



Economics of India's agricultural domestic and international prices during WTO regime: signals and policies

M B DASTAGIRI^{1*}, B GANESH KUMAR¹, A DHANDAPANI¹ and NAGA SINDHUJA P V¹

*ICAR-National Academy of Agricultural Research Management, Rajendranagar,
Hyderabad, Telangana 500 030, India*

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ABSTRACT

Prices play a great role in living economics. Prices act as signals for shortages and surpluses which help government, firms, consumers to respond to changing market conditions. The study was conducted at NAARM, Hyderabad. The study period was from 1990–91 to 2018–19. Trends, growth rates, terms of trade, instability, elasticities, domestic and international agriculture price analysis were employed for achieving objectives. An increasing trend of MSP has been found in India's major agricultural crops. Minimum Support Price (MSP) growth rate of pulses were more than cereals and oilseeds. WPI growth rate of pulse crops was greater than the cereal and oilseed crops except sorghum. The variation in WPI of major agricultural commodities in India was stable except sunflower. Consumer food price index has shown more or less linear trends. It indicates Government monitoring food prices stable. The variation in export price of rice and sunflower and import price of sorghum was stable. The study found that India has comparative advantage for rice, gram, groundnut and soybean crops in international markets. The export price elasticities of rice, wheat, gram, groundnut, soybean and sunflower was observed to be marginally higher than their import price elasticities. The findings can be useful to government in designing price fixing mechanism and monetary policy, distortion of prices and control of inflation.

Keywords: CPI, Economics, International prices, MSP, Policies, WPI

Economics is the study of how societies, governments, businesses, households, and individuals allocate their scarce resources and how they interact with each other in producing and maintaining livelihoods. (Capozzi and Wood 2018). Economics can provide individuals with valuable information that helps them make decisions in their everyday lives and provides knowledge to understand the system and policies that guide life (Pettinger 2019). Economists aspire for a better world where their subject will secure conditions in which all the people flourish and live with happiness (Jana 2018). It is one of the most important and relevant skills for the world today, helping us choose wisely social and professional lives.

Prices play an eminent role in living economics, inequality and poverty at household level (Ray 2017). Prices are signal for shortages and surpluses which help firms and consumers respond to changing market conditions (Pettinger 2017). Trading without information is profitable only with sell orders and providing justification for restrictions on

short sales (Goldstein 2018). However, in market economy price for abundant goods never gets high to a critical point due to the fact of consumer sovereignty which consumers are the rulers for suppliers (Boudreaux 2019).

Government Intervention through agricultural price policy is a very important phenomenon in the agricultural sector in many countries. Government price policy for agricultural produce seeks to ensure remunerative prices to growers for their produce and also ensures availability of food supplies at reasonable prices to consumers. The farmers shift from one crop to other crop mainly due to flexibility of prices. Hence accurate market information is needed to decide the cropping pattern by the farmer. There are no recent studies on the different prices of agricultural commodities in India. The objectives of the present study were to estimate trends of growth rates, instability of minimum support price, wholesale price, consumer price, domestic market and international prices, to analyse the export import price elasticities and terms of trade for selected agricultural commodities in India, to suggest appropriate strategies for government to make policies.

MATERIALS AND METHODS

The study was carried out in the year 2020 at NAARM, Hyderabad. The current study made use of secondary time

¹ICAR-National Academy of Agricultural Research Management, Rajendranagar, Hyderabad, Telangana.

*Corresponding author email: dgiri_mb@yahoo.co.in

series data on MSP, WPI, CPI, export and import quantity and values of major agricultural commodities in India. The major producing and exported agricultural commodities selected were cereals (Rice, Wheat, Sorghum and Maize), pulses (Gram, Arhar/Tur and Moong) and oilseeds (Groundnut, Soybean and Sunflower). The study period was from 1990–91 to 2018–19. The data was collected from CACP, FAOSTAT, CMIE, DGCIS and Agricultural Statistics at a glance. This research analyses MSP, WPI, CPI, exports and import price trends, growth rates, instability, TOT, and elasticities. The compound annual growth rates (CAGR), price elasticities, instability, TOT analysis were estimated as:

Growth rate:

Compound Annual Growth rate:

$$\text{CAGR} = (\text{BV}/\text{EV})^{1/n} - 1 \times 100$$

where EV is Ending value, BV is Beginning value, n is Number of years

Price elasticity of exports:

$$\Sigma \text{Pe} = \text{Per cent change in quantity exports} / \text{Per cent change in price}$$

The percentage change in quantity exports is % ΔQ , and the percentage change in price is % ΔP . We calculated % ΔQ as $\Delta Q/Q_{\text{ave}}$ and % ΔP as $\Delta P/P_{\text{ave}}$. So the price elasticity of exports was calculated as $(\Delta Q/Q_{\text{ave}})/(\Delta P/P_{\text{ave}})$.

Instability Index:

$$\text{Coefficient of variation} = (\text{Standard Deviation}/\text{Mean}) \times 100$$

Terms of Trade:

Terms of Trade = Average Price of Exports/ Average Price of Imports

$$= P_X/P_M$$

RESULTS AND DISCUSSION

Government or Minimum Support Prices: Minimum Support Price (MSP) is a form of market intervention by the Government of India to ensure agricultural producers against any sharp fall in farm prices. It is price fixed by Government of India to protect farmers against excessive fall in price during bumper production years.

Trends in MSP of Agricultural Commodities in India during 1990–91 to 2018–19: Fig 1 mainly shows that there was an increasing trend of MSP noticed in common A paddy, grade A paddy, wheat, sorghum variety, sorghum hybrid and also maize crop of India during 1990–91 to 2018–19. Most of the people in India depend on the staple food crops i.e., paddy and wheat. During 1990–91 to 2018–19, there was an increasing trend of MSP noticed in the gram, arhar/tur and moong in India. There was an increasing trend of MSP in the groundnut, soybean black, soybean yellow and sunflower crops in India during the same period.

The study found that there was an increasing trend noticed in the pulse crops which was more than that of cereal crops. This is mainly because of encouraging farmers to shift from water-intensive crops such as paddy and wheat to pulses. There is no self-sufficiency of oilseeds in India. We are importing edible oils from other countries. Hence, the government should encourage the farmers to take up the cultivation of oilseeds by rising the MSP of oilseed crops.

Consumer Price Index: Consumer Price Index is a comprehensive measure used for estimation of price changes in a basket of goods in an economy. It indicates whether the economy is experiencing inflation, deflation or stagflation. The government uses it to improve benefit levels for recipients of social security and other government programs.

Trends in Consumer Price Food index (2011–12 to 2015–16): It was seen that consumer price food index has shown more or less linear trend during 2011–12 to 2015–16. It indicates Government monitoring of food prices is stable.

Foreign Trade (International Prices)

Trends in Export Price of Agricultural Commodities in India during 1990–91 to 2017–18: Fig 2(a) shows that an increase with mixed trends was noticed in export price of rice crop. While more or less linear trends was noticed in export price of wheat, sorghum and maize crop during the period of 1990–91 to 2017–18. Pulses (Gram, Moong and Arhar) and oilseed crops (Groundnut and Sunflower) showed mixed trends during the period of 1990–91 to 2005–06.

Trends in Import Price of Agricultural Commodities in India: Fig 2(b) depicts that the import price of all crops showed more or less linear trends except groundnut and sunflower where the same the mixed trend was observed during the period of 1990–91 to 2017–18.

MSP, WPI, CPI Growth Rate and Instability of India's Agricultural Commodities

MSP Growth Rate and Instability of India's Agricultural Commodities (1990–91 to 2018–19): From Table 1, it is mainly inferred that there is no negative growth rate found in MSP of agricultural commodities in India. During the period of 1990–91 to 2018–19, the MSP growth rate of moong (10.03), arhar (9.22), gram (8.67), maize (8.35) and sunflower (8.15) has been found to be more. It means the procurement of these crops is somewhat less than other crops. Hence, the government raises the MSP of these crops to boost the growers. The pulse crop MSP growth rate was found to be more than other cereal and oilseed crops. Insufficient production, hoarding and growing imports are responsible for the hike in pulse MSP from the past few years. The variation in MSP growth rate of paddy, wheat, sorghum, maize, gram, arhar, moong, groundnut, soybean and sunflower was found to be stable in India during the period of 1990–91 to 2018–19.

Growth Rate and Instability of Wholesale Price Index of Agricultural Commodities in India (1990–91 to 2016–17): The annual compound growth rates and coefficient of variation of WPI of India's agricultural crops are presented

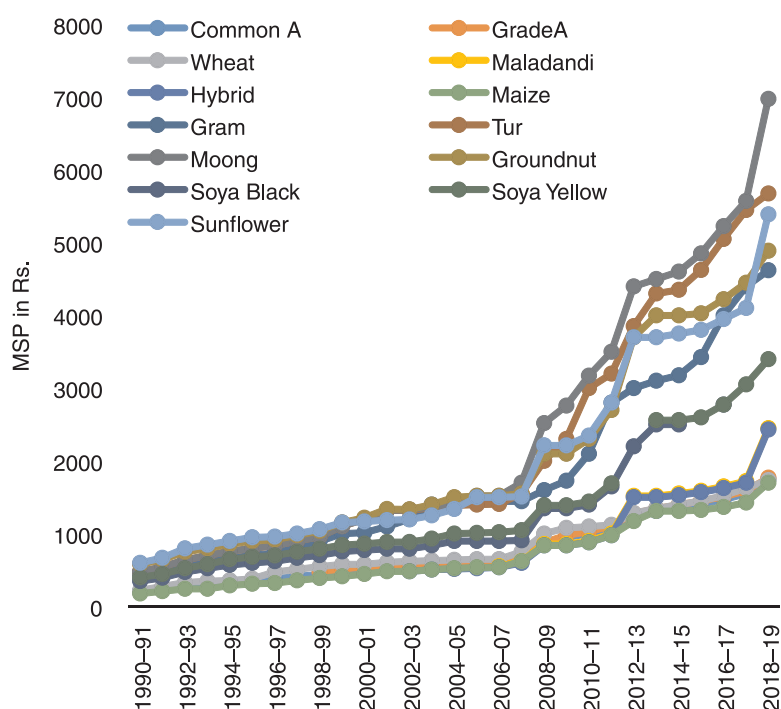


Fig 1 Trends in Minimum Support Price of Agricultural Commodities in India (₹/quintal).

in Table 1. During 1990-91 to 2016-17, WPI of rice, wheat, sorghum, maize, gram, arhar, moong, groundnut, soybean and sunflower growth rate was positive. The growth rate of sorghum (9.09), gram (9.02), moong (8.57) and arhar (8.21) were more than other crops. It represents that the pulse crop growers were benefitted more than the cereal and oilseed crop growers.

During 1990-91 to 2016-17 period, the variation in the WPI of rice, wheat, sorghum, maize, gram, arhar, moong, groundnut and soybean was stable except sunflower crop (111.42) where the variation in WPI was unstable.

The study found that the WPI growth rate of pulse

crops were greater than the cereal and oilseed crops except sorghum. The variation in WPI of all major agricultural commodities in India was stable except sunflower.

Growth Rate and Instability of Consumer Price Food Index in India (2011-12 to 2018-19): It is seen from Table 1 that the growth rate of Consumer Price Food Index in India was 2.28 and the variation in that was stable during the period of 2011-12 to 2018-19.

International Average Export-Import Prices Growth Rate, Terms of Trade, Elasticities

International Average Export-Import Prices Growth Rate, Terms of Trade of India's Agricultural commodities (1990-91 to 2017-18): The average export import prices growth rates, TOT and elasticities of India's major agricultural commodities are presented in Table 2. During 1990-91 to 2017-18, the export and import prices growth rate of India's major commodities was positive except sunflower (-7.06). The export price growth rate of wheat, gram, groundnut, soybean and sunflower was more than their import price growth rates. But

a reverse condition was noticed in case of rice, maize and arhar where the import price growth rates of these crops was more than that of export price. It reveals that India has comparative advantage for wheat, sorghum, gram, arhar, groundnut, and soybean crops. During 1990-91 to 2000-01, the export price of wheat, soybean and sunflower were observed to be more than their import price. During 2001-02 to 2017-18, the export price of wheat, sorghum, gram, arhar, groundnut, and soybean was more than that of their import price. During 1990-91 to 2017-18, the terms of trade of India with other countries improved for wheat, gram, groundnut, soybean and sunflower.

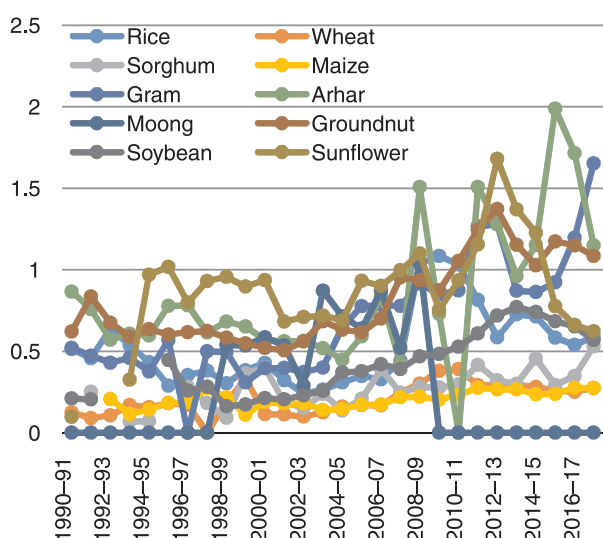


Fig 2(a) Trends in Export Price of Agricultural Commodities in India (1990-91 to 2017-18) (US\$/kg).

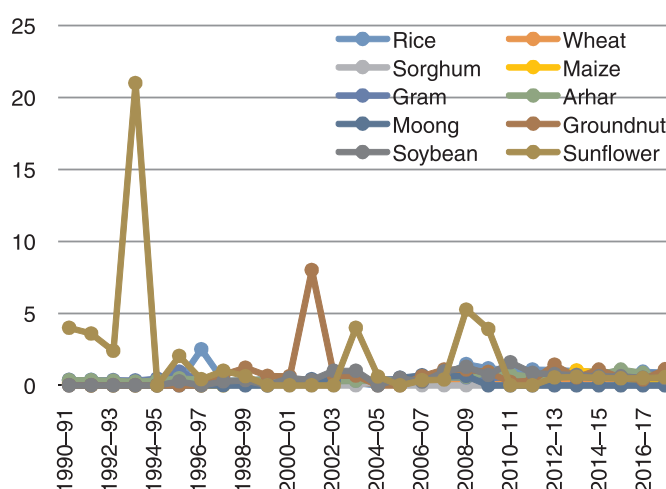


Fig 2(b) Trends in Import Price of Agricultural Commodities in India (1990-91 to 2017-18) (US\$/kg).

Table 1 Growth rate and Instability of MSP (1990–2019), Wholesale Price Index (1990–2017) and Consumer Price Food Index (2011–19) of Agricultural Commodities in India (Per centage)

Crop	MSP Growth Rate & Instability of Agricultural Commodities in India				WPI Growth Rate & Instability of Agricultural Commodities in India		
	1990–91 to 2000–01	2001–02 to 2011–12	2012–13 to 2018–19	1990–91 to 2018–19	1990–91 to 2000–01	2001–02 to 2016–17	1990–91 to 2016–17
<i>Cereals</i>							
Common-A Paddy	9.54 (28.01)	7.38 (29.94)	5.77 (11.64)	7.96 (60.21)	9.50 (27.79)	6.37 (36.01)	7.29 (50.82)
Grade –A Paddy	0.00 (7.07)	7.08 (28.60)	5.55 (11.13)	0.00 (44.55)			
Wheat	9.93 (29.81)	6.26 (27.26)	5.13 (10.68)	7.57 (54.49)	9.90 (29.93)	6.36 (32.06)	7.42 (50.16)
Maize	9.47 (27.75)	7.28 (28.40)	6.35 (11.86)	8.35 (63.12)	8.42 (24.22)	7.73 (39.54)	7.51 (53.64)
Sorghum Maladandi	0.00 (0.00)	0.00 (21.64)	8.28 (19.39)	0.00 (41.92)	10.57 (31.30)	9.39 (43.59)	9.09 (62.04)
Sorghum Hybrid	0.00 (0.00)	0.00 (28.37)	8.37 (19.64)	0.00 (52.68)			
<i>Pulses</i>							
Gram	8.47 (25.62)	9.79 (29.59)	7.46 (17.99)	8.67 (69.73)	8.04 (27.67)	8.83 (48.44)	9.02 (64.54)
Arhar	9.59 (27.36)	9.26 (37.90)	6.68 (13.90)	9.22 (76.63)	6.90 (29.42)	10.05 (49.05)	8.21 (62.37)
Moong	9.59 (27.36)	10.24 (40.62)	7.98 (17.50)	10.03 (79.36)	9.63 (30.77)	7.78 (47.49)	8.57 (67.34)
<i>Oilseeds</i>							
Groundnut	7.72 (22.20)	7.26 (26.15)	4.75 (9.24)	7.91 (66.80)	4.46 (16.47)	8.43 (39.28)	6.66 (54.64)
Soybean Black	8.27 (23.87)	7.57 (28.27)	0.00 (9.42)	0.00 (63.77)	4.51 (16.89)	7.24 (41.40)	6.18 (54.79)
Soybean Yellow	8.02 (23.70)	6.68 (23.72)	0.00 (11.99)	7.94 (65.79)			
Sunflower	6.91 (19.78)	8.98 (32.23)	6.46 (14.93)	8.15 (66.54)	0.00 (0.00)	0.00 (56.66)	0.00 (111.42)
Consumer Price Index (Base Year: 2015–16)			2.28 (Growth Rate)		6.95 (Instability)		

Figure in Parenthesis indicates Coefficient of Variation (Independent of units); Source for Consumer Price Index: Centre for Monitoring Indian Economy; Data Sources: Growth rates calculated using FAOSTAT, CMIE.

Export-Import Price Elasticities of India's Major Agricultural Commodities: Trade price elasticities are signals for exporters or importers to increase or decrease their trade as it indicates exports or imports responsiveness to changes in price. In order to fix prices of the goods to be exported, it is important to have knowledge about the elasticities of demand for such goods. A country may fix higher prices for the products with inelastic demand.

Export import price elasticities of India's oilseeds crops are presented in Table 2. During 1990–91 to 2017–18, the export and import price elasticities of all crops were positive. The export price elasticities of rice (1.15%), wheat (4.84%), gram (3.32%), groundnut (1.81%), soybean

(2.70%) and sunflower (9.44%) in India were marginally higher than their imports. But a reverse trend was noticed in the maize and arhar where the import price elasticity was more than their export price elasticity. David (2003) reported that most of the agricultural commodities have inelastic demand leading to world prices and lower export earnings for developing countries.

Government Price policy for agricultural produce seeks to ensure remunerative prices to growers for their produce and also for safeguarding the interests of consumers by making available food supplies at reasonable prices. An increasing trend of MSP has been seen in India's major agricultural crops. The study found that the MSP growth

Table 2 Average Export-Import Prices Growth Rate, Price Elasticity, ToT of Agricultural Commodities in India (1990–91 to 2017–18) (Percentage)

Crop	Variable (US\$/Kg)	Average Export Import Price Growth			Terms of			Price Elasticity of Major Crops in		
		rate of major crops in India			Trade			India (%)		
		1990–91 to 2000–01	2001–02 to 2017–18	1900–91 to 2017–18	1990–91 to 2000–01	2001–02 to 2017–18	1900–91 to 2017–18	1990–91 to 2000–01	2001–02 to 2017–18	1900–91 to 2017–18
Cereals										
Rice	Export	-1.78	3.82	0.51	1.76	0.45	0.14	0.75	2.00	1.15
	Import	-1.01	8.51	3.67				1.02	3.79	0.95
Wheat	Export	-0.95	5.75	2.94	0.35	1.80	5.76	0.89	0.88	4.84
	Import	-2.70	3.19	0.51				1.02	1.65	1.15
Sorghum	Export	0.00	6.74	0.00	-	-	-	0.00	2.87	0.00
	Import	0.00	0.00	0.00				0.00	0.00	0.00
Maize	Export	0.00	2.72	0.00	0.00	0.67	0.00	0.00	1.67	0.00
	Import	1.28	4.06	4.41				1.14	1.94	3.21
Pulses										
Gram	Export	-2.70	9.32	4.37	1.8	1.77	1.44	1.21	4.21	3.32
	Import	-1.50	5.27	3.04				1.09	2.91	2.39
Arhar	Export	-4.13	4.58	1.06	4.09	1.16	0.67	0.58	8.61	1.37
	Import	-1.01	3.94	1.58				0.82	7.02	1.55
Moong	Export	0.00	0.00	0.00	-	-	-	0.00	0.00	0.00
	Import	0.00	0.00	0.00				0.00	0.00	0.00
Oilseeds										
Groundnut	Export	-1.72	4.89	2.09	-	-0.42	-	0.73	2.29	1.81
	Import	0.00	-11.64	0.00				0.00	0.14	0.00
Soybean	Export	0.10	6.58	3.75	-	3.09	-	1.01	2.81	2.70
	Import	0.00	2.13	0.00				0.00	1.40	0.00
Sunflower	Export	25.37	-0.56	7.11	-	-	-1.01	-10.92	0.89	9.44
	Import	0.00	0.00	-7.06				1.00	0.00	0.14

Growth rates and Price elasticities calculated using FAOSTAT, DGCIS, CMIE.

rate of pulses was more than that of cereal and oilseed crops. WPI growth rate of pulse crops were greater than the cereal and oilseed crops except sorghum. The variation in WPI of major agricultural commodities in India were stable except sunflower. The consumer price food index has shown more or less linear trends in India. It indicates Government monitoring of food prices is stable. An increase with mixed trends was noticed in export price of cereals and pulses except maize. The import price of rice and maize showed increase with mixed trends. The import price of wheat showed more or less linear trends. An increase with mixed trends was noticed in the gram and arhar. The study found that India has comparative advantage for rice, gram, groundnut and soybean crops in international markets. The variation in import price growth rate of all crops was more than that of export price except arhar. It was seen that export price elasticities of rice, wheat, gram, groundnut, soybean and sunflower were marginally higher than their import price elasticities.

Government provides more MSP to pulse crops. But

farmers are still interested in cultivation of staple crops like paddy and wheat in all seasons. Government should arrange knowledge awareness programs regarding the healthy and nutritional benefits of pulses.

India is not self-sufficient in oilseeds and pulses. Edible vegetable oils are India's largest agricultural imports, followed by pulses sharing 34% and 18%, respectively. Government should support and provide incentives for farmers to balance their cropping pattern of agricultural commodities.

The findings of this study will be useful to government in designing price fixing mechanism for domestic and international market to benefit farmer, consumer, traders and other stakeholders. It can also be useful in designing monetary policy and control of inflation.

REFERENCES

- Allison Schrager. 2016. The single most important thing an economics course can teach you. *Quartz*. Retrieved from <https://qz.com/611394/economics>.
Anonymous, *what is Economics, and Why is it Important?* B.C.

- Campus, Press book. Retrieved from <https://pressbooks.bccampus.ca/>
- Catherine Capozzi and Catreal Wood. 2018. Economics in Everyday Life. *Pocket sense*, October 25, 2018. Retrieved from <https://pocketsense.com/economics-everyday-life-6462921.html>
- Centre for Monitoring Indian Economy Pvt Ltd, Mumbai 400093, Maharashtra. Retrieved from <http://www.cmie.com>.
- Commission for Agricultural Costs and Prices, Ministry of Agriculture and Farmers Welfare, Govt. of India. Retrieved from <https://cacp.dacnet.nic.in/>
- David H. 2003. Commodity Market Review 2003-2004. UNFAO Commodity and Trade Division, 3–18. Retrieved from <http://www.fao.org>.
- Directorate General of Commercial Intelligence and Statistics, Ministry of Commerce and Industry, Government of India, An ISO 9001:2015 Certified Organisation. Retrieved from <http://www.dgciskol.gov.in/>
- Donald J. 2019. Information and Prices. *Library of Economics and Liberty*. Retrieved from <https://www.econlib.org/library/Enc/InformationandPrices.html>
- FAOSTAT, Statistics Division, Food and Agriculture Organization of the United Nations, 00153 Rome, Italy.
- India stat, Data Net, India. Retrieved from <https://www.indiastat.com/>
- Itay G and Alexander G. 2007. Manipulation and the Allocational Role of Prices. *Review of Economic Studies* 75: 133–164.
- Ray R. 2017. The Role of Prices in Welfare Comparisons: Methodological Developments and a Selective Survey of the Empirical Literature. *Wiley Online Library*.
- Lalwani S. 2017. *Exploring the Economics of Everyday Life*. Wharton university. Pennsylvania.
- Jana S K. 2018. The Role and Importance of Studying Economics. *Knowledge Review*, November, 2018. Retrieved from <https://theknowledgereview.com>.
- Pettinger T. 2019. Applying economics in everyday life. *Economics Help.Org*, July 20, 2019
- Pettinger T. 2019. Role and Function of Price in Economy. *Economics Help.org*, November 15, 2019.