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Price Instability and Sustainable Agriculture Development: An Econometric Analysis

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Abstract

Government policy is playing an important role for sustainable agriculture growth. Agflation describes generalised inflation led by rises in Agricultural commodity. The price pattern is different as it has assumed. The widespread hunger prevailing in many nations of the world is not due to the non-availability of food in the market but is due to inflation in food crops. So inflation affects purchasing power of the society of rural as well as urban area. Wholesale prices index based study of food grains, wheat, rice and cereals of every month of last ten year analyzed that growth rate of price index of food grains, wheat, rice and cereals is much higher in the last quarter of the year.

Growth rate of price index of food grains, wheat, rice and cereals is much higher in the last quarter of the year. Food grains price index growth rate highest in the month of December and lowest in the month of June. The Growth rate of price index in wheat is highest in November and lowest in March. The growth rate of rice is highest in the month of December and at its lowest during the months of June and July. The growth rate of cereals price index is highest in the month of November and at its lowest in the month during April to August

Keywords: Sustainable, Agflation, Purchasing power, Wholesale prices index, Growth rate, Instruments, Per capita grain consumption, Food grains, Growing crops, Indebtedness, Ecological, Escalation, Global economic slump, Agribusinesses, Supermarkets, Food-security policies, Reforms, Self-employment, Household, Econometrics, Exponential, Dependent variables, Parameters, Regression, Coefficients, Variation.

Introduction

Government has many instruments for check fluctuations in agriculture commodity it is helpful for sustainable growth in agriculture. The various issues relating to the sustainable production of food for the growing population have been dealt with by the Panel on Food Security and Environment, of the World Commission on Environment and Development (Weccd, 1987). Thus, hunger existed amongst plenty and food production did not provide food security to everyone. Sanderson (1984) estimated per capita grain consumption in A.D. 2000 based on the expected per capita consumption in the recent past. Assuming that no significant changes in per capita grain consumption occur, the food grain requirements in various regions of the world were estimated.

The global requirement of food grains in 2025 is about 3050 million tonnes, including food, feed and industrial use. It has been pointed out in the Wced (1987) report, Food 2000 that food imports are not the answer for the increasing populations in developing countries--because importing leads to growing crops with export potential. Importing food also results in unemployment in predominantly agricultural countries. Coupled with this is the poor price of exported farm commodities in developed countries.

This has resulted in the increasing indebtedness of developing countries, with several undesirable ecological and political consequences. The objectives of the paper is to To analyses the effect price inflation in food grains, wheat, rice and cereals .To examine the volatility in inflation of food grains, wheat, rice and cereals production in different month, to analyze the growth rate of agriculture production in each month and to study the comparison of different agriculture product growth rate . Jacobs (2011) analyzed that The rapid escalation in the cost of food has converged with the global economic slump to depress the living standards of the poor. Sustainable solutions to counter the ongoing food crisis need

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to be found.

The logic of competition that governs agribusinesses and supermarkets works against guaranteeing the right to good-quality food for all. South Africa’s existing agro-food marketing and food-security policies (and agencies such as the Namc and the Competition Commission) start from a deeply flawed premise to resolve the ongoing food crisis. Fairer competition and other reforms of the food system within the limitations of existing laws and the Constitution are unworkable in the long run. To date these have been ineffective in curbing powerful corporations from dominating and manipulating food production, markets, and distribution systems for private gain.

The ways in which societies produce, market, and consume food must be radically rethought and restructured. The key pathway to such a new food system is through agrarian reform. It must start with constructing an ecologically sustainable farming system under the democratic control of peasant farmers, other workers in the agro-food sector, and consumers. The passage of food from the farm to the plate must be reconfigured so as to protect the environment and human well-being.

A food system for profit must be replaced with a food system to guarantee the right to adequate food for all. Fritsch(2011) analyzed Households could continue as at present or embark on different strategies, i.e. farm development, starting non-farm self-employment, or stopping agriculture, and could receive policy support for the chosen strategy. In general, results show that continuing as at present is not a feasible option and that action is needed.

Farm development is a preferable strategy for all household types, while early retirement or starting a non-farm self-employed activity is a practicable option only for a few households. Pradeepa et al (2012) observes that the main message emerging from this study is that the significant negative impact on food security caused by food price escalation has been offset by the rapid increase in income that was observed in developing countries such as Sri Lanka.

Methodology

The secondary data is collected from Department of Food & public Distribution from 1999-2010. Panel data is used here to check the growth rate of Food grains, wheat, rice, cereals. Semi log econometrics model has been used here to estimate the growth rate these product.

Semi-Log: The exponential equation is given by $\ln Y_i = \alpha + \beta t + U_i$

Here Y_i = Dependent variables the i^{th} year ($i= 1, 2, 3...N$)
 α = Intercept, β = Growth coefficient, U_i = Residual term

The parameters α and β are estimated by the least square method.

The significance of the regression coefficients of the model has been tested by usual Student’s t-test. The coefficient of determination has also been calculated for the model.

Food Grains

Month	Intercept	Growth Rate (P-Value)	R ²
January	5.018	0.035 (0.000)	.836
February	5.026	0.035 (0.000)	.821
March	5.028	0.035 (0.000)	.808
April	5.032	0.035 (0.000)	.760
May	5.036	0.035 (0.001)	.745
June	5.049	0.034 (0.001)	.739
July	5.053	0.035 (0.001)	.738
August	5.057	0.035 (0.001)	.741
September	5.053	0.037 (0.001)	.740
October	5.040	0.039 (0.001)	.760
November	5.027	0.043 (0.001)	.759
December	5.019	0.044 (0.000)	.763

Table 1

Semi log model shows that the growth rate inflation of food grains is about the same from the January to august but inflation growth much faster after August and it is much higher at November and December. Student t test shows that inflation growth rate of all months are significant. Coefficient of determination shows that January to March is more than 80 percent which reflect explained the change in variation of inflation of food grain more than 80 percent by the time.

Wheat

Month	Intercept	Growth Rate (P-Value)	R ²
January	5.043	0.039 (0.000)	.881
February	5.064	0.037 (0.000)	.881
March	5.064	0.036 (0.000)	.864
April	5.032	0.037 (0.000)	.825
May	5.022	0.038 (0.000)	.818
June	5.034	0.037 (0.000)	.828
July	5.043	0.038 (0.000)	.811
August	5.051	0.037 (0.000)	.816

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September	5.047	0.039 (0.000)	.808
October	5.048	0.040 (0.000)	.815
November	5.048	0.043 (0.000)	.813
December	5.058	0.042 (0.000)	.855

Table 2

The model shows that the growth rate of inflation of wheat rate is vary in each month .The inflation growth rate is lowest in March `and highest in November .Wheat inflation is the3.9 percent in January and September, 3.7 percent in February, April, June and August, 3.8 percent in May and July, 3.6 percent in March, 4.0 per cent in October, 4.3 per cent in November and 4.2 percent in December. Growth rate of all month is statistically significant. Coefficient of determination is more than 80 per cent.

Rice

Table 3

Month	Intercept	Growth Rate (P-Value)	R ²
January	4.982	0.029 (0.001)	.732
February	4.996	0.028 (0.001)	.700
March	5.001	0.028 (0.002)	.681
April	5.026	0.025 (0.005)	.605
May	5.033	0.025 (0.005)	.594
June	5.045	0.024 (0.007)	.576
July	5.053	0.024 (0.007)	.577
August	5.056	0.025 (0.006)	.585
September	5.052	0.026 (0.006)	.589
October	5.035	0.030 (0.003)	.638
November	5.017	0.032 (0.002)	.665
December	4.994	0.035 (0.002)	.680

The growth rate of inflation of rice January is 2.9 per cent in every year, 2.8 per cent in February and March, 2.5 percent in April, May and August, 2.6 percent in September, 3.0 per cent in October, 3.2 percent in November and 3.5 percent .The growth rate of all month are statistically significant. These models show that inflation of rice is highest in the month of December.

Cereals

Table 4

Month	Intercept	Growth Rate	R ²
January	5.018	0.034 (0.000)	.835

February	5.034	0.033 (0.000)	.809
March	5.038	0.033 (0.000)	.789
April	5.041	0.032 (0.001)	.731
May	5.042	0.032 (0.001)	.720
June	5.053	0.032 (0.001)	.719
July	5.060	0.032 (0.001)	.719
August	5.065	0.032 (0.001)	.717
September	5.059	0.034 (0.001)	.716
October	5.043	0.037 (0.001)	.748
November	5.018	0.043 (0.001)	.720
December	5.025	0.040 (0.000)	.787

The growth rate of cereals price index is highest in the month of November and at its lowest in the month during April to August.

Table 3

Source: Annual Report 2009-10, Department of Food and Distribution, Government of India

Conclusion and Suggestions

1. Growth rate of price index of food grains, wheat, rice and cereals is much higher in the last quarter of the year.
2. Food grains price index growth rate highest in the month of December and lowest in the month of June.
3. The Growth rate of price index in wheat is highest in November and lowest in March.
4. The growth rate of rice is highest is the month of December and at its lowest during the months of June and July.
5. The growth rate of cereals price index is highest in the month of November and at its lowest in the month during April to August.

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Annexure

Monthly Average of Wholesale Price Index of Foodgrains (BASE 1993-94 =100)

Commodity Name	Year	Jan	Feb	Mar	Apr	May	June	July	Aug	Sep	Oct	Nov	Dec
Food Grains	1999	159.7	165.9	166.5	168.2	169.7	172.8	175.8	180.5	183.2	182.9	180.9	177.1
	2000	175.4	174.8	175.3	177.6	178.0	178.4	179.0	176.2	172.7	170.5	171.1	172.1
	2001	171.0	169.2	169.8	171.1	173.0	175.7	175.6	174.1	173.3	172.9	172.4	171.2
	2002	168.9	169.7	170.7	170.1	169.9	170.7	172.6	175.8	177.1	175.1	175.9	175.6
	2003	175.2	176.9	177.3	176.1	176.1	177.3	177.5	176.4	175.9	176.6	176.0	174.2
	2004	176.4	177.7	175.4	172.7	173.2	174.1	175.4	178.7	178.9	179.0	178.9	179.3
	2005	179.3	180.2	179.9	179.1	179.2	182.1	184.9	185.6	186.1	187.0	188.4	189.3
	2006	192.7	194.4	194.8	194.5	196.7	198.4	198.8	201.0	206.5	210.6	212.4	214.1
	2007	213.5	213.8	211.1	210.9	210.9	211.2	214.1	215.6	215.5	216.3	216.9	216.3
	2008	217.7	219.1	222.3	223.9	222.8	223.8	228.1	229.7	229.8	235.3	237.5	239.6
2009	242.2	247.9	248.1	250.6	254.3	256.0	259.8	262.3	266.8	270.0	282.6	280.0	
Cereals	1999	158.0	166.5	168.3	170.0	170.7	173.8	177.3	182.7	184.9	183.6	181.9	178.7
	2000	176.7	176.3	176.6	178.4	178.4	178.4	178.3	175.5	172.0	169.4	169.4	170.1
	2001	169.6	168.2	168.2	169.6	171.3	173.3	173.2	171.1	170.4	169.6	169.3	168.4
	2002	166.8	168.4	169.8	168.9	168.6	169.1	171.6	174.8	175.8	173.6	174.4	175.1
	2003	175.6	177.3	177.4	176.0	175.9	177.4	177.4	176.4	176.0	176.3	175.7	174.1
	2004	176.5	178.0	175.7	172.9	173.5	174.6	175.6	178.9	178.7	178.9	179.1	179.7
	2005	180.1	181.5	181.5	180.0	179.5	182.3	184.5	185.1	185.5	186.2	186.6	187.0
	2006	190.3	191.5	191.7	189.1	190.6	192.3	192.8	195.4	199.6	201.5	204.3	206.7
	2007	207.1	207.3	205.8	205.2	205.6	206.3	209.2	211.1	211.5	212.6	213.9	213.7
	2008	215.7	217.2	219.2	220.9	220.2	221.1	224.7	224.8	225	231.3	233.6	236.2
2009	239.2	244.7	244.9	246.5	250.4	251.6	252.7	254.3	259.4	261.6	290.5	267.0	
Rice	1999	148.4	157.1	159.3	167.0	167.3	170.5	172.2	176.9	178.3	178.8	175.8	169.7
	2000	166.9	166.0	166.6	169.9	171.0	171.9	173.1	170.5	167.6	164.3	162.8	164.8
	2001	164.8	163.8	165.1	166.8	169.3	171.0	171.1	168.6	169.8	168.9	168.3	165.6
	2002	161.5	161.6	161.6	162.4	162.5	162.6	166.4	168.0	168.6	167.0	166.9	165.8
	2003	165.9	167.0	168.4	168.3	169.9	171.0	171.9	172.4	172.6	172.7	169.3	163.2
	2004	164.4	165.5	164.5	163.3	164.9	166.6	167.1	169.0	170.2	170.1	169.1	168.7
	2005	168.5	170.2	170.3	170.9	170.5	173.7	175.8	177.5	177.8	178.1	176.8	173.5
	2006	173.0	173.3	173.6	174.6	176.4	177.3	177.3	178.3	179.7	181.5	182.0	181.1
	2007	181.1	181.9	183.7	185.5	186.0	186.5	188.4	190.6	192.6	193.2	194.1	193.1
	2008	195.5	196.8	198.9	201.7	200.8	200.7	203.1	203.2	203	214.9	218.5	222.2
2009	225.2	230.5	232.2	231.3	233.8	235.8	237.4	238.8	244.8	245.6	248.0	249.6	
Wheat	1999	162.9	171.7	173.2	163.4	161.7	164.7	170.8	175.0	178.6	179.3	180.9	180.2
	2000	180.8	180.7	180.3	179.8	178.4	178.8	178.3	177.4	175.8	175.9	177.1	176.1
	2001	175.6	174.0	172.0	173.9	175.1	176.3	177.2	175.6	172.7	173.5	174.8	175.5
	2002	173.9	177.0	178.4	173.0	171.5	172.0	172.3	173.0	175.0	175.2	177.1	178.6
	2003	179.1	182.1	179.9	176.5	174.8	176.2	176.1	176.0	176.3	178.0	183.2	187.1
	2004	190.9	192.6	188.6	180.3	178.0	179.4	179.8	183.9	183.7	184.6	186.7	187.7
	2005	188.5	189.6	187.2	180.9	180.0	183.6	186.1	184.8	184.9	187.0	191.0	196.2
	2006	205.5	209.0	209.4	198.9	199.2	200.0	201.1	207.4	216.8	221.2	228.4	233.7
	2007	234.5	232.1	224.5	218.5	217.0	217.1	222.6	224.3	224.2	227.1	230.2	229.8
	2008	231.4	232.6	233.4	233.4	232.6	233.8	240.8	239.9	241.7	238.5	239.3	240.9
2009	243.6	246.8	244.2	246.8	249.9	249.0	248.6	247.6	253.4	260.7	279.7	269.9	

Figures for the month of December 2009 are provisional