

# Study on the effect of petroleum price on the price of food items

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## Abstract

The objective of this paper is to examine what the evidence is for a link from oil prices to food prices. We are not the first to raise this question. There is a rapidly growing literature using time-series data to study the link between oil prices, agricultural commodity prices and food prices. The modelling techniques used and the main conclusions reached in this literature have been reviewed by Serra and Silverman (2013). Much of this literature, however, is based on theoretical time-series models that are inherently incapable of establishing or quantifying causal.

Prices for agricultural commodities have been rising over the past 10 years. During the same period, crude oil prices have also increased substantially. The simultaneous rise in the price for agricultural inputs and crude oil has raised new questions about whether an increase in oil prices translates to increased food prices, an occurrence called pass-through.

## INTRODUCTION

Industrial Revolution had progressed at the beginning of the 20th century to the extent that the use of petroleum for illuminates ceased to be of primary importance. Because of the introduction of automobile petroleum industry became the major supplier of energy. Although petroleum constitutes a major petrochemical feedstock, its of primary importance as an energy source on which the economy of the world depends.

Petroleum is the most traded product and also the most essential commodity which influences an economy. Petroleum known as “liquid gold” is an extract of crude oil and is compared to gold because it is an exhaustible resource and also of its economic value. The study is an attempt to understand the causes for rise in petroleum prices and the factors that influence it and its impact on food prices. Petroleum being very indispensable it greatly affects the prices of commodities, particularly the transport sector. In India the change in the price of petroleum has been a major cause for the rise in inflation rate as it greatly affects the prices of essential commodities and adversely affecting the common man. The factors that are responsible for usage and pricing of gasoline are crude oil prices, local demand processing and distribution costs, local taxation, the strength of local currencies, and the

availability of local sources of petroleum Since fuels are traded, the trade prices are similar since fuels are traded worldwide. The price paid by consumers largely reflects national pricing policy.

Over the years there has been an increasing trend of petroleum prices, and a close consideration of the demand- and supply-side effects that sparked these price increases shows there is high probability that this trend will continue in the outlook period and beyond. There evidence for the prevailing wisdom that oil-price driven increases in the cost of food processing, packaging, transportation and distribution have been responsible for higher retail food prices. Similar results hold for other industrialized countries. There is reason to expect food commodity prices to be more tightly linked to retail food prices in developing countries.

### **Oil prices affect the cost of food in many ways**

When the price of oil increases, not only does it raise the cost of visiting the gas pump, but it also can increase the cost of going to the grocery store.

Energy prices have a big effect on the food sector. Some of these are fairly obvious. When higher oil prices result in higher prices for gasoline and diesel fuel, it costs more to get products from farms to final consumers. Whether a food item is moved by ship, train, semi or pickup, the price of fuel will affect the cost of transportation, and higher transportation costs generally mean higher food prices.

Farmers use petroleum fuels to power their tractors and other machinery. Fossil fuels are used in making fertilizer and many other farm-level inputs. Food- processing can be very energy-intensive. Energy costs account for a significant share of food production costs, so increases in energy prices can reduce the profits of farmers, food processors and retailers and raise consumer food prices.

This is nothing new. Growth of the biofuels industry, however, has significantly altered the connection between energy and food markets.

Last year, the United States produced almost 14 billion gallons of ethanol. That would be enough to provide a 10 percent ethanol blend to all of the nation's gasoline consumers, with a little left over to export.

Higher oil prices can make it more attractive to blend ethanol and biodiesel with petroleum fuels. But with most of the country's gasoline already blended with 10 percent ethanol, there is little opportunity to increase the amount of ethanol used in conventional fuels. In fact, if higher oil and gasoline prices cause people to drive a little less, the resulting drop in gasoline consumption can actually reduce the potential market for ethanol, at least in the short run.

New regulations eventually could allow the use of 15 percent ethanol blends in vehicles produced since 2001. If and when that happens, service stations will have to decide whether to sell 15 percent blends, and car drivers will have to decide whether to buy it. Those choices could be affected by relative prices of gasoline and ethanol. People might be a lot more interested in buying a 15 percent blended fuel if it sells at a significant discount to other fuels.

Finally, laws that mandate the use of biofuels further complicate matters. Although some subsidies that encouraged biofuel use have expired, the law still requires that certain minimum levels of various classes of biofuels be used each year.

When biofuels are expensive relative to petroleum fuels, there is very little incentive for people to use more biofuels than the law requires. If oil prices increase enough, however, the picture could change.

Changes in biofuels production can have important affects on the food sector. In general, more biofuels production means higher prices for the crops used to make the biofuels. This helps crop producers and has a number of other benefits, but it also can further increase the price of food to consumers.

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### **Political interference**

The government deregulated petrol price in 2010 and diesel price in 2014. It, henceforth, allowed oil marketing companies to decide on the prices of fuel, considering the change in international oil prices and currency exchange rate.

Since oil marketing firms Indian Oil Corp, Bharat Petroleum Corp and Hindustan Petroleum Corp are state owned, they are often not allowed to raise prices in the election season since it would prove detrimental to the prospects. To compensate oil companies for that, the government allows them to charge higher prices even when international oil rates have fallen.

Assembly elections in five states-Uttar Pradesh, Punjab, Goa, Manipur and Utrakhand- were held during January to March 2017. Oil marketing firms raised petrol and diesel prices by Rs 1.29 per liter and 97 paise on January 2, 2017. They cut price of petrol by Rs 3.77 per liter and that of diesel by Rs 2.91 a liter on April 1, 2017, the first change in rates in two-and-a-half months even though currency exchange rates and international crude oil prices fluctuated by wide margins during the period.

But the decision to change fuel prices everyday will less likely invite interference from political parties to address their interests. Even if they would interfere with the price change, they will not be able to defer the decision for long due to the urgency to revise prices daily.

**No shock to customers**

The revision in oil prices will not affect consumers much as international oil prices do not fluctuate widely on a daily basis. So, change in prices of petrol will not badly affect the commuters in the long run. They may be in for a surprise if some major international event affects the price of crude oil and its effects are felt on petrol prices in India.

**Effect on inflation**

The new practice will add one more factor to the change in price of essential commodities such as food items, cereals, fruits and vegetables. The prices of essentials may fluctuate on a daily basis, if the mechanism of daily change in fuel prices comes into effect.

**Books of accounts**

The price movement will immediately reflect on the book of accounts of oil marketing firms, allowing them to reduce or make provision for losses or profit arising out of sale and purchase of fuel on daily basis. Maintaining sales and cash receipts journals will become a lengthier process after due to daily change in prices of fuels.

The price of Petrol are derivatives of Crude Oil. So if the price of Crude falls, it effects our countries in several different ways.

- 1) Inflation - Crude oil had around 35% weightage in the calculation of WPI inflation It was the single largest factor which could move inflation up or down. Right now the CPI inflation gives around 6% weightage to Crude Oil. If the price of Crude oil falls by \$10 our inflation gets reduced by some 0.3%
- 2) Fiscal Deficit - Since Oil represents one of the largest import bills in India, the fall in oil prices will give relief to the total cost of imports thereby reducing Fiscal deficit.
- 3) Current Account Deficit - If the price of oil falls, the the dollar bill is less thereby resulting in a lower outflow of dollar reserves in India. It has a positive impact on the current account deficit.

**Here are 5 ways the fall in oil prices affects India:****Current account balance:**

India is one of the largest importers of oil in the world. It imports nearly 80% of its total oil needs. This accounts for one third of its total imports. For this reason, the price of oil affects India a lot. A fall in price would drive down the value of its imports. This helps narrow India's current account deficit - the amount India owes to the world in foreign currency. A fall in oil prices by \$10 per barrel helps reduce the current account deficit by \$9.2 billion, according to a report by Livemint. This amounts to nearly 0.43% of the Gross Domestic Product - a measure of the size of the economy.

**Inflation:**

Oil price affects the entire economy, especially because of its use in transportation of goods and services. A rise in oil price leads to an increase in prices of all goods and services. It also affects us all directly as petrol and diesel prices rise. As a result, inflation rises. A high inflation is bad for an economy. It also affects companies - directly because of a rise in input costs and indirectly through a fall in consumer demand. This is why the fall in global crude prices comes as a boon to India. Every \$10 per barrel fall in crude oil price helps reduce retail inflation by 0.2% and wholesale price inflation by 0.5%, according to a Money control report.

**Oil subsidy and fiscal deficit:**

The government fixes the price of fuel at a subsidized rate. It then compensates companies for any loss from selling fuel products at lower rates. These losses are called under-recoveries. This adds to the government's total expenditure and leads to a rise in fiscal deficit - the amount it borrows from the markets. A fall in oil prices reduces companies' losses, oil subsidies and thus helps narrow fiscal deficit. However, since diesel was recently deregulated, the fall in oil prices will likely have less effect on the government's fiscal deficit. Moreover, the government still has to pay for previous under-recoveries. Any benefit from the fall will be offset by payments for the past under-recoveries.

**Rupee exchange rate:**

The value of a free currency like Rupee depends on its demand in the currency market. This is why it depends to a great extent on the current account deficit. A high deficit means the country has to sell rupees and buy dollars to pay its bills. This reduces the value of the rupee. A fall in oil prices is, thus, good for the rupee. However, the downside is that the dollar strengthens every time the value of oil falls. This negates any benefits from a fall in current account deficit.

**Petroleum producers:**

The fall in global oil prices may be beneficial to India, but it also has its downsides. Directly, it affects the exporters of petroleum products in the country. India is the sixth largest exporter of petroleum products in the world, according to media reports. This helps it earn \$60 billion annually. Any fall in oil prices negatively impacts exports. At a time when India is running a trade deficit - high imports and low exports, any fall in exports. Moreover, a lot of India's trade partners and buyers of its exports are net oil exporters. A fall in oil price may impact their economy, and hamper demand for Indian products. This would indirectly affect India and its companies. For example, the share prices of Bharti Airtel and Bajaj Auto fell because of the devaluation of the Nigerian currency - Naira. Both the companies have a significant presence in the African country.

**Causes Of Food Price Increases****1) Use of Biofuels**

A lot of corn is now being used to produce ethanol. This has further reduced the supply of corn, which is a key input in a variety of food products and is also an important food source for farm animals.

**2) Increases in the Price of Oil**

Oil is used in the processing of many food products. In addition, oil is used in the transportation of food. As a result, with oil price increases, the price of food increases as well.

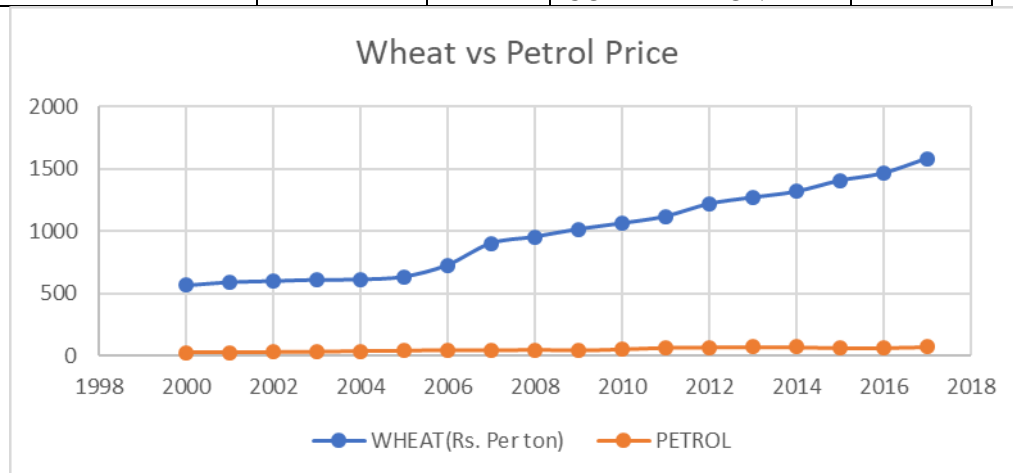
**3). Increase in Human Population**

The world population continues to grow, and with that comes increased demand of various food products. As a result, this rising demand directly leads to higher prices

**METHODOLOGY****RISE IN TRENDS OF PRICES OF PETROLEUM****1.WHEAT**

YEARS	WHEAT(Rs. Per ton)	PETROL
2000	564.96	26.07
2001	591.61	27.54
2002	600.86	29.52
2003	610.8	31.16
2004	613.47	37.34
2005	636.11	39.99
2006	728.27	46.4
2007	903.3	43.02
2008	955.54	48.08
2009	1017.36	42.67
2010	1064.32	51.57
2011	1119.18	64.94
2012	1219.41	69.11
2013	1271.11	69.44
2014	1317.82	69.57
2015	1406.15	61.83
2016	1466.01	62.62
2017	1583.3	70.6

<b>SUM</b>	17669.58	<b>VARIANCE</b>	117141.6
<b>MEAN</b>	981.643333	<b>STANDARD DEVIATION</b>	342.2596
		<b>CORRELATION</b>	0.922053

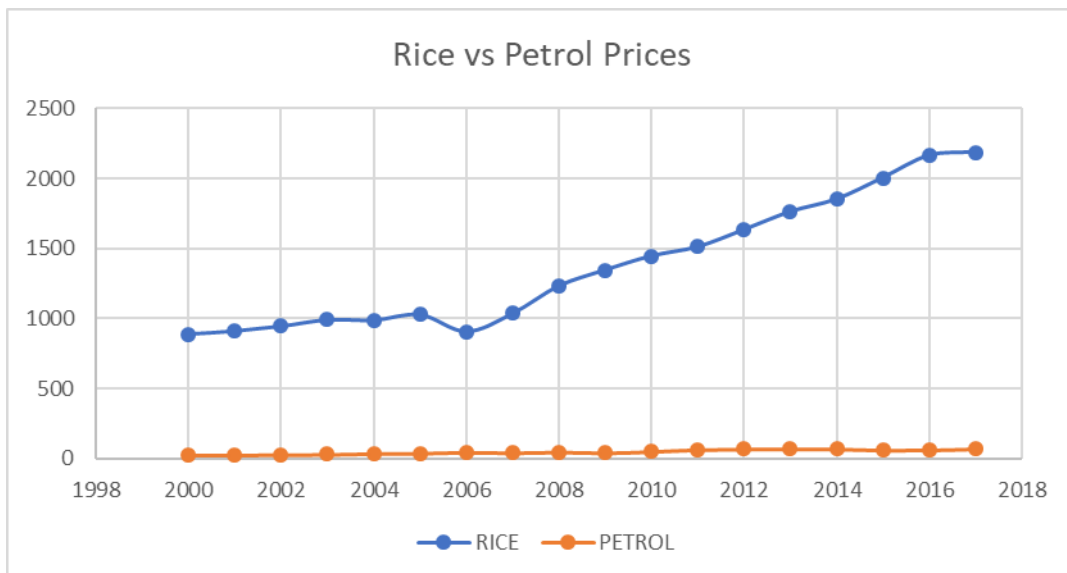


2.RICE

YEARS	RICE	PETROL
2000	889.72	26.07
2001	911.53	27.54
2002	945.64	29.52
2003	990.89	31.16
2004	988.6	37.34
2005	1028.2	39.99
2006	907.94	46.4
2007	1037.13	43.02
2008	1233.1	48.08
2009	1346.55	42.67
2010	1446.53	51.57
2011	1512.2	64.94
2012	1633.83	69.11
2013	1762.01	69.44
2014	1851.44	69.57
2015	2004.06	61.83
2016	2162.5	62.62
2017	2186.93	70.6

<b>SUM</b>	24838.8	<b>VARIANCE</b>	208669.6
<b>MEAN</b>	1379.93333	<b>STANDARD DEVIATION</b>	456.8037
		<b>CORRELATION</b>	0.882631



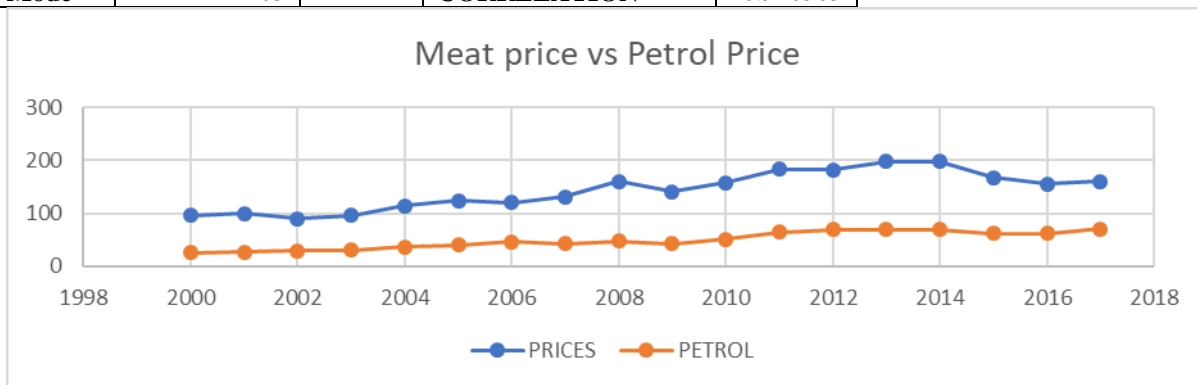


3.MEAT PRICE

YEARS	PRICES	PETROL
2000	96.5	26.07
2001	100.1	27.54
2002	89.9	29.52
2003	95.9	31.16
2004	114.2	37.34
2005	123.77	39.99
2006	120.9	46.4
2007	130.8	43.02
2008	160.7	48.08
2009	141.3	42.67
2010	158.3	51.57
2011	183.3	64.94
2012	182	69.11
2013	198.1	69.44
2014	198.3	69.57
2015	168.1	61.83
2016	156.2	62.62
2017	160.6	70.6

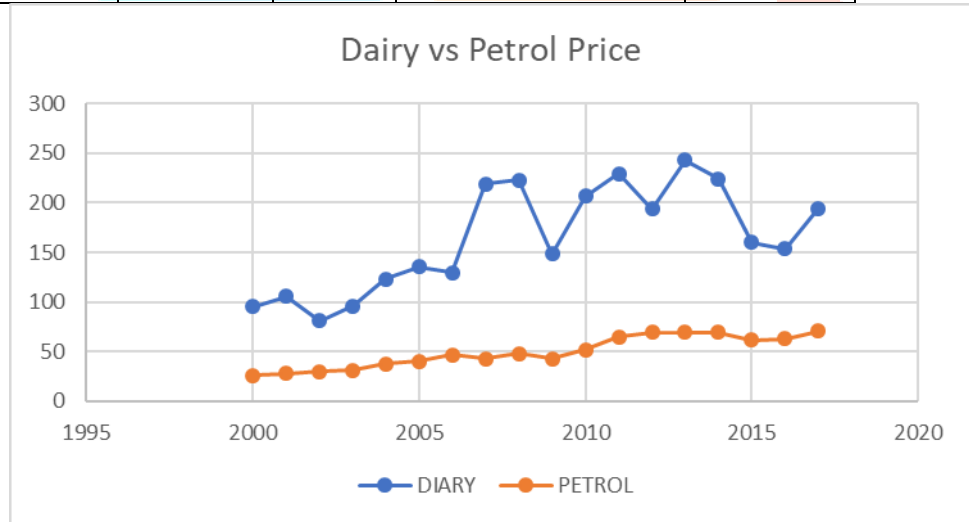


<b>Sum</b>	2578.97	<b>VARIANCE</b>	1281.133
<b>Mean</b>	143.2761111	<b>STANDARD DEVIATION</b>	35.79292
<b>Mode</b>	165	<b>CORRELATION</b>	0.940563



4.DAIRY PRODUCTS

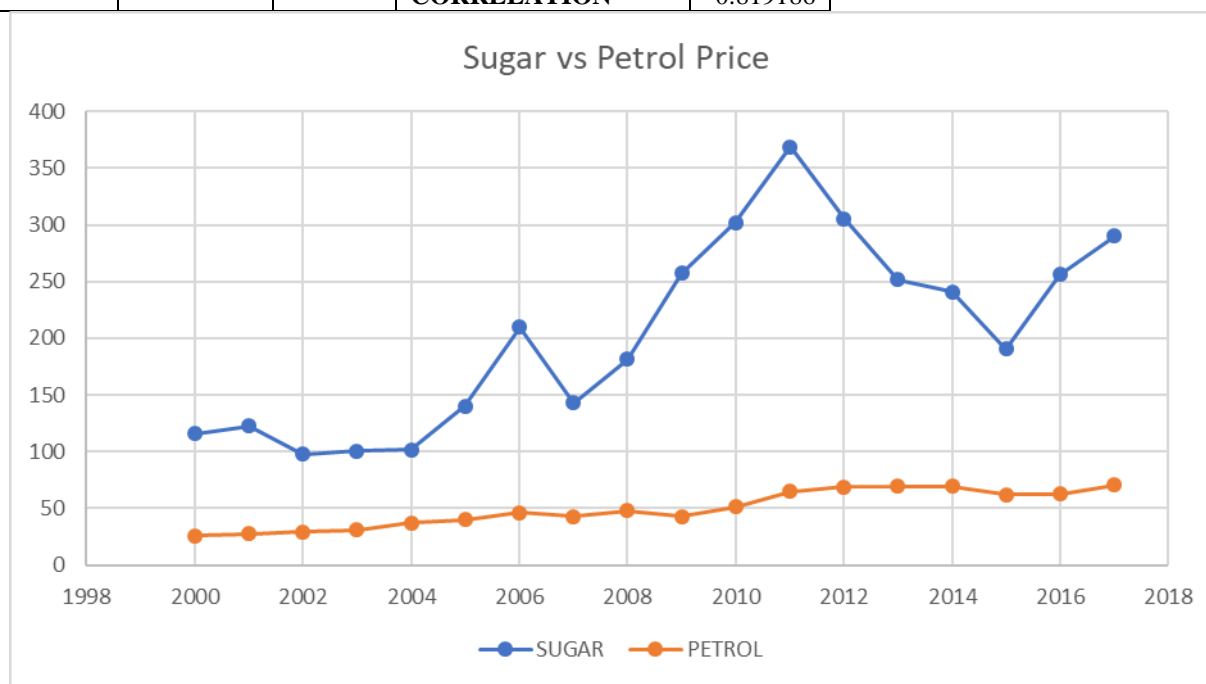
YEARS	DIARY	PETROL
2000	95.3	26.07
2001	105.5	27.54
2002	80.9	29.52
2003	95.9	31.16
2004	123.05	37.34
2005	135.2	39.99
2006	129.7	46.4
2007	219.1	43.02
2008	223.1	48.08
2009	148.6	42.67
2010	206.6	51.57
2011	229.5	64.94
2012	193.6	69.11
2013	242.7	69.44
2014	224.41	69.57
2015	160.3	61.83
2016	153.8	62.62
2017	194.2	70.6
<b>SUM</b>	2961.46	<b>VARIANCE</b> 53.127482
<b>MEAN</b>	164.52556	<b>STANDARD DEVIATION</b> 7.28886013
<b>MODE</b>	225	<b>CORRELATION</b> 0.78404665



5.SUGAR

YEARS	SUGAR	PETROL
2000	116.1	26.07
2001	122.6	27.54
2002	97.8	29.52
2003	100.6	31.16
2004	101.7	37.34
2005	140.3	39.99
2006	209.6	46.4
2007	143	43.02
2008	181.6	48.08

2009	257.3	42.67		
2010	302	51.57		
2011	368.9	64.94		
2012	305.7	69.11		
2013	251.7	69.44		
2014	241.2	69.57		
2015	190.7	61.83		
2016	256	62.62		
2017	290.3	70.6		
<b>SUM</b>	3677.1		<b>VARIANCE</b>	7003.854
<b>MEAN</b>	204.28333		<b>STANDARD DEVIATION</b>	83.68903
			<b>CORRELATION</b>	0.819186

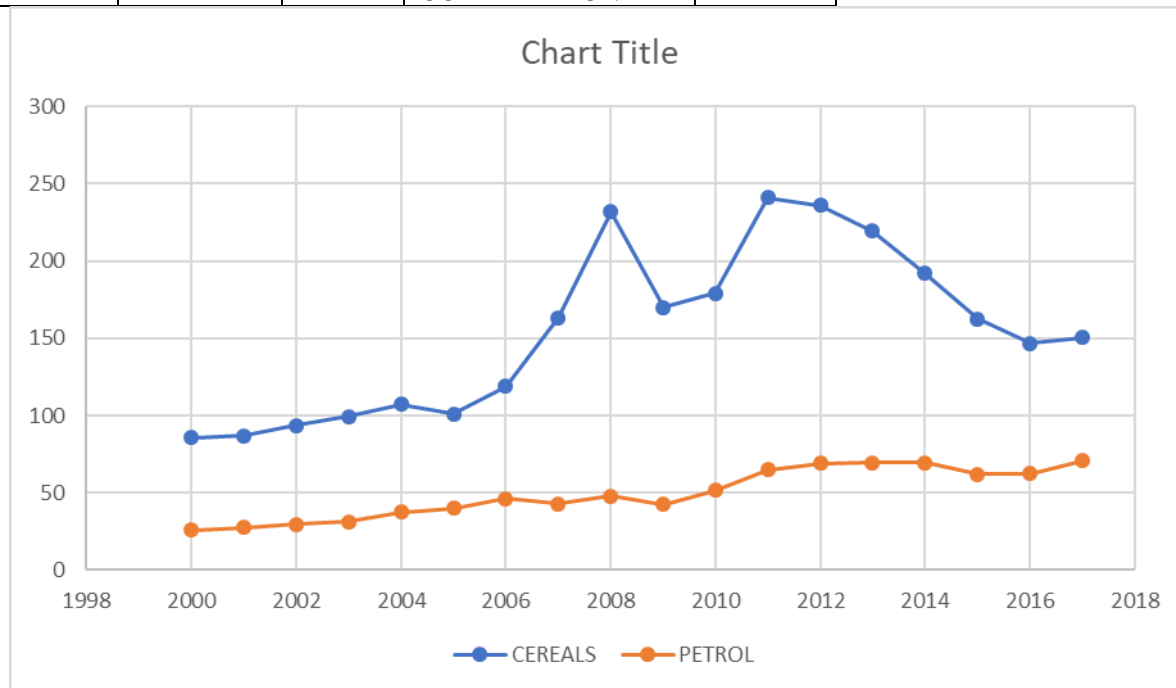


6.CEREALS

YEARS	CEREALS	PETROL
2000	85.8	26.07
2001	86.8	27.54
2002	93.7	29.52
2003	99.2	31.16
2004	107.1	37.34
2005	101.1	39.99
2006	118.9	46.4
2007	163.4	43.02
2008	232.1	48.08
2009	170.2	42.67
2010	179.2	51.57
2011	240.9	64.94
2012	236.1	69.11
2013	219.3	69.44
2014	191.9	69.57
2015	162.4	61.83

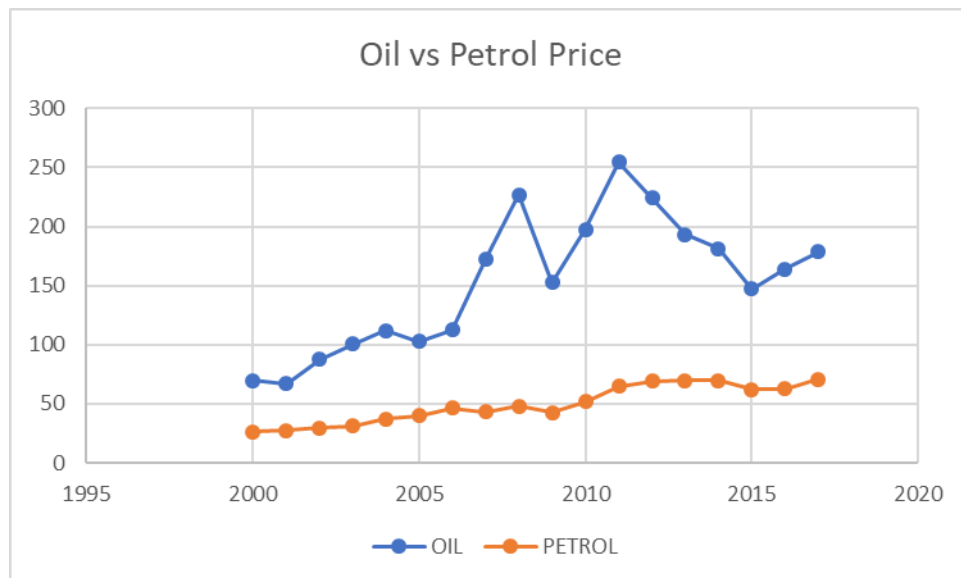


2016	146.9	62.62		
2017	150.6	70.6		
<b>SUM</b>	2785.6		<b>VARIANCE</b>	2896.263
<b>MEAN</b>	154.75556		<b>STANDARD DEVIATION</b>	53.81694
			<b>CORRELATION</b>	0.76871

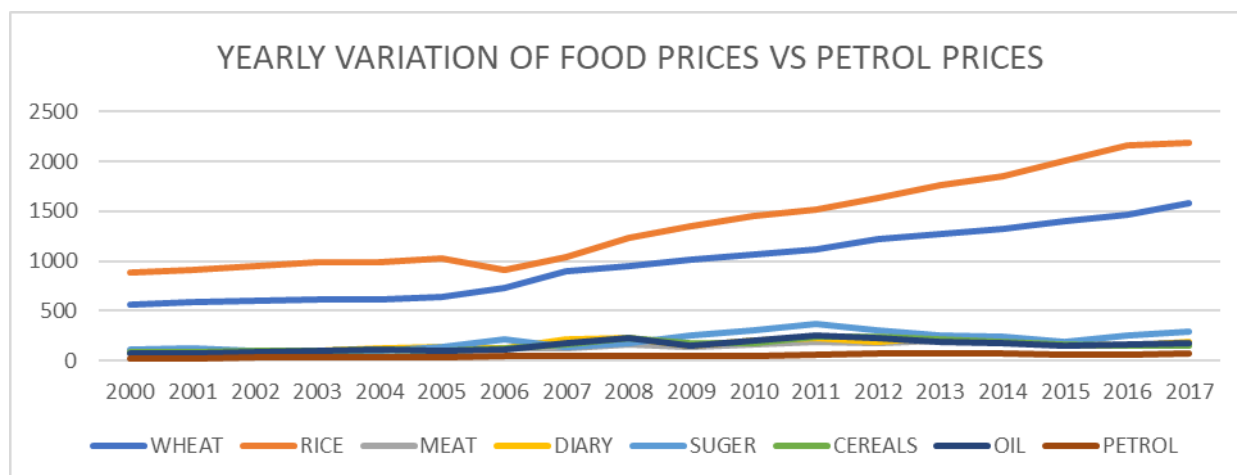


7.OIL

YEARS	OIL	PETROL		
2000	69.5	26.07		
2001	67.2	27.54		
2002	87.4	29.52		
2003	100.6	31.16		
2004	111.9	37.34		
2005	102.7	39.99		
2006	112.7	46.4		
2007	172	43.02		
2008	227	48.08		
2009	152.8	42.67		
2010	197.4	51.57		
2011	254.5	64.94		
2012	223.9	69.11		
2013	193	69.44		
2014	181.1	69.57		
2015	147	61.83		
2016	163.8	62.62		
2017	178.7	70.6		
<b>SUM</b>	2743.2		<b>VARIANCE</b>	3150.595294
<b>MEAN</b>	152.4		<b>STANDARD DEVIATION</b>	56.13016385
			<b>CORRELATION</b>	0.791154456



YEARS	WHEAT	RICE	MEAT	DIARY	SUGER	CEREALS	OIL	PETROL
2000	564.96	889.72	96.5	95.3	116.1	85.8	69.5	26.07
2001	591.61	911.53	100.1	105.5	122.6	86.8	67.2	27.54
2002	600.86	945.64	89.9	80.9	97.8	93.7	87.4	29.52
2003	610.8	990.89	95.9	95.9	100.6	99.2	100.6	31.16
2004	613.47	988.6	114.2	123.05	101.7	107.1	111.9	37.34
2005	636.11	1028.2	123.77	135.2	140.3	101.1	102.7	39.99
2006	728.27	907.94	120.9	129.7	209.6	118.9	112.7	46.4
2007	903.3	1037.13	130.8	219.1	143	163.4	172	43.02
2008	955.54	1233.1	160.7	223.1	181.6	232.1	227	48.08
2009	1017.36	1346.55	141.3	148.6	257.3	170.2	152.8	42.67
2010	1064.32	1446.53	158.3	206.6	302	179.2	197.4	51.57
2011	1119.18	1512.2	183.3	229.5	368.9	240.9	254.5	64.94
2012	1219.41	1633.83	182	193.6	305.7	236.1	223.9	69.11
2013	1271.11	1762.01	198.1	242.7	251.7	219.3	193	69.44
2014	1317.82	1851.44	198.3	224.41	241.2	191.9	181.1	69.57
2015	1406.15	2004.06	168.1	160.3	190.7	162.4	147	61.83
2016	1466.01	2162.5	156.2	153.8	256	146.9	163.8	62.62
2017	1583.3	2186.93	160.6	194.2	290.3	150.6	178.7	70.6



## CONCLUSION

The fuel has become a scarce resource that force many countries to develop alternative energies to maintain their economic activities without having any problem. It is obvious that, there is a strong correlation between energy demand and economic prosperity. Development of millions of people living standards depend on our existing energy infrastructure. To maintain economic progress on the whole world, economic experts should reinvent the ways in which they create, distribute and utilize energy.

In general, farmers can no longer assume that products derived from petroleum and natural gas (chiefly diesel, gasoline, synthetic fertilizers, and synthetic pesticides) will remain affordable in the future, and they should therefore change their business plans accordingly. While many approaches could be explored, which in any case would depend on specific geographic locations, the necessary outlines of a general transition strategy are already clear.

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