FORECASTING MODEL FOR PETROL AND DIESEL PRICE

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ABSTRACT

Forecasting may be defined as the general tendency of data tends to increase over a long period of time. Forecasting analysis helps to identify the historical pattern and helps to project the past pattern into future. In this paper, we use several forecasting models to fit the Crude oil production, price and Petrol and Diesel price and forecast the Crude oil production, price and Petrol and Diesel price value. Also the suitability of the fitted models is analyzed through SPSS Package.

Keywords: Crude oil, Petrol, Diesel, Forecasting, Regression.

Introduction:

Energy is the lifeblood of economy of a nation. How the overall role energy can play in the economy of a nation and how it serves as the mainspring of economic growth do not need explanation. Though India is the world's fourth-largest energy user, its per capita consumption is among the lowest in the world. Stagnant output of crude oil has increased external dependence for its sourcing (77% on consumption basis) and as a result crude oil constitutes the major item in India's import bill. Rising crude oil prices and volatility has negative implications for the Indian economy and the ambition of putting the economy on a higher growth trajectory.

In view of the criticality of energy usage for economic growth, it is imperative for India to formulate appropriate policies and strategies that reduce dependence on crude and product imports and review pricing strategies of regulated products, especially diesel. Lack of information on sectoral demand of diesel and petrol not only poses a challenge for taking policy decisions by the Government, but also creates a deficiency when it comes to demand estimation of these products. This necessitates estimation and analysis of diesel and petrol consumption trends in different sectors/ subsectors of the economy. The other implicit purpose of this study is to bring to the fore the actual facts / statistics pertaining to the recent trend of "dieselization" of private motor transport (at the time of commissioning of the study). Debate was on whether diesel subsidy was flowing to deserving sectors and consumers or largely to the well to do sections of the society.

FORECASTING MODELS

After knowing the relationship between two variables we may be interested in estimating (predicting) the value of one variable given the value of another. The variable predicted on the basis of other variables is called the "dependent" or the "explained" variable and the other the "independent" or the "predicting" variable. The prediction is based on average relationship derived statistically by regression analysis. The equation, linear or otherwise, is called the regression equation or the explaining equation. The relationship between two variables can be considered between, say, rainfall and agricultural production, price of an input and the overall cost of product, consumer expenditure and disposable income. Thus, regression analysis reveals average relationship between two variables and this makes possible estimation or prediction. Regression is used to denote estimation or prediction of the average values of one variable for a specified value of the other variable. One of the variables is called **independent** or the **explained variable** and the other is called **dependent** or the **explaining variable.**

Case: I

Null hypothesis

There is no correlation exist between price of the crude oil and price of the petrol

Alternative hypothesis

There is a correlation between price of the crude oil and price of the petrol

ANOVA[b]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	3659.761	1	3659.761	51.788	.000[a]
	Residual	1201.356	17	70.668		
	Total	4861.117	18			

a. Predictors: (Constant), demand of crude oil

b. Dependent Variable: petrol price

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	12.115	6.491		1.866	.079
	Demand of crude oil	.017	.002	.868	7.196	.000

a. Dependent Variable: petrol price

Inference

The regression equation for the demand of crude oil is Y = a + bx

Petrol price = 12.115 + (.017) x demand of crude oil.

Case -II

Null hypothesis
There is no correlation exist between price of the crude oil and price of the diesel
Alternative hypothesis

There is a correlation between price of the crude oil and price of the diesel

ANOVA[b]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	11051276.010	1	11051276.010	119.197	.000[a]
	Residual	1576138.117	17	92714.007		
	Total	12627414.126	18			

a. Predictors: (Constant), diesel price

b. Dependent Variable: demand of crude oil

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	438.567	211.675		2.072	.054
	Diesel price	50.621	4.637	.936	10.918	.000

a. Dependent Variable: demand of crude oil

Inference

The regression equation for the demand of crude oil is Y = a + bx

Diesel price = 438.567 + (50.621) x demand of crude oil

One Way ANOVA

ANOVA

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	6004647.481	2	3002323.741	1849.919	.000
Within Groups	87639.226	54	1622.949		
Total	6092286.708	56			

Inference

The calculated p- value (.000) is less than the 0.05 level of significance. Hence we reject our null hypothesis and conclude that there is significant difference among the three oil price.

CONCLUSION

The study titled "Forecasting model for petrol and Diesel Price" has been conducted by using secondary data of the prices of petrol and Diesel prevailed in India for the past 19 years (2001 December to 2019 December). In this study, to accomplish the framed objectives of the study various statistical tools namely, Trend analysis, Regression analysis and one way ANOVA have been employed to analyze the collected secondary data from various secondary sources. In terms of energy security, it is highly possible that there will be continuing periods of fuel shortages as richer countries compete for dwindling supplies leaving the most disadvantaged without the ability to obtain fuel at any price.

Finally, the poorest of the poor should not have to suffer for the environmental sins of developed countries and be limited in their options by only using the cleanest energy sources for development. But by the same token, the poor may suffer more than most in the face of climate change and increasingly scarce resources. It"s in everyone"s interest that development and care for the climate and environment happen at the same time especially when long term cost and reliability favour the cleaner option.

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