An Analysis Of Correlation Between Crop Inflation And Production

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ABSTRACT

The research will primarily focus on the relationship between crop production and wholesale crop inflation in India. With a growing population, inefficient distribution , rent seeking activities, inadequate support and infrastructure for our farmers as well as governments export policy . We would look for empirical evidence on whether crop prices behave in a way which is conducive to the supply curve

Keywords

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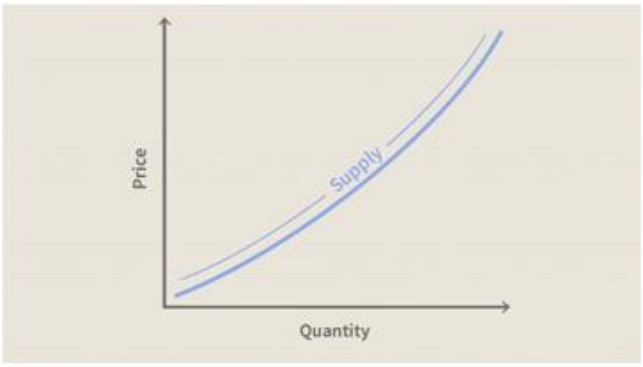
Introduction

The law of supply which is a widely popular theory in economics states that supply of a commodity is inversely proportional to its price in the market. Adam smith in his book the wealth of nations was the first one to explain the concept of supply and demand which was later refined by Alfred Marshall in his book principle of economics in 1890. Marshall's version is the one widely used now.



'Supply Curve '

In this paper we will study the correlation between crop production specifically food grains and pulses and their prices at the wholesale level. After we review several factors which affect the way our crops are priced we analyze whether the law of supply still holds true.

Review of literature

From 2006 till 2014 India experienced very high average inflation of 9% . This has been explained by a variety of reasons backed by literature .Rudrani Bhattacharya in her working paper for National institute of public finance and policy estimated the contribution of mark up shock in food inflation. In india as of august 2020 farmers are not allowed to directly sell their produce to retailers and have to go through agricultural marketing committees of different states or through licensed middlemen approved by the committees. This has in effect created a monopoly against the farmers as well as the retailers and hence has a big influence on the prices. Using the Structural Vector Autoregression (SVAR) framework the paper concluded that mark-up shocks have moderate, but significant effects on wholesale and retail food inflation rates. While the effect of mark-up shock on inflation in retail sector is found to be persistent, the pattern of mark-up shock propagation in wholesale market depends on the origin of the shock. The wholesale mark-up shock has a persistent positive effect on wholesale food articles inflation, when the shock originates in the wheat market. The effect is found to be short lived with the shock coming from wholesale market for potato. (Bhattacharya, 2016)

RBI's working paper in 2014 studied the impact of higher rural wages due to MGNREGA and its effect of inflation and it was found that it was the most over bearing factor as the cause of high food inflation but having said that it was not MGREGA but . Other factors such as MSP, increasing input cost pressures (other than rural wages) were studied as well and have a relatively less significant impact. Increase in income has resulted in change of consumer behavior who seek higher value and nutrition foods as shown by NSSO consumption expenditure surveys which explains the increase in prices(Sonna, 2014).

High fiscal deficit is also seen as a cause of inflation as it results in an increase in money supply. This money supply came in the form of doles such as farm loan wavers and MGNREGA wages. (Gulati & Saini, 2013)

Data and Research Methodology

Source of data

The primary source of data for production of crops is the pocket book of agricultural statistics released in collaboration by

- Ministry of Agriculture & Farmers Welfare
- Department of Agriculture, Cooperation & Farmers Welfare
- Directorate of Economics & Statistics

This pocketbook is released annually. For price data we use the wholesale price index data which is released by the Office of theeconomic advisor,

Departmentforpromotionofindustryandinternaltrade, Government of India.

Research Method Used for Analysis

We use correlation to understand whether there is a direct relation between the productionof the price of crops at the wholesale level. We consider the major crops as categorized in the pocketbook of agricultural statistics.

Correlation Coefficient Formula

$$r = \frac{n(\Sigma xy) - (\Sigma x)(\Sigma y)}{\sqrt{[n\Sigma x^2 - (\Sigma x)^2][n\Sigma y^2 - (\Sigma y)^2]}}$$

Where x and y are the two variables whose relationship is being studied

Table 1: Correlation

Food Grains								
Rice	Fiscal Year	2013	2014	2015	2016	2017	2018	2019
	Production (in million tonnes)	105.23	106.65	105.48	104.41	109.7	112.76	116.42
	WPI	113.2	129.1	136.6	134.7	143.6	149.4	155.3
	Correlation	0.817256						
Wheat	Production	93.51	95.85	86.53	92.29	98.51	99.87	102.19
	WPI	115.3	124.9	123.4	128.4	142.1	138.7	149.4
	Correlation	0.775805						
Maize	Production (in million tonnes)	22.26	24.26	24.17	22.57	25.9	28.75	27.23
	WPI	116.0	123.1	118.5	125.5	137.0	124.7	133.2
	Correlation	0.539208						
Pulses								
Gram	Production (in million tonnes)	8.83	9.53	7.33	7.06	9.38	11.38	10.13
	WPI	135.3	109.4	103	142	219.2	164.8	135.7
	Correlation	0.348694						
Arhar	Production (in million tonnes)	3.02	3.17	2.81	2.56	4.87	4.29	3.59
	WPI	109.8	118	128.1	193.2	181.1	116.8	118.2
	Correlation	0.090546						
Masur	Production (in million tonnes)	1.13	1.02	1.04	0.98	1.22	1.62	1.56
	WPI	115.5	132.9	153.9	188	176.9	135.4	122.9
	Correlation	-0.42167						

For WPI the base year is fiscal year 2012 which has a base value of 100 for each commodity.

Conclusion

From our analysis we can conclude

- For food grains which have more predictable and stable production output price wholesale price index correlation is very high specially for rice and wheat which have a correlation of .81 and .77 respectively. These two are also the most widely produced grains and hence with the area under cultivation being the highest these are least susceptible to regional supply shocks.
- Pulses on the other hand have a much more unpredictable and volatile production figures which reflects on the prices as well and results in a low correlation and in the case of masur the correlation is slightly negative.
- Hence we can conclude that due to so many factors which affect the pricing of our crops, the prices of our crops are not inversely proportional to the supply as with the supply curve.

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