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**Do we gain from collecting price data more than once per
month?**

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Introduction

The National Statistical Offices collect market prices for Consumer Price Indices and inflation either once or twice a month. There are advantages and disadvantages for whichever method is adopted. Price collection once-a-month reduces cost in terms of money, human resources and time which are scarce in most countries, especially, the developing countries. It also enables the release of inflation for the month on the first day or within the first week of the following month. However, it suffers from precision.

To come out with CPI numbers that reflect as good as possible actual price changes on the market, twice-a-month price collection was adopted. One argument for two times monthly data collection was like what happened in the United States after 11th September, 2001 attacked on the twin towers in New York USA. When the incident happened, Labour Statistics Office has already gone to the market to collect prices for the CPI. Consequently after the incident gasoline prices in the USA jumped high to shock everybody. When the CPI was announced there was no jump in the level of petroleum index and people wanted to know why? In general, thus, the argument for collecting prices twice-a-month is to be able to compile a CPI that is less vulnerable to short-term price fluctuations and better reflects the average monthly prices and. However, while collecting price twice-a-month increases precision, it increases costs as well. It also suffers from interviewer and interviewee fatigue.

Market prices in Ghana

Market price collection for the Consumer Price Indices and inflation in Ghana are solely done by the Ghana Statistical Service (GSS) and the history goes as far back as March 1963.

The CPI covers the whole country, both the urban and rural areas and all the ten regions. It is not possible to collect price data from every market. For this reason, forty (40) markets, made up of 9 urban and 31 rural markets have been sampled throughout the country from which market prices are collected. There are 242 goods and services in the basket.

Data collection for the calculation of the CPI is undertaken by staff of the Regional Offices of the GSS twice a month (in the 1st and 3rd weeks). This was an effort by the Service to capture accurately actual changes in prices throughout the month with the aim of improving inflation numbers reported. In fact this has been going on since May 2003 on the advice of IMF Consultant to Ghana in the beginning of year 2000. A single questionnaire is used for all the products at all the points of data collection or markets. For each item (except those with fixed prices, such as postage stamps), six price quotations are taken in the urban market centres and three in the rural market centres.

Until 2006, when data entry was centralised, all the market data sheets from the regions were forwarded to the head office for data capture. Data editing was and is still done by checking all prices that have changed by 25% or more in relation to the preceding month's price. Computer software calculates the index automatically from the cleaned data. The base year for current CPI is the 2002 (average) prices.

It was expected that it would make policy makers such as Government and District Assemblies and institutions like the IMF and World Bank have more confidence in the CPI.

Since the adoption of the twice-a-month prices collection, there has been improvement in the quality of CPI and inflation reported. Initially, this was conceded by our stakeholders including both local and international institutions, such as the Bank of Ghana, Ministry of Finance, the IMF, World Bank, DANIDA, UNDP, The EU, ECOWAS and other researches institutions and universities.

However, GSS lost the confidence in short time when unlikely price observations started to be reported from the price collectors. It turned out that with twice-a-month data collection, supervision is weak because of the cost involved The Service is not able to send the supervising teams to the scattered markets twice a month. When the data collector has been visited once in the month, he is sure that during the second reading the supervisory teams are most likely to visit other data collectors in the next week. In the long run, the quality being protected is lost again. A time has come for us to look back and ask ourselves pertinent questions such as:

- What have we gained from collecting price data twice in a month instead of once?
- What have been the major advantages and disadvantages?
- Can the advantages outweigh the cost to the Service

Objective of the paper

The objective of this paper is to assess the deviation of the CPI based on collection of prices once or twice per month. The research hypotheses are that there are differences in the inflation trends depending on whether prices are collected once or twice per month..

Benefits

The analysis provides a statistical/scientific basis for the GSS to take a decision on whether to discontinue the two times data collection and as to which of the weeks (first or third) to undertake CPI price collection.

Methodology

The task was to calculate the rate of inflation for year 2007 using the two sets of data and comparing corresponding levels to see whether there are large differences. The work centred on the following;

1. Assembling the two sets of data
 - a. 1st week data collection for 2006 and 2007
 - b. 3rd week data collection for 2006 and 2007
2. Calculating inflation rate from the 1st week prices data with 2002=100
3. Calculating inflation rate from the 3rd week prices data with 2002=100
4. Comparing the results with the existing method of twice-a-month collection: description of trends and testing for the significance of the inflation figures

The results of the analysis

Table 1 presents the results after the necessary steps have been followed. The existing rates are between the rates for the first and third weeks.

Table 1. CPI and rate of inflation using first and second CPI readings

Month/year	CPI			Rate of Inflation		
	1st & 3 weeks	1st week	3rd week	1st & 3 weeks	1st week	3rd week
Jan-06	185.84	186.98	184.70			
Feb-06	188.94	189.97	187.91			
Mar-06	191.74	192.99	190.49			
Apr-06	194.16	196.22	192.10			
May-06	196.73	199.27	194.19			
Jun-06	198.78	199.23	198.34			
Jul-06	202.10	205.08	199.11			
Aug-06	201.99	203.77	200.22			
Sep-06	201.94	203.79	200.09			
Oct-06	201.69	205.31	198.07			
Nov-06	202.60	208.21	196.98			
Dec-06	203.81	210.78	196.84			
Jan-07	206.08	209.40	202.75	10.89	11.99	9.77
Feb-07	208.62	211.56	205.68	10.42	11.37	9.46
Mar-07	211.28	214.07	208.49	10.19	10.92	9.45
Apr-07	214.55	215.83	213.27	10.50	9.99	11.02
May-07	218.41	218.34	218.48	11.02	9.57	12.51
Jun-07	220.02	220.92	219.13	10.69	10.89	10.48
Jul-07	222.59	223.48	221.70	10.14	8.97	11.35
Aug-07	223.02	223.58	222.46	10.41	9.72	11.11
Sep-07	222.52	224.05	220.98	10.19	9.95	10.44
Oct-07	222.15	226.17	218.13	10.14	10.16	10.13
Nov-07	225.69	232.19	219.20	11.40	11.52	11.28
Dec-07	229.79	236.36	223.23	12.75	12.14	13.40

Furthermore, Table 2 indicates how the average rates of the 12-month changes and it illustrate how close the three measures are on average:

Table 2. Average rates of 12-month price changes

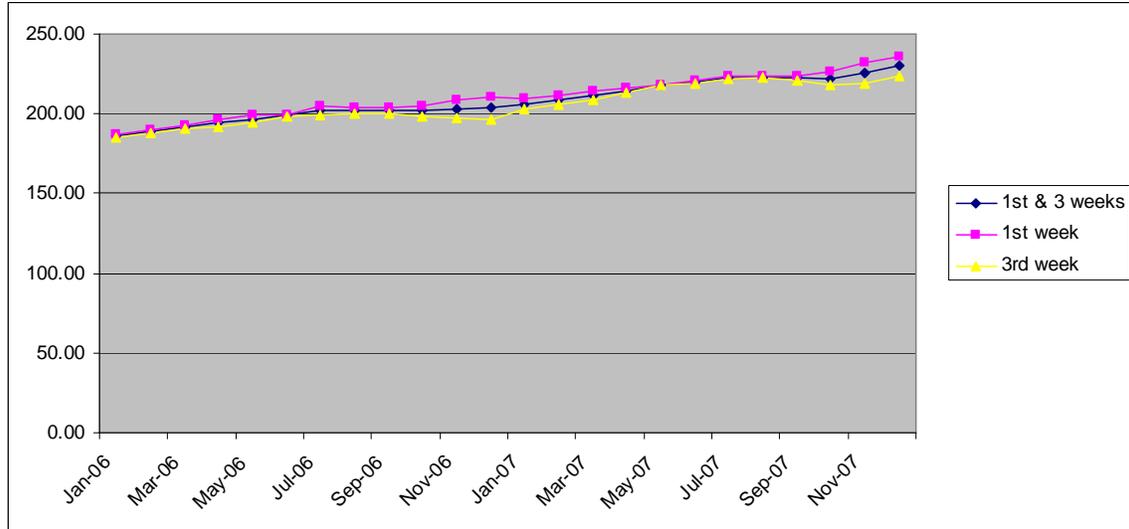
	1&3 weeks	1st week	3rd week
Arithmetic mean	10,73	10,60	10,87
Geometric mean	10,71	10,55	10,81

In the long-term, of course, it is expected that the 3 rates of inflation would converge. Thus, the question of whether to collect prices once or twice per month is primarily a question that affects the monthly and 12-monthly rates of changes.

Figure 1 shows the trend for three inflation figures, namely, inflation figures for the twice-at-a-time, from the first week and the third week data collection. From the visual presentation, we may conclude that even though the levels seem to be slightly different, the trends are very similar. In some cases the first week inflation figures are smaller than

the twice-at-a-time inflation figures and in other instances it the third week inflation figures which are smaller.

Figure 1. Comparing two readings with a single reading in a month



In all cases, the twice-at-a-time inflation laid in-between the two single readings inflation. The average of the two readings gives a picture almost the same (in fact in most cases they are exactly the same) as the twice-at-a-time inflation as may be seen from Figure 2.

Figure 2. Comparing two readings in a month with the average of two single readings



Are these small deviations significant? This we test with help of ANOVA. The ANOVA test indicates that there are no significant differences among the various approaches ($p=0.809$). That is, whether or not we collect prices data twice or once a month did not matter. The inflation figures are similar.

ANOVA

Inflation	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	.430	2	.215	.213	.809
Within Groups	33.249	33	1.008		
Total	33.679	35			

Conclusion:

There is not much to gain from the two readings vis-à-vis cost and quality of data. The single reading in the first week and third week do mimic the two readings exactly.

This is not unexpected. There are products in the baskets which do not change regularly. For instance, the prices of petroleum products, until recently when they started being volatile on the international markets, did not normally change every month. Again, the prices of beverages (alcoholic and non-alcoholic) and cost of some services (hair cut, dressmaking, hair dressing, etc) do not change that frequently in a month. The cost of some services normally increases when government increases the minimum wage of public workers. Since this is not normally done every month, one may argue that price of these services could be collected once instead of twice every month to compute inflation rate.

We conclude that collecting prices once per month would be cost effective. Firstly, cost of data collection will be reduced by fifty percent. Secondly, quality data can be guaranteed from a smaller investment. Supervision will be more effective.

We suggest that prices should be collected only once per month. It was observed that the average of the inflation rates obtained from the two single readings is the same as the inflation rates from the two readings. We therefore, suggest that the single reading be taken in the middle of the month. However, owing to the volatility in the price of the petroleum products, we suggest that petroleum prices should be taken twice.