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Towards Rationalising Income, Money Supply And Consumer Behaviour In Ghana (1972 - 1987)

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ABSTRACT

As an indicator of price change, the incidence of high price indexes and its derived counterpart, inflation, usually overemphasise the nominal values of economic variables, at the expense of real values. Given inflation as a monetary phenomenon, real variables may not respond equi-proportionately to an exogenous monetary shock. This underscored the gradual but stable responsiveness of real consumption activity variables due to government's monetary and other related policy initiatives as empirically rationalized in this paper for Ghana during the 1972 - 1987 period.

Keywords: Price indexes, inflation, real consumption, income and money supply, sensitivity and stability analyses, the economic recovery programme.

INTRODUCTION

With the consistent rapid increase in general price levels in Ghana, inflation has assumed a dominant economic character, permeating practically all other areas of economic activity. Consumers have been bruised with multidigited inflationary rates which have become the consequences and subsequent causes of commodity shortages, unemployment of materials and input resources and in particular inefficient use of human (labour) resources. In the process, consumer spending habits in the transitory sense, which covers a wide range of luxurious and "conspicuous" commodities and services have been affected. But even more important, the regular spending habits of consumers, related to the basic necessities and "essential" commodities and services, have been also affected. In the aggregate, these tendencies among others, have exerted threatening effects on consumers' confidence and thereby cast greater uncertainty on business and investment opportunities in the country.

Basically, the Government's expansionary monetary policy in the bid to deficit-finance the economy has accounted for the persistent rise in consumer price before the ERP. From 1983, Government's monetary policy has been contractionary in high interest rates, stringently adhered to sectorial ceilings. At the same time, wages and salaries increased within an environment of chronic under supply conditions for products and inputs, resulting in relatively higher aggregate demand and high commodity prices. The increase in money supply since 1985 has been largely due to favourable changes in net Foreign Assets.

Also in recent years, Ghana's population growth rate has increased to an average of 30 per thousand per annum from the average of 28 per thousand per annum which characterised the 1960-1970 period. The latter growth rate, rather than the often cited growth rate of 24 per thousand per annum, is more consistent with data on the 1960 and 1970 Population Census in Ghana. The increased population growth rate in recent times, has exerted additional upward pressure on aggregate demand. High production costs, especially in economic activities which utilise imported inputs, are also partially responsible for the inflationary tendencies. In this case, inflation and other undesirable economic elements are literally transported from other countries, notably, the advanced western economies, to add fuel to domestic price growth.

It is apt to point out that the political institutional and organizational processes, changes and transformations, the innovation of which dates back to 1966 when the first constitutional government was toppled by the Military, have had a definite share in conditioning the inflationary tendencies in the country. Disaffected governments, military or civilian, with the intent of fostering popular support often tended to discontinue and eschew the policies of their predecessors. The results have been Pyrrhic victories, considering the great economic costs at which such cheap political strategies come by. The economic and political path chartered by the revolutionary government of the Provisional National Defence Council (PNDC) in the post 1980 era have been

articulated through restructuring policies such as the Economic Recovery Programme (ERP), the Committee for the Defence of the Revolution (CDR), and the District Assembly concept, among others. The comprehensive and instantaneous application of these concepts could influence the macro activity variables of the economy and thus help unkeep society in a stranglehold. One's expectation however does not preclude frictional tendencies, ab initio, before a relatively stable path is charted, compatible to the desired tenent of the PNDC's hegemony.

In a sense, therefore, it may be stated that inflationary character in Ghana, not excluding the period under review, is a mixed breed; with inflation being pulled and pushed by demand and cost factors alongside the socio-political structural and organisational changes in the country. The price hikes, more importantly, have stultified rising nominal incomes, money supply and consumption estimates. Thus there is the need to deflate nominal values to determine real values in order not to distort the interpretation of quantitative relationships between economic variables.

In this article, the writer has attempted to rationalise the inflation factor by recursively estimating the functional relationship between real money supply, real income, real consumption, and the price level for Ghana between 1972 and 1987 inclusive. Basically, the paper is aimed at determining the following casual sequence for the purpose of analysis and interpretation: money supply determines income, incomes determines price, which in turn determines consumption at both the aggregate and private levels.

The sample period (1972-1987) was chosen to reflect local and global economic and political epochs. First there was the World Energy Crisis of 1973 when the countries of the Middle East (the Arab World) decided to use oil as a weapon to start an 'economic war' which exerted tremendous implications to the entire world. In the Arab oil blackmail, oil production and supply were curtailed drastically, and this served root-up the cultural, traditional and even the legal identity of the Arabs. But most notably the 1973 oil crisis ushered the Middle East into the limelight as a major economic component, capable of extending its sway over the international community. The implication of the 'economic war' for Ghana, a developing oil-importing country was obvious. Secondly, in 1972 the Military, for the second time, usurped the reigns of government in Ghana. The Military take-over that year was a political milestone in that military persons rather than professional politicians had a decisive advantage to test their hands on the wheels of the administration of Ghana. The advantage was decisive because the post-Independence years prior to 1972 witnessed the rise and fall of two distinctly conflicting systems of political administrations. For almost a decade ending 1966, Ghana was a socialist (one-party) state. After a brief period of military intervention, the country had the opportunity to experiment with a multi-party arrangement under the so-called Parliamentary Democracy from 1966 to 1972. Thus the year 1972 and after defines a critical period for all intent and purposes. Political authority got into the hand of a "non professional" body which in principle was expected to mitigate the adverse effects of an international economic war in addition to resolving an interrupted intra-national order in the economic, social and political spheres.

The rest of the paper is organised as follows. The concept and realities of price, a basic variable for measuring inflation, are discussed in Section two. The purpose is to relate the different indices used to define price change in different situations. The inflationary trend for the decade ending 1987 is also presented and analysed . Section three provides an empirical investigation into money supply - induced income, consumption and price relations. A modified version of David Laidler's (1974) small monetarist model is employed to "test-estimate" the Ghanaian experience. Finally, Section four provides a summary of the major conclusions and offers practical suggestions and recommendations for the consideration of policy and decision makers.

THE CONCEPT OF PRICE INDEX AND INFLATION

It is not too easy to sort out the causes and mode of consumer behaviour in society. Several factors including economic, emotional, traditional and cultural, and psychological reasons or their combination all tend to impart on consumer behaviour. The purchasing power of the consumer, an economic factor, has a notable relevance in that it cuts across the inflationary issue. With inflation, consumers' money pockets suffer greatly, for the ability to purchase commodities and services is reduced, denoting a decline in real income.

The price index of the consumer measures changes in the prices of constant market basket of commodities and services over a specified time period using a reference time base. Fundamentally, the Consumer Price Index (CPI) has three major roles. First, it serves as a price change indicator and indeed as heuristic determinant of inflation in periods of persistent price increases. In that role, the CPI may be used as the litmus test for a government's successful performance and popularity or otherwise. Secondly, the Consumer Price Index may be used to deflate nominal series of economic variables such as retail sales, earnings, investment expenditure, national income, among others, to purify these variables of their "market value infested" feature. A deflated economic series thus provides a real eco-

nomic series devoid of price-inflationary tendencies. The third role of the CPI is its use as the escalator of income payments. Essentially, a change in the consumer price index affects a sizeably large proportion of the population whose consumption deeds and behaviour are affected at the retail level. In this regard, a government can generate significant increases in revenues by deliberately raising prices (and price indices) even by a trashy percentage. The additional prices may simply be taxed away as revenues. The importance of the consumer price index suggest that much accuracy is required in its measurement in preclusion of misleading signals and interpretations especially at critical and crucial times of economic crises.

For the average consumer, the price index is based on prices at the retail level. The Wholesale Price Index (WPI) is the appropriate index for measuring price changes at the wholesale market level. The WPI compares the prices paid periodically by firms, government and foreign purchasers with reference to a time base. Thus unlike the CPI, the WPI has a foreign price component in the direct sense and is influenced by government purchases. These differences, in principle, identify the CPI as the more suitable index for domestic price changes.

The GDP-deflator is also an index for measuring the qualitative change in domestic prices. It represents the average prices of all final commodities and services produced by the country expressed as a proportion of their prices in a base period.

There are certain cases, however, for which the use of the Consumer Price Index is overly inadequate. For example, the CPI for Ghana in 1985 was 909.6 when 1980 is represented by 100. This means that the same quantity combination of commodities and services that would have been obtained for 1000 cedis Ghana currency in 1980 for example, cost about nine times as much (9096 cedis) in 1985. This exact notion of the consumer price index assumes away several practical considerations. It is questionable, for instance, whether consumers really buy the same or constant set of commodities and services period after period.

The practical realities of life calls for adjustments in demand to match changing income and relative price conditions; and this makes it unlikely for the consumer to buy the same (constant) market basket of commodities and services time after time. Thus what one must contest is whether it is the Cost-of-Living Index (CLI) or the CPI which directly caters for the variations in commodity (and service) combinations. Also, whereas the CLI explicitly accounts for a Social Security Tax, the CPI may not, at least directly, be associated with it. Furthermore, by permiting flexibilities in the size of the market basket periodically, the Cost-of-Living Index intrinsically accounts for changes in consumer expenditure pattern, thus respectively making room for and pushing out new and out-dated products. In spite of its demerits, however, the consumer price index is the widely used indicator for measuring price changes in many countries. It is easier to compute, which demonstrates its frequent use.

From Table 1 it is observed that the years 1977 and 1981 reported three-digited inflation in prices. Between these two years and also in 1982, however, the percentages increase in price were bi-digited ; but much more important, the rates decelerated towards a minimum of 22.30 per cent in 1982. The factors which caused the decline in inflation included government dirigiste policies like price control (minimum commodity price) measures which actually foreclosed inflationary expectation.

Table 1: Percentage Changes In National Consumer Price Index (Inflation): 1977 - 1987

Year	Percentage Increase in CPI
1977	116.45[a]
1978	73.70[a]
1979	54.89[a]
1980	50.09[a]
1981	116.53[a]
1982	22.30[a]
1983	123[b]
1984	40[b]
1985	10[b]
1986	25[b]
1987	40[b]

Sources. *a. Kodwo Ewusi, The Dimensions and Characteristics of Rural Poverty in Ghana (ISSER, Technical Publication No 43) April 1984 p.52*

b. Ghana Government; World Bank, OECD, UNICEF, Gill and Duffus compilation.

In the case of 1981, the inflation rate was unusually so high that interest rates were reduced drastically with the aim of reducing inflation to a level acceptable enough to stimulate economic activity [4]. Thus the low inflation rate reported for 1982 was a logical out-growth and indeed an indication of a successful interest rate (monetary) policy.

Table 1 also depicts 1983 as a year of crises. Inflation rate was very high (123%). The seemingly "hopeless" situation in 1983 was salvaged by the institution of realistic 'devaluation' and other policies under the Economic Recovery Programme (ERP). The two years following 1983 in Table 1 indicate that government succeeded in keeping inflation superlatively low to 10% in 1985. The data also show that the expansion in money supply since 1985 which was

due to increased net foreign assets, a point that has earlier been mentioned, tended to be inflationary.

EMPIRICAL RATIONALISATION OF VARIABLES

Expansionary monetary policy can be inflationary when scarcities of commodities and services abound. Consumer's confidence becomes impaired as a result, and the values of economic variables in nominal terms tend to be distorted and misleading. Thus to safeguard the actual state of economic affairs under inflationary condition, one needs to represent the value of economic variables in real terms.

Table 2 provides the real values of Ghana's Gross Domestic Product (GDP), Private Consumption, Total Consumption and Money Supply, in addition to the Consumer Price Unit Index for the 1972-87 period.

In real terms and generally money supply, the GDP, and the consumption variables rose from 1972 to 1975, trended downward up to 1983, and increased in later years. Table 2 however shows that the consumer price index experienced a consistent increase for the entire sample of 16 years.

The post-1983 expansion in these variables was to a large extent, the result of government policy initiatives directed at rehabilitating, stabilising and eventually restruturing the economy as envisaged in the ERP which took off in 1984.

The empirical model used by the author is a modified version of David Laidler's (1974) small monetarist model. The latter was based on the theoretical foundation of the monetarist view that sustained and severe inflation can be produced by excessive increase in money supply. In Laidler's (1974) model money supply was exogenously determined, and the role of interest rate was assumed away. He also defined the real income of the United States in terms of money supply and price; and finally price change was explained by previous income.

The Laidler (1974) model was recursive in such a way that prices and the demand for money explained real income; which in turn affected prices; and both prices and real income influenced money demand. The results of that study demonstrated with reasonable confidence that it is possible to achieve a meaningful linkage, however simple, between the demand for money, real income and inflation under a monetary setting.

The present model explained the functional relationships of real income, price, and real consumption as a recursive system. Money supply is also considered exogenous to the model, and consumption is used in place of the money demand variable used by Laidler based on the tacit assumption that money demand is held in transactionary (consumption) balances. Typical of any monetarist viewpoint, the present model assumes that sustained inflation is produced by expansion in money supply. The competing fiscal view that inflation is caused by excess demand through over spending such as by government is also recognised in the present model by determining the effects of price and money supply and income on consumption.

The operational model was conceptualised as follows:

$$Y_1 = f(X_1)$$
$$Y_2 = f(X_1, Y_1)$$
$$Y_3 = f(X_1, Y_1, Y_2)$$
and $$Y_4 = f(X_1, Y_1, Y_2)$$

where X_1 is real Money Supply
Y_1 is real Income (GDP)
Y_2 is price level
Y_3 is real total consumption
Y_4 is real private consumption

The model was first estimated using data for the subperiod 1972-1983, then data for the entire sample period 1972-1987 were used. Next a binary (coded) policy variable (X_2), representing the ERP, was exogenously introduced into the model and its effect estimated for the 1972-1987 period in conjunction with the other variables already defined. The coded X_2 variable assumed the value of zero for the pre 1984 years, and unity otherwise.

Since the structure of the model was recursive, the least squares technique of estimation was used with the inherent assumption that the disturbance (stochastic) terms of the equations are independent of each other. Wold [15] has long and consistently argued that economic systems tend to have a recursive flavour. It is argued that Institutional realities do not permit prices and quantities to be simultaneously determined but rather there exists adjustment processes with a set of linear chain reactions once the equilibrium state of an exogenous factor is disturbed.

One may easily submit, in regard of the above, that the crucial factor in the adjustment process is the time period. True, but since the present study used annual data for consumption, price and income all of which tend to exhibit "short haul" features, it is assumed that the time-adjustment factor is accordingly absorbed.

The estimated equations in the model are linear relations not only necessarily to provide for simple approximations of the relationships, but also, and more importantly, to avoid constraining the derived elasticities to "constant" estimates such as obtains under the double logarithmic (log-log) specification.

The resultant empirical estimates of the linear functional equations together with derived Mean Absolute Elasticity (MAE) estimates are provided in Table 3 through 8 for the 1972-83, 1972-87 and 1972-1987 (with ERP policy variable) periods.

Table 2: Selected Real Values, and Unit CPI For Ghana (1972 - 1987)

Year	Money Supply ¢' Billions	G.D.P. ¢'Billions	Total Consumption ¢' Billion	Private Consumption ¢' Billion	Unit CPI (1980 = 1)
1972	12.878	70.385	61.255	52.382	0.040
1973	13.361	72.943	62.517	54.552	0.048
1974	14.270	83.217	74.241	64.075	0.056
1975	14.854	72.369	62.487	53.193	0.073
1976	13.776	56.749	51.908	44.960	0.115
1977	9.597	44.777	40.300	34.648	0.221
1978	9.562	48.635	40.667	41.173	0.450
1979	7.023	42.278	39.802	35.460	0.809
1980	6.085	40.995	38.940	31.189	1.000
1981	4.384	35.408	34.512	27.525	2.024
1982	4.231	32.427	30.805	25.232	3.322
1983	2.833	30.844	29.302	25.575	7.937
1984	3.257	38.403	35.969	28.579	11.085
1985	3.103	40.327	38.882	30.008	12.228
1986	5.705	42.021[a]	37.146[b]	28.686[c]	15.232
1987	5.802	43.786[a]	38.706[b]	29.872[c]	21.296

Sources: 1. International Financial Statistics (IFS) an IMF Publication (Various Years)
2. Ghana Economic Survey (1974, 1977 - 1980).
3. Government Financial Statistical Year Book, 1987 IMF Publication

(a) based on optimistic annual growth rate for all LDCs (4.2% in 1986).
(b) based on consumption rate of 88.4% of GDP in 1986.
(c) based on 1986 estimate. Private Consumption being 77.2% of aggregate consumption.

The empirical results obtained for the real variables and price for the 1972-1983 sub-period revealed the following. Money supply exerted positive and statistically significant impact, but the elasticity of output for a change in money supply was below unity.

The results also show that an increase in money supply reduced the price level which was itself stimulated by an increase in output. This result was contrary to theoretical expectation and the relationship was not statistically significant. In terms of sensitivity, however, both the money supply and income had a highly elastic impact on prices. Thus in the final analysis, an income or output expansionary policy tended to be inflationary. In fact before 1984, and especially in 1982 and 1983, low industrial capacity utilisation was commonplace and the entire economy dived into depressed activity levels.

In the case of aggregate consumption, output was a positive and statistically significant explanatory factor. The output-total consumption elasticity was approximately unity. The results indicated that an increase in money supply did not stimulate total consumption; but price increases, as anticipated, tended to reduce consumption. These two relationships were however not statistically significant and the derived elasticity estimates were approximately zero.

In the case of private consumption, both the money supply and price variables were directly influential. The versatile income (output) factor was also statistically significant. However, like its aggregate

Table 4: The Mean Absolute Elasticity (MAE) Estimates for the Selected Functions for Ghana (1972 - 1983)

Functions	Explanatory Variables		
	X_1	Y_1	Y_2
Y_1	0.684		
Y_2	4.235	2.157	
Y_3	0.029	0.902	0.007
Y_4	0.044	0.862	0.0006

Source: Derived Estimation

Table 3: Empirical Estimates (Coefficients) of the Selected Price Functions for Ghana (1972 - 1987)

Function	Intercept	Explanatory Variables			R^2	$\bar{R}^2$	SEE	DW	Σe^2
		X_1	Y_1	Y_2					
Y_1	16.595	(3.824)							
	(SE)	(0.467)							
	(t)	(8.190)			0.870		6.806	0.905	463.142
	Prob. of Error	0.00							
Y_2	4.104								
	(SE)	0.604	0.055						
	(t)	(0.314)	(0.076)		0.582	0.489	1.648		
	Prob. of Error	(1.925)	(0.726)					0.889	24.453
		0.8	0.48						
Y_3	6.420								
	(SE)	0.150	0.819	0.260					
	(t)	(0.309)	(0.065)	(0.267)	0.994	0.991	1.368	3.087	
	Prob. of Error	(0.485)	(12.526)	(0.942)					14.957
		0.63	0.00	0.36					
Y_4	3.686								
	(SE)	0.195	0.670	-0.020					
	(t)	(0.409)	(0.086)	(0.365)	0.986	0.980	1.810	2.205	26.2009
	Prob. of Error	(0.478)	(7.753)	(0.056)					
		0.64	0.00	0.95					

Source: Estimation

R^2, ($\bar{R}^2$), SEE, DW and Σe^2 are the Coefficient of Determination (adjusted by the degree of freedom), Standard Error Estimates of equation, Durbin-Watson statistics and residual sum of squares respectively, SE is Stand Error of coefficient and t is the student t ration.

Table 5: Empirical Estimates (Coefficients) of the Selected Functions for Ghana (1972 - 1987)

Function	Intercerpt	Explanatory Variables			R^2	$\bar{R}^2$	SEE	DW	$\sum e^2$
		X_1	Y_1	Y_2					
Y_1	22.001	3.393							
	(SE)	(3.389)							
	(t)	(8.722)			0.845		6.649	0.811	618.426
	Prob. of Error	0.00							
Y_2	5.9137	-1.892	0.287						
	(SE)	(0.803)	(0.217)						
	(t)	(-2.354)	(1.320)		0.438	0.351	5.414	0.407	381.062
	Prob. of Error	0.03	0.20						
Y_3	5.701	-0.222	0.843	-0.127					
	(SE)	(0.021)	(0.053)	(0.064)					
	(t)	(-1.002)	(15.753)	(-1.997)	0.993	0.991	1.250	2.778	18.743
	Prob. of Error	0.33	0.00	0.06					
Y_4	4.645	0.003	0.693	-0.252					
	(SE)	(0.280)	(0.067)	(0.080)					
	(t)	(0.013)	(10.245)	(-3.122)	0.987	0.983	1.580	2.346	29.956
	Prob. of Error	0.98	0.00	0.00					

Source: Estimation

Table 6: The Mean Absolute Elasticity (MAE) Estimates for the Selected Functions for Ghana (1972 - 1987)

Functions	Explanatory Variables		
	X_1	Y_1	Y_2
Y_1	0.557		
Y_2	3.256	3.006	
Y_3	0.040	0.927	0.013
Y_4	0.0006	0.908	0.031

Source: Derived Estimation

Table 8: The Mean Absolute Elasticity (MAE) Estimates for the Selected Functions for Ghana (1972 - 1987)

Functions	Explanatory Variables			
	X_1	X_2	Y_1	Y_2
Y_1	0.616	0.035		
Y_2	0.324	0.650	3.142	
Y_3	0.033	0.008	0.912	0.022
Y_4	0.004	0.005	0.917	0.024

Source: Derived Estimation

Table 7: Empirical Estimates (Coefficients) of the Selected Functions for Ghana (1972 - 1987)

Function	Intercerpt	Explanatory Variables				R^2	$\bar{R}^2$	SEE	DW	$\sum e^2$
		X_1	X_2	Y_1	Y_2					
Y_1	17.298	3.752	7.075							
	(SE)	(0.421)	(4.160)							
	(t)	(8.896)	(1.701)			0.873	0.853	5.238	0.970	505.867
	Prob. of Error	0.00	0.10							
Y_2	4.695	-0.188	12.344	-0.300						
	(SE)	(0.521)	(2.137)	(0.128)						
	(t)	(-0.361)	(55.774)	(-0.233)		0.851	0.814	2.893	1.515	100.824
	Prob. of Error	0.72	0.00	0.81						
Y_3	6.092	-0.183	1.544	0.830	-0.219					
	(SE)	(0.228)	(1.812)	(0.056)	(0.125)					
	(t)	(-0.800)	(0.852)	14.729	(-1.746)	0.993	0.991	1.265	3.050	17.593
	Prob. of Error	0.43	0.40	0.00	0.10					
Y_4	4.417	-0.019	-0.900	0.700	-0.199					
	(SE)	(0.296)	(2.349)	(0.073)	(0.163)					
	(t)	(-0.065)	(-0.383)	(9.596)	(-1.220)	0.987	0.985	1.639	2.244	29.560
	Prob of Error	0.94	0.70	0.00	0.24					

Source: Estimation

counterpart, private consumption exhibited inelastic tendencies with respect to income.

The statistical fits of the estimated equations as indicated by the Coefficient of Determination were acceptably high except for the price equation. Autocorrelation did not post as a problem as DW tests proved to be either inconclusive or zero.

The empirical results presented in Tables 5, 6 for the total sample period 1972-1987 show features very similar to the results obtained for the 1972-1983 sub-sample period for all the functions except for private consumption. In addition, the probabilities of errors were relatively smaller and more acceptable than those for the 1972-83 sub period. However, traces of positive autocorrelation in the price and output equations showed, and the statistical fit of the price equation was remarkably below fifty per cent ($\bar{R}^2 = 0.351$).

The private consumption function as usual indicated a positive and dominant income (output) character during the entire sample period. Also, higher prices tended to curtail consumption, and in both cases, the relationships were based on highly acceptable levels of statistical significance. But the reported positive impact of money supply on private consumption was negligible and statistically not significant.

The estimates for the price and income elasticities of private consumption for the entire sample period were inelastic but on the higher side when compared to sub-sample period situation.

There is every reason to believe that post-1983 conditions were responsible for the improvements reported above. But to be absolutely certain, however, sufficient quantitative justifications are needed to substantiate this assertion. Tables 7 and 8, provide the empirical results of the estimated model for the entire sample period (1972 - 1987) with the coded policy variable indicated to represent the Economic Recovery Programme (ERP). The effect of the ERP on the real variables as well as price was thus estimated within the framework of the operational model.

The impact of the ERP as indicated in the empirical results, was to raise income (output) and price levels. The policy also influenced total consumption positively but restricted private consumption though the latter results were not based on acceptable level of statistical significance.

The Mean Absolute Elasticities (MAE) estimates were roughly similar to those in Tables 4 and 6 for the real variable functions. The sensitivity estimates of the real variables due to the ERP policy were considerably below unity (approximately zero). The policy's effect on the price level was also inelastic but moderate (0.650). Throughout the results, the sensitivity of the price level due to income (output) exceeded unity. But real money supply, however, exerted very inelastic tendencies on price, quite unlike the situation in Tables 4 and 6

The tests for autocorrelation in the estimated functions in Table 7 were inconclusive, and this time both the price equation and the real variable equations all reported good statistical fits.

FURTHER ANALYSES

So far the study has shown that the ERP exerted a positive impact on all the functions except for private consumption. Thus the general improvement in the regression results for the entire sample period (1972-87) over the sub-sample period (1972-83) can be attributed to government policy initiatives embodied in the ERP facility post 1983.

The background to the introduction of the ERP in Ghana is numerous and varied. The essential issues centred around the general price distortions which culminated in inflationary tendencies; the decline in domestic production and capacity of utilization, with adverse macro-economic and welfare implications. The period before the ERP also experienced a decline in exports. Imports including the inflow of foreign capital investment also suffered as a result of foreign exchange scarcity and the extremely low level of the country's credibility, either financially or otherwise. The country's currency (the cedi) was over-depreciated vis-a-vis the currencies of neighbouring countries in West Africa not to mention the hard and convertible currencies of the Advanced Western Economies. There was also the debt problem to contend with. All these, in addition to the residual incidence of drought and bushfires plunged Ghana into a severe economic recession. Thus the extent to which these problems have been or are being resolved, determined the current position of real economic variables within the economy.

The effect of the ERP as analysed in the empirical results is encouraging especially in terms of improvements in the income (output) and aggregate consumption. Indeed, the extra-sample performance tests conducted for price and the real variables indicated that the income (output), total consumption expenditure and real private consumption all in real terms were stable throughout the entire sample period (i.e. the pre and post ERP period). As shown in Table 9, only the price function exhibited unstable tendencies over time, implying that the price levels were very sensitive to changes in the sample period. More important, the degree of instability was severe judging by the superlatively high F estimate

Thus, based on the empirical findings up to 1987, it can be said that the Economic Recovery Programme achieved a stable output expansion and growth in consumption. The production of cocoa, timber, minerals, grains has stepped up since 1984 as shown in Table10.It must be mentioned that for some

Table 9: The Functional Stability (Extra-Sample Performance) Test: 1973 - 1983 - 1987

Function	Estimated F-Value*	Theoretical F-Value **	Comments
Real Gross Domestic product (GDP) (Y_1)	0.838	3.48	Good extra-sample performance Function on Stable over time
Price (Y_2)	32.812	3.53	Poor extra-sample performance Function is Unstable over time
Real Total Consumption (Y_3)	0.506	3.84	Good extra-sample performance Function is Stable over time
Real Private Consumption (Y_4)	0.286	3.84	Good extra-sample performance Function is Stable over time

Source: * Derived Estimation from Tables 4.1, 3.1
Bases on Chow's F test for stability in

$$F = \frac{(\sum e^2 - \sum e_1^2)/n_2}{\sum e_1^2 / n_1 - k}$$

Where $\sum e^2$ is the residual sum of squares from the augmented sample,

$\sum e_1^2$ is the residul sum of squares from the original sample

n_1 is the size of the original sample

n_2 is the number of additional observations

** Statistical Table Values: F distribution at 5% error level.

Table 10: Actual And Targeted Production Levels of Major Commodities 1983 - 1986

Commodity	Actual Production 1983	Targeted Production 1984	Targeted Production 1986
Cocoa ('000 tons)	158	210	300
Timber Logs ('000 Cubic Metres)	663	936	2000
Timber Lumber ('000 Cubic Metres)	279	421	880
Gold ('000 fine troy ounces)	280	374	485
Diamond ('000 carats)	339	850	1850
Bauxite ('000 tons)	70	220	350
Maize ('000 tons)	172	520	780
Rice ('000 tons)	40	67	83

Source: Compiled from Economic Recovery Programme 1984-1986, Review of progress in 1984 and goals for 1985 and 1986. Government of Ghana (Accra, November, 1984) pg. 25

of the commodities, the targets were achieved if not exceeded.

In spite of all these, however, price stability was not achieved. At the very tail end of the period under study, and as a way to redress the price problem, government instituted realistic changes in Ghana's weakened exchange rate regime by discontinuing the long patronised fixed exchange rate system in favour of a flexible exchange rate. The symbol and effect of such a change have been obvious. For example, currently, the country operates a weekly exchange rate auction market for the local cedis and the major convertible currencies on the basis of the demand for and supply of foreign exchange in the country. The result is that individuals and companies in the import-export business are now able to bid for foreign exchange in a virtually unrestricted competitive market.

Besides, and in order to eliminate what used to be a powerful underground (black) market for hard currencies, individual commercial banks as well as private companies now legally run foreign exchange bureaux which trade in currencies (the local cedis in relation to the key convertible currencies) at various rates quoted slightly higher than those established by the weekly auction market.

Thus currency convertibility/movement have become so liberalised to the extent that more and assorted imported goods, not excluding shoddy ones, are now available in the local market. But, these notwithstanding, prices are still higher compared with wages and salaries of consumers, thus creating conditions under which the economic welfare of the consumer can hardly be said to have improved.

It is true also that government policy under the ERP has increased exports, but the same policy via liberalisation has also increased imports as already mentioned. In 1983 for example, Ghana's total exports valued $439 million, and increased to $610 million in 1985, all figures reckoned on free-on-board (Fob) basis. Comparable estimates for imports were $500 million and $727 million in 1983 and 1985 respectively [13]. In relation to domestic production, import was obviously on the higher side. The actual export-GDP and import-GDP ratios for 1987 for example were 20.62% and 23.65% respectively [8] The 1987 estimates exceeded the anticipated ERP export-GDP ratio target of 19% for 1988 given the low ratio of 10% in early 1980 [13]. The import-GDP ratio for 1988 was also targeted at 25% given the actual ratio of 15% of the early 1980s.

There is thus little or no doubt that actual production and supply have increased and will continue to expand towards potential levels so as to improve the incomes and wealth of the average Ghanaian.

The increasing movement of foreign capital into the country since the ERP was instituted has provided the necessary financial impetus for funding domestic investment programmes. In 1983 there was $472 million worth of external capital inflow to Ghana. This increased to $606 million in 1985 and $743 million in 1987. The capital outflow from Ghana for the three years were $240, $407 and $441 million respectively [13]. The striking thing about these figures is that in all cases, the net capital inflow to Ghana was positive and substantial. In a way therefore, Ghana enjoyed a pool of financial resources needed to expand domestic production and investment activities in the years following 1983.

CONCLUDING IMPLICATIONS FOR POLICY

This paper has empirically analysed real variables and price relations for the economy of Ghana, using the characteristically high inflationary tendencies as a sound backdrop to justify the essence and behaviour of real variables.

The study has shown that for the period 1972-1987, money supply in the real sense, enhanced the growth of output. But in spite of this however, output did not seem to increase high enough to ensure price stability for the benefit of the consumer.

The study has also revealed that the Economic Recovery Programme and its package of policies designed to bail the economy out of the doldrums, created 'inflationary' tendencies in price, output and total consumption, but not private consumption. This implies that public or government consumption expenditure did expand.

The stability tests conducted on extra-sample performance using the ERP period, revealed that price charted an unstable path, but income (output) tended to be stable over time. Also total and private consumption, and by implication government consumption expenditure charted a stable path.

In terms of elasticities, the estimated functions mostly reported inelastic estimates, with the price equation as an exception. As an example, the elasticities of the real consumption variables with respect to income (output) were below unity, though on the higher side; but income (output) - price elasticity was greater than unity. All these go to demonstrate the sensitive and unstable character of the price variable over the years.

Given the outcomes, government policy will have to concentrate, in the main, on ways and means of stabilising price in order to generate adequate confidence in the consumer especially in the private sector. The levels and direction of public or government spending will also need to be controlled, monitored and safeguarded to bring about effective and efficient utilisation of both material and human resources [12].

It is also suggested that price hikes have to be utilised constructively. Indeed increases in money supply may not necessarily be inflationary, particularly if such increases are properly guided and channeled into production investment ducts, to ultimately promote expansion in domestic production. When money supply becomes inflationary, official prices will have to rise to the levels prevailing in parallel markets before growth in output is ultimately guaranteed. Certainly, following Keynes and Keynesian tradition, some degree of inflation is compatible with and indeed necessary for economic growth and development [9].

Finally, and as an interim measure, wages and salaries will have to be adjusted by the index of inflation to reduce and possibly eliminate, the short-term adverse impact on real variables. In the long run, income, price and monetary policies need to be rationalised and reconciled to boost the consumer's satisfaction and confidence.

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