

Kiribati CPI Weights: A Review of Household Expenditure Data

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Abstract

Household Income and Expenditure Surveys (HIES) are a common source of weights in the compilation of consumer price indices. While their weaknesses are globally recognized, it is even more challenging in developing island states whose territories often span thousands of miles over open oceans. It presents an enormous and expensive data collection exercise. Underestimation or overestimation of weights in the HIES can affect quality of the CPI. While consumer price inflation may display the same pattern even when weights have slightly changed, significant disparities lead to distortions. Commodity flow techniques can be strengthened to validate HIES data for purposes of CPI weighting for such countries like Kiribati.

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Introduction

The Kiribati National Statistics Office undertook a household and income expenditure survey in 1996 and consequently rebased its consumer price indices. A similar household expenditure and income survey (HIES) was undertaken in 2006. Results of the 2006 expenditure survey were expected to be used to update the CPI weights to a new base. The NSO made attempts to update the weights but it was not convinced that the new weights reflected expenditure patterns across the country.

Kiribati is a developing multi-island country in the middle of the Pacific ocean. Its territory is spread across a vast mass of open ocean. Consumption patterns, particularly with respect to goods and services does vary widely. In the capital, Tarawa, much of the trading happens with Australia, New Zealand and Fiji while the remote, but tourist Christmas Islands trades mainly with the US due to its close proximity to Hawaii. It also has good air-link to Hawaii than the capital Tarawa. As such there is a complex commodity basket for CPI purposes. Currently CPI does not include the Christmas Islands and is only compiled for the capital city.

Retail trade systems are not sophisticated. Use of scan data is not possible. Being a small island nation, issues of data confidentiality amongst retailers are contentious. Compounded by weaknesses in statistical legislation, data collection can be difficult despite the small size of the country, population wise.

In the absence of retail surveys, household expenditure survey data remain the most appropriate source in updating weights of the CPI. The NSO has put in place a regular programme of HIES

over the coming years. It will remain a major input towards revision of CPI weights over many years to come.

HIES data is subject to various kinds of errors. This could be sampling, survey or data entry related amongst others. Some major underreporting of alcohol or tobacco products is a common phenomena. Kiribati imports almost everything from its major trading partners of Australia, New Zealand and Fiji. Imports in other cases exceed total GDP or near it. Consequently commodity flow validation techniques such as use of imports to adjust HIES generated weights can be used. This however, assumes good quality merchandise trade statistics. It is not often the case with import statistics for Kiribati. Serious data quality issues with respect to trade statistics data for Kiribati do exist. It often renders commodity flow techniques hard to use in validating HIES results.

In this paper, I discuss weighting in the Kiribati CPI using HIES data from the 1996 and 2006 surveys and how it gets reflected in the CPI and draw some conclusions. There appears some variation in changes in the consumer price index holding other factors such as substitution bias, quality, seasonal variation amongst others constant. The essence is to look at variation in expenditure weights over two Household Surveys.

The Current CPI

Results of the 1996 Household Income and Expenditure Survey (HIES) were used to rebase the CPI. Table 1 below, gives a quick snapshot of the Kiribati CPI for 2011 on a monthly basis. With ten consumption groups, food constitutes 45 percent, the largest so far. Such a phenomena is consistent with most developing countries where households tend to spend much of their

earnings on food. Non-alcoholic beverages constitute the second largest expenditure item probably taking a similar pattern, as the preceding consumption group. Alcoholic beverages account for six percent while education related expenses constitute eight percent. The index is compiled on a monthly basis and is based only on the capital, Tarawa. The 1996 Household Income and Expenditure Survey however, covered the entire group of islands. Logistical issues, often confronting Kiribati, just like many other island nations, make price collection in outer islands an expensive undertaking that small NSOs can barely afford.

Table 1: Kiribati Consumer Price Index, August 1996=100

	<i>Food</i>	<i>Drinks</i>	<i>Alcohol & Tobacco</i>	<i>Clothing</i>	<i>Transport</i>	<i>Utilities</i>	<i>Housing</i>	<i>Education</i>	<i>Recreation</i>	<i>Household Operations</i>	<i>All Items</i>
Month/weight	450	100	60	20	80	80	20	80	50	60	1000
JAN--11	156.28	179.18	172.96	95.57	126.24	131.79	103.66	98.44	101.35	112.28	142.93
FEB--11	156.28	179.18	172.96	95.57	126.24	131.39	103.66	98.44	101.35	112.28	142.93
MAR--11	156.51	179.78	172.96	98.44	125.55	131.79	103.66	100.44	101.35	112.31	143.10
APR--11	158.95	181.16	173.50	97.49	123.81	131.79	103.66	100.44	101.35	112.72	144.39
MAY--11	160.18	187.00	173.50	97.29	123.78	131.71	103.66	99.78	101.35	112.73	145.47
JUN--11	159.01	187.50	173.50	97.29	123.81	131.77	103.66	99.78	101.35	113.46	145.04
JUL--11	158.92	187.10	173.50	95.57	126.24	131.79	103.66	98.44	101.35	112.26	144.94
AUG--11	157.59	186.87	175.33	97.42	126.50	131.79	103.66	98.44	101.35	108.74	144.27
SEP--11	159.21	187.16	175.33	99.58	126.50	131.79	103.66	98.89	101.35	111.50	145.28
OCT--11	156.83	187.16	175.33	101.37	126.50	131.85	103.66	99.11	101.35	110.75	144.22
NOV--11	156.69	181.53	173.41	101.32	126.50	131.77	103.66	98.67	101.35	111.30	143.47
DEC--11	156.79	173.40	156.62	99.68	126.42	131.77	103.66	99.11	101.35	111.37	141.69

In 2006, Kiribati National Statistics Office undertook another Household Income and Expenditure Survey. The 2006 HIES covered the entire group of islands as well. The methodology was not different, and as expected, data generally comparable. In Table 2, I present an extraction of household consumption groups on the basis of the CPI headings that are currently in use. The 2006 and 1996 consumption patterns are compared.

Food expenses as a share of household consumption expenditure rose by 14.5% to 51.5% from 45% in between the two HIESs. There is also a substantial rise in housing expenditures. Expenditure shares in tobacco and alcoholic beverages fall substantially. From 6% in 1996, alcoholic beverages accounted for 3.3% of household consumption expenditure in the 2006. Expenses in education as a share of household consumption declined to 3.9% from 8%. Similar trends are observable in other aspects of expenditure such as non-alcoholic drinks, utilities, transport and clothing. Household purchases on recreational items and transport were generally stable across the two surveys.

Table 2: Kiribati CPI Weights²

	1996	2006	% change
Food	45.0	51.5	14.5
Housing	2.0	10.3	417.2
Household Operations	6.0	10.5	75.8
Clothing and Footwear	2.0	0.9	-55.7
Transport and travel	8.0	6.0	-25.1
Tobacco& Alcohol	6.0	3.3	-45.2
Education	8.0	3.9	-50.9
Recreation	5.0	5.5	10.0
Utilities	8.0	4.0	-49.9
Drinks*	10.0	4.0	-59.9
	100.0	100.0	

Source: Kiribati National Statistical Office 1996 & 2006 HIES Reports

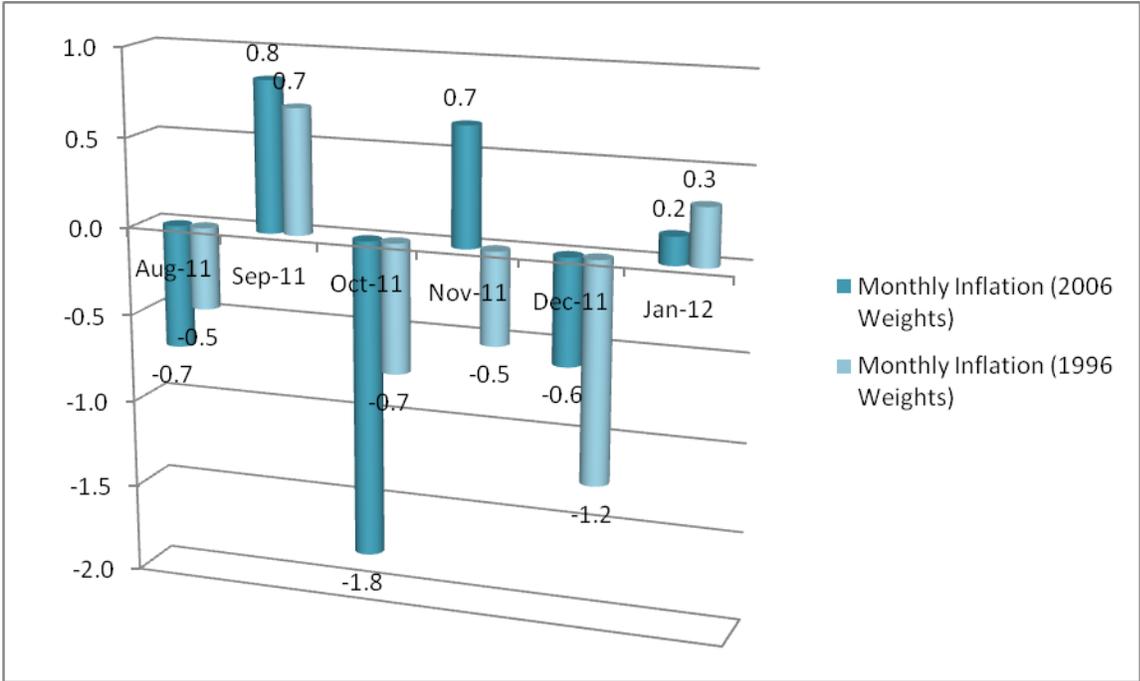
While the HIES has traditionally been used as a source of weights, results of the 2006 did raise some data quality issues. The intuition remains that the 2006 HIES did overestimate expenses on food, housing, and greatly underestimated education, clothing and alcoholic products. The

² Based on 1996 and 2006 Household Income Expenditure Surveys (HIES) conducted by the Kiribati National Statistics Office. Slight adjustments have been by the author to the 2006 weights for purposes of this paper.

Kiribati National Statistics Office decided not to adopt the new weights and opted to wait for a completely new approach to address the issues with the 2006 HIES.

Despite these shortfalls, in this paper I recreate the current CPI using the 2006 HIES weights. A key underlying assumption is that a change in base or weights should have a very minimal effect on consumer price inflation. I assume that other factors that can influence the CPI are constant and any change is purely a result of distortions arising from a change in weights. Results are presented in Chart 1 below.

Chart 1: Kiribati Monthly Inflation Rates with different HIES Weights



I simply replicate the new weights from the 2006 HIES and observe changes in monthly inflation over a six month period. The base period is held constant but different weights used over the

same period and the impact on changes in CPI is observed. This presupposes all factors that would affect quality of CPI such as substitution (outlet & product) bias, missing prices etc constant as the same prices are used. The monthly inflation rates for the 1996 HIES weights are official figures from the Kiribati National Statistics Office. Inflation rates on the basis of the 2006 HIES weights are calculations by the author. In both scenarios, the method is a Laspeyres³ and uses the same compilation sheets. In any case, the results are comparable controlling for other factors.

Differences in monthly inflation rates are observed and presented in Chart 1 above. Only six months are used to get a quick snapshot of behaviour in the CPI. One observation is that all months except November display a similar trend. There is no exact match in CPI inflation. While it might be difficult to draw a robust conclusion, we can speculate that CPI inflation can be affected by inaccurate weights.

There is a difference of 0.2 units in December, and an almost convergence in September and January. However there is a much starker difference in October and November. Using the 1996 weights, there is a general decline in the price level by 0.5% in November. On the contrary though, if 2006 weights are used, the general price level goes up by 0.7% in November, and by -0.5% in the same months if 1996 weights are used. We can infer that the source of weights can distort the CPI.

³ Laspeyres in this context is the formula. The weights and prices are not calculated in the strict sense of the Laspeyres in which both of them have the same timing.

Issues with HIES weights

Slight differences in inflation rates can have very serious implications for users. Given that the CPI is weighted index, accuracy of the weights has serious implications in the overall movement of the average price level. In the case of Kiribati, the HIES, just like many other surveys is prone to different errors such as non-response, incorrect expenditures details in the expenditure diary, missing records, recall periods in the diary amongst others.

While this is a common occurrence in household surveys, an attempt was made to consider commodity flow methods. The intent was to deal with issues that would affect expenditure weights for CPI purposes. One obvious approach was to use international merchandise statistics to track expenses such as alcohol and textiles or others suspect goods. The results have not been quite encouraging due to data quality issues with trade statistics.

However, from the perspective of SPC, as technical assistance providers, we have undertaken pre-emptive steps to help resolve matters in Kiribati and other countries in the region. Firstly, we are developing a common standard for HIES across all Pacific Island countries that not only includes standard core questions, but also recall periods for all expenses that households sampled have to follow. This is being currently tested in Nauru and Solomon Islands. Kiribati plans to run another HIES towards the end of 2012 or early 2013. Secondly, we have increased support to most of island countries to improve the quality of international trade merchandise statistics. In such a way, we envisage improved data quality for purposes of commodity flow data techniques.

Conclusion

The HIES remains a key source of updating CPI weights in Kiribati in the foreseeable future. While data quality for the CPI can get compromised by other factors, strengthening the source weights remains very critical. The average price level may never change but it is important to minimise fluctuations that are due to change in weights if applied over a similar reference period. Lack of alternative better quality commodity flow data can be a problem but must be strongly encouraged.

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