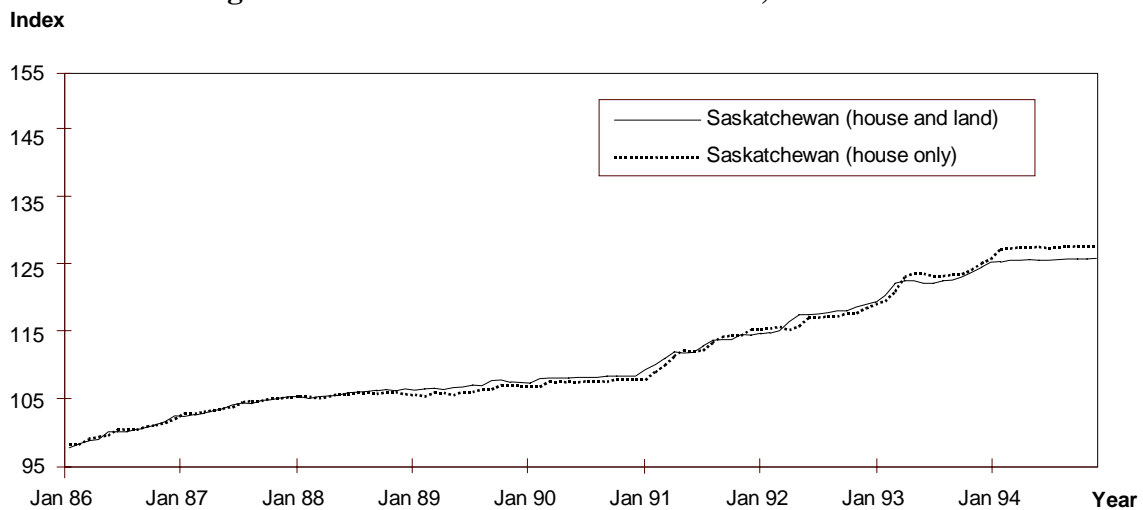


Figure 6: NHPI Series for Saskatchewan, 1986=100



5. Conclusions

Once again, the synthetic rural NHPI series were modelled after their urban counterparts by varying the path taken by the index as well as the cumulative amount of growth over the study period. The paths were varied by considering three predetermined patterns corresponding to a constant rate of growth, an increasing rate of growth, and a decreasing rate of growth. The cumulative levels, as of December 1994, were also altered by predetermined amounts. Two particular values were used, 30 and 90, and added to the December 1994 levels. These two values were chosen after some initial experimentation. The main rationale was that 30 seemed to be consistent with what we might actually expect if the relative dispersion observed among the NHPIs for urban cities is used as a guide. In contrast, the value 90 represents a rather unlikely extreme. The analysis that follows will discuss, almost exclusively, the results for which the latter value applies.

The results for British Columbia, Newfoundland, and Saskatchewan are presented in the Appendix Tables 4a to 6d. For each of the three provinces, the results are summarized in four tables, one corresponding to each of the following: Replacement Cost, Mortgage Interest Cost, Owned Accommodation, and All-items. In each cell, three index levels are reported, all of which correspond to the final month of the study period, December 1994. The first level is for the **urban** stratum, the middle one is the **total** for the province, and the last one is for the **rural** stratum. Since the simulations in this study have no effect on the index values for the urban strata, the first index value is identical in all cells of a given table. The **total** index value for a component is simply the weighted average of the urban and rural indexes for that component, as was specified in the methodology section. The weights, W^{rural} and W^{urban} , are shown in the title of each table for ease of reference.

Looking at the results in a given table, one can see the effect of varying the cumulative amount of growth by examining the data in the rows, since for a given row the path of the index is held constant. In contrast, the effect of varying the path taken by the NHPI can be seen in the columns, since in a given column the variation in the cumulative growth of the NHPI is held constant.

It is important to note that the analysis of the impact on provincial estimates of the CPI by including rural house price movements is incomplete if we just focus on differences in the component index levels at the end of the study period (i.e. December 1994). A more complete analysis would include a visual inspection of how the CPI trends change in response to the inclusion of the rural strata. Although a separate trend analysis was produced corresponding to each of the cells in the Appendix Tables 4a-6d, it is not practical to include them all in this paper. A small selection of graphs will be shown just to illustrate the point that trend differences can be quite important even in cases where differences between the final index levels are negligible.

The most extreme differences between the urban index and the total index resulted when the simulations were based on a decreasing pattern of growth, and when a value of 90 index points was used as the increment. In Appendix Tables 4a through 6d, the pertinent values for the urban and total indexes are reported in the bottom row in the right-most cell. Their differences, both in absolute and in relative terms, are summarized below in Table 3.

Table 3: Most Extreme Index Point (and Relative) Differences Between Urban and Total December 1994 NHPI Levels, by Component

Province	Replacement Cost	Mortgage Interest Cost	Owned Accommodation	All-items
British Columbia	16.6 (12.8%)	9.7 (9.3%)	6.8 (5.3%)	1.0 (0.7%)
Newfoundland	65.3 (48.4%)	25.5 (22.3%)	28.2 (22.4%)	2.3 (1.8%)
Saskatchewan	49.8 (39.0%)	21.7 (20.4%)	18.5 (15.3%)	2.8 (2.1%)

Focusing first on the Replacement Cost, we see the largest difference was for Newfoundland, followed quite closely by Saskatchewan, while the discrepancy was much smaller for British Columbia. Because the Replacement Cost Index is the NHPI (house only) series, the only factor that really influences the final total index to differ from the urban one is the relative importance of the rural stratum in the province, in terms of its expenditure share. These shares were: 0.19 for British Columbia, 0.73 for Newfoundland, and 0.44 for Saskatchewan.

The path assumed for the synthetic rural NHPI (house only) index only affects the trend of the total Replacement Cost Index. This point is illustrated in Figures 7, 8, and 9. They show the simulation results for British Columbia, for each of the three assumptions about the path of the index, where the final level of the synthetic rural NHPI (house only) has been held constant at a level exceeding the urban one by 30 index points. We notice from Figure 7 that when a constant rate of growth is assumed the total province index is almost always above the urban one, and follows a very similar trend, while the gap between them tends to grow with time. When an increasing rate of growth is assumed, as in Figure 8, the total province index is below the urban one until well into the eighth year, when the rural index finally catches up and intersects with the urban one.⁹ Figure 9 shows the results associated with the decreasing rate assumption. In this case, the total province index departs immediately from the urban index, due to the very rapid increases in the rural index at the beginning of the period, with the gap diminishing gradually over time.

⁹ This point of intersection occurs much sooner when the synthetic rural NHPI exceeds the urban one by 90 index points.

Figure 7: Replacement Cost Index for British Columbia Assuming: 1) Increment in Final NHPI (House Only)=30, and 2) Pattern="Constant"

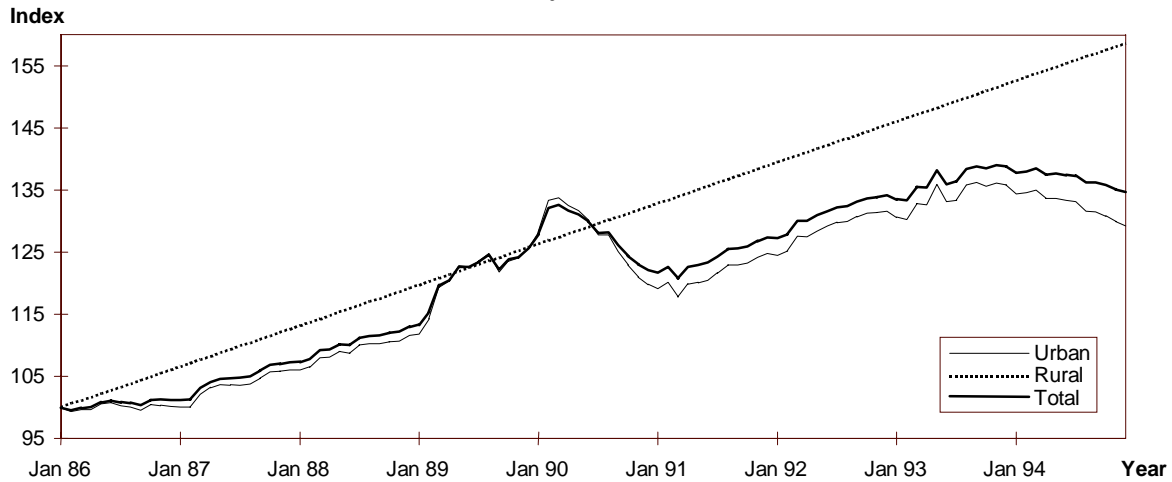


Figure 8: Replacement Cost Index for British Columbia Assuming: 1) Increment in Final NHPI (House Only)=30, and 2) Pattern="Increasing"

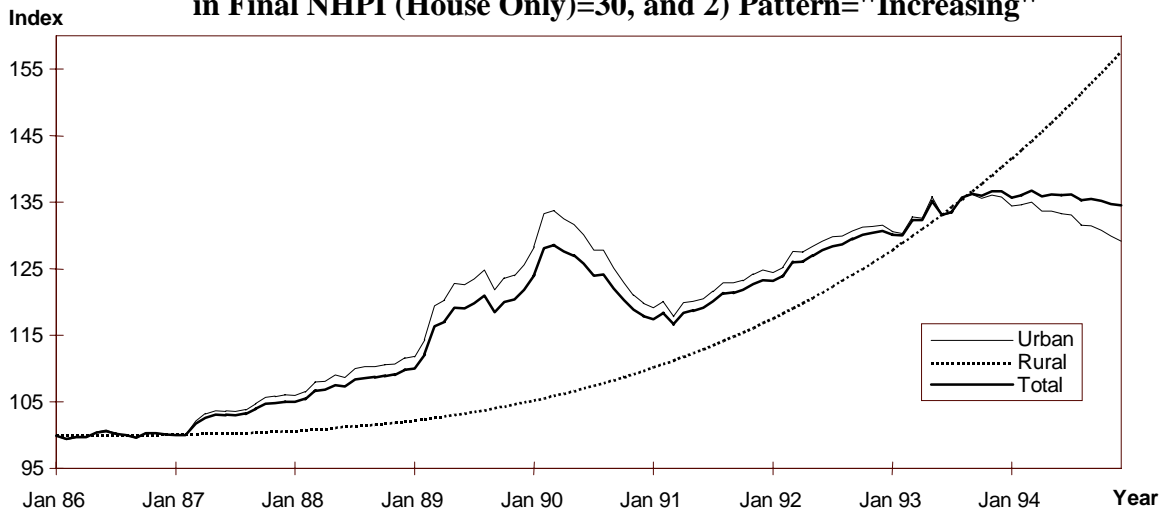
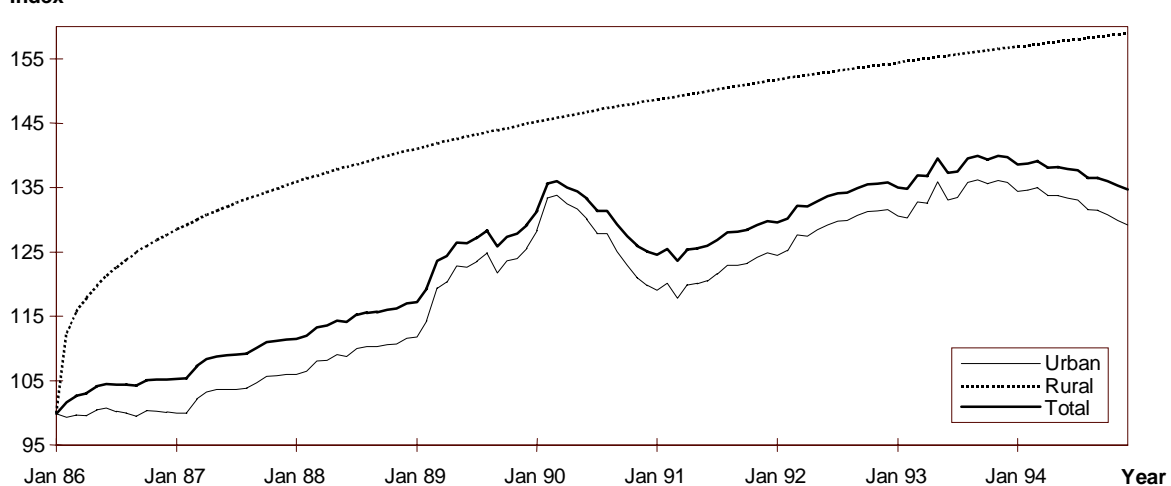


Figure 9: Replacement Cost Index for British Columbia Assuming: 1) Increment in Final NHPI (House Only)=30, and 2) Pattern="Decreasing"



In all three cases the end-points of all three indexes are the same.¹⁰ What differs are the routes that the rural and, hence, the total indexes took along the way.

Turning now to the Mortgage Interest Cost, we see from Table 3 that differences were again most pronounced for Newfoundland, followed closely by Saskatchewan, and least for British Columbia. Here again, part of the answer as to why the differences varied across provinces lies in the fact that different proportions of expenditures are attributed to Mortgage Interest Cost for the rural population in each province. These shares were: 0.19 for British Columbia, 0.51 for Newfoundland, and 0.39 for Saskatchewan. However, due to the rather complex methodology used to produce Mortgage Interest Cost (i.e. the fact that the dwelling price index is a 25-year weighted average of house prices), a somewhat deeper analysis would be required to unravel exactly how to account for these differences.¹¹

We saw previously that the path assumed for the synthetic rural NHPI (house only) index only makes a difference to the trend of the total Replacement Cost Index. The same cannot be said for the Mortgage Interest Cost Index. This is illustrated in Figures 10, 11, and 12. Here again, the simulation results are for British Columbia, for each of the three assumptions about the path of the index, where the final level of the synthetic rural NHPI (house and land) has been held constant at a level exceeding the urban one by 30 index points. In Figure 10 we notice that when a constant rate of growth is assumed, the total province index is always very slightly above the urban one reaching a final level of 106.7 by December 1994, exceeding the final urban level by two index points. When an increasing rate of growth is assumed, as in Figure 11, the total province index is below the urban one for the entire study period. Even in December 1994, the total index level of 104.1 is six tenths of a point below the urban level. This result is counter-intuitive in the sense that even if rural house prices increase faster than urban ones, over the long run, the associated Mortgage Interest Cost Index has the potential to fall. Figure 12 shows the results associated with the decreasing rate assumption. In this case, the total province index is always above the urban one, reaching a final level of 108.2, which exceeds the urban level by 3.5 index points.

As we proceed to higher levels of aggregation, we notice that the differences between the **urban** and the **total** province index levels at the end of the study period tend to diminish, due to the presence of additional components in the index. However, in the case of Owned Accommodation, the ranking of differences by province has not changed; they were greatest for Newfoundland and least for British Columbia, with Saskatchewan falling somewhere in between. The proportion of expenditures associated with Owned Accommodation for the rural population in each province were: 0.28 for British Columbia, 0.65 for Newfoundland, and 0.49 for Saskatchewan.

¹⁰ While this is true in theory, the method of computation used to generate the synthetic NHPI series gave rise to minor differences in the December 1994 levels.

¹¹ At this point, it is interesting to note that the results of the benchmark test show that even when the cumulative growth of the NHPI (house and land) is held constant, variations in the path of the index will lead to differences in the final levels. This can be verified by looking down the first column in Appendix Tables 4b, 5b, and 6b.

Figure 10: Mortgage Interest Cost Index for British Columbia Assuming: 1) Increment in Final NHPI (House and Land)=30, and 2) Pattern="Constant"

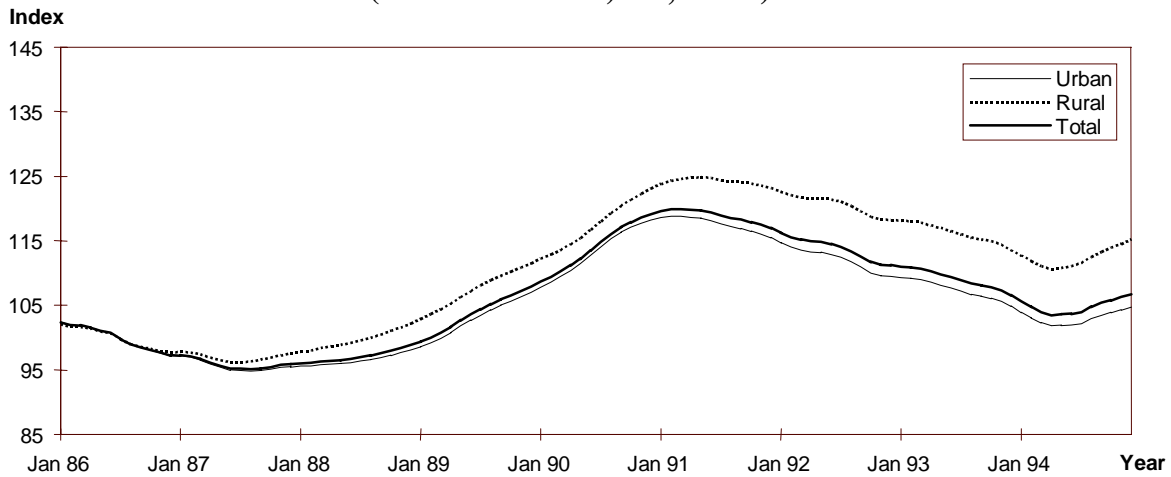


Figure 11: Mortgage Interest Cost Index for British Columbia Assuming: 1) Increment in Final NHPI (House and Land)=30, and 2) Pattern="Increasing"

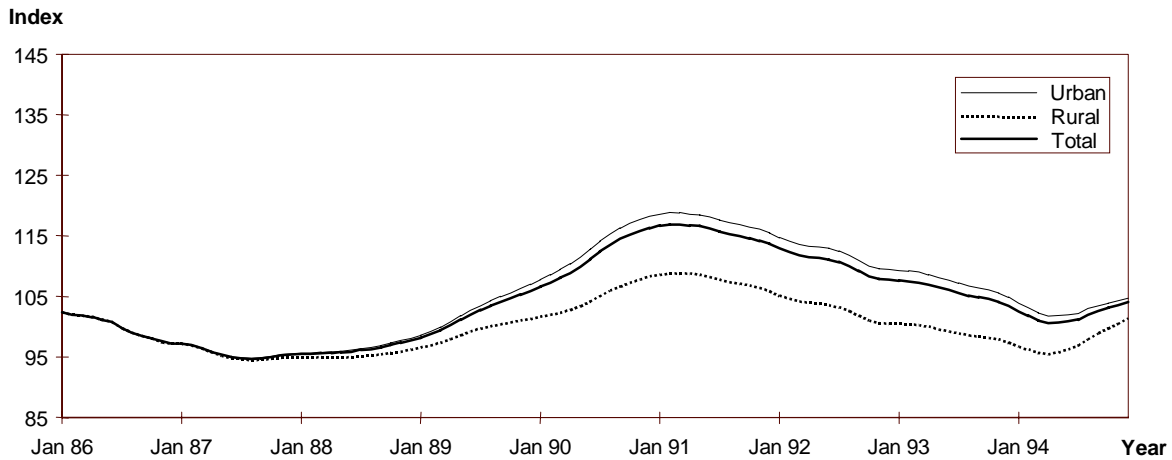
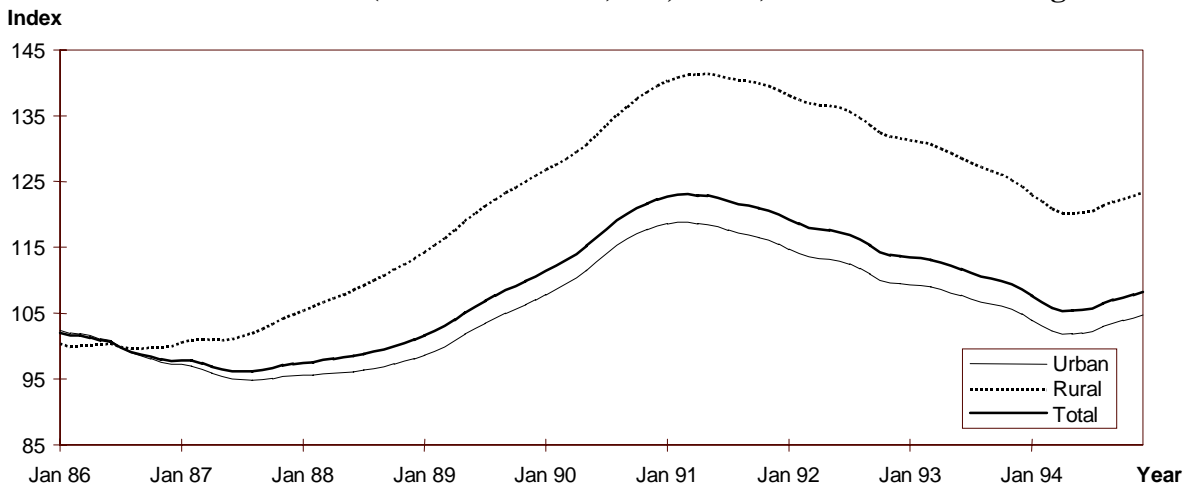


Figure 12: Mortgage Interest Cost Index for British Columbia Assuming: 1) Increment in Final NHPI (House and Land)=30, and 2) Pattern="Decreasing"



At the highest level of aggregation, the differences between the **urban** and the **total** province index levels for the All-items index at the end of the study period are diminished much further. In this case, however, the largest difference was for Saskatchewan, followed first by Newfoundland, and finally by British Columbia. The proportion of expenditures associated with All-items for the rural population in each province were: 0.23 for British Columbia, 0.66 for Newfoundland, and 0.53 for Saskatchewan.

From the results just presented we cannot obtain a direct answer to the following question: How large would the difference have to be between the rural and the urban NHPI series to bring about a certain percentage change in the All-items index for the total population? Some further simulations were carried out with the objective of providing an answer to this type of question. All of the synthetic NHPI series used in this exercise were derived under the assumption of a decreasing rate of growth (i.e. "Type 4" in Table 2). The results pertaining to 1% and 2% changes in the All-items index are presented in Table 4.

Table 4: Differences Required Between Rural and Urban December 1994 NHPI Levels to Bring About Relative Differences in the All-items Index of 1% and 2%

Province	Relative Difference in All-items Index: $\left(\frac{total - urban}{urban}\right) \times 100\%$	
	1%	2%
British Columbia	130	260
Newfoundland	62	95
Saskatchewan	25	85

Summarizing the results of this study, the differences between the **urban** and the **total** province index levels at the end of the study period were most striking at the lowest level of aggregation (i.e. Mortgage Interest Cost and Replacement Cost), as was expected. The path assumed for the synthetic rural NHPI (house only) series only had an impact on the trend of the total index, and not on its final level, in the case of Replacement Cost. However, in the case of Mortgage Interest Cost, the path assumed affected both the trend as well as the final level of the total index. More generally, the degree to which differences were observed between the final total index level and the urban one varies quite significantly across provinces. The differences were always least for British Columbia for all four aggregates, and greatest for Newfoundland for all aggregates, except the All-items index, where Saskatchewan exhibited the largest difference. In reference to the Owned Accommodation and All-items, the differences between provinces in terms of how much the impacts of different NHPIs for rural and urban strata diminish with aggregation are, no doubt, largely due to differences between the rural and urban expenditure shares for the various component indexes (shown in Appendix Table 2).

6. Future Work

In light of the results obtained and presented in the previous section, we need to reconsider the central question that was posed in the introduction: Does the fact that we do not explicitly account for the movement in rural house prices compromise provincial CPI estimates to a great enough extent to warrant action? Now, we see from Table 4 that for British Columbia and Newfoundland changes in rural house price movements would have to exceed the urban ones, persistently, for a long period of time in order to move the All-items CPI by as little as one percent. Therefore, it is extremely tempting to say that the likely impact on the overall CPI of not taking rural house prices into account is too small to warrant any further concern or action. That being the case, we should be fairly confident that the current CPI methodology is robust enough to apply to the expanded population, which includes rural regions. However, this is still based on the conjecture that a spread of, say, 62 index points between Newfoundland's final rural and urban NHPI index levels is much larger than what we might expect in reality. For this reason, we cannot say with certainty whether or not the CPI is being compromised by not taking rural house price movements explicitly into account. A new phase of this study will be initiated shortly to explore the possibilities for measuring actual movements in rural house prices. If this can be done, the results of the current study can then be put into perspective.

The objective in the next phase will be to develop a methodology to construct price indexes, however primitive, for rural regions. There are several reasons why it would not be sensible to use the NHPI methodology to measure house price movements in rural regions. Even if it were, new surveys of the house builders in rural regions would have to be implemented, which, if it were even possible, would take time and considerable resources. A more reasonable, and definitely less expensive, approach is to use data on owner-occupied private dwellings supplied by the Census of Population. The "long" Census forms, which are received by one fifth of the Canadian population, require that the respondent supply the following information about an owned private dwelling: the type of dwelling (e.g. single-detached, semi-detached, row), the expected selling price, regular monthly mortgage payments, estimated yearly property taxes, the number of rooms (and bedrooms) in the dwelling, the approximate age of the dwelling, and the maintenance and repair requirements needed. These data are not well suited to the construction of price indexes in contrast to the surveys used to produce the NHPI, which are conducted monthly. Through these surveys, of representative new homebuilders, information on the producer prices of new houses of constant quality is collected. In contrast, the Census data provide very crude approximations of market prices for a sample of existing dwellings, which may vary considerably in quality from one Census to the next. These are just a few of the challenging issues that will be addressed in the next phase of the study.

Appendix Tables

Table 1: Expenditure Weights from the 1986 Family Expenditure Survey (Values)

	Newfoundland			Saskatchewan			British Columbia		
	Urban	Rural	Total	Urban	Rural	Total	Urban	Rural	Total
All-items	1437669	2753585	4191254	3952515	4395297	8347812	21093607	6138075	27231682
Food	273398	531407	804805	658901	775256	1434157	3898703	1130584	5029287
Housing	514500	1147571	1662071	1448347	1490794	2939141	7889792	2441396	10331188
Shelter	361745	641945	1003690	1001651	946159	1947810	5640192	1778505	7418697
Principal accommodation	348225	599402	947627	938830	872644	1811474	5368740	1684380	7053120
Rented private accommodation	80891	53138	134029	283771	125190	408961	1575074	270076	1845150
Owned accommodation	171193	323769	494962	497822	483424	981246	3002260	1151256	4153516
Repairs and maintenance	22684	74328	97012	51628	79755	131383	245533	77308	322841
Condo charges	35	0	35	1846	0	1846	36470	0	36470
Property taxes	18617	30807	49424	110925	106080	217005	570405	125751	696156
Insurance premiums	10007	20701	30708	26932	41925	68857	128821	474439	603260
Mortgage interest cost	69062	72046	141108	184382	116610	300992	1155064	272837	1427901
Replacement cost	42383	113662	156045	96992	121309	218301	648280	147709	795989
Other expenditures	8405	12225	20630	25117	17745	42862	217687	53212	270899
Water, fuel and electricity	96141	222495	318636	157237	264030	421267	791406	263048	1054454
Other accommodations	13520	42543	56063	62821	73515	136336	271452	94125	365577
Household operations	85230	242544	327774	237377	297765	535142	1216587	408879	1625466
Household furniture, equipment, etc.	67525	263082	330607	209319	246870	456189	1033013	254012	1287025
Clothing	130816	211370	342186	354199	390586	744785	1628221	374917	2003138
Transportation	228887	415535	644422	692417	848746	1541163	3656735	1160896	4817631
Health and personal care	63327	104890	168217	176130	185825	361955	841536	234073	1075609
Recreation, education, and reading	112551	179055	291606	402589	447206	849795	2018993	520745	2539738
Tobacco and alcohol	114190	163757	277947	219932	256884	476816	1159627	275464	1435091

Table 2: Expenditure Weights from the 1986 Family Expenditure Survey (Percentages)

	Newfoundland			Saskatchewan			British Columbia		
	Urban	Rural	Total	Urban	Rural	Total	Urban	Rural	Total
All-items	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Food	19.0	19.3	19.2	16.7	17.6	17.2	18.5	18.4	18.5
Housing	35.8	41.7	39.7	36.6	33.9	35.2	37.4	39.8	37.9
Shelter	25.2	23.3	23.9	25.3	21.5	23.3	26.7	29.0	27.2
Principal accommodation	24.2	21.8	22.6	23.8	19.9	21.7	25.5	27.4	25.9
Rented private accommodation	5.6	1.9	3.2	7.2	2.8	4.9	7.5	4.4	6.8
Owned accommodation	11.9	11.8	11.8	12.6	11.0	11.8	14.2	18.8	15.3
Repairs and maintenance	1.6	2.7	2.3	1.3	1.8	1.6	1.2	1.3	1.2
Condo charges	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.0	0.1
Property taxes	1.3	1.1	1.2	2.8	2.4	2.6	2.7	2.0	2.6
Insurance premiums	0.7	0.8	0.7	0.7	1.0	0.8	0.6	7.7	2.2
Mortgage interest cost	4.8	2.6	3.4	4.7	2.7	3.6	5.5	4.4	5.2
Replacement cost	2.9	4.1	3.7	2.5	2.8	2.6	3.1	2.4	2.9
Other expenditures	0.6	0.4	0.5	0.6	0.4	0.5	1.0	0.9	1.0
Water, fuel and electricity	6.7	8.1	7.6	4.0	6.0	5.0	3.8	4.3	3.9
Other accommodations	0.9	1.5	1.3	1.6	1.7	1.6	1.3	1.5	1.3
Household operations	5.9	8.8	7.8	6.0	6.8	6.4	5.8	6.7	6.0
Household furniture, equipment, etc.	4.7	9.6	7.9	5.3	5.6	5.5	4.9	4.1	4.7
Clothing	9.1	7.7	8.2	9.0	8.9	8.9	7.7	6.1	7.4
Transportation	15.9	15.1	15.4	17.5	19.3	18.5	17.3	18.9	17.7
Health and personal care	4.4	3.8	4.0	4.5	4.2	4.3	4.0	3.8	3.9
Recreation, education, and reading	7.8	6.5	7.0	10.2	10.2	10.2	9.6	8.5	9.3
Tobacco and alcohol	7.9	5.9	6.6	5.6	5.8	5.7	5.5	4.5	5.3

Table 3: Expenditure Weights from the 1986 Family Expenditure Survey (Normalizations with Respect to Provincial Totals)

	Newfoundland			Saskatchewan			British Columbia		
	Urban	Rural	Total	Urban	Rural	Total	Urban	Rural	Total
All-items	34.3	65.7	100.0	47.3	52.7	100.0	77.5	22.5	100.0
Food	6.5	12.7	19.2	7.9	9.3	17.2	14.3	4.2	18.5
Housing	12.3	27.4	39.7	17.4	17.9	35.2	29.0	9.0	37.9
Shelter	8.6	15.3	23.9	12.0	11.3	23.3	20.7	6.5	27.2
Principal accommodation	8.3	14.3	22.6	11.2	10.5	21.7	19.7	6.2	25.9
Rented private accommodation	1.9	1.3	3.2	3.4	1.5	4.9	5.8	1.0	6.8
Owned accommodation	4.1	7.7	11.8	6.0	5.8	11.8	11.0	4.2	15.3
Repairs and maintenance	0.5	1.8	2.3	0.6	1.0	1.6	0.9	0.3	1.2
Condo charges	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.1
Property taxes	0.4	0.7	1.2	1.3	1.3	2.6	2.1	0.5	2.6
Insurance premiums	0.2	0.5	0.7	0.3	0.5	0.8	0.5	1.7	2.2
Mortgage interest cost	1.6	1.7	3.4	2.2	1.4	3.6	4.2	1.0	5.2
Replacement cost	1.0	2.7	3.7	1.2	1.5	2.6	2.4	0.5	2.9
Other expenditures	0.2	0.3	0.5	0.3	0.2	0.5	0.8	0.2	1.0
Water, fuel and electricity	2.3	5.3	7.6	1.9	3.2	5.0	2.9	1.0	3.9
Other accommodations	0.3	1.0	1.3	0.8	0.9	1.6	1.0	0.3	1.3
Household operations	2.0	5.8	7.8	2.8	3.6	6.4	4.5	1.5	6.0
Household furniture, equipment, etc.	1.6	6.3	7.9	2.5	3.0	5.5	3.8	0.9	4.7
Clothing	3.1	5.0	8.2	4.2	4.7	8.9	6.0	1.4	7.4
Transportation	5.5	9.9	15.4	8.3	10.2	18.5	13.4	4.3	17.7
Health and personal care	1.5	2.5	4.0	2.1	2.2	4.3	3.1	0.9	3.9
Recreation, education, and reading	2.7	4.3	7.0	4.8	5.4	10.2	7.4	1.9	9.3
Tobacco and alcohol	2.7	3.9	6.6	2.6	3.1	5.7	4.3	1.0	5.3

Table 4a: December 1994 CPI Replacement Cost Index Levels for British Columbia, Expenditure Weights = 0.814 (Urban) : 0.186 (Rural)

Pattern of Growth	Stratum	Increase in December 1994 in the NHPI (House Only) Level		
		0	30	90
Benchmark	urban	129.2	129.2	129.2
	total	129.2	134.7	145.7
	rural	129.2	158.9	218.4
Constant Rate	urban	129.2	129.2	129.2
	total	129.1	134.7	145.7
	rural	128.9	158.6	218.1
Increasing Rate	urban	129.2	129.2	129.2
	total	129.1	134.5	145.3
	rural	128.4	157.6	215.9
Decreasing Rate	urban	129.2	129.2	129.2
	total	129.2	134.7	145.8
	rural	129.1	159.0	218.8

Table 4b: December 1994 CPI Mortgage Interest Cost Index Levels for British Columbia, Expenditure Weights = 0.809 (Urban) : 0.191 (Rural)

Pattern of Growth	Stratum	Increase in December 1994 in the NHPI (House and Land) Level		
		0	30	90
Benchmark	urban	104.7	104.7	104.7
	total	104.8	107.4	112.6
	rural	105.1	118.8	146.0
Constant Rate	urban	104.7	104.7	104.7
	total	104.1	106.7	111.9
	rural	101.6	115.2	142.3
Increasing Rate	urban	104.7	104.7	104.7
	total	102.5	104.1	107.3
	rural	93.0	101.4	118.1
Decreasing Rate	urban	104.7	104.7	104.7
	total	105.1	108.2	114.4
	rural	106.7	123.3	155.6

Table 4c: December 1994 CPI Owned Accommodation Index Levels for British Columbia, Expenditure Weights = 0.723 (Urban) : 0.277 (Rural)

Pattern of Growth	Stratum	Increase in December 1994 Levels for Both NHPI Series (House Only and Total)		
		0	30	90
Benchmark	urban	129.1	129.1	129.1
	total	129.4	131.4	135.3
	rural	130.2	137.2	151.3
Constant Rate	urban	129.1	129.1	129.1
	total	129.2	131.1	135.0
	rural	129.3	136.3	150.4
Increasing Rate	urban	129.1	129.1	129.1
	total	128.6	130.2	133.4
	rural	127.2	132.9	144.4
Decreasing Rate	urban	129.1	129.1	129.1
	total	129.5	131.7	135.9
	rural	130.5	138.3	153.6

Table 4d: December 1994 CPI All-items Index Levels for British Columbia, Expenditure Weights = 0.775 (Urban) : 0.225 (Rural)

Pattern of Growth	Stratum	Increase in December 1994 Levels for Both NHPI Series (House Only and Total)		
		0	30	90
Benchmark	urban	135.8	135.8	135.8
	total	135.8	136.1	136.7
	rural	135.7	137.0	139.6
Constant Rate	urban	135.8	135.8	135.8
	total	135.7	136.0	136.6
	rural	135.5	136.8	139.5
Increasing Rate	urban	135.8	135.8	135.8
	total	135.6	135.9	136.4
	rural	135.1	136.2	138.4
Decreasing Rate	urban	135.8	135.8	135.8
	total	135.8	136.1	136.8
	rural	135.8	137.2	140.1

**Table 5a: December 1994 CPI Replacement Cost Index Levels for Newfoundland,
Expenditure Weights = 0.272 (Urban) : 0.728 (Rural)**

Pattern of Growth	Stratum	Increase in December 1994 in the NHPI (House Only) Level		
		0	30	90
Benchmark	urban	135.0	135.0	135.0
	total	135.0	156.6	199.9
	rural	135.0	164.7	224.2
Constant Rate	urban	135.0	135.0	135.0
	total	134.8	156.4	199.7
	rural	134.7	164.4	223.8
Increasing Rate	urban	135.0	135.0	135.0
	total	134.3	155.5	198.0
	rural	134.0	163.2	221.6
Decreasing Rate	urban	135.0	135.0	135.0
	total	134.9	156.7	200.3
	rural	134.9	164.8	224.6

**Table 5b: December 1994 CPI Mortgage Interest Cost Index Levels for Newfoundland,
Expenditure Weights = 0.489 (Urban) : 0.511 (Rural)**

Pattern of Growth	Stratum	Increase in December 1994 in the NHPI (House and Land) Level		
		0	30	90
Benchmark	urban	114.4	114.4	114.4
	total	114.4	120.5	132.8
	rural	114.5	126.4	150.4
Constant Rate	urban	114.4	114.4	114.4
	total	113.3	119.4	131.6
	rural	112.2	124.2	148.1
Increasing Rate	urban	114.4	114.4	114.4
	total	110.2	113.6	120.3
	rural	106.2	112.8	126.0
Decreasing Rate	urban	114.4	114.4	114.4
	total	115.7	123.8	139.9
	rural	116.9	132.8	164.3

Table 5c: December 1994 CPI Owned Accommodation Index Levels for Newfoundland, Expenditure Weights = 0.346 (Urban) : 0.654 (Rural)

Pattern of Growth	Stratum	Increase in December 1994 Levels for Both NHPI Series (House Only and Total)		
		0	30	90
Benchmark	urban	125.9	125.9	125.9
	total	126.2	134.8	151.9
	rural	126.4	139.5	165.7
Constant Rate	urban	125.9	125.9	125.9
	total	125.8	134.4	151.5
	rural	125.8	138.9	165.1
Increasing Rate	urban	125.9	125.9	125.9
	total	124.8	132.5	147.8
	rural	124.2	135.9	159.4
Decreasing Rate	urban	125.9	125.9	125.9
	total	126.6	135.7	154.1
	rural	126.9	141.0	168.9

Table 5d: December 1994 CPI All-items Index Levels for Newfoundland, Expenditure Weights = 0.344 (Urban) : 0.657 (Rural)

Pattern of Growth	Stratum	Increase in December 1994 Levels for Both NHPI Series (House Only and Total)		
		0	30	90
Benchmark	urban	126.9	126.9	126.9
	total	125.9	127.0	129.0
	rural	125.4	127.0	130.1
Constant Rate	urban	126.9	126.9	126.9
	total	125.9	126.9	128.9
	rural	125.4	126.9	130.0
Increasing Rate	urban	126.9	126.9	126.9
	total	125.8	126.7	128.5
	rural	125.2	126.6	129.3
Decreasing Rate	urban	126.9	126.9	126.9
	total	126.0	127.1	129.2
	rural	125.5	127.2	130.4

**Table 6a: December 1994 CPI Replacement Cost Index Levels for Saskatchewan,
Expenditure Weights = 0.444 (Urban) : 0.556 (Rural)**

Pattern of Growth	Stratum	Increase in December 1994 in the NHPI (House Only) Level		
		0	30	90
Benchmark	urban	127.6	127.6	127.6
	total	127.6	144.1	177.1
	rural	127.6	157.3	216.8
Constant Rate	urban	127.6	127.6	127.6
	total	127.4	144.0	177.0
	rural	127.3	157.1	216.5
Increasing Rate	urban	127.6	127.6	127.6
	total	127.2	143.4	175.8
	rural	126.8	156.0	214.4
Decreasing Rate	urban	127.6	127.6	127.6
	total	127.5	144.2	177.4
	rural	127.5	157.4	217.2

**Table 6b: December 1994 CPI Mortgage Interest Cost Index Levels for Saskatchewan,
Expenditure Weights = 0.613 (Urban) : 0.387 (Rural)**

Pattern of Growth	Stratum	Increase in December 1994 in the NHPI (House and Land) Level		
		0	30	90
Benchmark	urban	106.6	106.6	106.6
	total	106.7	111.8	122.2
	rural	106.8	120.2	146.8
Constant Rate	urban	106.6	106.6	106.6
	total	107.0	112.1	122.5
	rural	107.5	120.9	147.5
Increasing Rate	urban	106.6	106.6	106.6
	total	105.0	108.0	113.9
	rural	102.6	110.2	125.4
Decreasing Rate	urban	106.6	106.6	106.6
	total	108.4	115.1	128.3
	rural	111.1	128.5	162.5

**Table 6c: December 1994 CPI Owned Accommodation Index Levels for Saskatchewan,
Expenditure Weights = 0.507 (Urban) : 0.493 (Rural)**

Pattern of Growth	Stratum	Increase in December 1994 Levels for Both NHPI Series (House Only and Total)		
		0	30	90
Benchmark	urban	120.9	120.9	120.9
	total	121.7	127.0	137.5
	rural	122.5	133.2	154.5
Constant Rate	urban	120.9	120.9	120.9
	total	121.7	127.0	137.5
	rural	122.6	133.3	154.6
Increasing Rate	urban	120.9	120.9	120.9
	total	121.1	125.6	134.6
	rural	121.3	130.4	148.7
Decreasing Rate	urban	120.9	120.9	120.9
	total	122.2	128.0	139.4
	rural	123.5	135.2	158.4

**Table 6d: December 1994 CPI All-items Index Levels for Saskatchewan,
Expenditure Weights = 0.473 (Urban) : 0.527 (Rural)**

Pattern of Growth	Stratum	Increase in December 1994 Levels for Both NHPI Series (House Only and Total)		
		0	30	90
Benchmark	urban	134.0	134.0	134.0
	total	134.7	135.3	136.6
	rural	135.4	136.6	138.9
Constant Rate	urban	134.0	134.0	134.0
	total	134.7	135.3	136.6
	rural	135.4	136.6	138.9
Increasing Rate	urban	134.0	134.0	134.0
	total	134.6	135.2	136.2
	rural	135.3	136.3	138.3
Decreasing Rate	urban	134.0	134.0	134.0
	total	134.8	135.5	136.8
	rural	135.5	136.8	139.4