

# **Analytical Consumer Price Indexes for Owned Accommodation**

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December 2014

Preliminary draft  
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I acknowledge very useful comments from Joshua Gertsman; Ning Huang; Mathieu Lequain; Sue Morris; Brad Snider, Amadou Soumare; and Amanda Wright. Any opinions expressed are those of the author and not those of Statistics Canada.

## I. Introduction

The Consumer Price Index (CPI) has become widely accepted as the measure of inflation. It dominates most media and economists' comments on the inflation outlook. One reason of this pre-eminence is that the CPI is calculated with extraordinary care. The prices of over 660 different classes of goods and services in 19 Canadian geographical areas are sampled on a monthly basis<sup>1</sup>. Considerable thought has been given, over a number of years, to methods by which this information is then put together to produce the index. However, there is no international consensus on how price change for owned accommodation is measured in the CPI.

Since shelter is an important element in most people's household budgets, it is also the most important component of the CPI. Shelter includes three components: rented accommodation, owned accommodation; and water, fuel and electricity. Owned accommodation accounts for more than half of the shelter expenditures. Expenditure weights and price movements of the owned accommodation component in the CPI are critically dependent on the choice of the approach for measuring owned accommodation. There are several approaches used by official statistical agencies in their respective CPI. In contrast, the Gross Domestic Product Price Deflator (an alternative price deflator to CPI), there is an international consensus to use the rental equivalence approach to measure owned accommodation costs.

There are many uses for the CPI and in principal the main use of the CPI determines its design. It is used by Central Banks to monitor their monetary policies and maintain inflation within a target range. It is used in official indexation arrangements (e.g. for the up-rating of pensions and tax allowances) and is used as the basis for most wage negotiations in both private and public sectors. It is finally used as a price deflator in many economic analysis and researches by business analysts and economists.

As part of the ongoing research program to better understand and adopt enhanced statistical concepts and techniques to improve the Canadian CPI, this paper presents twelve alternative owned accommodation series based on six different concepts, including the official one. It is the first time that the Diewert and Nakamura (2009) opportunity cost approach is estimated using survey data. Owned accommodation, shelter and CPI-all items indexes are presented for these alternatives (all other components are based on the official concept). It is based on 2001, 2005, 2009, and 2011 surveys of household expenditures, with the intention of being linked to historic series<sup>2</sup> and being produced on a monthly basis.

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<sup>1</sup> Some goods and services are sampled on an intermittent basis (quarterly, semi-annual, etc).

<sup>2</sup> The historic series covers the period from January 1982 to August 2000.

This analytical series are firstly, intended to allow the comparison of the Canadian CPI with other countries' CPI using a common approach to the treatment of owned accommodation and secondly, to stimulate a debate on this important issue. There is no tendency to change the fundamental orientation or the purpose of the CPI as a measure of inflation.

## **II. Treatment of Owned Accommodation in the CPI: definition and Concepts**

The CPI measures the change in the cost of a fixed basket of goods and services that Canadians typically buy. These include shelter (housing services), an important element of consumer spending.

In a market economy, there is relatively little difficulty in measuring the price of housing services, which is given by the rent that a landlord charges for providing accommodation. A rise in average rents represents (keeping the same quality of the provided services) a rise in price.

The problem starts when the landlord and occupier is the same person: there is consumption of housing services but no measurable rent. How statistical agencies should treat the owned accommodation in their CPI is a complex and difficult question. Price of owned accommodation service is difficult to identify and measure. Because of the importance of owned accommodation in the CPI, each alternate measure generates a different result. Thus, the choice affects the use of the resulting CPI.

### ***Option I: Excluding Owned Accommodation from CPI***

Conceptually, an owner-occupied dwelling can be considered as an investment or as a consumption good, or both. Hence, one option is to consider owned accommodation as a pure investment and therefore exclude from the CPI any effect of price change related to the purchase and use of an owned accommodation.

### ***Option II: Net Purchase***

If owned accommodation is considered as consumption good, one option would be to treat owned accommodation similarly to other durables in the CPI. That is, CPI will attribute all expenditure on housing purchase to the period of purchase, even though the use of this housing extends beyond that period. In this option, only net purchase of dwellings in the reference year is used in the owned accommodation weight.

Dion and Sabourin (2011) provide a detailed evaluation and analysis of owned accommodation approaches and the variety of CPI users' needs and requirements. They find the net purchase approach has an interesting characteristic for the purpose of measuring price inflation for monitoring central bank monetary policies, because it encompasses instantly the effect of housing price increase in the CPI. However, the net purchase approach is not consistent with the purpose of an escalator for nominal income (cost of living indexing), because it does not take into account the flows of service that are generated by owned accommodation.

### ***Option III: Rental Equivalence***

A third option is to account for the shelter services that are generated by an owned accommodation, as if the homeowner to be renting his dwelling to himself. Since, these service prices are not observable and can't be priced on the base of a market transaction, we need to impute the price movement from another series, such as the rent series. This approach is the Rental Equivalence approach in which owned accommodation weight in the CPI is based on the estimated rental expenditure by homeowners.

The advantage of this approach is that services obtained from owned accommodation are treated symmetrically with shelter services obtained in the market, i.e. whether the house occupier is a tenant or a homeowner does not prevent statisticians from comparing their aggregate consumption expenditures across households.

The Rental Equivalence approach as a measure of current consumption is suitable for cost-of-living indexing. However, because of the absence of a direct housing price effect on its measure, the rental equivalence index has a limited use for monetary policy purposes (Dion and Sabourin, 2011). In fact, there is an indirect effect of housing price in the rental equivalent owned accommodation prices. This occurs since they are imputed from tenant rent prices which are affected, at least in long term, by the housing price changes.

### ***Option IV: Current Official Treatment of owner-occupied dwellings in the Canadian CPI***

In the Canadian context, treatment of owned accommodation is essentially determined by the main purpose that CPI is designed to serve. The official Canadian CPI is designed to be an indicator of changes in consumer prices experienced by Canadians. Hence, as the rented accommodation index is designed to detect the impact of price changes on tenants' specific cost of shelter, the owned accommodation index is also designed to detect the impact of price changes on homeowners' specific cost.

The homeowners' specific cost of shelter is related to the stock of dwellings that is equivalent to those that were actually owned in the reference year by the target population.

The Canadian CPI compilation is based on the assumption that price indexes pertain to commodities that are identical or equivalent to those that were actually purchased in the reference year of the CPI basket. Hence, CPI indexes measure the impact of price changes on the cost of buying a fixed basket of commodities. The owned accommodation index measures the impact of price changes in the cost of using a fixed stock of dwellings.

Homeowners' specific cost of shelter in the Canadian CPI includes the following components:

- Replacement cost or depreciation cost<sup>3</sup>
- Mortgage interest cost
- Property taxes
- The cost of homeowners' insurance
- The cost of homeowners' maintenance and repair

### ***Mortgage interest Cost***

Owned accommodation is not treated in the Canadian CPI in the same manner as other durable goods. This inconsistency is justified by the fact that other durable goods have, in general, much shorter useful lives, lower values and less complicated terms of payment than owned accommodation. Although these differences are of a quantitative rather than of a qualitative nature, they are important enough to be taken into account in the computation of the CPI.

Since almost all owned shelter acquisitions are made through mortgage credit, it is important to consider mortgage credit as an integral part of dwelling purchase, and it would not be appropriate to disregard the impact of changing mortgage interest rates on the overall shelter price index. In addition, since mortgage payments for purchased dwellings are spread over many years<sup>4</sup>, it is important to take into account not only their current but also their previous prices, in order to produce an appropriate indicator of the impact of price on the cost of owned accommodation in the CPI.

### ***Replacement Cost***

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<sup>3</sup> This is the amount of owned accommodation that is assumed to be used up

<sup>4</sup> In the Canadian CPI, we assume that housing stock is bought by the target population within the 25 years before the reference year.

The second most important component of owned accommodation is the replacement cost. The foremost of the costs of owning a house, like any other item of capital equipment, is a wasting asset. It can lose value not just through wear and tear but also by becoming “obsolescent”. This actual loss in value is not generally recognised because it is hidden by the apparently inexorable rise in the price of houses nationwide. Yet it is a clear example of the true cost of housing services, which is that the stock has to be continually renewed to match the changing pattern of demand.

This cost should certainly be taken into account in the owned accommodation component that defines the price of housing service in the Canadian CPI. It is imputed based on 1.5 (or 1.4) per cent per annum depreciation rate on housing value.

The official Canadian measure of owned accommodation attempts to measure the flow of owned shelter service by accounting for homeowners’ specific cost, which make it consistent with cost-of-living indexing. In addition, the housing price changes affect the official Canadian measure of owned accommodation through two main components: the mortgage interest cost and replacement cost<sup>5</sup>, which make it useful to the Bank of Canada’s monetary policy monitoring mission. Dion and Sabourin (2011) find it to be a good compromise between monetary policy purpose and escalation purpose.

#### ***Option V: Payment Approach***

This approach assumes that owned accommodation service is equivalent to the actual payments made by homeowners such as mortgage payments and other operating expenditures. Imputed costs are excluded by definition, as are other costs which are considered to be investment costs.

Almost all official owned accommodation items can be considered as cash payments, and would be in scope under the payment approach. These items are mortgage interest cost, property taxes, homeowners’ insurance premium, homeowners’ maintenance and repair, and other owned accommodation expenses. The only exception is replacement cost, which represents essential required expenditures to restore lost value of owned accommodation by becoming “obsolescent”. It is considered to be unreal cost as an imputed item, and is excluded from the owned accommodation cost under the payment approach.

Some economists argue that payment approach is appropriate for CPI’s primary use as an escalator of money income; however, Dion and Sabourin (2011) find it not compatible for monetary policy purpose.

#### ***Option VI: User Cost Approach***

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<sup>5</sup> Dion and Sabourin (2011) find mortgage interest cost and replacement cost significantly sensitive at medium term to housing price movements.

The user cost approach is derived from capital theory that assumes user cost is an estimation of rental price based on the costs of owning a house. User cost encompasses actual and imputed costs for owner accommodation. Hence, an owner would incur interest costs during the period of ownership (actual interest costs on mortgages and/or forgone rate of return on owned funds which could otherwise have earned interest), a replacement cost, and other operating costs (such as maintenance and repairs fees, property taxes and insurance premiums). Offsetting these expenses would be an expected capital gain (the expected selling price at the end of the year less the purchase price).

User cost is defined as follows:

$$u^t \equiv r_D^t D^t + r^t (V^t - D^t) + O^t - (E(V^{t+1}) - V^t)$$

$r_D^t$  is the mortgage interest rate

$D^t$  is the amount of debt on home at the beginning of period

$r^t$  is the forgone rate of return on owned funds

$V^t$  is the market price of home at the beginning of period

$O^t$  is the operating cost at the end of period

$E(V^{t+1})$  is the forecasted expected value of home as of the end of period

According to the official concept, owned accommodation excludes capital gain (considered as negative cost) and forgone rate of return on owned funds invested in the home; these are excluded as expenses related to investment rather than consumption.

We estimate the two missing components of user cost, expected capital gain and forgone rate of return, based on a 25 year average assumption (referred as DV user cost based on 25 year avareg). Hence, the expected capital gain is based on 25 years prior home price information. This length of time presents the length of the lag on house prices in the existing CPI calculation.

Finally, we estimate the basic model of user cost by calculating the capital gain estimate as ex post housing price growth rate and Verbrugge Variant (VV) of the user cost, by estimating the expected capital gain based on four quarters (or one year) of prior home price information. In order to generate these two variants of user cost, we set the forgone rate of return on owned funds as equal to the interest rate on homeowner mortgage or home equity debts (Diewert et al., 2011).

There are a number of problem with this approach. The first question is whether it is right to capture the increase in wealth that occurs when house prices rise via a price index. It seems reasonable to assert that people feel better off in a housing boom not

because the price of housing services has fallen, but because their comprehensive income (earnings plus capital gains) has risen. It seems odd to try and capture this increase in welfare statistically via a fall in a price index.

The second question is whether the approach overstates the extent to which people are made better off by a housing boom. The formula implicitly treats the increase in wealth due to a rise in value of a house exactly on par with the cost of borrowing. But typically interest charges are cash outgoings, while the capital gain on the house is a notional increase in wealth which may never be realised.

The User cost approach is consistent with a cost-of-living index. However, there is a negative relationship between expected housing appreciation and the user cost. That is, in a period of increasing house prices, there is a significant risk of having a negative value of the estimate of market rental price using the user cost approach. Using this estimation in the CPI makes it less credible and less useful for monitoring central bank monetary policies.

### ***Option VII: Diewert and Nakamura's Opportunity Cost Approach***

Due to the limits of the user cost approach and the assumption that considers user cost as an estimator of market rental price, it has become questionable (Verbrugge ,2008) to use this approach to measure owned accommodation services. In response, Diewert and Nakamura (2009) came up with a new approach called the opportunity cost approach.

The opportunity cost approach is developed by considering a situation of arbitrage that homeowners would face every year. During the period of ownership an owner would evaluate at the beginning of each year the market information on his house value, interest rates, expected capital gain and their effect on his wealth and debt level. He would then decide whether to sell his home (not staying a homeowner anymore) or continue to own it for an expected number of years and whether to rent out his home or occupy it for that period.

A homeowner who decides to remain and occupy his home for the next year is passing the opportunity of selling it at the beginning of the year or renting it out during the next year (Diewert and Nakamura, 2009).

Diewert and Nakamura (2009) present the opportunity cost as the gain that individual homeowner forgoes by not choosing the best decision:

- At the individual homeowner level, Diewert and Nakamura (2009) define Owned Accommodation Opportunity Cost (OAOC) as the maximum of what cost to rent an equivalent dwelling (the rental opportunity cost, ROC) and the financial opportunity costs (FOC).



The ROC component, which is defined as a forgone rent that the homeowner could receive if he decided to rent out his home, is equivalent to the imputed rent.

The FOC component, referred as the Diewert variant or DV user cost, is similar to user cost, where expected capital gain<sup>6</sup> is based on a longer expectation period.

- At the national level, Diewert and Nakamura define OAOC index as a weighted expenditure share of rental equivalence index (ROC) and financial opportunity cost (FOC) index, where expenditure share weight of rental equivalence is the estimated proportion of owned accommodation for which ROC is higher than FOC.

Diewert and Nakamura (2009) opportunity cost corrects the user cost approach limitation in the case of higher housing price expectations, where there is a significant risk of having a negative value of user cost estimates. As the maximum value of rental equivalent and user cost, the DV opportunity cost will never be zero or negative. This situation is associated with a homeowner who has positive or null home equity. However, the DV opportunity cost ignores the situation where a homeowner has a negative home equity. This situation is challenging because we can't apply the same situation of opportunity cost arbitrage, and the decision options are quite different.

In term of CPI use, this characteristic of a combination of rental equivalent and user cost approaches make it consistent with the cost-of-living indexing; however, Dion and Sabourin (2011) find it challenging in terms of monetary policy use. In fact, it still embraces the limit of including an interest rate component of the user cost.

### **III. Weights Estimation**

In this section, we will present the estimation method of each component weight of all indexes. Information on expenditure weights are essentially derived from the survey of household expenditures for 2001, 2005, 2009 and 2011.

This section does not describe the official estimation of owned accommodation (see the CPI reference paper). It will cover the new components and required adjustments of some owned accommodation components to match each one of these approaches.

The owned accommodation under the payment approach includes all official components except replacement cost, whereas the CPI excluding owned accommodation calculation does not include any components of the official owned accommodation.

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<sup>6</sup> Shimizu, Diewert, Nishimura, and Watanabe estimate the expected capital gain using a geometric average of housing price growth rates for the past 5 years.

## 1- Net purchase approach:

All basket update surveys include information on the purchase price of homes (new or resale) bought in the survey year and the selling price of homes sold in the survey year. We estimate two types of expenditure weights of the net home purchase, one including land and a second excluding land (housing only) by applying the house to land ratio on the difference between purchase price of the home bought and selling price of the home sold in the survey year (see formula below). To be coherent with the official CPI scope, we have only included transactions on principal dwellings. Transactions on vacation dwellings are excluded.

Net Home Purchase (Housing Only)

$$= \left[ \begin{array}{l} \text{Value of Purchase Price of Home Bought in Survey Year} \\ - \text{Value of Selling Price of Home Sold in Survey Year} \end{array} \right] \times (\text{House to Land Ratio})$$

The estimation of net home purchase by urban centre and baskets encompasses a risk of having an unreliable (some case negative) expenditure weight on net home purchase in some urban centres, because the proportion of sample households that buy or sell a home is small. As a result, it is important to apply regional expenditure weights for these urban centres and adjust for the difference in homeownership ratio between the given urban centre and its region.

In addition, there is an important issue associated with the volatility of expenditures weights through baskets. This is due mainly to the cyclical feature of the housing market, so the expenditure weights can vary significantly from one basket to another, especially in a reference year considered to be a recession year. Hence, it would be important in these reference years to calculate the net home purchase as an average of expenditures weights of multiple years.

In this approach, for the other components of owned accommodation, we have used the official expenditure weights for Property Taxes, Homeowners' Insurance Premiums, and Homeowners' Maintenance and Repair.

## 2- Rental equivalence approach:

**Rental Equivalent or imputed rent**

Unfortunately, the 2001 and 2005 surveys did not ask any questions that would permit the estimation of an equivalent rent weight. However, the 2009 and 2011 surveys asked the following question "if you were to rent this dwelling today, how much would you

expect to rent it for monthly, unfurnished and without utilities?” The annual expenditure weight for rental equivalent is calculated by annualizing these monthly values.

In the survey years 2001 and 2005, we estimate the rental equivalent by applying the ratio of imputed homeowner rent to tenant’s rent (based on the personal expenditure values from the national accounts) to the tenant’s rent reported in the survey.

The estimated values of rental equivalent seem to be upward-biased. Since most rented homes include appliances, there is good reason to think that the estimated rental values of owned accommodation also include the rental of some appliances provided with houses<sup>7</sup>. To adjust for that, we would need to extend the rental approach to some durables, which is outside the scope of this project. Hence, there is no adjustment made on the rental equivalent expenditure weights.

In addition to this option based on survey data (and imputed values for 2001 and 2005), we estimate as well the rental equivalent expenditure weight based only on the national account personal expenditure values for imputed rent.

### **Homeowners’ Maintenance and Repair**

The weight of homeowners’ maintenance and repair in rental equivalence series includes expenditure which the tenant usually incurs on materials and services for minor maintenance and repairs. Since 2005, the household survey has started to collect detailed information on maintenance and repair made by homeowners. We have used this information to estimate homeowners’ maintenance and repair under the rental equivalence concept. We only include materials and services on painting and wall papering, interior walls and ceilings, electrical fixtures and equipment and plumbing fixtures and equipment.

For the 2001 homeowners’ maintenance and repair calculation, we apply the 2005 ratio of rental equivalence homeowners’ material and labour costs to total official homeowners’ material and labour costs, to the 2001 total official homeowners’ material and labour costs.

### **Homeowners’ Insurance Premiums**

The weight of homeowners’ insurance premiums in the rental equivalence concept is less than the official homeowners’ insurance premium expenditure weights because there are differences between homeowner and tenant insurance contract coverage. The

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<sup>7</sup> BLS adjust the costs for large appliances and certain types of home insurance by subtracting a proportion by comparing full expenditures paid for these by homeowners and the expenditures by renters for item for the same type of rental units.

first difference is that homeowner insurance contract includes replacement cost, i.e. the insurance company covers the construction cost in the homeowner insurance contract. In contrast, tenant insurance covers essentially the tenant's personal belongings, such as furniture, and the payment of any damage to the landlords' building and his neighbours' personal belongings.

We estimate the homeowners' insurance premiums in the rental equivalence approach by multiplying the average value of tenant insurance premium per tenant by the ratio of owner to tenant households. This estimation is downward-biased because tenant occupied residence and owner occupied dwellings are not similar. Owner occupied dwellings are larger and more expensive. We then adjust this estimate by multiplying by an adjustment factor that accounts for this difference.

### **3- User cost approach**

The different options of estimating the user cost vary on the estimation of expected capital gain and forgone rate of return on owned funds. Hence, in all user cost approach options, we use the official expenditure weights of Mortgage Interest Cost, Property Taxes, Homeowners' Insurance Premiums, and Homeowners' Maintenance and Repair.

#### **Expected capital gain**

The capital gain is the most important element of user cost. Its estimation method has an important effect on user cost estimated values, and thus its reliability.

To estimate the capital gain, we start by calculating the value of owned accommodation by multiplying the reported value of the home owned by the reported percentage of households that are homeowners. We then multiply this value by an expected annual capital gain.

$$\begin{aligned} \text{Expected Capital Gain} = & \\ & (\text{Value of Home Owned} \times \text{Homeowner Percentage}) \\ & \times \text{Expected Annual Capital Gain Rate} \end{aligned}$$

The expected capital gain price change is a slowly changing function of past house price changes. The number of years over which these expectations are formed will have a significant effect on the result. We have experimented with various averages:

In DV Variant and VV Variant, the Expected Annual Capital Gain Rates are respectively the annual average of 60 and 12 months geometric mean of monthly prior home price changes. In Basic user cost, Capital Gain Rate is an annual average of monthly home price changes.

In DV user cost based on a 25 year average, we estimate the expected capital gain based on 25 years of prior home price information. The Expected Annual Capital Gain Rate is calculated as an annual average of 300 months geometric mean of monthly prior home price changes.

### Foregone rate of return on owned funds

The foregone rate of return is also an important element of user cost. Its estimation method has an important effect on the volatility of user cost indexes, which could make the use of this approach challenging for many CPI users.

To estimate the foregone rate of return expenditure weights, we start by calculating the value of capital invested on owned accommodation, by taking the difference between the product of reported value of home owned by reported percentage of homeowner and mortgage outstanding. This value of capital invested on owned accommodation is then multiplied by a rate of return. We apply one type of rate for all user cost options.

Forgone Return on Owned Funds =

$$\left[ (\text{Value of Home Owned} \times \text{Homeowner Percentage}) - \text{Mortgage Outstanding} \right] \times \text{Annual Rate of Return}$$

In DV user cost<sup>8</sup>, VV user cost and Basic user cost, the annual rate of return is the annual average of monthly 5-years average of residential mortgage rate, the highest return rate on investment during the estimation period.

In DV user cost based on 25 years average, we estimate the forgone rate of return on owned funds by annualizing the monthly weighted geometric mean over 25 years of 5-years average mortgage interest rates, defined as follows:

$$r_i = \prod_{j=i-300}^i (r_m^j)^{w_j} = \exp\left( \sum_{j=i-300}^i w_j \cdot r_m^j \right)$$

Where

$r_m^j$  is the 5-years average mortgage interest rate in month  $j$ ,

$w_j$  is the fixed weight associated for month  $j$  based on its rank to the current month  $i$ .

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<sup>8</sup> We choose Average 5-years residential mortgage lending rate because it has the highest return rate. We also generate the DV user cost using 10 years Government of Canada bond yields. Both estimates generate the same conclusion.

Ideally, these weights should be estimated on the base of owned funds invested in owned accommodation by homeowners. Similarly to the weighted estimated for the sub-mortgage cost index calculation, H (this sub-index estimates the impact of changes in dwelling prices on the amount of principal outstanding), we could assume survey housing stock is bought during these 25 years and estimate the series of 300 weights based on the information provided by household: the date of buying owned accommodation, the owned accommodation value and the amount of mortgage outstanding during the survey year. However, in this paper we estimate  $w_j$  as the inverse distribution of mortgage outstanding weights used to estimate the sub-mortgage cost index. We assume survey housing stock is bought during these 25 years, and their owned fund distribution is the inverse of outstanding weights distribution over time. Houses bought in the 5 years before the reference years have less weight to the total in terms of owned funds invested in owned houses than houses bought 20 years before the reference years. Whereas, using mortgage outstanding as the unit of measure to estimate these weights will generate the opposite result (see table below).

	reference year	Forgone Rate of Return Internal Weights	Mortgage Interest Cost Internal Weights
Before the Reference Year	Year 1	0.61	12.61
	Year 2	0.69	11.05
	Year 3	0.78	9.69
	Year 4	0.88	8.50
	...	...	...
	Year 22	8.50	0.88
	Year 23	9.69	0.78
	Year 24	11.05	0.69
	Year 25	12.61	0.61
	Sum	100.00	100.00

#### 4- Opportunity cost approach

As mentioned by Diewert and Nakamura, at the national level, the expenditure share of OAOC is the weighted expenditure share of the rental equivalence index (ROC) and the financial opportunity cost index (FOC), where the expenditure weight of rental equivalence is the estimated proportion of owned accommodations for which ROC is higher than FOC.

Ideally, we need to estimate this portion by year or by basket based on the available information (household survey or other) for the reference year. Hence, this requires

information on the period in which the household is planning to occupy his owned dwelling, the market value of his house, the mortgage interest rate, the expected rate of return, the expected capital gain by type of homes etc. There is no household survey that collects this level of required data to estimate the opportunity cost at individual and national levels.

In addition, as an empirical limit of this approach, because of the time lag to implement an expenditure basket, the estimated portion of household that is required to estimate the opportunity cost index could not be appropriate for the period when the basket is implemented.

In this project, we have used information on rent, housing price, and income in the estimation of these portions by basket. We account for the time lag of basket implementation in our arbitrary decisions.

Flowchart 1 presents price-to-income ratio above its long-term average, which can be considered a measure of the affordability of housing. It also presents the price-to-rent ratio above its long-term average, which can be considered as a measure of the profitability of owning a house.

The economic interpretation is simple; increases in housing prices cannot deviate in the long term from growth in rent. The choice of being a homeowner or a renter is affected by the relative levels of prices and rents. High prices relative to rents should push more households into renting, reducing pressures on housing prices and pushing rents up. Similarly, increases in housing prices cannot deviate in the long term from growth in income. If housing price growth exceeds income growth, at some point households will no longer be able to afford to buy and demand will decline and bring prices down.

However, the economic literature calls for caution in interpreting these ratios in terms of overvaluation or undervaluation of housing prices because of the lack of stationarity<sup>9</sup> in price-to-income and price-to-rent ratios. In addition, deviation of price-to-income or price-to-rent ratios from their averages may be the result of structural changes, such as deregulation of mortgage markets, changes in rental market regulations, property taxation and land-use planning rules.

Nevertheless, we analyse these ratios during the period of estimation to set the proportion of rental equivalent to financial opportunity cost. The proportion of households for which the rental equivalent is higher than their financial opportunity

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<sup>9</sup> André, Gil-Alana and Gupta (2013) investigate the persistence of housing price-to-income and price-to-rent ratios in 16 OECD countries over a 40-year period, using a fractional integration framework. They find in Canada the assumption of mean-reversion of price-to-income ratio and price-to-rent ratio can clearly be rejected.

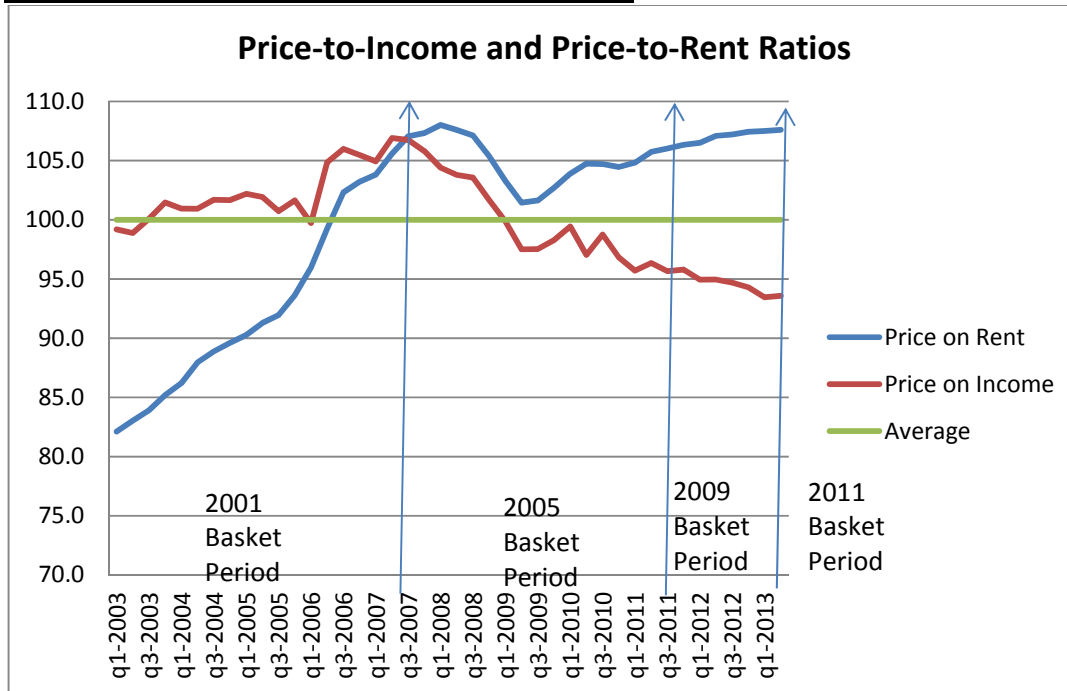
cost varies by basket and urban centre. However, in this project, we assume the proportion is constant across urban centres but varies by baskets.

For the implementation period of the 2001 basket, starting from January 2003 to July 2007, we see that the Price-to-Rent ratio has increased surpassing its average in the four quarters of 2005, and Price-to-Income ratio is close to its average, except for the period starting from the second quarter of 2005. The economic interpretation of the first ratio is that it is better for a household to own than to rent their houses, and the second ratio is that most households cannot afford to buy houses. Hence, we arbitrarily set the proportion as 30% ROC and 70% FOC (similar to Dion and Sabourin, 2011)

For the period starting from July 2007 to June 2013, Price-to-Rent ratio has increased significantly surpassing its average, which means it is better for households to rent than to own their houses. However, Price-to-Income ratio has declined, and was below its average almost during this period; which means that growth in income is surpassing growth in housing price, and household affordability is improving. Hence, we arbitrarily set the proportion as 70% ROC and 30% FOC.



**Chart1: Price-to-Income and Price-to-Rent Ratios**



For both Financial opportunity costs (DV user cost and DV user cost based on 25-years average), we use the Rental Equivalent Approach, where expenditure weights are estimated based on the expenditure survey data.

Table 1 presents the expenditure shares of owned accommodation (OA) in the CPI by approach. The OA share varies by basket and differs considerably depending on the adopted treatment of owned accommodation. Table 2 presents the distribution of expenditures over the various components of owned accommodation. The choice of treatment of owned accommodation can have a significant impact on the CPI.

Different pictures emerge in each basket, expenditures aggregates vary significantly from one approach to another. Hence, based on the 2001 basket, the expenditure aggregates vary from a low of \$396,235,261,000 (excluding OA) to \$498,391,570,000 (DV user cost), a \$102,156,309,000 difference. The relative weight of shelter also varies from a low of 12.7% to 30.6%.

The 2005 basket expenditure aggregates vary from a low of \$482,639,472,000 (excluding OA) to \$591,715,815,000 (Rental equivalence, based on SNA data source), a \$109,076,343,000 difference. The relative weight of shelter also varies from a low of 12.0% to 28.2%.

The 2009 basket expenditure aggregates vary from a low of \$564,140,613,000 (excluding OA) to \$780,098,521,000 (VV user cost), a \$215,957,908,000 difference. The relative weight of shelter also varies from a low of 12.8% to 37.0%.

Finally, the 2011 basket expenditure aggregates vary from a low of \$544,288,010,000 (excluding OA) to \$783,193,847,000 (Net Purchase Approach), a \$238,905,837,000 difference. The relative weight of shelter also varies from a low of 12.2% to 30.5%.

However, the measures that include owned accommodation (OA), the owned accommodation weight varies respectively:

- from 11.8% (Net Purchase Approach, Housing Only) to a high of 20.5% (DV User Cost Approach) in 2001;
- from 10.2% (Basic User Cost) to a high of 18.4% (Rental Equivalence Approach, SNA data source) in 2005;
- from 13.3% (Payments Approach) to a high of 27.7% (VV User Cost Approach) in 2009;
- from 11.8% (Payments Approach) to a high of 20.8% (Net Purchase approach) in 2011 .

Over time and for the same approach, the expenditure share of owned accommodation is less volatile using the official approach, without OA, payments and rental equivalence approaches, whereas the other approaches show a high weight volatility, which would be a concern.

In Table 2 expenditure share values vary by components depending on the adopted treatment of owned accommodation, as would be expected. Capital gain, as a negative (cost) expenditure, varies considerably by user cost variant. Under DV variant based on 25 years average, capital gains were less volatile over time, as opposite to the other user cost variant. As counterintuitive result, capital gain using basic user cost and VV variant were (costs) expenditures in 2009, presenting 9.2% and 19.4% of all owned accommodation expenditure respectively.

## **IV. Price Indexes Estimations and Sources**

In this section, we will describe the price index calculation of each component of these approaches.

### **1- Net purchase Approach:**

The new housing price index is used as a price index for net purchases of houses. However, this index has limitations because it does not include new condominium or resale houses<sup>10</sup>. It would be better to price the series using a residential price index.

At the urban centre level, we may need to impute prices from a higher geographic region, because of low numbers of transactions or low new house construction, which can affect the reliability of the urban new house price index.

We use the official price index for Property Taxes, Homeowners' Insurance Premiums, and Homeowners' Maintenance and Repair.

### **2- Rental Equivalence Approach:**

In this paper, we assume that the rent price index is a good estimator of the rental equivalent price index. However, the equivalent rent price index for each urban centre could be estimated as a weighted average of rent indexes for apartments (excluding bachelor apartments) and houses. The weights for these two dwelling types would be derived from the owned accommodation estimate for the survey.

There is a high chance that houses are rented with utilities such as fuel, electricity, water or furniture compared to apartment rentals; therefore, the movement of rent price in the CPI could be influenced by these elements. We didn't adjust rent series for any utilities or furniture.

The index of homeowners' maintenance and repair under the rental equivalence approach is based on prices of the type of maintenance and repair materials and services that are covered under the rental equivalence approach. The index of homeowners' insurance premium is based on the tenants' insurance premium price indexes<sup>11</sup> adjusted to the furniture price index.

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<sup>10</sup> Net purchase house stock can include resale houses bought by new homeowners. Hence, net purchase price should include resale house prices.

<sup>11</sup> Tenants' insurance premiums price index is escalated by furniture price index.

### 3- User cost approach

The different options of estimating the user cost vary only in the estimation of expected capital gain, forgone rate of return on owned funds, and mortgage interest cost. Hence, in all user cost approach options, we use the official price indexes of Property Taxes, Homeowners' Insurance Premiums, and Homeowners' Maintenance and Repair.

#### Expected capital gain

In DV user cost based on 25-year average, we apply the 25 years geometric mean where Monthly Capital Gain Rates is defined as follows:

$$r_i = \prod_{j=i-300}^i (P_j/P_{j-1} - 1) = \exp\left(\sum_{j=i-300}^i (P_j/P_{j-1} - 1)\right)$$

Where

$P_j$  is the new housing price index in month  $j$ ,

In DV user cost, the Capital Gain Rate per month is calculated as a geometric mean of prior 60 months home price changes. In VV user cost, the Capital Gain Rate per month is calculated as a geometric mean of prior 12 months home price changes. As for the Basic user cost, the Capital Gain Rate per month is calculated as monthly home price changes.

Chart 2 presents the capital gain price index of each user cost variant. As expected, the capital gain price change estimated using the longer period presents a smoother growth rate. Hence, capital gain of basic user cost is the most volatile, where capital gain price index decreases during the period of housing price declines from August 2008 to July 2009. Both DV user cost variants do not show a decline during the 2008-2009 recession period, with a average growth rate of 4.13% per annum for DV user cost capital gain, and of 3.09% per annum for DV user cost based on 25 years average.

**Chart2: Capital Gain Price Index by User Cost Variant**

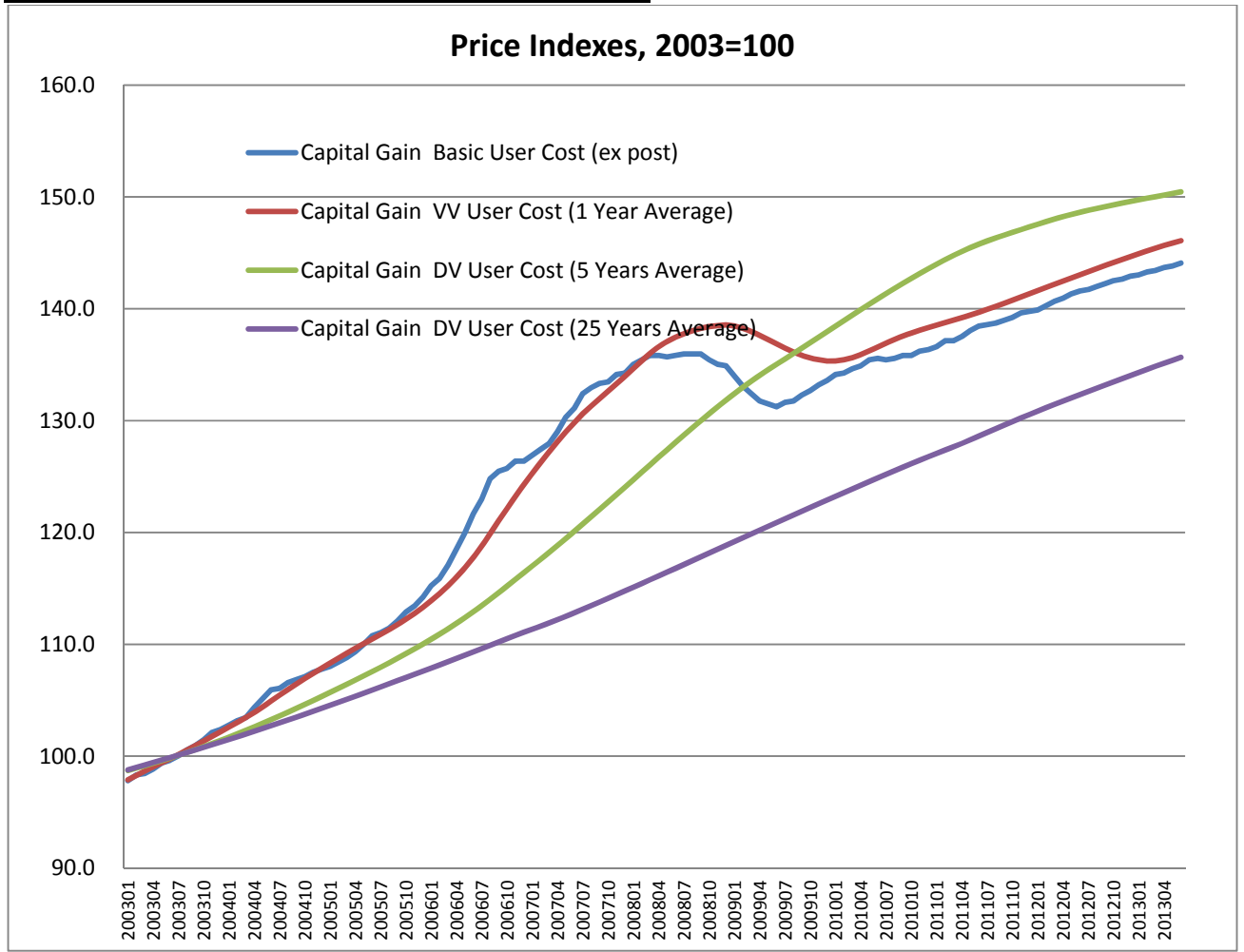
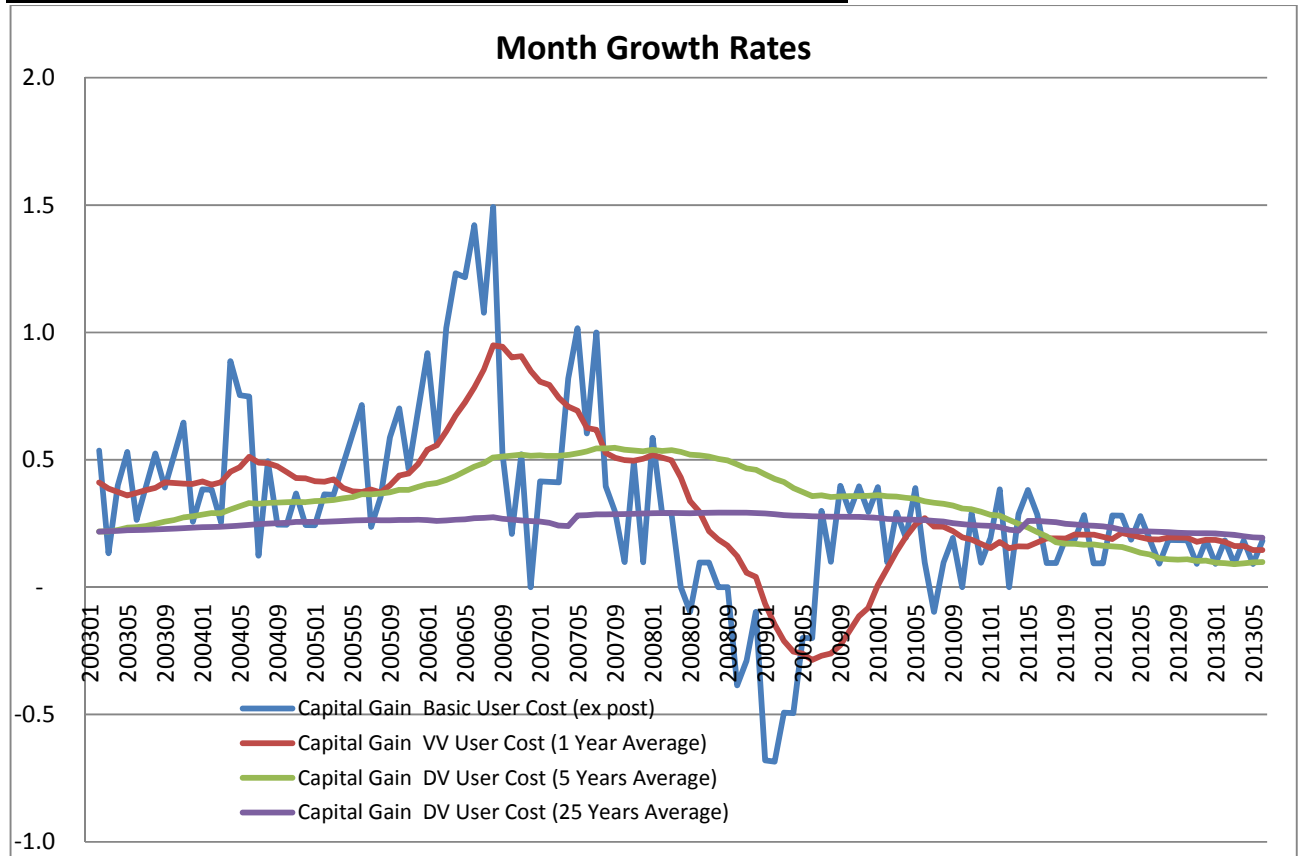


Chart 3 shows the monthly growth of the capital gain price index by user cost variant. The monthly growth rate of the capital gain using basic user cost was the most volatile. It peaked in July 2006, with a rate of 1.5%, and its lowest rate was in January 2009 (-0.7%). The capital gains of VV user cost were cyclical showing an increase from January 2003 to July 2006 and then a decline to July 2009. Both basic user cost and VV user cost capital gains were affected by the housing price decline from August 2008 to July 2009. Monthly capital gain growth rates under DV user cost were stable during the period of study. It started at 0.3% to reach more than 0.5% in the period from July 2006 to July 2008. It then declined to 0.1% during the 2011-2013 period. The monthly growth rate of the capital gain under the DV variant based on 25 years average was almost fixed at approximately a 0.3% growth rate.

**Chart3: Monthly Capital Gain Price Change by User Cost Variant<sup>12</sup>**



### Foregone rate of return

The forgone rate of return index for any given month is calculated as a product of the following two indexes, which are computed separately:

- An index  $K_i$  which estimates the impact of changes in dwelling prices on the amount invested in the dwelling, assuming a fixed stock of dwellings and the same opportunity of investment; and
- An index  $R_i$  which estimates the impact of changes in rate of return on owned funds invested in the dwelling, assuming a fixed amount invested in dwelling.

The price index estimating the effect of housing price changes:

$$K_i = \sum_{j=i-300}^i w_j \cdot P_j$$

<sup>12</sup> Because of limit number of observation on prior housing price change, we have used 240 month observations to estimate the capital gain during the 2001 basket period, 288 month observations during the 2005 basket period and 300 month observations during the 209 and 2011 basket periods.

The price index estimating the rate of return changes:

$$R_i = \prod_{j=i-300}^i (r_m^j)^{w_j} = \exp\left(\sum_{j=i-300}^i w_j \cdot r_m^j\right)$$

Where

$P_j$  is the new housing price index in month  $j$ ,

$r_m^j$  is the 5-year average mortgage interest rate in month  $j$ ,

$w_j$  is the fixed weight associated in month  $j$  based on its rank to the current month  $i$ .

In DV user cost, VV user cost, and basic user cost calculations, the foregone rate of return is the product of two price indexes. The first index is the housing price index and the second index is the average 5-year residential mortgage rate index.

### **Mortgage interest cost**

In the DV user cost based on a 25-year average, we use the official mortgage interest cost index. In DV user cost, VV user cost and basic user cost calculations, the mortgage interest rate index is the product of the housing price index and the average 5-year residential mortgage rate index.

## **V. Comparison Analysis**

Table 3, Table 4 and Table 5 show the CPI all items, shelter and owned accommodation respectively. The estimation period of these analytical series run from January 2003 to June 2013. This period covers the 2008-2009 Canadian economic recession and witness an important increase in house prices. It includes also a decline in housing prices and housing demand which started in August 2008 and lasted until July 2009.

The owned accommodation series based on the net purchase approach reflect these changes in house prices which contribute to their higher rates of price change relative to the official series and other series. Of the two net purchase series, the one including house and land price change shows a growth rate of 3.65% per annum, by far the highest rates of price change, followed by the series based on housing only price changes (3.60% per annum).

The rental equivalence series show a significantly lower rate of price change (1.30%) per annum. This is due essentially to two factors. On average, the rental equivalence

approach has the highest owned accommodation expenditure share associated with the lowest owned accommodation rates of price change.

The payment approach series drops below the official concept series for most of the estimation period, with a rate of 2.13% per annum. This index is equivalent to the official concept series excluding replacement cost, and the replacement cost component showed a high rate of increase over the estimation period.

Under the user cost approach, DV user cost shows the lowest rate of price change (-1.53% per annum), and DV user cost based on a 25 year average has the highest rate per annum (0.66%). This can be explained by the low price changes during the period starting July 2008 to June 2013 (Table 9), where for DV user cost it is -9.24% per annum and only -2.85% per annum for DV user cost based on a 25 year average, reflecting the substantial difference in expected capital gain price estimates (5 versus 25 years previous housing price change).

The opportunity cost approach using DV user cost based on a 25 year average has a growth rate of 1.49% per annum, and using DV user cost has a growth rate of 1.25%. Similarly to the user cost approach, the opportunity cost approach using DV user cost has a negative growth rate of -1.74% during the period from July 2008 to June 2013. It is important to mention the opportunity cost approach results are primarily affected by the arbitrary proportion of ROC vs. FOC, but intuitively its results are less volatile than the user cost approach and its growth rates are higher than the rental equivalence approach growth rates.

Chart 14 shows the 12-month growth rate of the Official CPI and other analytical series over the period 2004-2013. All the analytical series track the official CPI fairly closely.

All variants of user cost present both volatile owned accommodation expenditures shares and price indexes. Owned accommodation series based on user cost are far more volatile than its official counterpart (see chart 11). CPI series using the user cost approach are far more volatile than the official index, reflecting essentially the inconsistency impact of expected capital gain price changes on the owned accommodation estimates. The DV user cost based on a 25-year average tracks better the official CPI (Chart 15), because it differentiates from the official series by two components (forgone rate of return and expected capital gain). The volatility of housing price changes is heavily diluted by the 25-year average, which is part of the owned accommodation components.



We conclude that alternatives measures of owned accommodation, with the exception of rental equivalence approach, produce an index of inflation which is less stable than the official measure but much quicker to reflect the inflationary pressure implicit in rising house prices.

## **VI. Conclusion**

The treatment of owned accommodation is one of the most difficult and controversial issues faced by CPI compilers. Statistical agencies usually implement a variant of approaches listed in the CPI Manual. However, there is no best method; each one has its own limits.

Ideally, the approach chosen should align with the conceptual basis that best satisfies the principal purpose of the CPI. The treatment of owned accommodation in the Canadian CPI is designed to detect the impact of price changes on homeowners' specific costs. We attempt to measure the price induced changes in the cost of using, instead of buying, a fixed stock of dwellings.

In fact, none of the known and feasible approaches to the treatment of owned accommodation can serve equally well all of the purposes for which the Canadian CPI is used. Hence, the Consumer Prices Division also produces some analytical index series for owned accommodation based on different approaches, including series based on rental equivalence approach, net purchase approach, payment approach, some variants of the user cost and opportunity cost approaches.

The movements of analytical CPI all items are not so very different. However, under the user cost approach the CPI series are far more volatile than the official index, reflecting the inconsistent impact of expected capital gain price changes on the owned accommodation estimates. The DV user cost based on a 25-year average, in which volatility of housing price changes are heavily diluted by the 25-year average that enter the owned accommodation components, tracks better the official CPI.

We conclude that, generally, alternatives measures of owned accommodation, with the exception of rental equivalence approach, produce an index of inflation which is less stable than the official measure but much quicker to reflect the inflationary pressure implicit in rising house prices.

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**Table 1: Expenditures and Weights by Major Components**

Baskets	2001		2005		2009		2011	
	Expenditure \$	Weight %	Expenditure \$	Weight %	Expenditure \$	Weight %	Expenditure \$	Weight %
<b>Official Approach</b>								
All Items	469,148,364		571,532,643		678,445,521		734,103,918	
All Excluding Shelter	345,856,701	73.7%	424,611,211	74.3%	491,717,653	72.5%	544,288,010	74.1%
Shelter	123,291,663	26.3%	146,921,432	25.7%	186,727,867	27.5%	189,815,909	25.9%
Rented Accommodation	29,496,727	6.3%	31,279,581	5.5%	42,259,446	6.2%	43,457,652	5.9%
Owned Accommodation	72,913,104	15.5%	88,893,171	15.6%	114,304,908	16.8%	113,918,875	15.5%
Water, Fuel and Electricity	20,881,832	4.5%	26,748,681	4.7%	30,163,514	4.4%	32,299,999	4.4%
<b>CPI Without Owned Accommodation</b>								
All Items	396,235,261		482,639,472		564,140,613		620,185,043	
All Excluding Shelter	345,856,701	87.3%	424,611,211	88.0%	491,717,653	87.2%	544,288,010	87.8%
Shelter	50,378,560	12.7%	58,028,261	12.0%	72,422,959	12.8%	75,897,033	12.2%
Rented Accommodation	29,496,727	7.4%	31,279,581	6.5%	42,259,446	7.5%	43,457,652	7.0%
Water, Fuel and Electricity	20,881,832	5.3%	26,748,681	5.5%	30,163,514	5.3%	32,299,999	5.2%
<b>Payments Approach</b>								
All Items	455,228,898		554,159,511		650,962,525		702,885,428	
All Excluding Shelter	345,856,701	76.0%	424,611,211	76.6%	491,717,653	75.5%	544,288,010	77.4%
Shelter	109,372,197	24.0%	129,548,300	23.4%	159,244,871	24.5%	158,597,418	22.6%
Rented Accommodation	29,496,727	6.5%	31,279,581	5.6%	42,259,446	6.5%	43,457,652	6.2%
Owned Accommodation	58,993,638	13.0%	71,520,039	12.9%	86,821,912	13.3%	82,839,767	11.8%
Water, Fuel and Electricity	20,881,832	4.6%	26,748,681	4.8%	30,163,514	4.6%	32,299,999	4.6%
<b>Rental Equivalence Approach, SNA Data Source</b>								
All Items	487,361,553		591,715,815		700,286,409		767,565,736	
All Excluding Shelter	345,856,701	71.0%	424,611,211	71.8%	491,717,653	70.2%	544,288,010	70.9%
Shelter	141,504,852	29.0%	167,104,604	28.2%	208,568,756	29.8%	223,277,727	29.1%
Rented Accommodation	29,496,727	6.1%	31,279,581	5.3%	42,259,446	6.0%	43,457,652	5.7%
Owned Accommodation	91,126,293	18.7%	109,076,343	18.4%	136,145,797	19.4%	147,520,076	19.2%
Water, Fuel and Electricity	20,881,832	4.3%	26,748,681	4.5%	30,163,514	4.3%	32,299,999	4.2%

**Table 1: Expenditures and Weights by Major Components (con't)**

Baskets	2001		2005		2009		2011	
	Expenditure \$	Weight %	Expenditure \$	Weight %	Expenditure \$	Weight %	Expenditure \$	Weight %
<b>Rental Equivalence Approach, SHS Data Source</b>								
All Items	481,639,871		575,059,768		685,870,312		736,643,818	
All Excluding Shelter	345,856,701	71.8%	424,611,211	73.8%	491,717,653	71.7%	544,288,010	73.9%
Shelter	135,783,170	28.2%	150,448,557	26.2%	194,152,658	28.3%	192,355,809	26.1%
Rented Accommodation	29,496,727	6.1%	31,279,581	5.4%	42,259,446	6.2%	43,457,652	5.9%
Owned Accommodation	85,404,611	17.7%	92,420,296	16.1%	121,729,699	17.7%	116,598,158	15.8%
Water, Fuel and Electricity	20,881,832	4.3%	26,748,681	4.7%	30,163,514	4.4%	32,299,999	4.4%
<b>Net Purchase Approach, Housing and Land</b>								
All Items	456,037,143		560,458,599		670,015,374		783,193,847	
All Excluding Shelter	345,856,701	75.8%	424,611,211	75.8%	491,717,653	73.4%	544,288,010	69.5%
Shelter	110,180,442	24.2%	135,847,389	24.2%	178,297,720	26.6%	238,905,837	30.5%
Rented Accommodation	29,496,727	6.5%	31,279,581	5.6%	42,259,446	6.3%	43,457,652	5.5%
Owned Accommodation	59,801,883	13.1%	77,819,127	13.9%	105,874,761	15.8%	163,148,187	20.8%
Water, Fuel and Electricity	20,881,832	4.6%	26,748,681	4.8%	30,163,514	4.5%	32,299,999	4.1%
<b>Net Purchase Approach, Housing Only</b>								
All Items	449,106,713		551,393,959		653,436,747		753,163,747	
All Excluding Shelter	345,856,701	77.0%	424,611,211	77.0%	491,717,653	75.3%	544,288,010	72.3%
Shelter	103,250,012	23.0%	126,782,749	23.0%	161,719,094	24.7%	208,875,737	27.7%
Rented Accommodation	29,496,727	6.6%	31,279,581	5.7%	42,259,446	6.5%	43,457,652	5.8%
Owned Accommodation	52,871,453	11.8%	68,754,487	12.5%	89,296,135	13.7%	133,118,087	17.7%
Water, Fuel and Electricity	20,881,832	4.6%	26,748,681	4.9%	30,163,514	4.6%	32,299,999	4.3%

**Table 1: Expenditures and Weights by Major Components (con't)**

Baskets	2001		2005		2009		2011	
	Expenditure \$	Weight %	Expenditure \$	Weight %	Expenditure \$	Weight %	Expenditure \$	Weight %
<b>User Cost Approach</b>								
<b>Basic User Cost</b>								
All Items	486,615,423		537,469,143		755,675,985		743,771,061	
All Excluding Shelter	345,856,701	71.1%	424,611,211	79.0%	491,717,653	65.1%	544,288,010	73.2%
Shelter	140,758,722	28.9%	112,857,932	21.0%	263,958,331	34.9%	199,483,051	26.8%
Rented Accommodation	29,496,727	6.1%	31,279,581	5.8%	42,259,446	5.6%	43,457,652	5.7%
Owned Accommodation	90,380,163	18.6%	54,829,671	10.2%	191,535,372	25.3%	123,725,401	16.6%
Water, Fuel and Electricity	20,881,832	4.3%	26,748,681	5.0%	30,163,514	4.0%	32,299,999	4.3%
<b>VV User Cost</b>								
All Items	487,802,944		550,862,909		780,098,521		750,208,955	
All Excluding Shelter	345,856,701	70.9%	424,611,211	77.1%	491,717,653	63.0%	544,288,010	72.5%
Shelter	141,946,242	29.1%	126,251,698	22.9%	288,380,868	37.0%	205,920,945	27.5%
Rented Accommodation	29,496,727	6.0%	31,279,581	5.7%	42,259,446	5.4%	43,457,652	5.8%
Owned Accommodation	91,567,683	18.8%	68,223,437	12.4%	215,957,909	27.7%	130,163,295	17.3%
Water, Fuel and Electricity	20,881,832	4.3%	26,748,681	4.9%	30,163,514	3.9%	32,299,999	4.3%
<b>DV User Cost</b>								
All Items	498,391,570		559,338,266		654,183,134		740,401,090	
All Excluding Shelter	345,856,701	69.4%	424,611,211	75.9%	491,717,653	75.2%	544,288,010	73.5%
Shelter	152,534,869	30.6%	134,727,056	24.1%	162,465,480	24.8%	196,113,081	26.5%
Rented Accommodation	29,496,727	5.9%	31,279,581	5.6%	42,259,446	6.5%	43,457,652	5.7%
Owned Accommodation	102,156,309	20.5%	76,698,794	13.7%	90,042,521	13.8%	120,355,430	16.2%
Water, Fuel and Electricity	20,881,832	4.2%	26,748,681	4.8%	30,163,514	4.6%	32,299,999	4.3%
<b>DV User Cost-- 25 years average</b>								
All Items	483,439,659		573,080,744		685,879,292		745,595,362	
All Excluding Shelter	345,856,701	71.5%	424,611,211	74.1%	491,717,653	71.7%	544,288,010	73.0%
Shelter	137,582,957	28.5%	148,469,534	25.9%	194,161,639	28.3%	201,307,352	27.0%
Rented Accommodation	29,496,727	6.1%	31,279,581	5.5%	42,259,446	6.2%	43,457,652	5.8%
Owned Accommodation	87,204,398	18.0%	90,441,272	15.8%	121,738,679	17.7%	125,549,701	16.8%
Water, Fuel and Electricity	20,881,832	4.3%	26,748,681	4.7%	30,163,514	4.4%	32,299,999	4.3%

**Table 2: Owned Accommodation (OA) Component Weights Shares by Approach**

Baskets	2001		2005		2009		2011	
	Expenditure \$	Weight %	Expenditure \$	Weight %	Expenditure \$	Weight %	Expenditure \$	Weight %
<b>Official Approach</b>								
Owned Accommodation	72,912,820		88,893,171		114,304,908		114,044,241	
Mortgage Interest Cost	26,156,848	35.9%	29,507,942	33.2%	39,429,671	34.5%	30,294,342	26.6%
Replacement Cost	13,919,466	19.1%	17,373,132	19.5%	27,482,996	24.0%	31,218,490	27.4%
Property Taxes (including special charges)	14,885,087	20.4%	18,692,913	21.0%	21,609,336	18.9%	23,900,795	21.0%
Homeowners' Insurance Premiums	3,651,900	5.0%	4,913,330	5.5%	6,356,557	5.6%	7,675,826	6.7%
Homeowners' Mortgage Insurance	848,045	1.2%	1,163,677	1.3%	1,657,262	1.4%	1,172,317	1.0%
Homeowners' Maintenance and Repair	8,284,960	11.4%	8,680,623	9.8%	8,713,282	7.6%	8,839,998	7.8%
Other Owned Accommodation Expenses	5,166,514	7.1%	8,561,553	9.6%	9,055,805	7.9%	10,942,473	9.6%
<b>Payments Approach</b>								
Owned Accommodation	58,993,354		71,520,039		86,821,912		82,825,751	
Mortgage Interest Cost	26,156,848	44.3%	29,507,942	41.3%	39,429,671	45.4%	30,294,342	36.6%
Property Taxes (including special charges)	14,885,087	25.2%	18,692,913	26.1%	21,609,336	24.9%	23,900,795	28.9%
Homeowners' Insurance Premiums	3,651,900	6.2%	4,913,330	6.9%	6,356,557	7.3%	7,675,826	9.3%
Homeowners' Mortgage Insurance	848,045	1.4%	1,163,677	1.6%	1,657,262	1.9%	1,172,317	1.4%
Homeowners' Maintenance and Repair	8,284,960	14.0%	8,680,623	12.1%	8,713,282	10.0%	8,839,998	10.7%
Other Owned Accommodation Expenses	5,166,514	8.8%	8,561,553	12.0%	9,055,805	10.4%	10,942,473	13.2%



<b>Rental Equivalence Approach, SNA Data Source</b>								
Owned Accommodation	85,404,611		92,420,296		121,729,699		116,598,158	
Rent Equivalent	80,383,344	94.1%	87,411,946	94.6%	116,517,911	95.7%	111,864,928	95.9%
Homeowners' Insurance Premiums (RE)	1,299,487	1.5%	1,521,696	1.6%	2,006,149	1.6%	1,606,730	1.4%
Homeowners' Maintenance and Repair (RE)	3,721,780	4.4%	3,486,654	3.8%	3,205,639	2.6%	3,126,500	2.7%

**Table 2: Owned Accommodation (OA) Component Weights Shares by Approach (con't)**

Baskets	2001		2005		2009		2011	
	Expenditure \$	Weight %	Expenditure \$	Weight %	Expenditure \$	Weight %	Expenditure \$	Weight %
<b>Rental Equivalence Approach, SHS Data Source</b>								
Owned Accommodation	91,126,293		109,076,343		136,145,797		147,520,076	
Rent Equivalent	86,014,000	94.4%	103,783,000	95.1%	130,690,000	96.0%	142,349,000	96.5%
Homeowners' Insurance Premiums (RE)	1,390,513	1.5%	1,806,688	1.7%	2,250,158	1.7%	2,044,576	1.4%
Homeowners' Maintenance and Repair (RE)	3,721,780	4.1%	3,486,654	3.2%	3,205,639	2.4%	3,126,500	2.1%
<b>Net Purchase Approach, Housing and Land</b>								
Owned Accommodation	59,801,883		77,819,127		105,874,761		163,148,187	
Net Home Purchase	27,813,422	46.5%	36,970,708	47.5%	60,139,782	56.8%	111,810,454	68.5%
Property Taxes (including special charges)	14,885,087	24.9%	18,692,913	24.0%	21,609,336	20.4%	23,879,436	14.6%
Homeowners' Insurance Premiums	3,651,900	6.1%	4,913,330	6.3%	6,356,557	6.0%	7,675,826	4.7%
Homeowners' Maintenance and Repair	8,284,960	13.9%	8,680,623	11.2%	8,713,282	8.2%	8,839,998	5.4%
Other Owned Accommodation Expenses	5,166,514	8.6%	8,561,553	11.0%	9,055,805	8.6%	10,942,473	6.7%

<b>Net Purchase Approach, Housing Only</b>								
Owned Accommodation	52,871,453		68,754,487		89,296,135		133,118,087	
Net Home Purchase	20,882,992	39.5%	27,906,068	40.6%	43,561,156	48.8%	81,780,354	61.4%
Property Taxes (including special charges)	14,885,087	28.2%	18,692,913	27.2%	21,609,336	24.2%	23,879,436	17.9%
Homeowners' Insurance Premiums	3,651,900	6.9%	4,913,330	7.1%	6,356,557	7.1%	7,675,826	5.8%
Homeowners' Maintenance and Repair	8,284,960	15.7%	8,680,623	12.6%	8,713,282	9.8%	8,839,998	6.6%
Other Owned Accommodation Expenses	5,166,514	9.8%	8,561,553	12.5%	9,055,805	10.1%	10,942,473	8.2%

**Table 2: Owned Accommodation (OA) Component Weights Shares by User Cost Variants (con't)**

Baskets	2001		2005		2009		2011	
	Expenditure \$	Weight %	Expenditure \$	Weight %	Expenditure \$	Weight %	Expenditure \$	Weight %
<b>Basic User Cost</b>								
Owned Accommodation	90,380,163		54,829,671		191,535,372		123,725,401	
Forgone Rate of Return	42,057,352	46.5%	51,447,933	93.8%	59,658,929	31.1%	62,333,194	50.4%
Mortgage Interest Cost	26,156,848	28.9%	29,507,942	53.8%	39,429,671	20.6%	30,294,342	24.5%
Replacement Cost	13,919,466	15.4%	17,373,132	31.7%	27,482,996	14.3%	31,218,490	25.2%
Capital Gain	24,590,293	-27.2%	85,511,433	-156.0%	17,571,535	9.2%	52,666,052	-42.6%
Property Taxes (including special charges)	14,885,087	16.5%	18,692,913	34.1%	21,609,336	11.3%	23,900,795	19.3%
Homeowners' Insurance & Mortgage Insurance Premiums	4,500,229	5.0%	6,077,007	11.1%	8,013,819	4.2%	8,862,159	7.2%
Homeowners' Maintenance and Repair	8,284,960	9.2%	8,680,623	15.8%	8,713,282	4.5%	8,839,998	7.1%
Other Owned Accommodation Expenses	5,166,514	5.7%	8,561,553	15.6%	9,055,805	4.7%	10,942,473	8.8%
<b>VV User Cost</b>								
Owned Accommodation	91,567,683		68,223,437		215,957,909		130,163,295	
Forgone Rate of Return	42,057,352	45.9%	51,447,933	75.4%	59,658,929	27.6%	62,333,194	47.9%
Mortgage Interest Cost	26,156,848	28.6%	29,507,942	43.3%	39,429,671	18.3%	30,294,342	23.3%
Replacement Cost	13,919,466	15.2%	17,373,132	25.5%	27,482,996	12.7%	31,218,490	24.0%
Capital Gain	23,402,773	-25.6%	72,117,667	-105.7%	41,994,071	19.4%	46,228,157	-35.5%
Property Taxes (including special charges)	14,885,087	16.3%	18,692,913	27.4%	21,609,336	10.0%	23,900,795	18.4%
Homeowners' Insurance & Mortgage Insurance Premiums	4,500,229	4.9%	6,077,007	8.9%	8,013,819	3.7%	8,862,159	6.8%
Homeowners' Maintenance and Repair	8,284,960	9.0%	8,680,623	12.7%	8,713,282	4.0%	8,839,998	6.8%
Other Owned Accommodation Expenses	5,166,514	5.6%	8,561,553	12.5%	9,055,805	4.2%	10,942,473	8.4%

**Table 2: Owned Accommodation (OA) Component Weights Shares by User Cost Variants (con't)**

Baskets	2001		2005		2009		2011	
	Expenditure \$	Weight %	Expenditure \$	Weight %	Expenditure \$	Weight %	Expenditure \$	Weight %
<b>DV User Cost</b>								
Owned Accommodation	102,156,309		76,698,794		90,042,521		120,355,430	
Forgone Rate of Return	42,057,352	41.2%	51,447,933	67.1%	59,658,929	66.3%	62,333,194	51.8%
Mortgage Interest Cost	26,156,848	25.6%	29,507,942	38.5%	39,429,671	43.8%	30,294,342	25.2%
Replacement Cost	13,919,466	13.6%	17,373,132	22.7%	27,482,996	30.5%	31,218,490	25.9%
Capital Gain	12,814,146	-12.5%	63,642,310	-83.0%	83,921,316	-93.2%	56,036,022	-46.6%
Property Taxes (including special charges)	14,885,087	14.6%	18,692,913	24.4%	21,609,336	24.0%	23,900,795	19.9%
Homeowners' Insurance & Mortgage Insurance Premiums	4,500,229	4.4%	6,077,007	7.9%	8,013,819	8.9%	8,862,159	7.4%
Homeowners' Maintenance and Repair	8,284,960	8.1%	8,680,623	11.3%	8,713,282	9.7%	8,839,998	7.3%
Other Owned Accommodation Expenses	5,166,514	5.1%	8,561,553	11.2%	9,055,805	10.1%	10,942,473	9.1%
<b>DV User Cost-- 25 years average</b>								
Owned Accommodation	87,204,398		90,441,272		121,738,679		125,549,701	
Forgone Rate of Return	40,573,417	46.5%	49,104,034	54.3%	52,206,812	42.9%	53,748,733	42.8%
Mortgage Interest Cost	26,156,848	30.0%	29,507,942	32.6%	39,429,671	32.4%	30,294,342	24.1%
Replacement Cost	13,919,466	16.0%	17,373,132	19.2%	27,482,996	22.6%	31,218,490	24.9%
Capital Gain	26,282,122	-30.1%	47,555,933	-52.6%	44,773,041	-36.8%	42,257,289	-33.7%
Property Taxes (including special charges)	14,885,087	17.1%	18,692,913	20.7%	21,609,336	17.8%	23,900,795	19.0%
Homeowners' Insurance & Mortgage Insurance Premiums	4,500,229	5.2%	6,077,007	6.7%	8,013,819	6.6%	8,862,159	7.1%
Homeowners' Maintenance and Repair	8,284,960	9.5%	8,680,623	9.6%	8,713,282	7.2%	8,839,998	7.0%
Other Owned Accommodation Expenses	5,166,514	5.9%	8,561,553	9.5%	9,055,805	7.4%	10,942,473	8.7%

**Table 3: Analytical Consumer Price Series for CPI All Items**

<b>Official Approach</b>														
	January	February	March	April	Mai	June	July	August	September	October	November	December	Annual	Annual Growth Rate
2003	99.2	100.0	100.4	99.7	99.7	99.8	99.9	100.2	100.4	100.0	100.3	100.4	100.0	
2004	100.5	100.7	101.1	101.3	102.2	102.2	102.2	102.0	102.2	102.4	102.7	102.6	101.8	1.8%
2005	102.4	102.9	103.5	103.7	103.8	104.0	104.3	104.7	105.5	105.0	104.9	104.7	104.1	2.2%
2006	105.3	105.1	105.7	106.3	106.8	106.6	106.7	106.8	106.3	106.0	106.3	106.5	106.2	2.0%
2007	106.5	107.2	108.2	108.6	109.1	108.9	109.0	108.7	108.9	108.6	108.9	109.0	108.5	2.1%
2008	108.8	109.2	109.6	110.5	111.5	112.3	112.7	112.5	112.6	111.4	111.0	110.3	111.0	2.4%
2009	110.0	110.7	111.0	110.8	111.6	112.0	111.6	111.7	111.6	111.5	112.2	111.7	111.4	0.3%
2010	112.0	112.5	112.5	112.9	113.2	113.1	113.7	113.6	113.7	114.2	114.4	114.4	113.4	1.8%
2011	114.6	115.0	116.2	116.6	117.3	116.6	116.8	117.0	117.4	117.6	117.6	117.0	116.7	2.9%
2012	117.5	117.9	118.4	118.9	118.9	118.3	118.2	118.6	118.7	118.9	118.6	117.9	118.4	1.5%
2013	118.0	119.4	119.6	119.4	119.7	119.7								
<b>CPI Without Owned Accommodation</b>														
	January	February	March	April	Mai	June	July	August	September	October	November	December	Annual	Annual Growth Rate
2003	99.4	100.2	100.6	99.7	99.7	99.7	99.9	100.2	100.4	99.8	100.1	100.2	100.0	
2004	100.3	100.5	100.9	101.1	102.2	102.2	102.1	101.8	101.9	102.0	102.4	102.1	101.6	1.6%
2005	102.0	102.5	103.1	103.4	103.4	103.6	103.9	104.4	105.4	104.6	104.4	104.2	103.7	2.1%
2006	104.8	104.5	105.1	105.8	106.2	105.9	106.0	106.1	105.3	104.8	105.1	105.2	105.4	1.6%
2007	105.2	106.0	107.0	107.4	107.9	107.6	107.6	107.2	107.4	106.9	107.1	107.1	107.0	1.6%
2008	106.9	107.3	107.7	108.6	109.8	110.6	111.0	110.8	110.9	109.3	108.8	107.9	109.1	1.9%
2009	107.5	108.4	108.8	108.6	109.6	110.1	109.6	109.7	109.7	109.5	110.3	109.7	109.3	0.2%
2010	110.1	110.7	110.7	111.1	111.4	111.2	111.8	111.7	111.9	112.3	112.5	112.4	111.5	2.0%
2011	112.7	113.1	114.6	115.1	115.9	115.0	115.2	115.5	115.9	116.0	116.1	115.2	115.0	3.2%
2012	115.8	116.4	117.0	117.4	117.4	116.7	116.6	117.1	117.2	117.4	117.0	116.2	116.8	1.6%
2013	116.4	118.0	118.2	117.9	118.3	118.3								

**Table 3: Analytical Consumer Price Series for CPI All Items (con't)**

<b>Payments Approach</b>														
	January	February	March	April	Mai	June	July	August	September	October	November	December	Annual	Annual Growth Rate
2003	99.3	100.1	100.4	99.7	99.7	99.8	99.9	100.2	100.3	100.0	100.2	100.3	100.0	
2004	100.4	100.6	101.0	101.2	102.1	102.1	102.0	101.8	102.0	102.2	102.6	102.4	101.7	1.7%
2005	102.2	102.6	103.2	103.5	103.6	103.8	104.0	104.4	105.3	104.8	104.6	104.4	103.9	2.1%
2006	105.0	104.8	105.3	105.9	106.4	106.2	106.3	106.4	105.7	105.5	105.8	105.9	105.8	1.8%
2007	105.9	106.7	107.6	108.0	108.5	108.3	108.4	108.1	108.3	108.0	108.3	108.3	107.9	2.0%
2008	108.1	108.5	109.0	109.8	110.9	111.7	112.1	111.9	112.0	110.8	110.4	109.7	110.4	2.4%
2009	109.3	110.1	110.4	110.3	111.1	111.5	111.1	111.2	111.1	111.0	111.7	111.2	110.8	0.4%
2010	111.5	111.9	112.0	112.3	112.6	112.4	113.1	113.0	113.1	113.6	113.8	113.7	112.7	1.7%
2011	114.0	114.3	115.6	116.1	116.8	116.0	116.2	116.4	116.8	117.0	117.0	116.3	116.0	2.9%
2012	116.8	117.3	117.8	118.3	118.2	117.7	117.5	117.9	118.1	118.3	117.9	117.2	117.8	1.5%
2013	117.3	118.7	118.9	118.7	119.0	119.0								
<b>Rental Equivalence Approach, SHS Data Source</b>														
	January	February	March	April	Mai	June	July	August	September	October	November	December	Annual	Annual Growth Rate
2003	99.4	100.1	100.4	99.7	99.7	99.8	99.9	100.2	100.4	99.9	100.2	100.3	100.0	
2004	100.3	100.6	100.9	101.1	102.0	102.0	101.9	101.7	101.8	101.9	102.3	102.0	101.5	1.5%
2005	101.9	102.3	102.9	103.1	103.2	103.3	103.6	104.0	104.8	104.2	104.0	103.9	103.4	1.9%
2006	104.4	104.2	104.7	105.2	105.6	105.4	105.5	105.6	104.9	104.5	104.8	104.9	105.0	1.5%
2007	104.9	105.6	106.5	106.9	107.3	107.1	107.1	106.8	107.0	106.5	106.8	106.8	106.6	1.6%
2008	106.6	107.0	107.3	108.1	109.2	109.9	110.3	110.1	110.2	108.9	108.5	107.8	108.6	1.9%
2009	107.4	108.2	108.5	108.4	109.3	109.7	109.3	109.5	109.5	109.3	110.0	109.6	109.1	0.4%
2010	109.9	110.4	110.4	110.7	111.0	110.8	111.4	111.4	111.5	111.9	112.1	112.0	111.1	1.9%
2011	112.3	112.6	113.9	114.3	115.0	114.3	114.5	114.7	115.1	115.2	115.3	114.6	114.3	2.9%
2012	115.1	115.6	116.1	116.5	116.5	116.0	115.9	116.3	116.5	116.6	116.4	115.7	116.1	1.6%
2013	115.9	117.2	117.4	117.3	117.5	117.6								

**Table 3: Analytical Consumer Price Series for CPI All Items (con't)**

<b>Rental Equivalence Approach, SNA Data Source</b>														
	January	February	March	April	Mai	June	July	August	September	October	November	December	Annual	Annual Growth Rate
2003	99.4	100.1	100.4	99.7	99.7	99.8	99.9	100.2	100.4	99.9	100.2	100.3	100.0	
2004	100.4	100.6	100.9	101.1	101.9	102.0	101.9	101.7	101.8	101.9	102.2	102.0	101.5	1.5%
2005	101.9	102.3	102.9	103.1	103.2	103.3	103.6	104.0	104.8	104.2	104.0	103.9	103.4	1.9%
2006	104.4	104.1	104.7	105.2	105.6	105.4	105.4	105.5	104.9	104.5	104.8	104.9	105.0	1.5%
2007	104.9	105.6	106.5	106.8	107.3	107.1	107.1	106.8	107.0	106.5	106.8	106.8	106.6	1.6%
2008	106.6	107.0	107.3	108.1	109.1	109.8	110.2	110.1	110.1	108.9	108.5	107.8	108.6	1.9%
2009	107.5	108.2	108.5	108.4	109.3	109.7	109.3	109.5	109.5	109.3	110.0	109.6	109.1	0.4%
2010	109.9	110.4	110.4	110.7	111.0	110.8	111.4	111.4	111.5	111.8	112.1	112.0	111.1	1.9%
2011	112.3	112.6	113.8	114.3	114.9	114.2	114.4	114.6	115.0	115.1	115.2	114.5	114.2	2.8%
2012	115.0	115.5	116.0	116.4	116.4	115.9	115.8	116.2	116.4	116.5	116.3	115.7	116.0	1.5%
2013	115.8	117.1	117.3	117.2	117.4	117.5								
<b>Net Purchase Approach, Housing and Land</b>														
	January	February	March	April	Mai	June	July	August	September	October	November	December	Annual	Annual Growth Rate
2003	99.2	100.0	100.3	99.6	99.7	99.7	99.9	100.2	100.4	100.1	100.4	100.5	100.0	
2004	100.6	100.9	101.3	101.5	102.5	102.6	102.5	102.4	102.5	102.8	103.1	102.9	102.1	2.1%
2005	102.8	103.2	103.9	104.2	104.3	104.5	104.7	105.2	106.1	105.6	105.5	105.4	104.6	2.4%
2006	106.0	105.8	106.5	107.2	107.7	107.5	107.7	107.9	107.2	107.0	107.3	107.3	107.1	2.4%
2007	107.4	108.2	109.1	109.5	110.1	109.9	110.0	109.7	109.8	109.5	109.8	109.8	109.4	2.2%
2008	109.6	110.0	110.4	111.2	112.2	112.9	113.3	113.1	113.2	111.9	111.4	110.7	111.7	2.1%
2009	110.3	111.0	111.2	111.0	111.9	112.4	112.0	112.1	112.2	112.1	112.9	112.5	111.8	0.1%
2010	112.8	113.3	113.5	113.8	114.2	114.0	114.6	114.6	114.7	115.2	115.4	115.4	114.3	2.2%
2011	115.7	116.1	117.3	117.9	118.6	117.9	118.1	118.3	118.7	118.9	119.0	118.3	117.9	3.2%
2012	118.8	119.3	119.9	120.4	120.4	119.8	119.7	120.2	120.4	120.6	120.3	119.7	120.0	1.7%
2013	119.8	121.2	121.4	121.2	121.5	121.5								

**Table 3: Analytical Consumer Price Series for CPI All Items (con't)**

<b>Net Purchase Approach, Housing Only</b>														
	January	February	March	April	Mai	June	July	August	September	October	November	December	Annual	Annual Growth Rate
2003	99.2	100.0	100.3	99.6	99.7	99.7	99.9	100.2	100.4	100.1	100.4	100.5	100.0	
2004	100.6	100.8	101.2	101.5	102.5	102.5	102.5	102.3	102.4	102.7	103.0	102.8	102.1	2.1%
2005	102.7	103.1	103.8	104.1	104.2	104.4	104.6	105.1	106.0	105.5	105.3	105.2	104.5	2.4%
2006	105.9	105.6	106.3	106.9	107.5	107.3	107.4	107.6	106.9	106.6	106.9	107.0	106.8	2.2%
2007	107.1	107.8	108.8	109.2	109.7	109.5	109.6	109.3	109.4	109.1	109.4	109.4	109.0	2.1%
2008	109.2	109.5	109.9	110.8	111.8	112.5	113.0	112.7	112.8	111.5	111.1	110.3	111.3	2.0%
2009	109.9	110.6	110.9	110.7	111.6	112.0	111.7	111.8	111.8	111.8	112.5	112.1	111.5	0.2%
2010	112.5	113.0	113.1	113.4	113.8	113.6	114.3	114.2	114.3	114.8	115.1	115.0	113.9	2.2%
2011	115.3	115.7	117.0	117.5	118.3	117.5	117.7	117.9	118.4	118.6	118.6	117.9	117.5	3.2%
2012	118.4	118.9	119.5	120.0	120.0	119.4	119.3	119.8	120.0	120.2	119.9	119.3	119.6	1.7%
2013	119.4	120.8	121.0	120.8	121.1	121.1								



**Table 3: Analytical Consumer Price Series for CPI All Items, User Cost Variants (con't)**

<b>Basic User Cost</b>														
	January	February	March	April	May	June	July	August	September	October	November	December	Annual	Annual Growth Rate
2003	99.5	100.4	100.9	100.4	99.8	98.8	99.1	99.9	100.3	99.7	100.5	100.6	100.0	
2004	100.2	99.8	99.7	100.6	102.3	103.0	103.0	102.6	102.7	103.0	103.2	102.6	101.9	1.9%
2005	102.3	102.7	103.3	103.8	103.6	103.2	103.4	103.9	104.8	104.6	104.9	104.9	103.8	1.8%
2006	105.7	105.8	106.5	107.5	108.4	108.5	109.1	109.3	108.4	107.9	108.1	107.9	107.7	3.8%
2007	108.0	109.0	109.7	110.1	111.0	112.5	112.8	112.6	112.7	112.6	113.0	113.1	111.4	3.4%
2008	113.1	113.2	113.1	113.3	113.7	114.4	115.4	114.7	114.5	114.2	113.8	111.8	113.8	2.1%
2009	110.1	109.2	109.0	107.6	108.0	109.4	109.8	109.9	109.4	109.4	110.4	109.2	109.3	-3.9%
2010	109.4	109.7	109.8	111.7	112.6	112.0	112.1	111.4	110.7	111.0	110.9	111.0	111.0	1.6%
2011	111.5	112.3	113.7	114.9	115.4	114.2	114.2	114.3	114.4	114.3	114.5	113.9	114.0	2.6%
2012	114.2	114.4	114.8	115.8	115.8	115.0	114.9	115.3	115.4	115.5	115.2	114.7	115.1	1.0%
2013	114.8	116.1	116.0	115.8	116.1	116.0								
<b>VV User Cost</b>														
	January	February	March	April	May	June	July	August	September	October	November	December	Annual	Annual Growth Rate
2003	99.5	100.4	100.8	100.4	99.8	98.8	99.1	99.9	100.3	99.7	100.6	100.6	100.0	
2004	100.2	99.9	99.7	100.7	102.3	103.0	103.1	102.6	102.7	103.0	103.2	102.6	101.9	1.9%
2005	102.3	102.7	103.3	103.8	103.6	103.3	103.4	104.0	104.8	104.6	104.9	105.0	103.8	1.8%
2006	105.8	105.9	106.6	107.6	108.6	108.8	109.3	109.5	108.7	108.1	108.3	108.0	107.9	4.0%
2007	108.1	109.1	109.7	110.2	111.1	112.6	113.0	112.8	112.9	112.7	113.1	113.1	111.6	3.4%
2008	113.1	113.2	113.1	113.2	113.5	114.2	115.2	114.5	114.2	113.8	113.4	111.4	113.6	1.8%
2009	109.6	108.6	108.4	107.0	107.4	108.7	109.2	109.4	109.0	109.2	110.2	109.1	108.8	-4.2%
2010	109.4	109.7	109.8	111.7	112.6	112.0	112.0	111.3	110.6	110.8	110.8	110.9	111.0	2.0%
2011	111.4	112.2	113.6	114.7	115.2	114.0	114.1	114.2	114.2	114.2	114.4	113.8	113.8	2.6%
2012	114.1	114.3	114.7	115.7	115.7	115.0	114.8	115.2	115.3	115.5	115.2	114.7	115.0	1.0%
2013	114.8	116.0	115.9	115.8	116.0	116.0								

**Table 3: Analytical Consumer Price Series for CPI All Items, User Cost Variants (con't)**

<b>DV User Cost</b>														
	January	February	March	April	May	June	July	August	September	October	November	December	Annual	Annual Growth Rate
2003	99.5	100.4	100.8	100.4	99.8	98.8	99.2	99.9	100.3	99.8	100.6	100.7	100.0	
2004	100.3	100.0	99.9	100.8	102.4	103.1	103.1	102.7	102.8	103.1	103.3	102.8	102.0	2.0%
2005	102.5	102.9	103.5	104.0	103.8	103.5	103.7	104.2	105.1	104.9	105.2	105.2	104.0	2.0%
2006	106.0	106.1	106.9	107.8	108.8	109.0	109.5	109.8	109.0	108.4	108.7	108.5	108.2	4.0%
2007	108.6	109.6	110.3	110.8	111.7	113.2	113.5	113.4	113.5	113.3	113.8	113.8	112.1	3.6%
2008	113.8	113.9	113.8	113.8	114.2	114.8	115.7	115.0	114.7	114.2	113.8	111.8	114.1	1.8%
2009	109.9	108.9	108.5	107.1	107.3	108.6	109.0	109.0	108.6	108.6	109.5	108.4	108.6	-4.8%
2010	108.7	108.9	109.0	110.8	111.7	111.1	111.1	110.4	109.7	109.9	109.8	109.9	110.1	1.3%
2011	110.4	111.2	112.5	113.6	114.2	112.7	112.8	112.8	112.9	112.8	113.0	112.2	112.6	2.3%
2012	112.5	112.7	113.2	114.3	114.2	113.3	113.2	113.6	113.7	113.8	113.5	112.8	113.4	0.7%
2013	112.9	114.2	114.1	113.9	114.2	114.2								
<b>DV User Cost--25 Years Average</b>														
	January	February	March	April	May	June	July	August	September	October	November	December	Annual	Annual Growth Rate
2003	99.5	100.3	100.7	100.1	99.8	99.3	99.5	100.0	100.3	99.8	100.4	100.4	100.0	
2004	100.3	100.2	100.3	100.8	102.1	102.5	102.5	102.2	102.3	102.5	102.8	102.4	101.7	1.7%
2005	102.2	102.6	103.2	103.5	103.5	103.4	103.6	104.1	104.9	104.5	104.5	104.4	103.7	1.9%
2006	105.1	105.0	105.6	106.4	107.1	107.0	107.3	107.5	106.8	106.4	106.7	106.7	106.5	2.7%
2007	106.7	107.5	108.3	108.8	109.4	109.9	110.0	109.8	110.0	109.8	110.1	110.1	109.2	2.6%
2008	110.0	110.3	110.6	111.1	111.9	112.6	113.2	112.9	112.8	111.9	111.5	110.3	111.6	2.2%
2009	109.5	109.6	109.6	109.0	109.6	110.3	110.1	110.2	110.0	110.0	110.7	110.0	109.9	-1.5%
2010	110.3	110.7	110.8	111.6	112.1	111.8	112.2	111.9	111.7	112.1	112.1	112.1	111.6	1.6%
2011	112.5	112.9	114.2	114.9	115.5	114.5	114.6	114.7	114.9	115.0	115.1	114.3	114.4	2.5%
2012	114.7	115.1	115.6	116.2	116.2	115.5	115.4	115.7	115.9	116.0	115.7	115.0	115.6	1.0%
2013	115.1	116.4	116.5	116.3	116.5	116.6								

**Table 3: Analytical Consumer Price Series for CPI All Items, Opportunity Cost Approach (con't)**

<b>DV Index</b>														
	January	February	March	April	May	June	July	August	September	October	November	December	Annual	Annual Growth Rate
2003	99.4	100.3	100.7	100.2	99.8	99.1	99.4	100.0	100.4	99.8	100.5	100.6	100.0	
2004	100.3	100.1	100.2	100.9	102.3	102.8	102.8	102.5	102.5	102.8	103.0	102.6	101.9	1.9%
2005	102.3	102.7	103.3	103.7	103.6	103.5	103.6	104.2	105.0	104.7	104.8	104.8	103.9	1.9%
2006	105.4	105.4	106.1	106.9	107.7	107.8	108.2	108.4	107.6	107.1	107.4	107.3	107.1	3.1%
2007	107.4	108.3	109.0	109.5	109.7	110.3	110.6	110.9	111.1	110.7	111.1	111.2	110.0	2.7%
2008	111.3	111.5	111.7	111.7	112.4	112.4	112.5	112.2	112.1	112.6	112.9	112.3	112.1	2.0%
2009	111.7	111.4	111.8	111.5	111.3	111.9	112.5	112.9	113.7	113.1	113.0	112.5	112.3	0.1%
2010	113.0	112.6	113.1	114.4	115.0	114.6	114.5	114.3	113.2	112.8	113.0	113.1	113.6	1.2%
2011	113.2	114.2	115.1	115.8	115.8	115.4	115.5	115.8	115.7	115.2	115.5	115.6	115.2	1.4%
2012	115.6	115.7	116.0	116.6	117.6	117.5	117.4	117.2	117.3	117.4	117.7	117.5	117.0	1.5%
2013	117.4	118.2	118.4	117.6	117.7	117.7								
<b>DV Index, 25 Years Average</b>														
	January	February	March	April	May	June	July	August	September	October	November	December	Annual	Annual Growth Rate
2003	99.5	100.2	100.6	100.0	99.8	99.4	99.6	100.1	100.3	99.9	100.3	100.4	100.0	
2004	100.3	100.3	100.4	100.9	102.1	102.3	102.3	102.0	102.1	102.3	102.6	102.3	101.7	1.7%
2005	102.1	102.5	103.1	103.4	103.4	103.4	103.6	104.1	104.9	104.5	104.4	104.3	103.6	1.9%
2006	104.8	104.6	105.2	105.9	106.5	106.4	106.6	106.8	106.1	105.7	106.0	106.0	105.9	2.2%
2007	106.1	106.8	107.7	108.1	108.2	108.4	108.6	109.0	109.2	108.8	109.1	109.2	108.3	2.2%
2008	109.3	109.6	109.9	110.0	110.9	110.9	110.9	110.7	110.7	111.0	111.4	111.0	110.5	2.1%
2009	110.7	110.9	111.5	111.6	111.5	111.8	112.2	112.6	113.5	112.9	112.7	112.4	112.0	1.3%
2010	112.9	112.6	113.1	113.9	114.4	114.1	114.1	114.1	113.3	112.9	113.2	113.3	113.5	1.3%
2011	113.3	114.1	115.0	115.5	115.5	115.4	115.5	115.8	115.9	115.4	115.7	115.8	115.2	1.6%
2012	115.9	116.1	116.4	116.7	117.7	117.7	117.6	117.4	117.5	117.7	118.0	117.8	117.2	1.7%
2013	117.6	118.4	118.8	118.0	118.0	118.0								

**Table 4: Analytical Consumer Price Series for Shelter**

<b>Official Approach</b>														
	January	February	March	April	Mai	June	July	August	September	October	November	December	Annual	Annual Growth Rate
2003	98.9	99.3	99.9	99.1	99.6	100.2	100.1	100.2	100.4	100.6	100.7	101.1	100.0	
2004	101.0	101.2	101.3	101.8	102.0	102.4	102.7	102.9	103.1	103.7	104.0	104.0	102.5	2.5%
2005	104.2	104.4	104.7	105.0	105.2	105.4	105.9	105.9	106.6	107.2	107.3	107.0	105.7	3.1%
2006	108.2	108.2	108.4	108.7	109.4	109.3	109.6	109.9	110.5	110.5	110.5	111.0	109.5	3.6%
2007	111.2	111.2	111.8	112.5	112.4	113.1	113.3	113.9	114.1	115.0	115.0	115.5	113.3	3.4%
2008	115.5	115.8	116.3	117.4	117.8	118.5	119.4	119.9	119.2	119.4	119.5	119.5	118.2	4.4%
2009	119.3	119.3	118.8	117.6	117.5	117.5	117.1	117.3	117.1	117.4	117.5	117.5	117.8	-0.3%
2010	118.0	117.9	117.9	118.5	119.2	119.4	120.4	120.1	120.0	120.7	120.5	120.7	119.4	1.4%
2011	120.6	120.6	120.7	121.3	121.2	121.4	122.0	122.2	121.8	122.5	122.3	122.8	121.6	1.8%
2012	123.2	122.9	122.6	122.6	122.7	123.0	123.2	123.4	123.2	123.6	123.5	123.5	123.1	1.2%
2013	123.8	123.9	123.9	124.2	124.3	124.5								
<b>CPI Without Owned Accommodation</b>														
	January	February	March	April	Mai	June	July	August	September	October	November	December	Annual	Annual Growth Rate
2003	99.3	100.0	101.2	98.4	99.4	100.5	100.2	100.3	100.5	99.7	99.9	100.6	100.0	
2004	100.1	100.5	100.4	101.4	101.5	102.3	102.5	102.8	103.0	102.8	103.3	103.0	102.0	2.0%
2005	103.3	103.7	104.0	104.5	104.4	104.5	105.7	105.4	107.0	107.4	107.3	106.1	105.3	3.2%
2006	108.7	108.1	108.0	108.0	109.1	108.4	108.6	108.4	108.9	107.4	107.2	107.8	108.2	2.8%
2007	108.0	107.7	108.4	109.6	108.9	109.9	109.7	110.3	110.1	110.4	109.9	110.3	109.4	1.1%
2008	110.3	110.3	111.1	112.7	113.6	114.7	116.5	117.5	115.5	114.4	114.5	114.3	113.8	4.0%
2009	113.3	113.6	112.8	110.4	110.7	110.7	109.9	110.8	110.7	110.2	111.1	111.2	111.3	-2.2%
2010	112.2	112.0	111.8	112.8	114.0	114.3	115.5	115.3	115.2	115.0	114.8	115.4	114.0	2.5%
2011	115.1	115.0	115.2	116.7	116.1	116.3	117.3	117.9	116.9	117.9	117.4	118.4	116.7	2.3%
2012	119.0	118.6	117.6	116.9	117.1	117.8	118.1	118.9	118.5	118.7	118.5	118.7	118.2	1.3%
2013	119.8	120.0	119.9	120.5	120.7	120.9								

**Table 4: Analytical Consumer Price Series for Shelter (con't)**

<b>Payments Approach</b>														
	January	February	March	April	Mai	June	July	August	September	October	November	December	Annual	Annual Growth Rate
2003	99.1	99.5	100.1	99.2	99.7	100.2	100.1	100.1	100.3	100.4	100.5	100.8	100.0	
2004	100.7	100.9	100.9	101.5	101.5	101.9	102.1	102.3	102.5	103.1	103.4	103.4	102.0	2.0%
2005	103.5	103.7	104.0	104.3	104.4	104.6	105.2	105.1	105.8	106.4	106.5	106.0	104.9	2.9%
2006	107.4	107.2	107.3	107.5	108.2	107.9	108.2	108.4	108.9	108.8	108.8	109.4	108.2	3.1%
2007	109.5	109.6	110.1	110.8	110.6	111.3	111.5	112.0	112.2	113.1	113.2	113.6	111.5	3.0%
2008	113.6	113.9	114.4	115.6	116.1	116.8	117.9	118.4	117.6	117.8	118.1	118.2	116.5	4.6%
2009	117.9	118.0	117.5	116.3	116.3	116.3	115.8	116.1	115.9	116.1	116.2	116.1	116.5	0.0%
2010	116.5	116.4	116.3	116.8	117.5	117.6	118.7	118.4	118.2	119.0	118.7	119.0	117.8	1.1%
2011	118.9	118.8	118.9	119.6	119.4	119.6	120.2	120.4	119.9	120.7	120.5	121.0	119.8	1.7%
2012	121.3	121.1	120.6	120.6	120.7	121.0	121.1	121.3	121.0	121.5	121.3	121.3	121.1	1.0%
2013	121.6	121.7	121.7	122.0	122.1	122.2								
<b>Rental Equivalence Approach, SHS Data Source</b>														
	January	February	March	April	Mai	June	July	August	September	October	November	December	Annual	Annual Growth Rate
2003	99.4	99.7	100.2	99.2	99.7	100.1	100.1	100.2	100.4	100.2	100.3	100.6	100.0	
2004	100.5	100.6	100.6	101.1	101.2	101.5	101.6	101.8	102.0	101.9	102.2	102.1	101.4	1.4%
2005	102.2	102.4	102.6	102.8	102.8	102.9	103.4	103.4	104.0	104.2	104.2	103.8	103.2	1.8%
2006	104.8	104.6	104.6	104.7	105.1	104.9	105.1	105.2	105.4	104.9	104.8	105.2	104.9	1.7%
2007	105.3	105.3	105.6	106.2	105.9	106.5	106.5	106.9	106.8	107.1	106.9	107.2	106.3	1.3%
2008	107.2	107.3	107.7	108.5	108.9	109.5	110.3	110.8	110.1	109.7	109.9	109.9	109.1	2.6%
2009	109.5	109.7	109.5	108.5	108.7	108.8	108.5	109.1	109.1	109.0	109.4	109.5	109.1	0.0%
2010	109.9	109.9	109.9	110.3	110.9	111.1	111.7	111.7	111.7	111.8	111.7	112.0	111.0	1.8%
2011	111.9	111.9	112.1	112.7	112.5	112.7	113.1	113.4	113.1	113.6	113.5	113.9	112.9	1.6%
2012	114.1	114.1	113.8	113.7	113.8	114.2	114.4	114.8	114.8	114.9	115.0	115.2	114.4	1.4%
2013	115.6	115.8	115.8	116.1	116.3	116.5								

**Table 4: Analytical Consumer Price Series for Shelter (con't)**

<b>Rental Equivalence Approach, SNA Data Source</b>														
	January	February	March	April	Mai	June	July	August	September	October	November	December	Annual	Annual Growth Rate
2003	99.4	99.7	100.1	99.2	99.7	100.1	100.1	100.2	100.4	100.2	100.3	100.6	100.0	
2004	100.5	100.6	100.6	101.1	101.2	101.5	101.6	101.8	101.9	101.9	102.1	102.1	101.4	1.4%
2005	102.2	102.4	102.5	102.7	102.8	102.8	103.3	103.3	103.9	104.1	104.1	103.7	103.2	1.7%
2006	104.7	104.5	104.5	104.6	105.0	104.8	105.0	105.1	105.3	104.8	104.8	105.1	104.9	1.6%
2007	105.2	105.2	105.6	106.1	105.9	106.4	106.4	106.8	106.8	107.0	106.9	107.1	106.3	1.4%
2008	107.1	107.3	107.6	108.3	108.7	109.3	110.0	110.5	109.8	109.6	109.7	109.7	109.0	2.6%
2009	109.4	109.6	109.4	108.5	108.7	108.8	108.6	109.1	109.1	109.0	109.4	109.5	109.1	0.1%
2010	109.9	109.9	109.9	110.3	110.8	111.0	111.5	111.6	111.6	111.7	111.6	111.9	111.0	1.7%
2011	111.8	111.9	112.0	112.6	112.4	112.5	113.0	113.3	113.0	113.4	113.3	113.7	112.7	1.6%
2012	114.0	113.9	113.7	113.6	113.7	114.1	114.3	114.7	114.7	114.8	114.9	115.1	114.3	1.4%
2013	115.5	115.6	115.7	116.0	116.1	116.3								
<b>Net Purchase Approach, Housing and Land</b>														
	January	February	March	April	Mai	June	July	August	September	October	November	December	Annual	Annual Growth Rate
2003	98.5	99.0	99.6	98.7	99.3	100.0	100.1	100.3	100.6	100.9	101.3	101.7	100.0	
2004	101.6	102.0	102.1	103.0	103.4	103.9	104.2	104.4	104.7	105.3	105.7	105.7	103.8	3.8%
2005	105.9	106.1	106.5	106.9	107.2	107.4	108.0	108.1	108.9	109.9	110.1	109.9	107.9	3.9%
2006	111.4	111.4	111.8	112.4	113.3	113.5	113.9	114.5	114.9	114.8	114.8	115.1	113.5	5.2%
2007	115.4	115.4	116.0	116.9	117.0	117.7	117.9	118.4	118.5	119.2	119.1	119.5	117.6	3.6%
2008	119.5	119.6	120.0	120.9	121.2	121.8	122.8	123.2	122.2	122.0	122.0	121.9	121.4	3.3%
2009	121.3	121.1	120.5	119.1	119.3	119.3	119.2	119.7	119.9	120.5	120.9	121.2	120.2	-1.0%
2010	121.9	122.0	122.1	122.8	123.6	123.9	124.9	124.7	124.6	125.4	125.3	125.6	123.9	3.1%
2011	125.7	125.8	125.9	126.8	126.9	127.1	127.7	128.0	127.6	128.4	128.4	128.8	127.3	2.7%
2012	129.2	129.0	128.8	129.0	129.3	129.8	130.0	130.4	130.3	131.0	131.0	131.2	129.9	2.1%
2013	131.7	131.9	131.9	132.3	132.5	132.7								

**Table 4: Analytical Consumer Price Series for Shelter (con't)**

<b>Net Purchase Approach, Housing Only</b>														
	January	February	March	April	Mai	June	July	August	September	October	November	December	Annual	Annual Growth Rate
2003	98.5	99.1	99.7	98.7	99.4	100.0	100.1	100.3	100.6	100.9	101.2	101.6	100.0	
2004	101.5	101.9	101.9	102.9	103.2	103.7	104.0	104.2	104.5	105.0	105.5	105.5	103.6	3.6%
2005	105.6	105.9	106.2	106.6	106.9	107.1	107.8	107.8	108.7	109.6	109.8	109.5	107.6	3.8%
2006	111.1	111.0	111.3	111.8	112.7	112.8	113.2	113.6	114.0	113.9	113.8	114.3	112.8	4.8%
2007	114.5	114.5	115.0	115.9	115.9	116.6	116.8	117.3	117.3	118.1	118.0	118.3	116.5	3.3%
2008	118.3	118.4	118.8	119.8	120.1	120.7	121.8	122.3	121.2	121.1	121.1	121.0	120.4	3.3%
2009	120.4	120.3	119.7	118.2	118.5	118.6	118.4	118.9	119.1	119.6	120.1	120.3	119.3	-0.9%
2010	121.0	121.1	121.2	121.9	122.7	123.0	124.0	123.8	123.7	124.5	124.4	124.8	123.0	3.1%
2011	124.8	124.9	125.1	126.0	126.0	126.2	126.8	127.1	126.7	127.5	127.5	127.9	126.4	2.7%
2012	128.3	128.1	127.8	128.0	128.2	128.8	129.0	129.4	129.3	130.0	130.0	130.2	128.9	2.0%
2013	130.8	130.9	130.9	131.4	131.5	131.7								

**Table 4: Analytical Consumer Price Series for Shelter, User Cost Variants (con't)**

<b>Basic User Cost</b>														
	January	February	March	April	May	June	July	August	September	October	November	December	Annual	Annual Growth Rate
2003	99.9	100.8	101.6	101.7	99.8	96.7	97.5	99.1	100.3	99.4	101.4	101.7	100.0	
2004	100.0	98.2	96.7	99.6	102.3	104.8	105.5	104.7	104.8	105.4	105.2	103.8	102.6	2.6%
2005	103.2	103.4	103.9	104.9	104.1	102.3	102.4	103.0	103.6	105.3	107.0	107.2	104.2	1.6%
2006	109.1	110.1	110.8	112.4	114.9	115.9	117.6	118.1	117.7	116.5	116.2	115.7	114.6	10.0%
2007	116.0	117.1	116.7	117.6	119.0	127.8	129.2	130.2	130.2	132.3	132.8	133.4	125.2	9.3%
2008	134.3	133.0	131.3	129.0	126.2	126.6	130.6	129.1	126.4	131.2	131.7	125.9	129.6	3.5%
2009	119.1	110.9	108.1	100.8	98.4	103.1	106.5	107.0	104.6	105.7	107.0	103.7	106.2	-18.0%
2010	103.9	102.9	102.8	111.0	114.4	112.8	111.4	107.7	103.8	103.4	101.9	103.1	106.6	0.3%
2011	103.9	106.0	106.6	110.5	110.3	108.6	108.7	108.5	107.5	107.5	107.8	107.9	107.8	1.1%
2012	107.7	107.0	106.8	108.3	108.4	107.9	108.0	108.2	108.0	108.2	108.1	108.3	107.9	0.1%
2013	108.5	108.3	107.3	107.6	107.8	107.7								
<b>VV User Cost</b>														
	January	February	March	April	May	June	July	August	September	October	November	December	Annual	Annual Growth Rate
2003	99.8	100.8	101.6	101.6	99.8	96.7	97.5	99.1	100.3	99.5	101.5	101.8	100.0	
2004	100.0	98.3	96.8	99.7	102.4	105.0	105.5	104.8	104.8	105.4	105.2	103.8	102.7	2.7%
2005	103.2	103.4	103.8	104.8	104.2	102.4	102.5	103.1	103.8	105.5	107.1	107.4	104.3	1.6%
2006	109.3	110.4	111.2	112.9	115.4	116.5	118.3	119.0	118.4	117.1	116.8	116.1	115.1	10.4%
2007	116.4	117.3	116.9	117.8	119.4	127.3	128.9	129.8	129.7	131.3	131.8	132.1	124.9	8.5%
2008	133.0	131.7	130.1	127.7	124.9	125.2	128.6	127.2	124.6	128.4	128.6	123.3	127.8	2.3%
2009	116.8	109.0	106.2	99.5	97.4	101.6	105.2	105.8	104.2	105.5	107.2	104.5	105.2	-17.6%
2010	105.0	104.1	104.2	111.5	114.7	113.2	111.6	108.3	104.8	104.3	103.1	104.1	107.4	2.1%
2011	104.9	106.9	107.4	110.9	110.7	109.2	109.4	109.2	108.3	108.3	108.6	108.7	108.5	1.1%
2012	108.6	107.9	107.8	109.1	109.3	108.8	108.9	109.1	109.0	109.2	109.1	109.2	108.8	0.3%
2013	109.5	109.3	108.3	108.6	108.8	108.8								



**Table 4: Analytical Consumer Price Series for Shelter, User Cost Variants (con't)**

<b>DV User Cost</b>														
	January	February	March	April	May	June	July	August	September	October	November	December	Annual	Annual Growth Rate
2003	99.6	100.5	101.3	101.3	99.8	97.1	97.8	99.3	100.4	99.6	101.5	101.8	100.0	
2004	100.2	98.7	97.4	100.2	102.6	105.0	105.6	105.0	105.1	105.6	105.5	104.3	102.9	2.9%
2005	103.8	104.0	104.5	105.4	104.8	103.3	103.5	104.0	104.7	106.3	107.8	108.1	105.0	2.0%
2006	109.9	110.9	111.7	113.2	115.7	116.7	118.4	119.1	118.8	117.7	117.5	117.0	115.5	10.0%
2007	117.4	118.3	118.0	119.0	120.7	128.1	129.6	130.5	130.4	131.9	132.4	132.7	125.8	8.8%
2008	133.6	132.5	131.0	128.8	126.1	126.3	129.3	127.8	125.3	128.6	128.6	123.4	128.5	2.1%
2009	117.1	109.5	106.6	100.0	97.6	101.1	104.0	104.2	102.3	103.2	104.4	101.6	104.3	-18.8%
2010	101.9	100.9	100.9	107.5	110.5	109.0	107.5	104.4	101.1	100.6	99.4	100.2	103.7	-0.6%
2011	100.9	102.7	103.1	106.3	105.8	103.1	103.1	102.7	101.0	100.7	101.1	101.2	102.6	-1.0%
2012	100.8	99.6	99.1	101.3	101.5	100.6	100.5	100.8	100.4	100.7	100.4	100.6	100.5	-2.1%
2013	100.9	100.7	99.8	100.1	100.3	100.3								
<b>DV User Cost--25 Years Average</b>														
	January	February	March	April	May	June	July	August	September	October	November	December	Annual	Annual Growth Rate
2003	99.7	100.3	101.0	100.5	99.8	98.4	98.7	99.6	100.2	99.8	100.9	101.1	100.0	
2004	100.1	99.3	98.5	100.3	101.7	103.2	103.5	103.3	103.4	103.8	103.9	103.3	102.0	2.0%
2005	103.1	103.2	103.5	104.0	103.8	103.1	103.4	103.6	104.2	105.2	105.9	105.8	104.1	2.0%
2006	107.2	107.6	108.0	108.8	110.2	110.6	111.5	111.9	112.0	111.5	111.4	111.4	110.2	5.9%
2007	111.6	112.0	112.2	113.0	113.5	116.4	117.1	117.8	117.9	119.0	119.2	119.5	115.8	5.1%
2008	119.9	119.7	119.6	119.5	118.9	119.4	121.0	120.9	119.6	120.8	120.9	119.2	119.9	3.6%
2009	116.9	114.4	113.0	110.0	109.2	110.3	111.1	111.3	110.6	111.1	111.6	110.7	111.7	-6.9%
2010	111.1	110.7	110.6	113.2	114.6	114.3	114.3	113.0	111.8	112.0	111.4	111.8	112.4	0.6%
2011	111.9	112.5	112.6	114.0	113.8	112.8	113.1	113.0	112.1	112.3	112.3	112.5	112.7	0.3%
2012	112.5	111.8	111.4	112.2	112.3	112.1	112.1	112.3	112.1	112.4	112.1	112.2	112.1	-0.5%
2013	112.5	112.4	112.0	112.3	112.3	112.3								

**Table 4: Analytical Consumer Price Series for Shelter, Opportunity Cost Approach (con't)**

<b>DV Index</b>														
	January	February	March	April	May	June	July	August	September	October	November	December	Annual	Annual Growth Rate
2003	99.6	100.3	100.9	100.9	99.7	97.8	98.3	99.5	100.4	99.8	101.3	101.5	100.0	
2004	100.3	99.2	98.3	100.4	102.3	104.1	104.6	104.2	104.3	104.7	104.6	103.8	102.6	2.6%
2005	103.5	103.7	104.1	104.8	104.4	103.3	103.6	104.0	104.6	105.8	106.9	107.0	104.6	2.0%
2006	108.1	108.8	109.3	110.5	112.2	112.9	114.1	114.7	114.5	113.6	113.5	113.3	112.1	7.2%
2007	113.5	114.2	114.1	114.9	116.0	118.6	119.0	119.3	119.5	119.6	120.0	120.3	117.4	4.7%
2008	120.5	120.4	119.9	119.6	118.8	119.1	119.9	119.6	119.3	120.4	120.7	119.2	119.8	2.0%
2009	117.6	115.4	114.7	112.9	112.0	113.4	115.3	115.2	115.2	115.9	116.2	114.7	114.9	-4.1%
2010	115.2	114.7	114.7	117.1	118.4	117.6	117.0	115.9	115.0	114.3	113.8	114.3	115.7	0.7%
2011	114.7	115.4	115.8	117.3	117.6	116.8	116.6	116.4	116.0	115.5	115.9	116.0	116.2	0.5%
2012	115.6	115.3	115.3	117.0	117.1	116.9	117.0	117.2	117.3	117.4	117.5	117.5	116.8	0.5%
2013	117.7	117.9	118.0	117.2	117.6	118.0								
<b>DV Index, 25 Years Average</b>														
	January	February	March	April	May	June	July	August	September	October	November	December	Annual	Annual Growth Rate
2003	99.6	100.1	100.7	100.2	99.7	98.9	99.1	99.7	100.2	99.9	100.7	101.0	100.0	
2004	100.2	99.7	99.1	100.5	101.5	102.7	103.0	102.9	103.0	103.3	103.4	103.0	101.9	1.9%
2005	102.9	103.0	103.3	103.7	103.6	103.1	103.5	103.6	104.2	105.0	105.5	105.3	103.9	2.0%
2006	106.1	106.3	106.6	107.2	108.2	108.4	109.1	109.4	109.6	109.0	109.0	109.1	108.2	4.1%
2007	109.3	109.5	109.7	110.4	111.1	112.4	112.6	112.8	113.1	113.1	113.4	113.7	111.8	3.3%
2008	113.7	113.9	113.8	114.0	113.8	114.2	114.6	114.7	114.7	115.2	115.6	115.1	114.4	2.4%
2009	114.7	114.1	114.0	113.6	113.3	113.8	114.7	114.6	115.1	115.6	115.6	114.9	114.5	0.0%
2010	115.4	115.1	115.1	115.9	116.5	116.2	116.1	115.8	115.7	115.3	115.1	115.4	115.6	1.0%
2011	115.6	115.8	116.0	116.8	117.2	117.2	117.1	117.1	117.1	116.8	117.0	117.2	116.7	0.9%
2012	117.0	117.1	117.0	117.9	118.0	118.2	118.3	118.5	118.6	118.7	118.9	118.9	118.1	1.2%
2013	119.0	119.3	119.7	118.8	119.2	119.6								

**Table 5: Analytical Consumer Price Series for Owned Accommodation**

<b>Official Approach</b>														
	January	February	March	April	May	June	July	August	September	October	November	December	Annual	Annual Growth Rate
2003	98.7	98.9	99.2	99.5	99.8	100.0	100.0	100.1	100.3	101.1	101.1	101.4	100.0	
2004	101.4	101.6	101.8	102.0	102.2	102.4	102.8	102.9	103.2	104.2	104.4	104.7	102.8	2.8%
2005	104.7	104.8	105.1	105.3	105.7	106.0	106.1	106.1	106.3	107.1	107.3	107.6	106.0	3.1%
2006	107.9	108.2	108.6	109.1	109.6	109.9	110.4	110.9	111.5	112.6	112.7	113.2	110.4	4.1%
2007	113.3	113.6	114.1	114.5	114.8	115.2	115.8	116.3	116.8	118.1	118.5	118.9	115.8	4.9%
2008	118.9	119.5	119.8	120.3	120.5	120.7	121.1	121.2	121.5	122.5	122.8	122.9	121.0	4.4%
2009	123.1	123.0	122.7	122.5	122.2	122.1	122.0	121.8	121.6	122.4	121.9	121.9	122.3	1.1%
2010	121.9	122.0	122.1	122.4	122.6	122.8	123.6	123.2	123.2	124.4	124.3	124.3	123.1	0.6%
2011	124.3	124.3	124.3	124.3	124.6	124.8	125.0	125.0	124.9	125.5	125.6	125.7	124.9	1.5%
2012	125.9	125.8	125.9	126.4	126.5	126.5	126.5	126.3	126.2	126.8	126.7	126.6	126.3	1.2%
2013	126.4	126.5	126.6	126.6	126.6	126.8								
<b>Payments Approach</b>														
	January	February	March	April	May	June	July	August	September	October	November	December	Annual	Annual Growth Rate
2003	98.9	99.2	99.3	99.6	99.9	100.1	100.0	100.0	100.1	100.9	100.9	101.0	100.0	
2004	101.1	101.2	101.3	101.5	101.6	101.6	101.9	102.0	102.2	103.4	103.6	103.8	102.1	2.1%
2005	103.7	103.7	104.0	104.1	104.5	104.8	104.8	104.8	104.8	105.7	105.8	106.0	104.7	2.6%
2006	106.3	106.4	106.8	107.2	107.5	107.6	108.1	108.6	108.9	110.1	110.2	110.8	108.2	3.3%
2007	110.9	111.2	111.6	111.9	112.2	112.5	113.0	113.5	114.0	115.5	115.9	116.4	113.2	4.6%
2008	116.5	117.0	117.3	117.8	118.0	118.3	118.7	118.8	119.1	120.5	120.9	121.3	118.7	4.8%
2009	121.6	121.6	121.4	121.3	121.1	121.0	120.9	120.7	120.4	121.2	120.5	120.4	121.0	2.0%
2010	120.3	120.2	120.2	120.3	120.4	120.4	121.3	120.9	120.8	122.3	122.1	122.1	120.9	-0.1%
2011	122.2	122.1	122.0	121.9	122.2	122.3	122.5	122.5	122.3	122.9	123.0	123.1	122.4	1.2%
2012	123.2	123.1	123.1	123.7	123.7	123.6	123.5	123.2	123.0	123.8	123.6	123.3	123.4	0.8%
2013	123.0	123.1	123.2	123.2	123.1	123.2								

**Table 5: Analytical Consumer Price Series for Owned Accommodation (con't)**

<b>Rental Equivalence Approach, SHS Data Source</b>														
	January	February	March	April	May	June	July	August	September	October	November	December	Annual	Annual Growth Rate
2003	99.4	99.5	99.5	99.7	99.8	99.9	100.0	100.2	100.3	100.5	100.5	100.6	100.0	
2004	100.6	100.7	100.8	100.9	101.0	101.0	101.1	101.3	101.3	101.4	101.5	101.6	101.1	1.1%
2005	101.6	101.6	101.7	101.7	101.9	101.9	102.0	102.2	102.2	102.3	102.3	102.4	102.0	0.9%
2006	102.5	102.5	102.6	102.7	102.8	102.8	103.0	103.2	103.3	103.4	103.4	103.6	103.0	1.0%
2007	103.7	103.8	104.0	104.1	104.2	104.4	104.5	104.8	104.9	105.1	105.2	105.3	104.5	1.5%
2008	105.4	105.6	105.7	105.8	105.9	106.1	106.2	106.5	106.6	106.8	107.0	107.2	106.2	1.6%
2009	107.2	107.4	107.5	107.6	107.8	107.8	108.0	108.2	108.4	108.6	108.6	108.7	108.0	1.6%
2010	108.8	108.8	108.9	109.0	109.1	109.2	109.3	109.5	109.6	109.9	109.9	110.0	109.3	1.2%
2011	110.0	110.1	110.2	110.3	110.3	110.4	110.5	110.7	110.8	110.9	111.0	111.1	110.6	1.1%
2012	111.2	111.4	111.5	111.7	111.8	112.0	112.1	112.4	112.5	112.7	112.9	113.0	112.1	1.4%
2013	113.1	113.2	113.3	113.5	113.6	113.7								
<b>Rental Equivalence Approach, SNA Data Source</b>														
	January	February	March	April	May	June	July	August	September	October	November	December	Annual	Annual Growth Rate
2003	99.4	99.5	99.5	99.7	99.8	99.9	100.0	100.2	100.3	100.5	100.5	100.6	100.0	
2004	100.6	100.7	100.8	100.9	100.9	101.0	101.1	101.3	101.3	101.4	101.5	101.6	101.1	1.1%
2005	101.6	101.6	101.7	101.7	101.9	101.9	102.0	102.2	102.2	102.3	102.3	102.4	102.0	0.9%
2006	102.5	102.5	102.6	102.7	102.8	102.8	103.0	103.2	103.3	103.4	103.4	103.6	103.0	1.0%
2007	103.7	103.8	104.0	104.1	104.2	104.4	104.5	104.8	104.9	105.1	105.2	105.3	104.5	1.5%
2008	105.4	105.6	105.7	105.8	106.0	106.1	106.2	106.5	106.6	106.8	107.0	107.2	106.3	1.7%
2009	107.2	107.4	107.5	107.6	107.8	107.8	108.0	108.2	108.4	108.5	108.6	108.7	108.0	1.6%
2010	108.7	108.8	108.9	109.0	109.0	109.1	109.3	109.5	109.6	109.9	109.9	109.9	109.3	1.2%
2011	110.0	110.1	110.2	110.3	110.3	110.4	110.5	110.7	110.8	110.9	111.0	111.1	110.5	1.1%
2012	111.2	111.4	111.5	111.7	111.8	111.9	112.1	112.3	112.5	112.6	112.8	113.0	112.1	1.4%
2013	113.1	113.2	113.3	113.5	113.6	113.7								

**Table 5: Analytical Consumer Price Series for Owned Accommodation (con't)**

<b>Net Purchase Approach, Housing and Land</b>														
	January	February	March	April	May	June	July	August	September	October	November	December	Annual	Annual Growth Rate
2003	97.8	98.3	98.3	98.8	99.3	99.6	99.9	100.3	100.7	101.9	102.4	102.6	100.0	
2004	102.8	103.2	103.5	104.3	104.9	105.2	105.5	105.7	106.1	107.2	107.6	107.9	105.3	5.3%
2005	107.9	108.1	108.5	108.8	109.4	109.7	109.9	110.2	110.5	111.9	112.3	112.9	110.0	4.5%
2006	113.6	114.0	114.9	115.9	116.7	117.6	118.2	119.4	119.7	120.8	120.8	121.1	117.7	7.0%
2007	121.3	121.7	122.1	122.7	123.5	123.9	124.5	124.9	125.2	126.3	126.6	126.8	124.1	5.4%
2008	126.9	127.1	127.2	127.3	127.1	127.2	127.5	127.4	127.4	128.1	127.9	127.9	127.4	2.7%
2009	127.7	127.2	126.8	126.3	126.4	126.5	127.0	127.1	127.6	129.0	129.0	129.5	127.5	0.1%
2010	129.9	130.2	130.7	131.0	131.4	131.6	132.4	132.2	132.1	133.7	133.8	133.8	131.9	3.4%
2011	134.2	134.5	134.6	134.9	135.4	135.7	135.9	136.0	136.2	136.8	137.1	137.1	135.7	2.9%
2012	137.3	137.4	137.7	138.6	138.9	139.2	139.4	139.5	139.7	140.8	140.9	141.1	139.2	2.6%
2013	141.2	141.4	141.5	141.8	142.0	142.1								
<b>Net Purchase Approach, Housing Only</b>														
	January	February	March	April	May	June	July	August	September	October	November	December	Annual	Annual Growth Rate
2003	97.9	98.3	98.3	98.9	99.3	99.7	99.9	100.3	100.6	101.9	102.3	102.5	100.0	
2004	102.7	103.1	103.4	104.1	104.7	105.0	105.3	105.5	105.8	107.1	107.5	107.7	105.1	5.1%
2005	107.8	107.8	108.2	108.6	109.2	109.5	109.7	109.9	110.2	111.6	112.0	112.5	109.8	4.4%
2006	113.2	113.6	114.4	115.3	116.1	116.8	117.4	118.4	118.7	119.9	119.9	120.2	117.0	6.6%
2007	120.4	120.7	121.1	121.7	122.4	122.8	123.3	123.7	124.0	125.2	125.5	125.7	123.0	5.2%
2008	125.6	125.9	125.9	126.1	125.9	126.0	126.2	126.1	126.2	127.1	127.0	127.1	126.3	2.6%
2009	126.9	126.4	126.1	125.7	125.9	126.0	126.4	126.6	127.0	128.5	128.4	128.9	126.9	0.5%
2010	129.3	129.5	130.0	130.3	130.7	130.9	131.7	131.5	131.4	133.2	133.3	133.3	131.3	3.4%
2011	133.7	134.0	134.1	134.4	134.9	135.1	135.3	135.4	135.5	136.2	136.5	136.5	135.1	2.9%
2012	136.7	136.8	137.0	138.1	138.4	138.6	138.8	138.9	139.1	140.3	140.3	140.5	138.6	2.6%
2013	140.7	140.8	140.9	141.2	141.4	141.5								

**Table 5: Analytical Consumer Price Series for Owned Accommodation, User cost Variants (con't)**

<b>Basic User Cost</b>														
	January	February	March	April	May	June	July	August	September	October	November	December	Annual	Annual Growth Rate
2003	100.2	101.3	101.9	103.8	100.1	94.4	95.8	98.3	100.1	99.3	102.4	102.5	100.0	
2004	99.8	96.7	94.5	98.5	102.7	106.4	107.3	105.9	105.9	107.0	106.4	104.3	103.0	3.0%
2005	103.2	103.3	103.8	105.1	104.0	100.9	100.4	101.5	101.6	104.0	106.8	107.9	103.5	0.6%
2006	109.3	111.4	112.6	115.2	118.5	120.5	123.2	124.1	123.1	122.1	121.9	120.6	118.5	14.5%
2007	121.0	122.9	121.9	122.6	126.2	142.6	145.4	146.9	147.0	150.9	152.4	153.3	137.8	16.2%
2008	155.1	152.5	148.3	141.8	135.4	135.0	140.9	136.8	133.8	144.5	145.5	134.1	142.0	3.0%
2009	121.8	105.2	100.5	88.8	83.6	92.9	100.8	100.6	96.1	98.7	100.4	93.7	98.6	-30.6%
2010	93.0	91.2	91.3	106.4	111.9	108.3	104.1	97.2	89.5	89.0	86.3	87.9	96.3	-2.3%
2011	89.9	94.1	95.2	101.1	101.1	99.0	98.7	98.3	97.4	96.9	97.5	97.4	97.2	0.9%
2012	97.0	96.2	96.2	98.3	98.5	97.6	97.5	97.6	97.4	97.7	97.5	97.7	97.4	0.2%
2013	97.7	97.2	95.8	96.0	96.1	95.9								
<b>VV User Cost</b>														
	January	February	March	April	May	June	July	August	September	October	November	December	Annual	Annual Growth Rate
2003	100.2	101.2	101.8	103.6	100.1	94.4	95.9	98.4	100.1	99.3	102.5	102.5	100.0	
2004	99.9	96.9	94.6	98.7	103.0	106.7	107.4	106.0	106.0	107.0	106.4	104.3	103.1	3.1%
2005	103.2	103.2	103.7	105.0	104.0	101.1	100.6	101.7	101.8	104.3	107.0	108.2	103.7	0.6%
2006	109.7	111.8	113.2	115.9	119.4	121.6	124.3	125.5	124.3	123.1	122.8	121.2	119.4	15.2%
2007	121.6	123.2	122.2	122.9	126.5	139.8	142.9	144.0	143.9	146.6	147.9	148.1	135.8	13.7%
2008	149.7	147.5	143.9	138.1	132.2	131.7	136.3	132.8	130.1	138.0	138.3	128.9	137.3	1.1%
2009	118.0	103.7	99.4	89.6	85.4	93.0	100.2	100.5	97.8	100.6	102.7	97.8	99.1	-27.8%
2010	97.9	96.4	96.8	109.0	113.8	110.7	106.8	101.0	94.9	94.2	92.2	93.4	100.6	1.6%
2011	95.1	98.9	99.6	104.6	104.6	102.6	102.4	102.1	101.2	100.9	101.4	101.3	101.2	0.6%
2012	101.0	100.3	100.3	102.3	102.4	101.6	101.6	101.7	101.6	101.8	101.7	101.9	101.5	0.3%
2013	101.9	101.5	100.0	100.2	100.3	100.1								

**Table 5: Analytical Consumer Price Series for Owned Accommodation, User cost Variants (con't)**

<b>DV User Cost</b>														
	January	February	March	April	May	June	July	August	September	October	November	December	Annual	Annual Growth Rate
2003	99.9	100.9	101.4	103.1	100.0	95.0	96.3	98.6	100.2	99.6	102.5	102.6	100.0	
2004	100.3	97.6	95.7	99.4	103.3	106.7	107.4	106.3	106.3	107.3	106.8	105.0	103.5	3.5%
2005	104.1	104.2	104.7	106.0	105.1	102.6	102.2	103.2	103.4	105.6	108.1	109.2	104.9	1.3%
2006	110.7	112.6	113.9	116.4	119.7	121.8	124.4	125.6	124.8	123.9	123.8	122.6	120.0	14.4%
2007	123.1	124.7	123.9	124.8	128.1	140.0	142.8	143.9	143.9	146.3	147.5	147.7	136.4	13.6%
2008	149.2	147.3	144.2	139.1	133.9	133.3	137.1	133.7	131.1	137.6	137.5	128.9	137.7	1.0%
2009	118.8	105.7	101.3	91.9	87.7	93.6	99.2	98.8	95.8	97.6	99.0	94.2	98.6	-28.4%
2010	93.9	92.4	92.5	103.0	107.1	104.3	100.9	95.7	90.2	89.5	87.7	88.6	95.5	-3.2%
2011	90.0	93.2	93.7	98.0	97.6	92.7	92.0	90.9	88.7	87.6	88.6	88.1	91.7	-3.9%
2012	87.0	85.2	85.0	89.3	89.4	87.4	87.1	87.1	86.6	87.0	86.6	86.7	87.0	-5.1%
2013	86.6	86.2	84.9	85.1	85.2	85.1								
<b>DV User Cost--25 Years Average</b>														
	January	February	March	April	May	June	July	August	September	October	November	December	Annual	Annual Growth Rate
2003	100.0	100.5	100.8	101.8	100.0	97.2	97.8	99.1	100.0	99.9	101.4	101.5	100.0	
2004	100.1	98.6	97.4	99.6	101.8	103.7	104.1	103.5	103.6	104.5	104.3	103.5	102.1	2.1%
2005	102.9	102.9	103.1	103.7	103.4	102.3	102.1	102.4	102.5	103.8	105.0	105.6	103.3	1.2%
2006	106.3	107.2	108.0	109.3	111.0	112.0	113.3	114.1	113.9	114.0	114.0	113.6	111.4	7.8%
2007	113.8	114.6	114.5	115.0	116.3	120.5	121.7	122.4	122.7	124.3	124.9	125.3	119.7	7.4%
2008	125.9	125.6	124.9	123.6	122.0	122.0	123.5	122.5	121.9	124.7	124.8	122.1	123.6	3.3%
2009	119.0	114.8	113.1	109.9	108.4	110.2	112.0	111.8	110.8	111.9	112.1	110.6	112.1	-9.3%
2010	110.5	110.0	110.1	113.6	115.0	114.2	113.4	111.5	109.6	110.1	109.3	109.5	111.4	-0.6%
2011	109.9	110.9	111.0	112.3	112.2	110.6	110.4	109.9	109.0	108.8	109.0	108.9	110.2	-1.0%
2012	108.4	107.7	107.6	109.3	109.3	108.5	108.4	108.3	108.0	108.4	108.2	108.2	108.4	-1.7%
2013	108.0	107.8	107.2	107.2	107.2	107.1								

**Table 5: Analytical Consumer Price Series for Owned Accommodation, Opportunity Cost Approach (con't)**

<b>DV Index</b>														
	January	February	March	April	May	June	July	August	September	October	November	December	Annual	Annual Growth Rate
2003	99.7	100.4	100.8	102.1	99.9	96.5	97.4	99.1	100.3	99.9	101.9	102.0	100.0	
2004	100.4	98.6	97.2	99.9	102.7	105.0	105.6	104.9	104.9	105.6	105.3	104.1	102.8	2.8%
2005	103.5	103.5	103.9	104.8	104.2	102.5	102.3	103.0	103.1	104.7	106.5	107.3	104.1	1.2%
2006	108.3	109.6	110.6	112.3	114.5	115.9	117.7	118.6	118.1	117.5	117.5	116.7	114.8	10.2%
2007	117.1	118.2	117.8	118.4	119.4	122.8	123.7	124.2	124.3	125.0	125.5	125.6	121.8	6.2%
2008	126.1	125.8	125.0	123.8	122.5	122.5	123.6	122.9	122.3	124.3	124.4	122.2	123.8	1.6%
2009	119.4	115.6	114.2	111.1	109.7	112.0	114.1	114.1	113.2	114.0	114.5	112.9	113.7	-8.1%
2010	112.8	112.3	112.4	116.3	117.8	116.9	115.9	114.3	112.4	112.3	111.6	112.0	113.9	0.2%
2011	112.6	113.9	114.1	115.7	115.6	113.9	113.8	113.5	112.7	112.4	112.8	112.7	113.6	-0.2%
2012	112.4	111.8	111.8	113.6	113.8	113.1	113.1	113.3	113.2	113.4	113.4	113.6	113.0	-0.5%
2013	113.6	113.5	113.1	113.3	113.4	113.4								
<b>DV Index, 25 Years Average</b>														
	January	February	March	April	May	June	July	August	September	October	November	December	Annual	Annual Growth Rate
2003	99.8	100.2	100.4	101.1	99.9	98.0	98.5	99.4	100.1	100.1	101.2	101.2	100.0	
2004	100.3	99.2	98.4	100.0	101.6	102.9	103.2	102.9	102.9	103.6	103.5	102.9	101.8	1.8%
2005	102.6	102.5	102.7	103.1	103.0	102.2	102.1	102.4	102.4	103.4	104.3	104.7	103.0	1.2%
2006	105.2	105.8	106.4	107.3	108.5	109.2	110.2	110.8	110.7	110.8	110.7	110.6	108.8	5.7%
2007	110.7	111.3	111.3	111.7	112.1	113.5	113.9	114.3	114.5	115.1	115.3	115.5	113.3	4.1%
2008	115.8	115.8	115.7	115.4	115.1	115.2	115.7	115.6	115.5	116.5	116.7	116.1	115.8	2.2%
2009	115.2	114.1	113.7	112.8	112.5	113.1	113.8	113.9	113.7	114.1	114.2	113.9	113.7	-1.7%
2010	113.9	113.8	113.8	115.0	115.5	115.3	115.2	114.7	114.2	114.6	114.3	114.5	114.6	0.7%
2011	114.6	115.0	115.1	115.5	115.6	115.1	115.1	115.1	114.9	114.9	115.1	115.1	115.1	0.5%
2012	115.0	114.9	114.9	115.6	115.7	115.6	115.7	115.8	115.9	116.1	116.1	116.2	115.6	0.5%
2013	116.2	116.3	116.2	116.3	116.3	116.4								



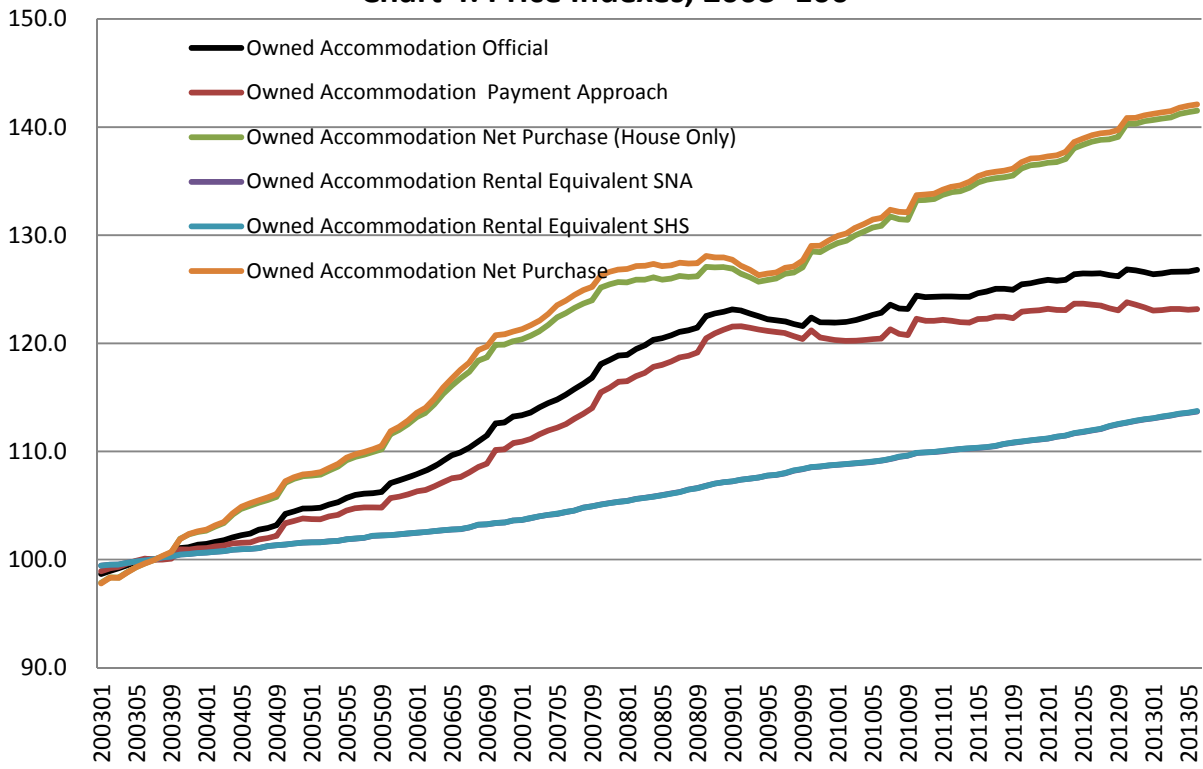
**Table 6: Analytical Consumer Price Series for Capital Gain, User cost Variants**

<b>Basic User Cost</b>														
	January	February	March	April	May	June	July	August	September	October	November	December	Annual	Annual Growth Rate
2003	97.8	98.3	98.5	98.9	99.4	99.6	100.0	100.6	101.0	101.5	102.1	102.4	100.0	
2004	102.8	103.2	103.4	104.4	105.1	105.9	106.1	106.6	106.9	107.1	107.5	107.8	105.6	5.6%
2005	108.0	108.4	108.8	109.3	110.0	110.8	111.0	111.4	112.1	112.9	113.4	114.2	110.9	5.0%
2006	115.2	115.9	117.1	118.5	120.0	121.7	123.0	124.8	125.5	125.7	126.4	126.4	121.7	9.7%
2007	126.9	127.4	128.0	129.0	130.3	131.1	132.4	132.9	133.3	133.5	134.1	134.3	131.1	7.7%
2008	135.0	135.4	135.8	135.8	135.7	135.8	136.0	136.0	136.0	135.4	135.0	134.9	135.6	3.4%
2009	134.0	133.1	132.4	131.8	131.5	131.2	131.6	131.8	132.3	132.7	133.2	133.6	132.4	-2.3%
2010	134.1	134.3	134.6	134.9	135.4	135.6	135.4	135.6	135.8	135.8	136.2	136.3	135.3	2.2%
2011	136.6	137.1	137.1	137.5	138.1	138.4	138.6	138.7	139.0	139.2	139.6	139.8	138.3	2.2%
2012	139.9	140.3	140.7	140.9	141.3	141.6	141.7	142.0	142.2	142.5	142.6	142.9	141.6	2.3%
2013	143.0	143.3	143.4	143.7	143.8	144.1								
<b>VV User Cost</b>														
	January	February	March	April	May	June	July	August	September	October	November	December	Annual	Annual Growth Rate
2003	97.9	98.3	98.7	99.0	99.4	99.8	100.1	100.5	100.9	101.4	101.8	102.2	100.0	
2004	102.6	103.0	103.4	103.9	104.4	104.9	105.5	106.0	106.5	106.9	107.4	107.9	105.2	5.2%
2005	108.3	108.8	109.2	109.6	110.1	110.5	110.9	111.3	111.8	112.2	112.7	113.3	110.7	5.2%
2006	113.9	114.5	115.2	116.0	116.9	117.8	118.8	119.9	121.0	122.1	123.2	124.3	118.6	7.1%
2007	125.3	126.3	127.2	128.1	129.0	129.8	130.6	131.3	132.0	132.6	133.3	134.0	130.0	9.5%
2008	134.7	135.3	136.0	136.6	137.1	137.5	137.8	138.0	138.2	138.4	138.5	138.6	137.2	5.6%
2009	138.5	138.3	138.0	137.6	137.3	136.9	136.5	136.1	135.8	135.6	135.4	135.3	136.8	-0.3%
2010	135.3	135.4	135.6	135.9	136.2	136.6	136.9	137.3	137.6	137.8	138.1	138.3	136.8	0.0%
2011	138.5	138.8	139.0	139.2	139.4	139.7	139.9	140.2	140.5	140.8	141.1	141.3	139.9	2.3%
2012	141.6	141.9	142.2	142.5	142.8	143.0	143.3	143.6	143.9	144.1	144.4	144.7	143.2	2.4%
2013	144.9	145.2	145.4	145.7	145.9	146.1								

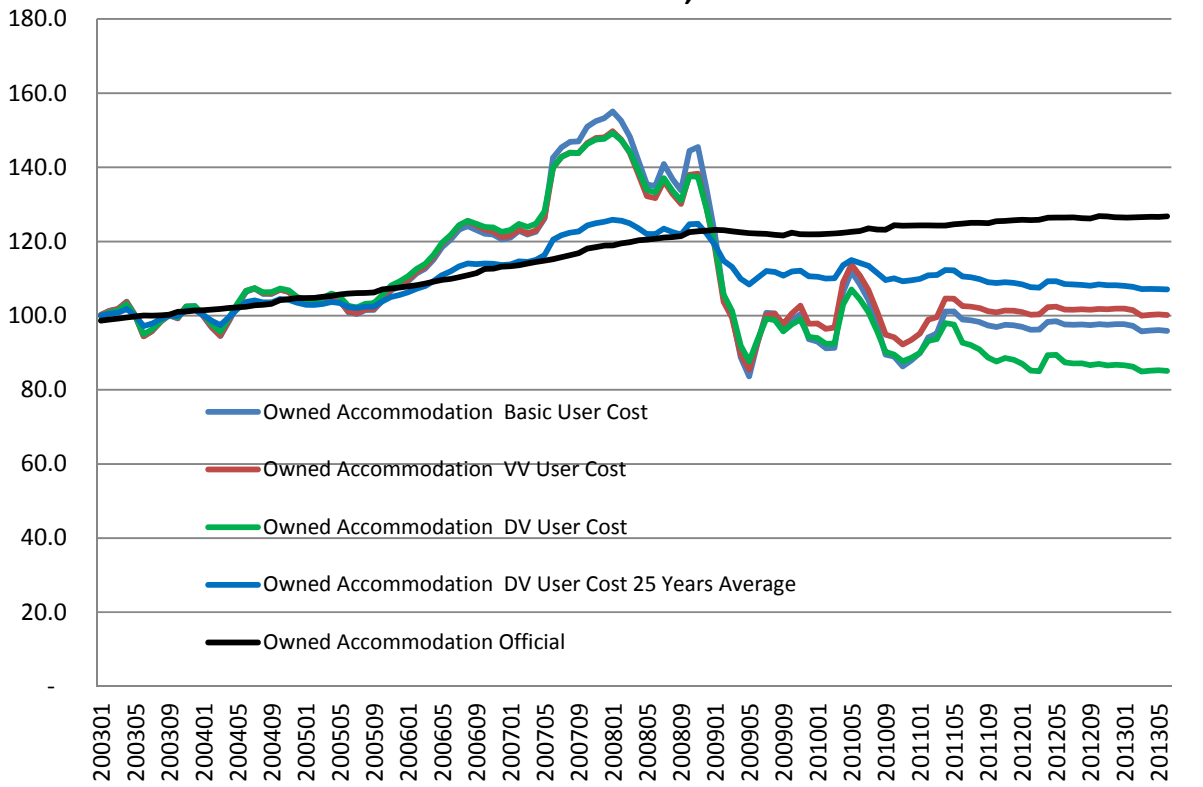
**Table 6: Analytical Consumer Price Series for Capital Gain, User cost Variants (con't)**

<b>DV User Cost</b>														
	January	February	March	April	May	June	July	August	September	October	November	December	Annual	Annual Growth Rate
2003	98.7	98.9	99.2	99.4	99.6	99.8	100.1	100.3	100.6	100.9	101.1	101.4	100.0	
2004	101.7	102.0	102.3	102.6	102.9	103.3	103.6	103.9	104.3	104.6	105.0	105.3	103.5	3.5%
2005	105.7	106.1	106.4	106.8	107.2	107.6	108.0	108.3	108.8	109.2	109.6	110.0	107.8	4.2%
2006	110.5	110.9	111.4	111.9	112.4	112.9	113.5	114.0	114.6	115.2	115.8	116.4	113.3	5.1%
2007	117.0	117.6	118.2	118.8	119.5	120.1	120.7	121.4	122.1	122.7	123.4	124.0	120.5	6.3%
2008	124.7	125.4	126.1	126.7	127.4	128.0	128.7	129.3	130.0	130.6	131.2	131.8	128.3	6.5%
2009	132.4	133.0	133.5	134.0	134.5	135.0	135.5	136.0	136.5	137.0	137.5	138.0	135.2	5.4%
2010	138.5	138.9	139.4	139.9	140.4	140.9	141.4	141.8	142.3	142.7	143.1	143.6	141.1	4.3%
2011	144.0	144.4	144.8	145.1	145.5	145.8	146.1	146.3	146.6	146.8	147.1	147.3	145.8	3.4%
2012	147.6	147.8	148.0	148.2	148.4	148.6	148.8	149.0	149.1	149.3	149.4	149.6	148.7	2.0%
2013	149.7	149.9	150.0	150.2	150.3	150.5								
<b>DV User Cost--25 Years Average</b>														
	January	February	March	April	May	June	July	August	September	October	November	December	Annual	Annual Growth Rate
2003	98.8	99.0	99.2	99.4	99.7	99.9	100.1	100.3	100.6	100.8	101.0	101.3	100.0	
2004	101.5	101.7	102.0	102.2	102.5	102.7	103.0	103.2	103.5	103.8	104.0	104.3	102.9	2.9%
2005	104.5	104.8	105.1	105.4	105.6	105.9	106.2	106.5	106.8	107.0	107.3	107.6	106.1	3.1%
2006	107.9	108.2	108.4	108.7	109.0	109.3	109.6	109.9	110.2	110.5	110.8	111.1	109.5	3.2%
2007	111.4	111.6	111.9	112.2	112.5	112.8	113.1	113.5	113.8	114.1	114.4	114.8	113.0	3.2%
2008	115.1	115.4	115.8	116.1	116.5	116.8	117.1	117.5	117.8	118.2	118.5	118.9	117.0	3.5%
2009	119.2	119.5	119.9	120.2	120.5	120.9	121.2	121.6	121.9	122.2	122.6	122.9	121.1	3.5%
2010	123.2	123.6	123.9	124.2	124.6	124.9	125.2	125.5	125.8	126.2	126.5	126.8	125.0	3.3%
2011	127.1	127.4	127.7	127.9	128.3	128.6	128.9	129.3	129.6	129.9	130.2	130.5	128.8	3.0%
2012	130.9	131.2	131.5	131.7	132.0	132.3	132.6	132.9	133.2	133.5	133.7	134.0	132.5	2.8%
2013	134.3	134.6	134.9	135.1	135.4	135.7								

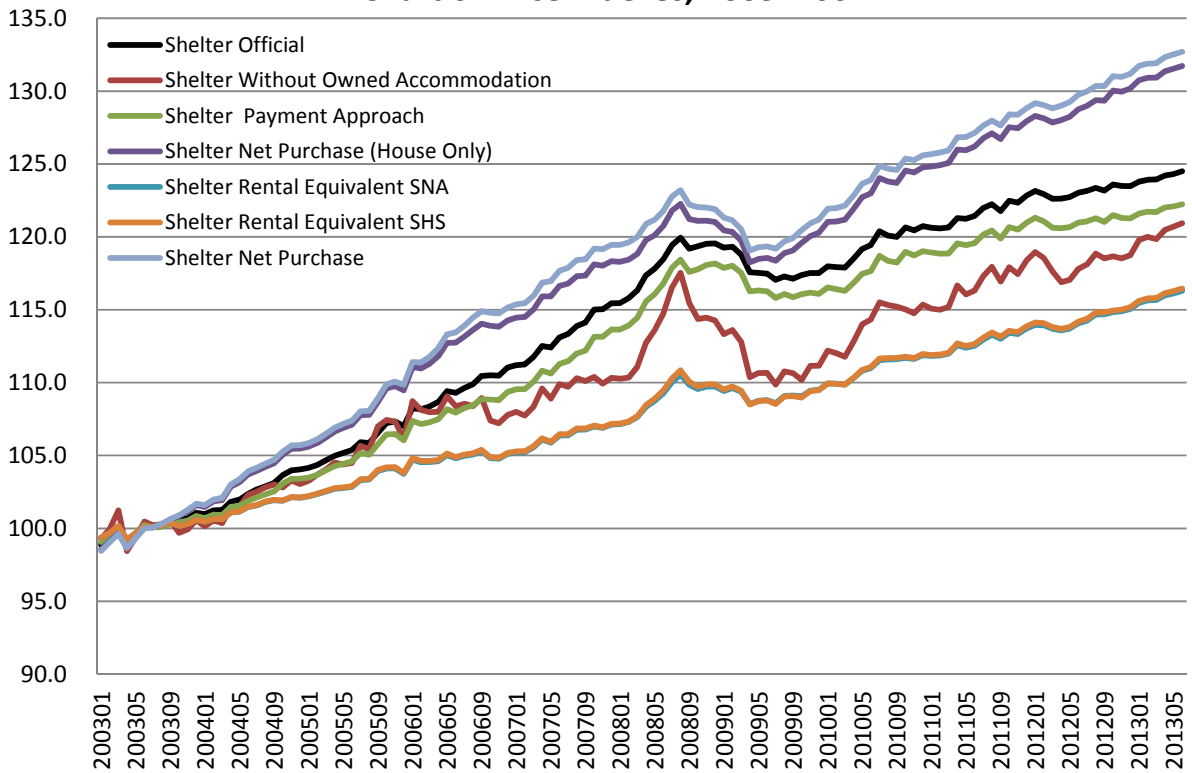
**Chart 4: Price Indexes, 2003=100**



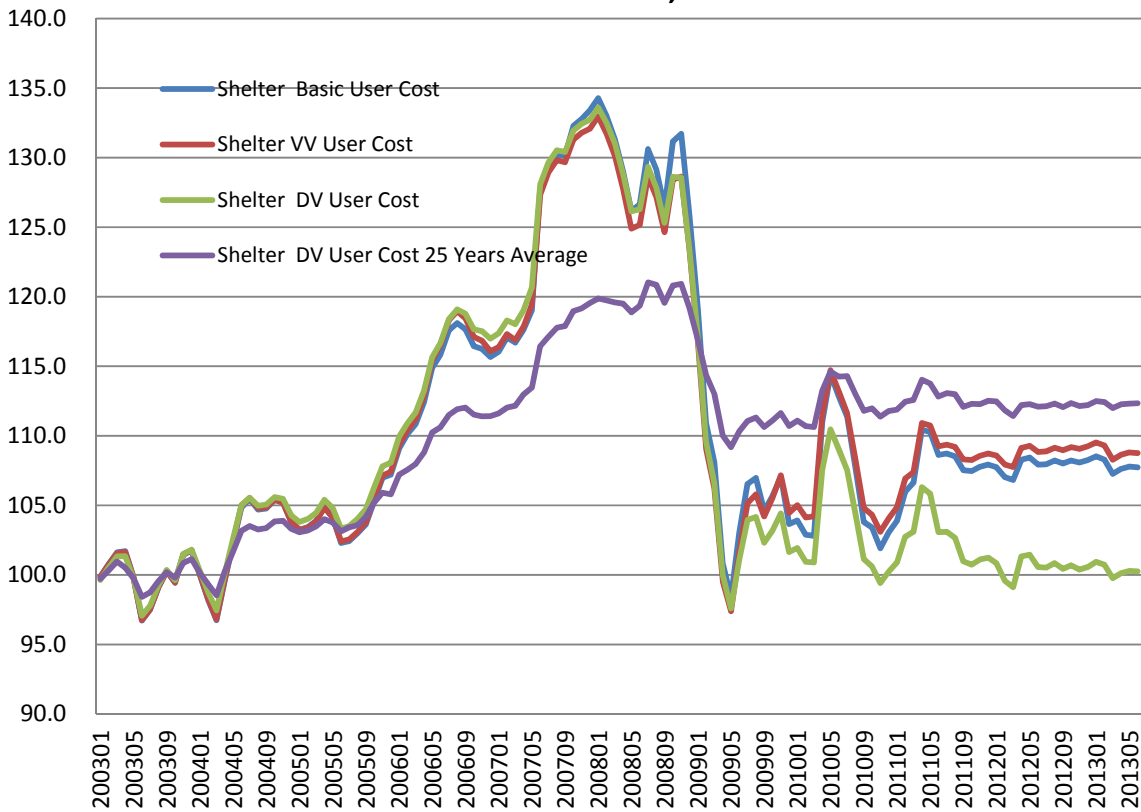
**Chart 5: Price Indexes, 2003=100**



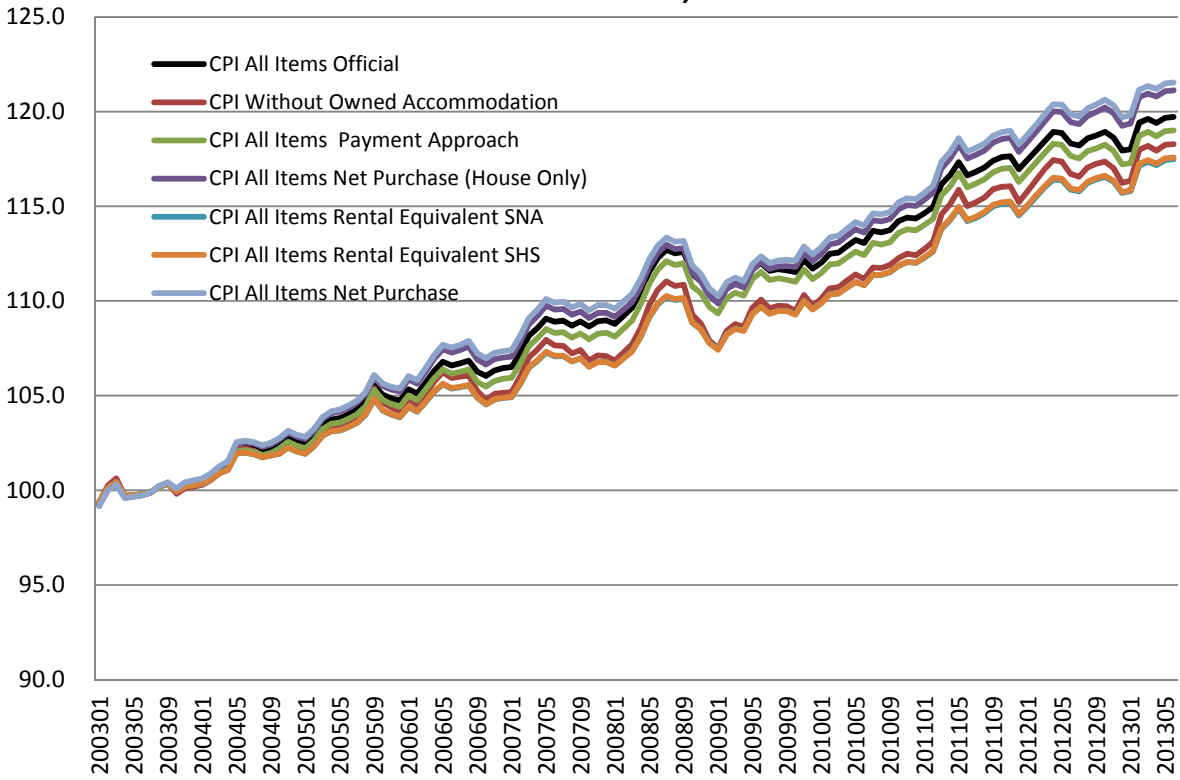
**Chart 6: Price Indexes, 2003=100**



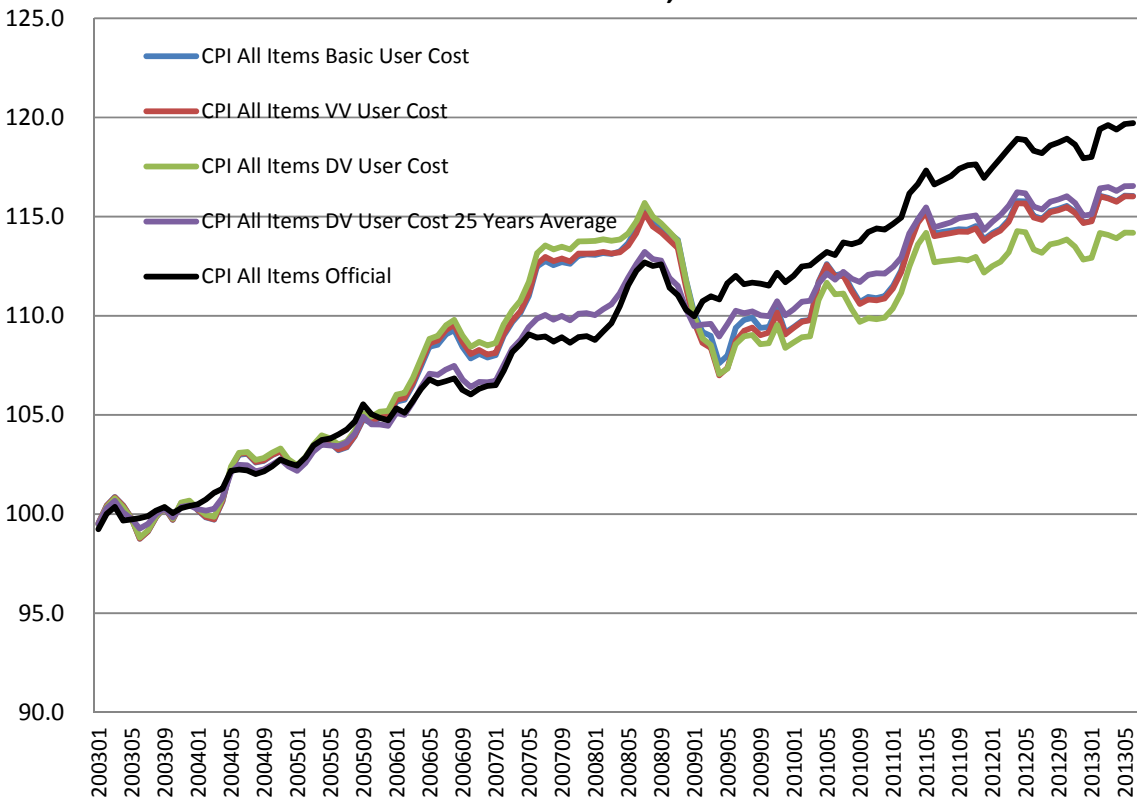
**Chart 7: Price Indexes, 2003=100**



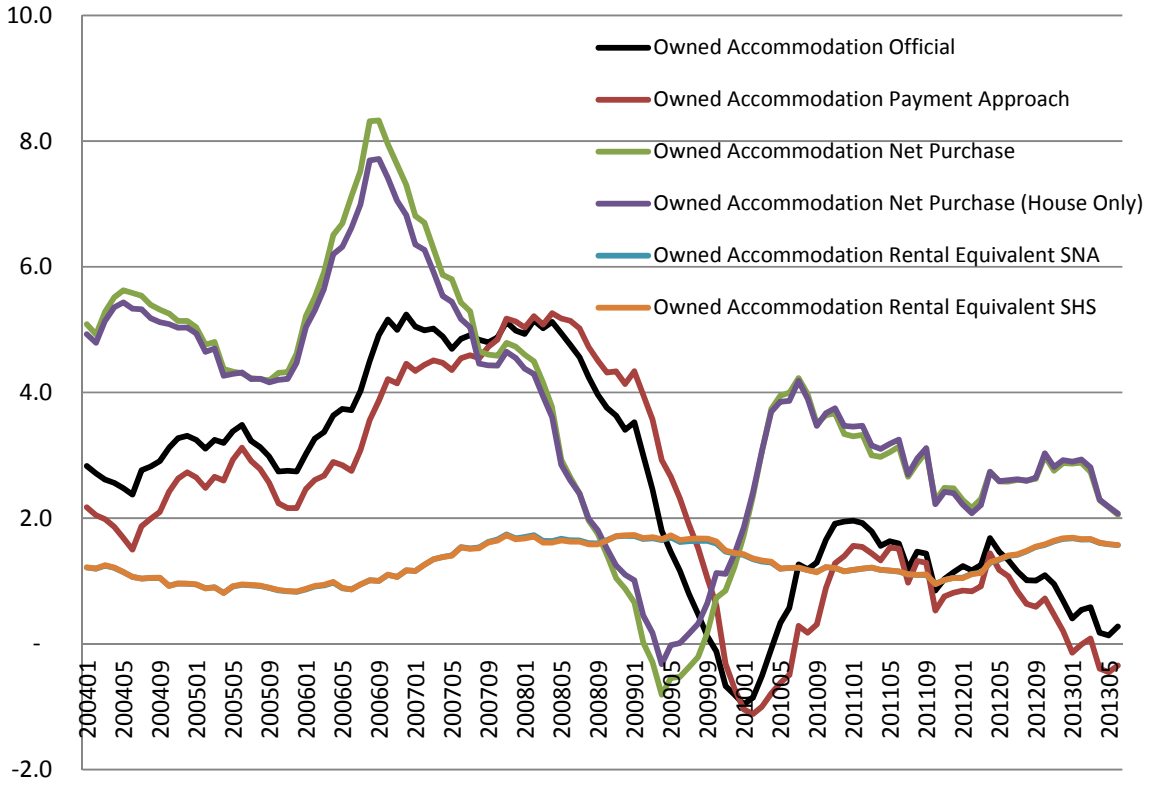
**Chart 8: Price Indexes, 2003=100**



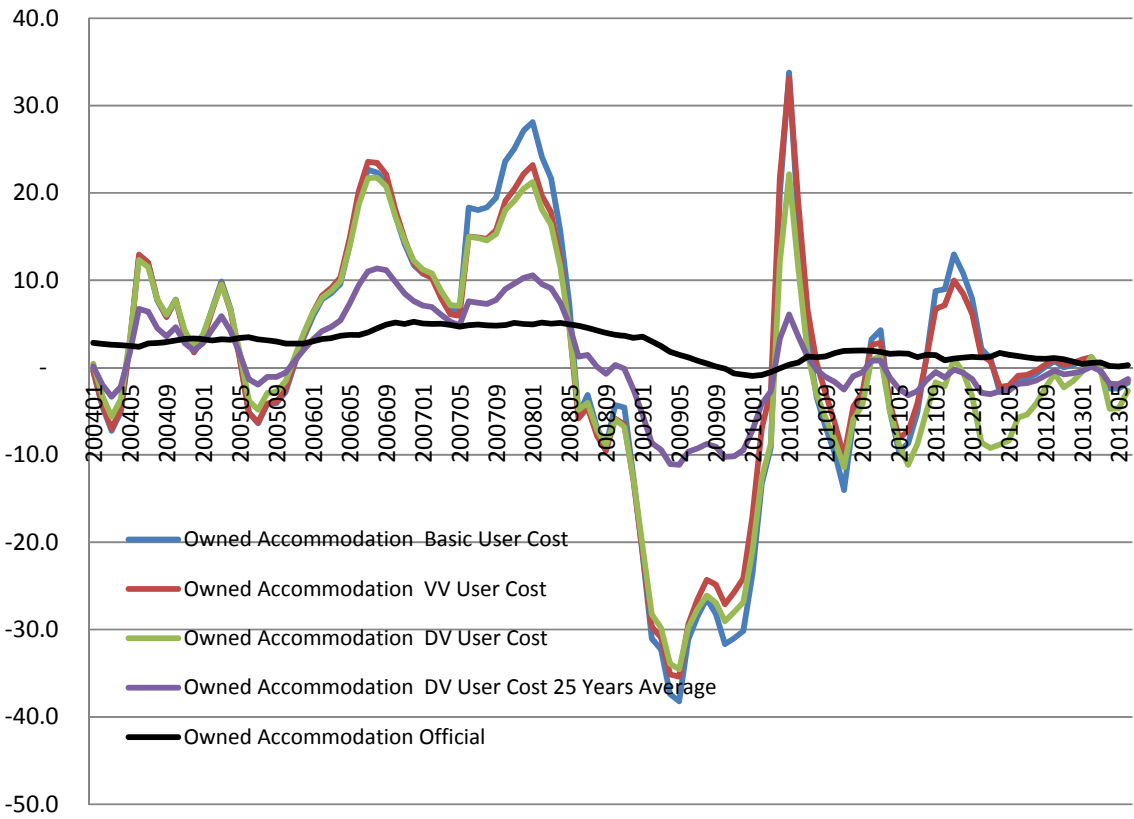
**Chart 9: Price Indexes, 2003=100**



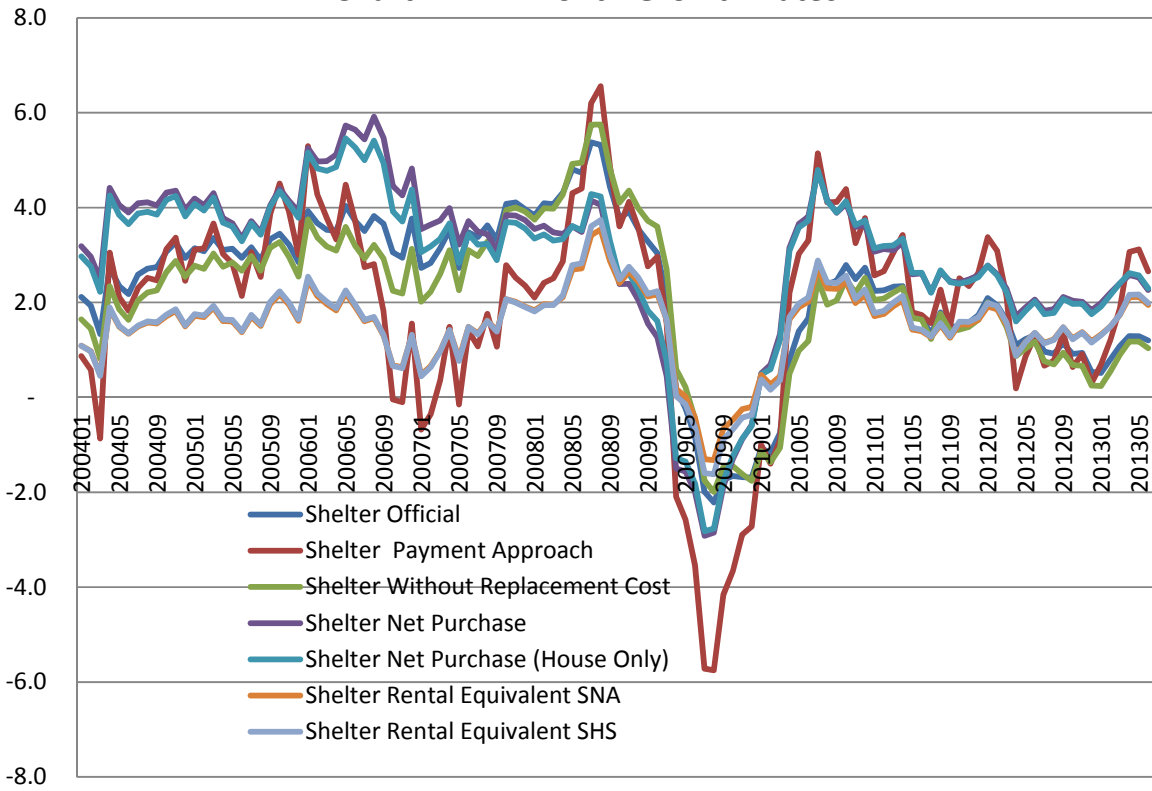
**Chart 10: 12 Month Growth Rates**



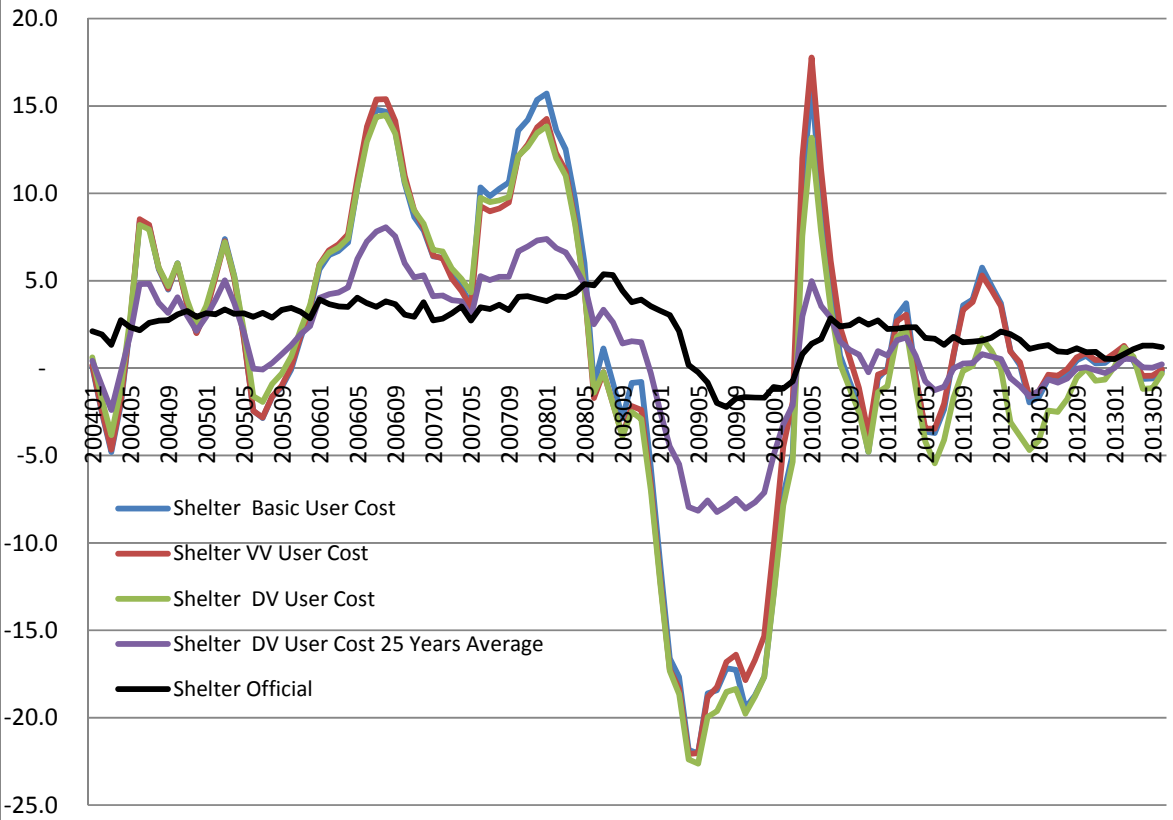
**Chart 11: 12 Month Growth Rates**



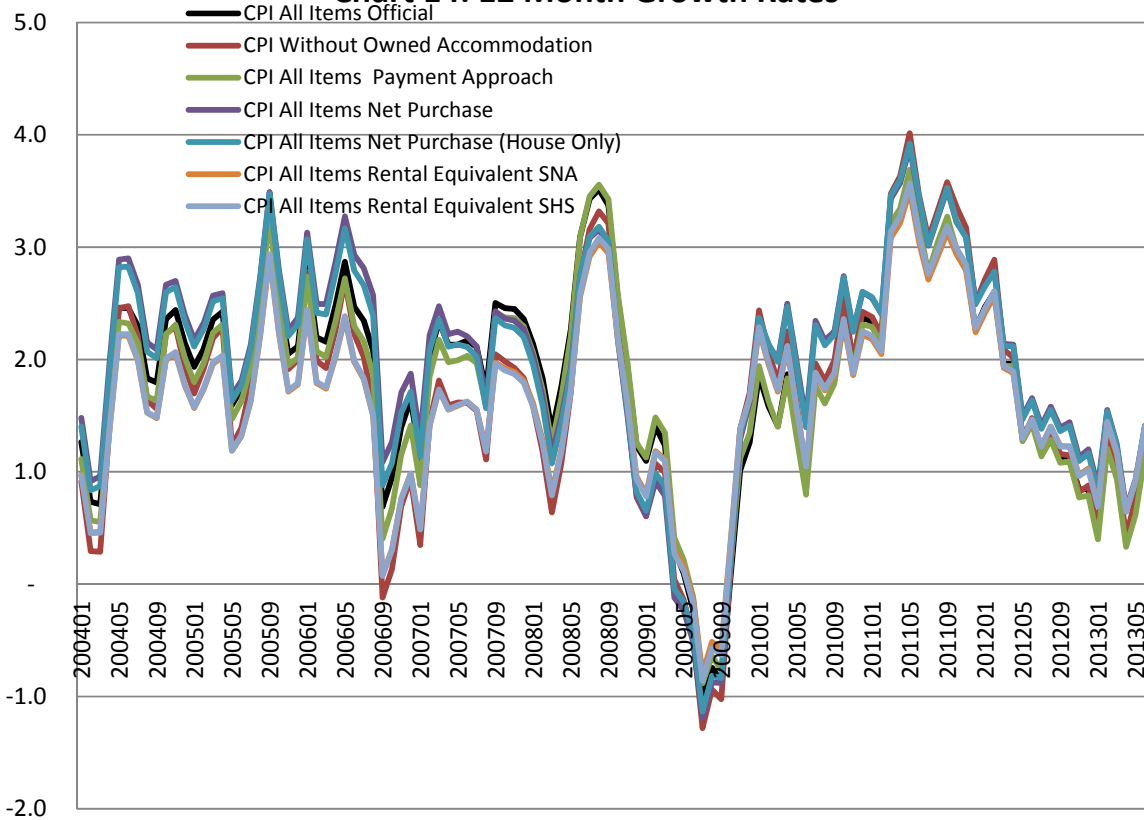
**Chart 12: 12 Month Growth Rates**



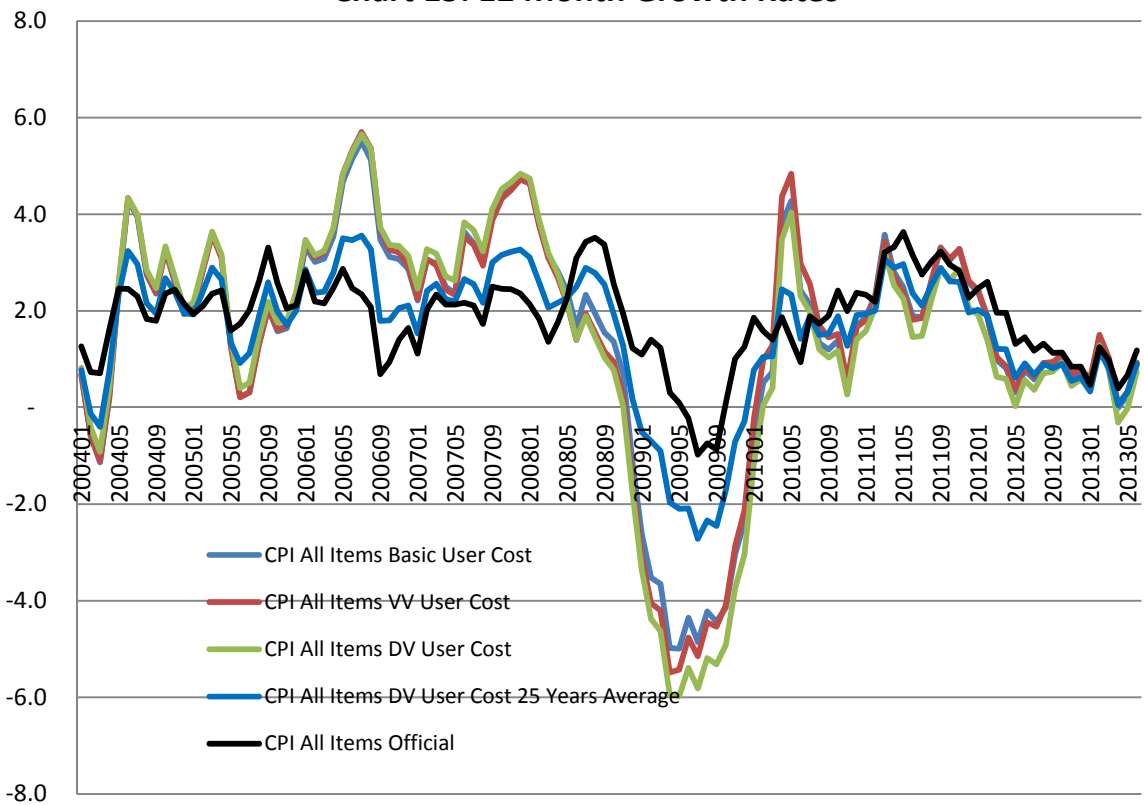
**Chart 13: 12 Month Growth Rates**



**Chart 14: 12 Month Growth Rates**

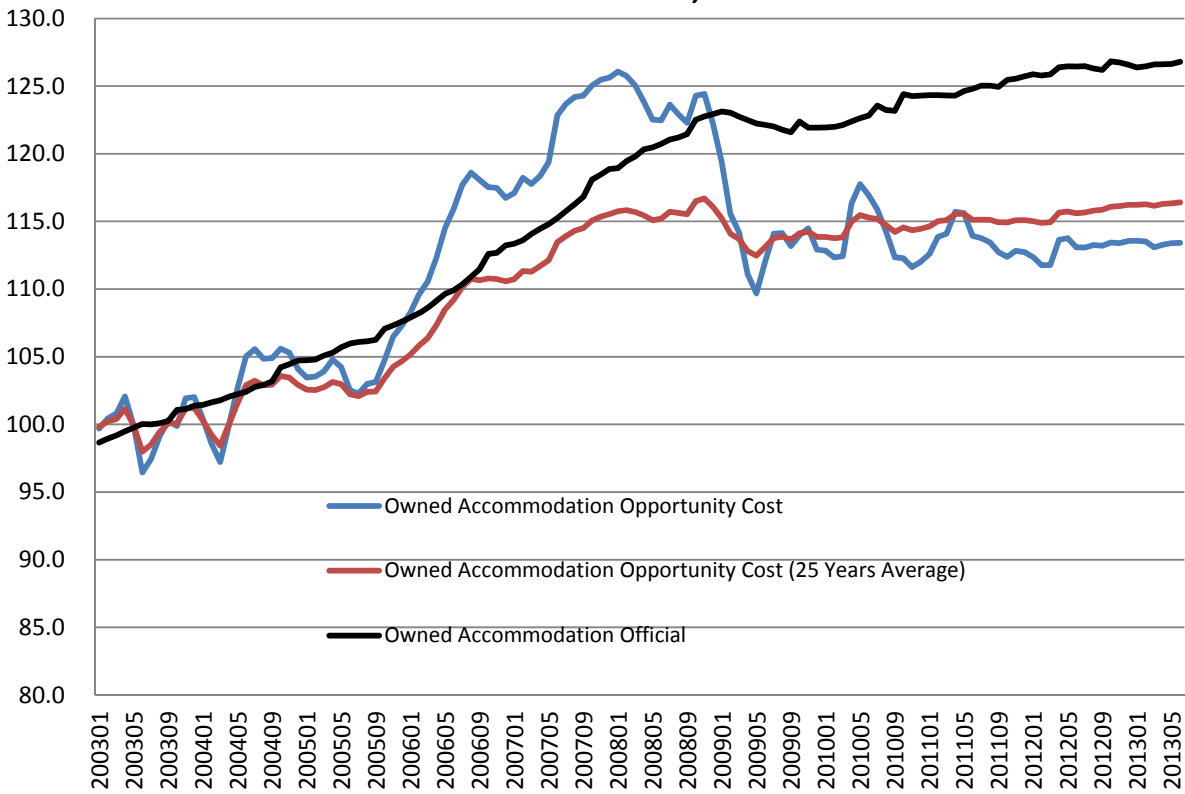


**Chart 15: 12 Month Growth Rates**

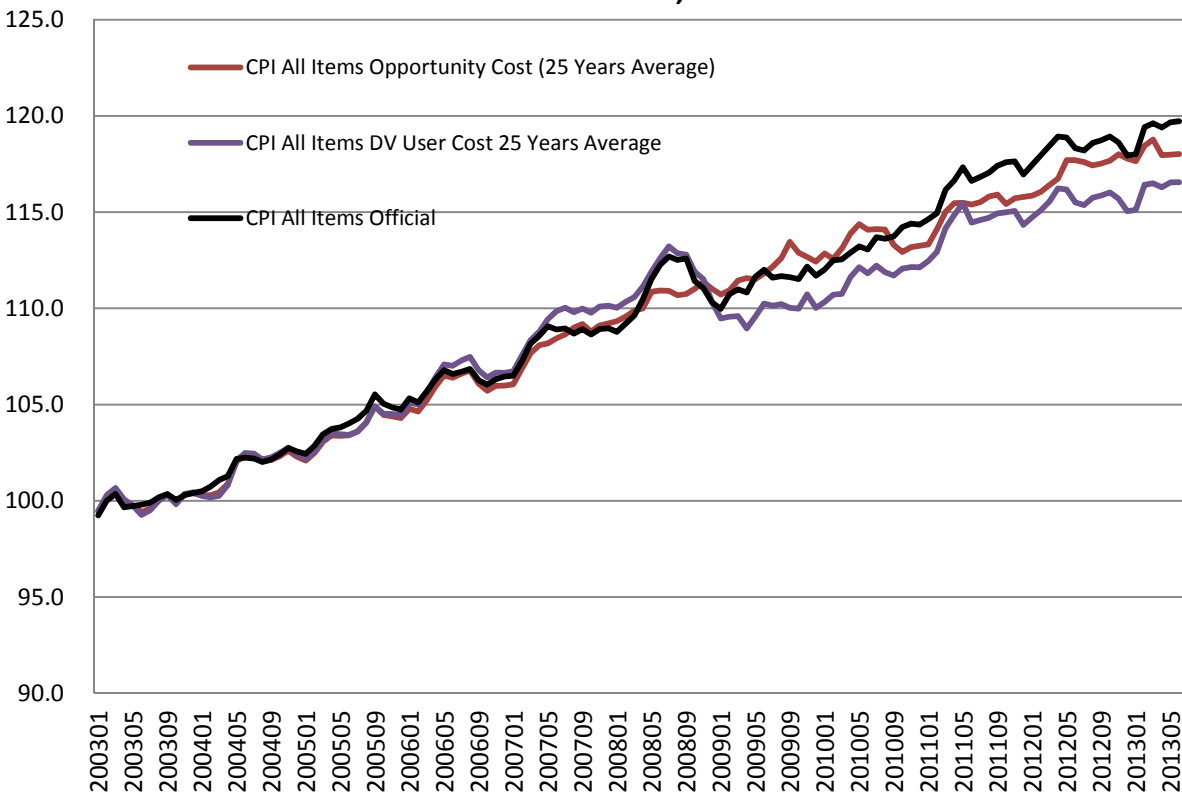




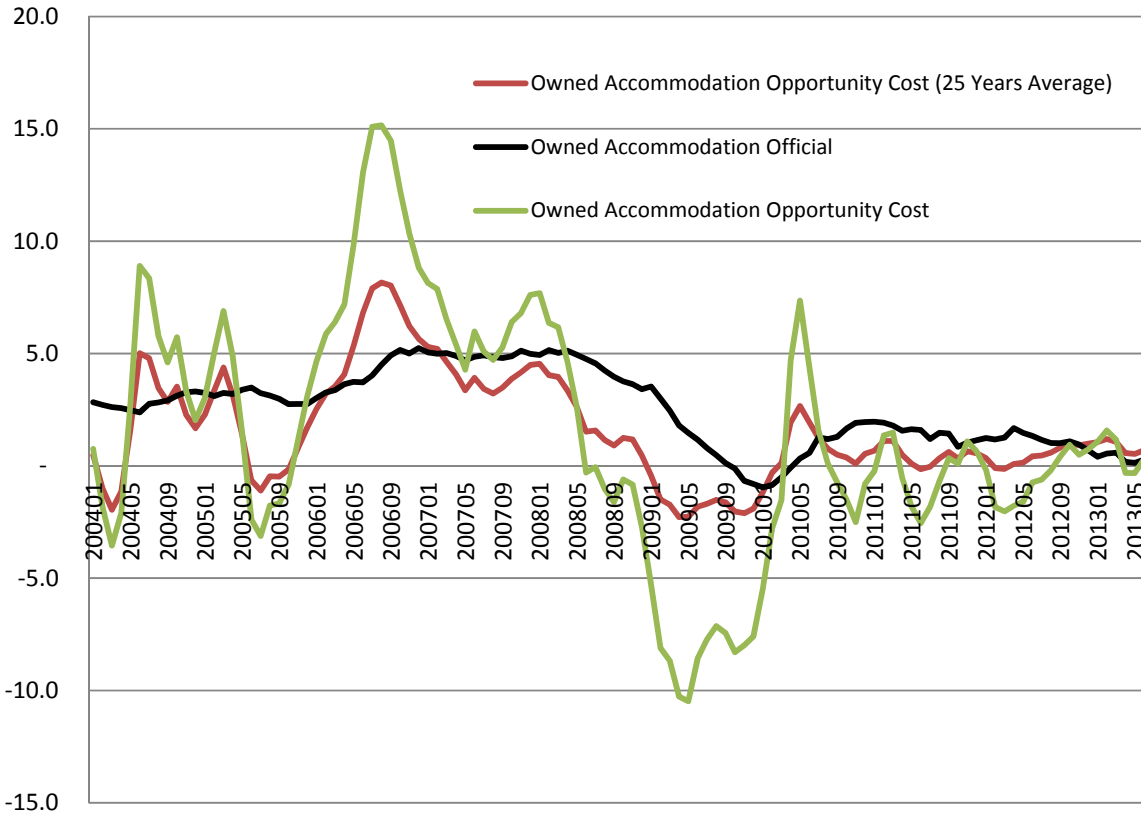
**Chart 16: Price Indexes, 2003=100**



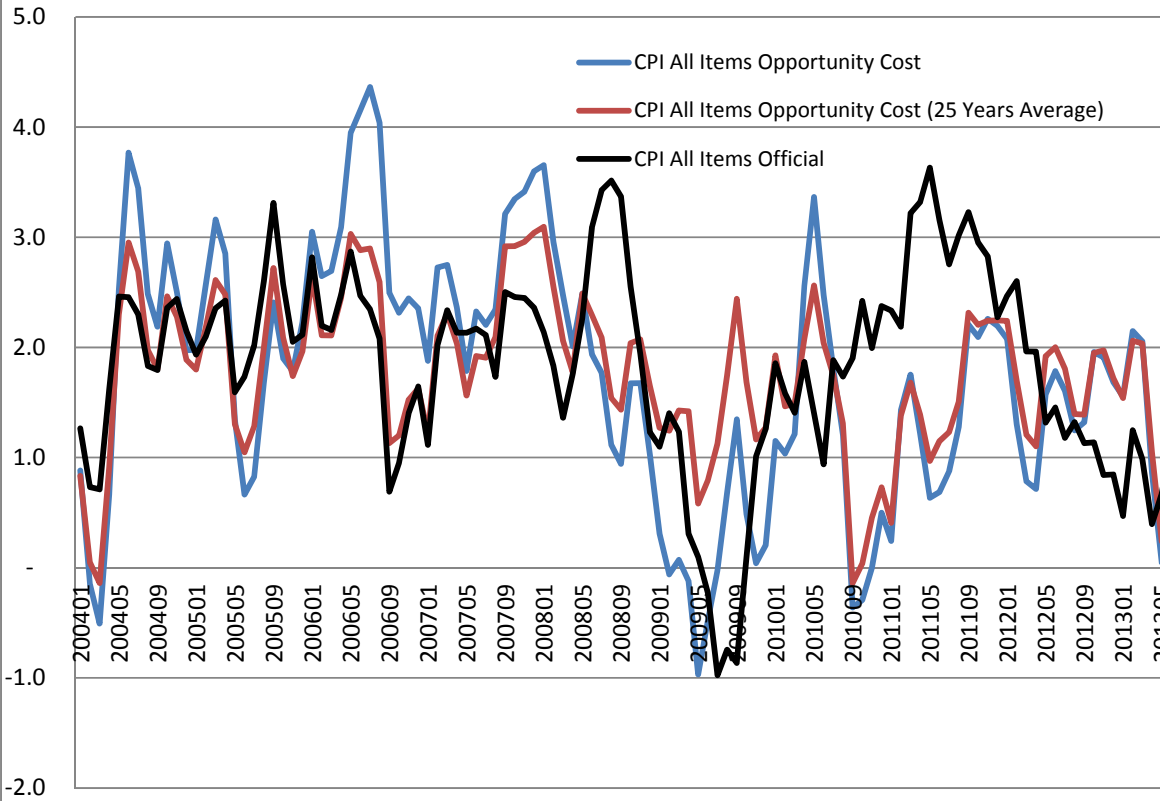
**Chart 17: Price Indexes, 2003=100**



**Chart 18: 12 Months Growth Rates**



**Chart 19: 12 Months Growth Rates**



**Table 7: Annual Growth Rates of CPI All Items**

	Jan2003-June2013	Jan2003-July2008	July2008-June2013
Official	1.82	2.34	1.24
Without Owned Accommodation	1.69	2.04	1.29
Without Replacement Cost	1.75	2.23	1.22
Net Purchase	1.97	2.46	1.43
Net Purchase (House Only)	1.94	2.39	1.43
Rental Equivalent SNA	1.62	1.90	1.31
Rental Equivalent SHS	1.63	1.91	1.31
Basic User Cost	1.48	2.72	0.11
VV User Cost	1.48	2.69	0.15
DV User Cost	1.33	2.79	-0.27
DV User Cost 25 Years Average	1.53	2.38	0.59
Opportunity Cost	1.63	2.27	0.92
Opportunity Cost (25 Years Average)	1.66	2.00	1.27

**Table 8: Annual Growth Rates of Shelter**

	Jan2003-June2013	Jan2003-July2008	July2008-June2013
Official	2.24	3.49	0.85
Without Owned Accommodation	1.91	2.95	0.76
Without Replacement Cost	2.04	3.21	0.74
Net Purchase	2.91	4.09	1.59
Net Purchase (House Only)	2.83	3.93	1.60
Rental Equivalent SNA	1.52	1.87	1.13
Rental Equivalent SHS	1.53	1.91	1.11
Basic User Cost	0.73	5.00	-3.84
VV User Cost	0.82	4.71	-3.36
DV User Cost	0.06	4.86	-5.05
DV User Cost 25 Years Average	1.15	3.58	-1.50
Opportunity Cost	1.64	3.44	-0.32
Opportunity Cost (25 Years Average)	1.77	2.58	0.87

**Table 9: Annual Growth Rates of Owned Accommodation**

	<b>Jan2003-June2013</b>	<b>Jan2003-July2008</b>	<b>July2008-June2013</b>
Official	2.44	3.79	0.95
Without Replacement Cost	2.13	3.37	0.75
Net Purchase	3.65	4.93	2.24
Net Purchase (House Only)	3.60	4.74	2.35
Rental Equivalent SNA	1.30	1.21	1.39
Rental Equivalent SHS	1.30	1.21	1.40
Basic User Cost	-0.43	6.38	-7.53
VV User Cost	0.00	5.76	-6.08
DV User Cost	-1.53	5.93	-9.24
DV User Cost 25 Years Average	0.66	3.91	-2.85
Opportunity Cost	1.25	3.99	-1.74
Opportunity Cost (25 Years Average)	1.49	2.73	0.12

**Table 10: Annual Growth Rates of Capital Gain**

	<b>Jan2003-June2013</b>	<b>Jan2003-July2008</b>	<b>July2008-June2013</b>
Basic User Cost (ex Post)	3.79	6.17	1.19
VV User Cost (1 Year Average)	3.92	6.41	1.20
DV User Cost (5 Years Average)	4.13	4.94	3.23
DV User Cost (25 Years Average)	3.09	3.15	3.03

**Table 11: Annual Growth Rates of CPI All Items**

	2001 Basket	2005 Basket	2009 Basket	2011 Basket
	Jan2003-April2007	May2007-April2011	May2011-Jan2013	Feb2013-June2013
<b>CPI All Items</b>				
Official	2.10	1.69	0.33	0.62
Without Owned Accommodation	1.82	1.62	0.24	0.61
Without Replacement Cost	1.96	1.69	0.25	0.56
Net Purchase	2.32	1.72	0.59	0.75
Net Purchase (House Only)	2.24	1.73	0.54	0.73
Rental Equivalent SNA	1.68	1.59	0.46	0.70
Rental Equivalent SHS	1.69	1.60	0.44	0.69
Basic User Cost	2.37	0.86	-0.31	0.00
VV User Cost	2.39	0.79	-0.23	0.00
DV User Cost	2.51	0.42	-0.64	0.02
DV User Cost 25 Years Average	2.08	1.22	-0.17	0.27
Opportunity Cost	2.24	1.37	0.79	-0.98
Opportunity Cost (25 Years Average)	1.94	1.64	1.06	-0.87

**Table 12: Annual Growth Rates of Shelter**

	2001 Basket	2005 Basket	2009 Basket	2011 Basket
	Jan2003-April2007	May2007-April2011	May2011-Jan2013	Feb2013-June2013
<b>Shelter</b>				
Official	3.02	1.92	1.19	1.14
Without Owned Accommodation	2.31	1.74	1.82	1.90
Without Replacement Cost	2.62	1.96	1.03	0.99
Net Purchase	4.03	2.05	2.18	1.47
Net Purchase (House Only)	3.82	2.10	2.16	1.49
Rental Equivalent SNA	1.52	1.54	1.55	1.35
Rental Equivalent SHS	1.54	1.56	1.57	1.40
Basic User Cost	3.85	-1.85	-0.91	-1.23
VV User Cost	3.90	-1.83	-0.63	-1.19
DV User Cost	4.19	-3.12	-2.67	-1.15
DV User Cost 25 Years Average	2.92	0.12	-0.64	-0.19
Opportunity Cost	3.36	0.29	0.03	0.23
Opportunity Cost (25 Years Average)	2.41	1.26	0.91	0.58

**Table 13: Annual Growth Rates of Owned Accommodation**

	2001 Basket	2005 Basket	2009 Basket	2011 Basket
	Jan2003-April2007	May2007-April2011	May2011-Jan2013	Feb2013-June2013
<b>Owned Accommodation</b>				
Official	3.49	2.01	0.80	0.63
Without Replacement Cost	2.89	2.10	0.37	0.15
Net Purchase	5.38	2.23	2.42	1.27
Net Purchase (House Only)	5.16	2.36	2.43	1.26
Rental Equivalent SNA	1.07	1.42	1.41	1.06
Rental Equivalent SHS	1.07	1.42	1.41	1.07
Basic User Cost	4.76	-5.38	-1.96	-3.25
VV User Cost	4.84	-4.63	-1.48	-3.07
DV User Cost	5.28	-6.49	-6.60	-3.17
DV User Cost 25 Years Average	3.29	-0.88	-2.17	-1.50
Opportunity Cost	4.04	-0.78	-1.01	-0.21
Opportunity Cost (25 Years Average)	2.63	0.75	0.33	0.30

**Table 14: Annual Growth Rates of Capital Gain and Rate of Return**

	2001 Basket	2005 Basket	2009 Basket	2011 Basket
	Jan2003-April2007	May2007-April2011	May2011-Jan2013	Feb2013-June2013
<b>Capital Gain</b>				
Basic User Cost (ex Post)	6.60	1.36	2.05	1.32
VV User Cost (1 Year Average)	6.41	1.92	2.24	1.48
DV User Cost (5 Years Average)	4.37	4.99	1.67	0.92
DV User Cost (25 Years Average)	2.98	3.27	2.66	1.92
<b>Foregone Rate of Return</b>				
DV User Cost	5.60	-3.88	-6.27	-5.07
DV User Cost 25 Years Average	-0.64	0.82	-1.61	-1.57