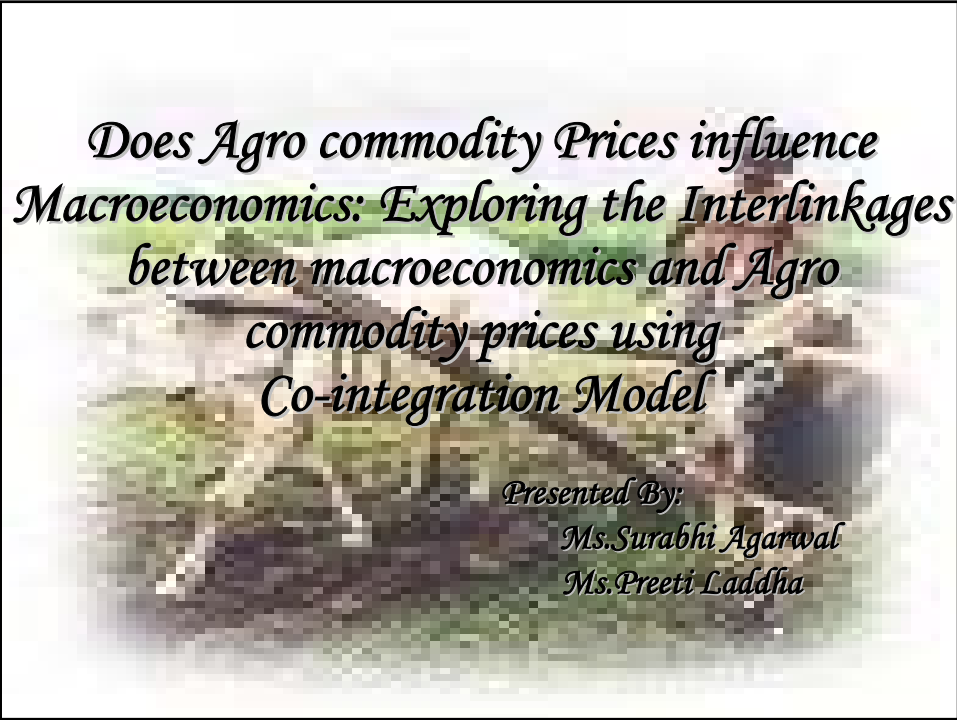


*International Conference on  
Agribusiness and Food Industry in  
Developing Countries:  
Opportunities and Challenges*



*Does Agro commodity Prices influence  
Macroeconomics: Exploring the Interlinkages  
between macroeconomics and Agro  
commodity prices using  
Co-integration Model*

*Presented By:*

*Ms. Surabhi Agarwal*

*Ms. Preeti Laddha*

## *Backdrop to the Study*

- Agricultural production and its role in commodity markets
- Agriculture vs. Services
  - Agro production still contributes to the GDP to a sizeable extent.
  - 24% in Indian GDP
  - Employs 57% of the work force.

### *Graph showing the Fluctuations in the National GDP of Agriculture*

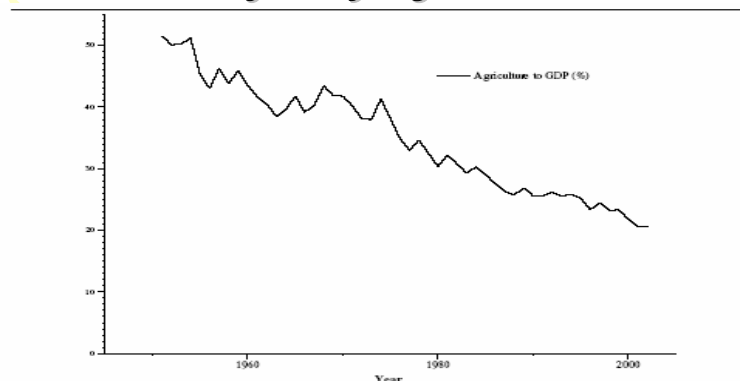


Figure 1: Fraction of agriculture in national GDP

*Source : GoI Statistics*

## *History of Commodity Markets*

Existence of commodity markets in India for centuries,  
- by and large unorganized.

Emergence of commodity exchanges and revival of futures trading in recent years.

Strong interlinkages of Commodity prices with various macroeconomic factors like GDP, inflation money supply and exchange rates.

## *Objective Of the Study*

- Understanding the linkages between macroeconomics and commodity markets in India.
- Measuring the degree of influence of commodity prices on macroeconomic factors in India.
- Understanding what these relations mean for the economy as a whole and agro based industries in particular



## *Methodology*

Examining the relationship between GDP, wholesale price index (WPI) and agricultural yield and prices.

- Five major crops were selected namely rice , wheat , cotton ,sugar and oilseeds .

Hypothesizing that the macroeconomic indicators have a significant influence on the commodity prices

- its impact on pricing mechanisms in the commodity markets both at spot prices and futures.

Analysis with the use of:

- OLS Model
- Co-Integration Model

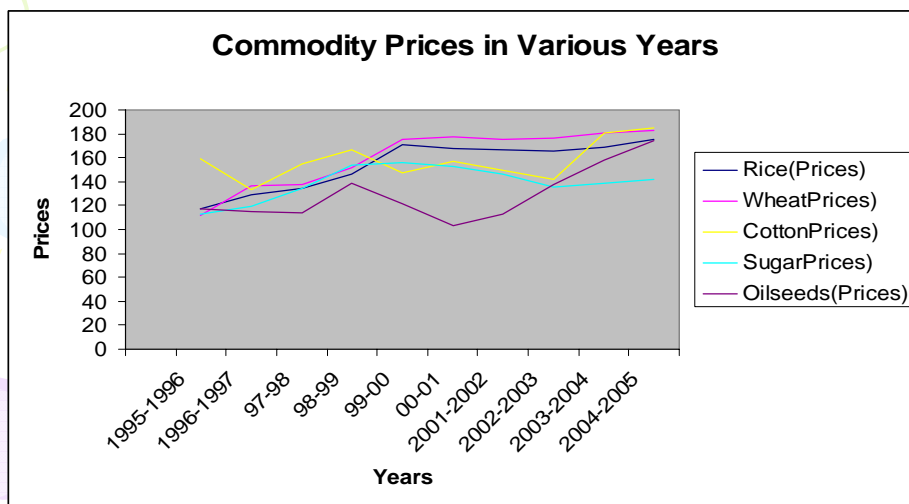


## *Some Facts.....*

### *Index Numbers for Commodity prices for select Crops (1995-96 to 2004-05)*

Year	Cotton	Sugar	Rice	Oilseeds	Wheat
1995-96	159	113	117	117	112
1996-97	133	119	129	115	137
1997-98	155	134	134	114	138
1998-99	167	154	146	139	152
1999-00	147	156	171	122	175
2000-01	157	153	168	103	177
2001-02	149	146	167	113	175
2002-03	142	135	166	138	176
2003-04	181	139	169	158	181
2004-05	185	142	175	174	183

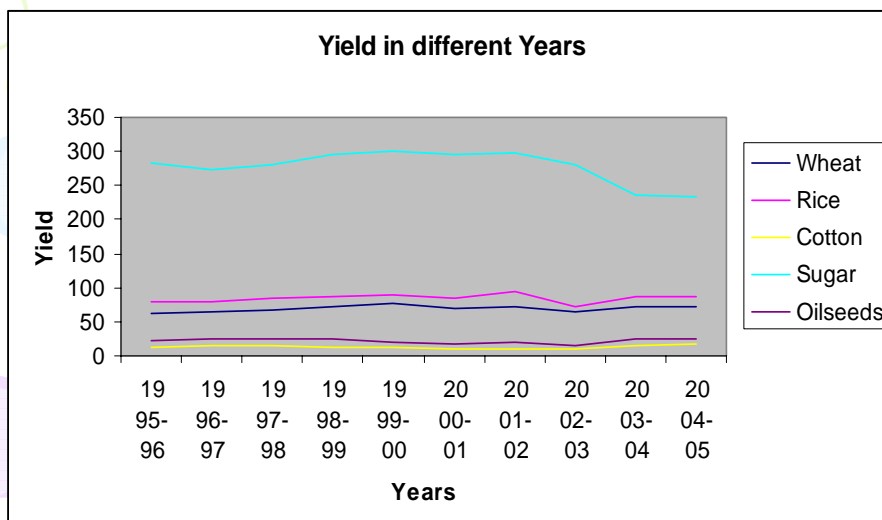
### *Graph Showing the Commodity Prices in Different Years*



## *Yield of different Crops for different Years*

Year	Cotton	Sugar	Rice	Oilseeds	Wheat
1995-96	13.1	283	79.6	22.4	62.6
1996-97	14.3	273.6	79.6	24.1	64.5
1997-98	14.8	280	83.52	25.5	66.38
1998-99	12.2	295.7	86	25.2	70.8
1999-00	11.5	299.3	89.7	20.7	76.4
2000-01	9.5	296	85	18.4	69.7
2001-02	10	297.2	93.3	20.7	72.8
2002-03	8.7	281.6	72.7	15.1	65.1
2003-04	13.8	236.2	87	25.1	72.1
2004-05	17.1	234.2	87.8	24.8	73

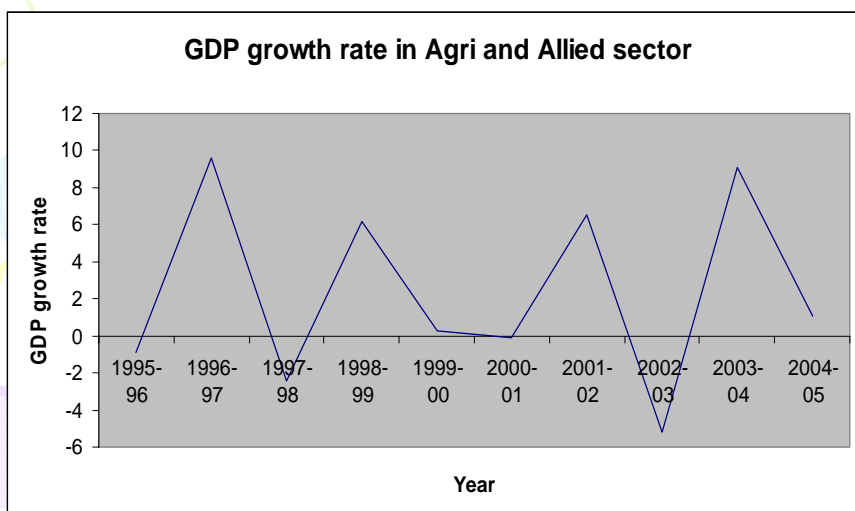
## *Graph Showing the Yield of Different Crops*



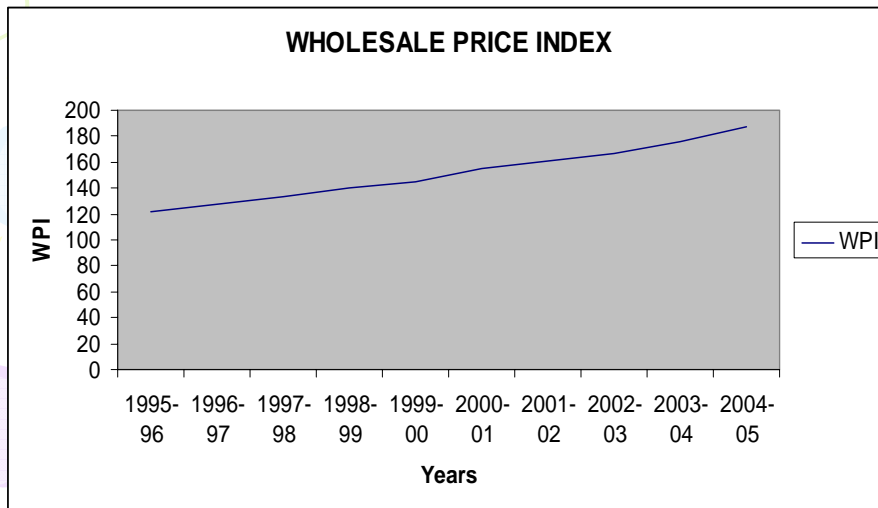
## *Agricultural GDP Growth Rate and WPI*

Year	GDP	WPI
1995-96	-0.9	121.6
1996-97	9.6	127.2
1997-98	-2.4	132.8
1998-99	6.2	140.7
1999-2000	0.3	145.3
2000-01	-0.1	155.7
2001-02	6.5	161.3
2002-03	-5.2	166.8
2003-04	9.1	175.9
2004-05	1.1	187.9

## *Graph Showing The GDP Growth Rate*



## *Graph Showing the changes in WPI*



## *Analysis*


Correlation analysis suggests that commodity prices and WPI do share a strong relationship. However, testing the convergence among them in the long run can be shown with the help of co-integration model.

## *Results Based on OLS Model*

Commodity	GDP ,Output , Prices		WPI , Prices	
	R	R <sup>2</sup>	R	R <sup>2</sup>
Cotton	0.247	0.061	0.563	0.317
Sugar	0.241	0.058	0.446	0.199
Rice	0.50	0.25	0.87	0.76
Oilseeds	0.539	0.29	0.708	0.501
Wheat	0.332	0.11	0.883	0.779

## *OLS Model Significance Results*

Commodity	GDP ,Output , Prices	WPI , Prices
	Significance Level	Significance Level
Cotton	Not significant	Significant
Sugar	Not significant	Significant
Rice	Significant	Significant
Oilseeds	Significant	Significant
Wheat	Not significant	Significant



## Co-Integration Results

Commodity	GDP ,Output , Prices			WPI , Prices		
	T Stats	Critical Value	Significance	T Stats	Critical Value	Significance
Cotton	-9.564	-2.365	Significant	-0.8137	-2.365	Not Significant
Sugar	-3.741	-2.365	Significant	-0.2114	-2.365	Not Significant
Rice	-0.651	-2.365	Not Significant	-1.7640	-2.365	Not Significant
Oilseeds	-1.723	-2.365	Not Significant	-1.6269	-2.365	Not Significant
Wheat	-2.227	-2.365	Not Significant	-0.1136	-2.365	Not Significant

## OLS Model & Co-Integration Model Results

OLS MODEL results give mixed picture.

- there lies a significant correlation between the prices of rice and oilseeds and yield of corresponding prices and the agricultural growth rate.
- the relationship is not significant in other cases.

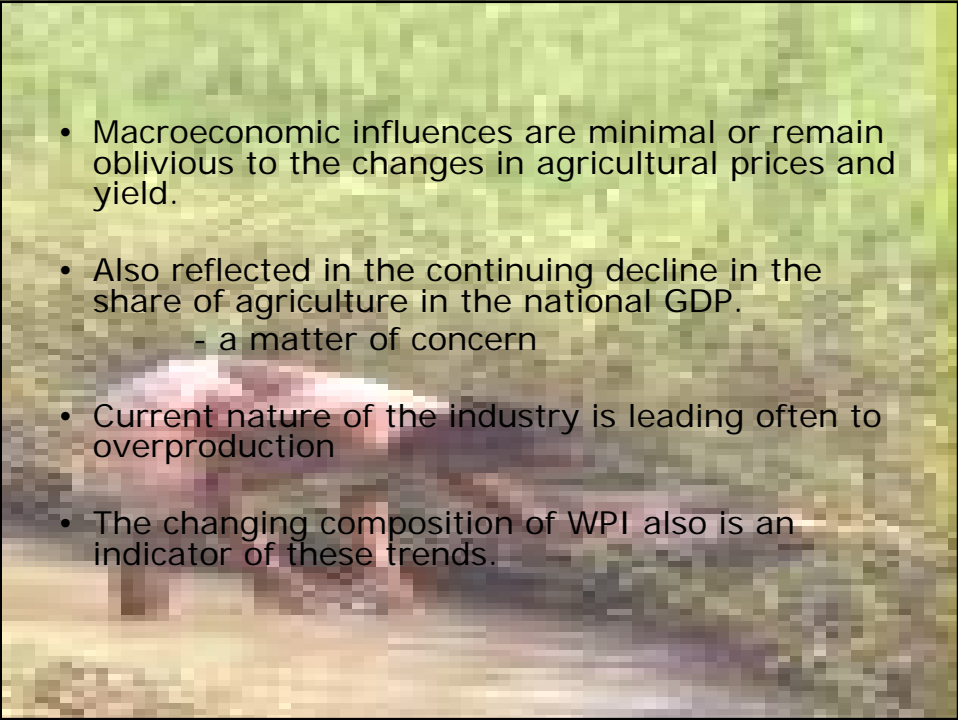
CO- INTEGRATION results :

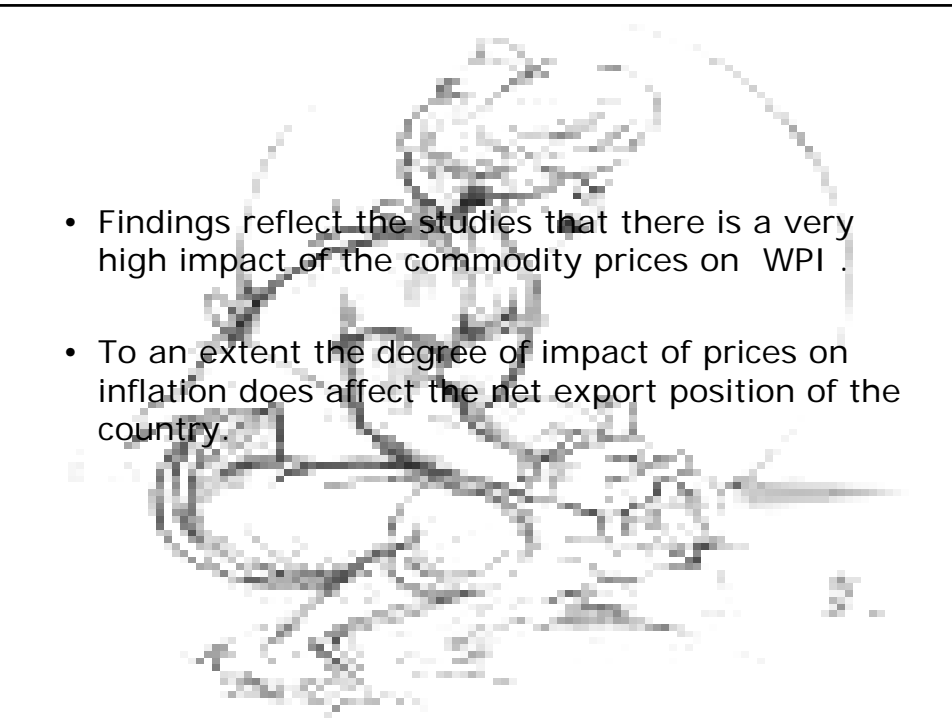
- only cotton and sugar exhibit stationarity in the case where GDP is a function of Prices and Yield but not in the case of WPI being a function of Prices.



## *Our Take*

- High degree of correlation between WPI and commodity prices
  - sugar and cotton, the degree of co-relation with WPI is less (56 and 44% respectively).
  - both sugar and cotton have a high degree of weightage attached to them in WPI composition compared to the other three crops.
- Cotton and sugar though being co integrated, their correlation is low.

- 
- Macroeconomic influences are minimal or remain oblivious to the changes in agricultural prices and yield.
  - Also reflected in the continuing decline in the share of agriculture in the national GDP.
    - a matter of concern
  - Current nature of the industry is leading often to overproduction
  - The changing composition of WPI also is an indicator of these trends.

- 
- Findings reflect the studies that there is a very high impact of the commodity prices on WPI .
  - To an extent the degree of impact of prices on inflation does affect the net export position of the country.

- 
- **The issue of the commodity prices responding to aggregate demand shocks also rises**
  - **The availability of alternative instruments might have reduced the hedging in commodities which would have influenced these prices.**
  - **Prices may respond to short run shocks indicating a high co-relation with the WPI but may not sustain it in the longer run.**

