

Neural Network-Based Fuel Price Prediction

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Abstract: In India, from June 16th onwards fuel price is fixed by the oil companies by day today basis. The price fixation is based on the crude oil prices in the international market. This study probes the revised petrol price based on the estimated GST in India for the time span of October 2, 2017 to January 31, 2018. Neural network model is trained by this data and crude prices to predict the fuel price. From February 1, 2018 to 22, 2018 the fuel price is simulated and verified with the original price. The error percentage also reveals the exactness of the model simulated. In this paper, additionally fuel price is estimated along with GST. Even though GST is not yet implemented for fuel, with 4 different percentages it was simulated. Results revealed that there is a considerable amount of decrease in the petrol price if the GST is implemented in India. This study also breaks up the taxes involved in pricing of petrol in India and shows how GST helps the end consumer in the reduction of petrol prices by cutting down the taxes like excise duty and VAT.

Keywords: GST; Petrol price; Crude oil price.

1. INTRODUCTION

Oil is the second largest source of primary commercial energy in India after coal. Petrol and Diesel Prices have steadily been increasing after daily price revisions. In fact, our world would almost clog without oil. Factories would stop running. Cars would become useless trash. Airplanes would be grounded and rust. Tractors on the farm would sputter to a standstill. Oil is used in many products. Here are just a few examples: farm fertilizers, plastic toys and other plastic goods, cosmetics, detergents, and nylon clothing. Oil is directly linked to production process oil price shocks have significant impact on output, inflation, employment, investment, interest rate, terms of trade and exchange rate [1]. It is commonly known thing is that the price of fuel in India depends upon the global crude oil prices. The fluctuations in the crude oil price is expected the same to reflect in the amount of money we pay at the petrol pump. The uproar regarding the prices gained a few decibels when it was discovered that crude oil prices have declined in the last three years. On May 26, 2014, when the current government took over, a barrel of crude oil cost Rs.6,330.65 which by September 11,2017 had almost halved to Rs.3,368.39[2]. India is not influenced by the price of the crude oil in international markets. Since the retail price of petroleum products is still under government control and is insulated from international oil price volatility, an increase in international oil price has not generally altered the price of petroleum products in domestic markets [3]. In India prices of petrol and diesel are decided by the petroleum companies. The government's role is restricted to levying taxes. Petroleum pricing is complex process. The Centre imposes excise tax and cess. The major drawback is the excise duty is fixed in terms of rupee and not in terms of percentage. Then the dealer's commission per litre is factored in and finally the state governments charges the (VAT) value-added taxes [4]. Daily petrol price revision reveals that Crude oil is not the only factor that influences the petrol price. The other actors are rupee-dollar exchange rate Inventory, Logistics and Revision [5]. If petrol and diesel become part of the GST regime, the prices will sharply fall in many states like Maharashtra, Tamil Nadu etc. But, in some states may actually see a rise in the petrol prices like Goa, Andaman and almost all the north eastern states [6].

2. LITERATURE REVIEW

Crude oil price volatility has its own impact on economic activities. oil is needed to generate electricity, run production machinery, and transport the output to the market. Further, volatility in oil prices may reduce aggregate output temporarily as it delays business investment by raising uncertainty or by inducing expensive sectoral resource reallocation [7]. Amano and van Norden [8] propose two-sector model for tradable(oil) and non-tradable (labor) goods to explain theoretical linkage between oil price and exchange rate. India is one of the countries that are being projected for fastest growth in fuel consumption corresponding to their growth in GDP. It is critical to understand the impact of oil price shocks on economic and investment activities in the country and Oil constitutes more than one-third of the total imports value in India, which is struggling with high current account deficit (CAD). A Value-at-risk analysis was reported to suggest that with every \$10 increase in oil prices, CAD would rise by 0.4 percentage points [9]. Oil price fluctuations has the impact on India's economy through various channels: a) Impact on the real sector variables of growth and inflation; b) Monetary policy responses in the form of interest rates and money supply to gauge the role of monetary policy in the overall oil dynamics; c) Impact on the external sector variables, i.e. net exports, exchange rates and foreign exchange reserves; and d) Impact on the investment front – both financial, i.e. stock exchange and the popular alternative investment instrument in India, i.e. gold.[10].

3. DATA DESCRIPTION

Crude oil prices are taken from [11] from October 2,2017 to February22, 2018 shown in Table 3. Crude oil prices are generally mention in dollars per Barrel. And one-barrel equals to 158.98 litres. The rupee-dollar exchange rate is collected from [12] October 2,2017 to February22, 2018 shown in Table 2. The Daily petrol price revisions is collected from a petrol bunk in Vellore district, Tamil Nadu. The Commission to Petrol Pump Dealers is Rs.3.5 (In Tamil Nadu). The State Government (Tamil Nadu) is charging VAT around 34% including the petrol pump dealers commission [13]. The Entry Tax, Refinery Processing, Landing Cost & Other Operational Costs along with Margins costs around Rs.4.75 per litre. And OMC Margin, Transportation and Freight cost costs around Rs.3.31 per litre. The Centre imposes excise tax and road cess around Rs.19.48 per litre [14].These details are tabulated in the following Table.

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TABLE 1 BREAK DOWN OF THE COSTS OF PETROL

Parameters	Petrol Price
Entry Tax, Refinery Processing, Landing Cost & Other Operational Costs along with Margins costs	Rs.4.75 per litre
OMC Margin, Transportation and Freight cost	Rs.3.31 per litre
Excise tax and Road cess	Rs.19.48 per litre
petrol pump dealers commission (In Tamil Nadu)	Rs.3.5 per litre
VAT (by Tamil Nadu Government)	34% per litre (including petrol pump dealers commission)

TABLE 3 CRUDE OIL PRICES

Oct-17		Nov-17		Dec-17		Jan-18		Feb-18	
Date	Crude oil prices in \$	Date	Crude oil prices in \$	Date	Crude oil prices in \$	Date	Crude oil prices in \$	Date	Crude oil prices in \$
2	50.58	1	54.3	1	58.36	1	60.24	1	65.8
3	50.42	2	54.54	2	58.36	2	60.37	2	65.45
4	49.98	3	55.64	3	58.36	3	61.63	3	65.45
5	50.79	4	55.64	4	57.47	4	62.01	4	65.45
6	49.29	5	55.64	5	57.62	5	61.44	5	64.15
7	49.29	6	57.35	6	55.96	6	61.44	6	63.39
8	49.29	7	57.2	7	56.69	7	61.44	7	61.79
9	49.58	8	56.81	8	57.36	8	61.73	8	61.15
10	50.92	9	57.17	9	57.36	9	62.96	9	59.2
11	51.3	10	56.74	10	57.36	10	63.57	10	59.2
12	50.6	11	56.74	11	57.99	11	63.8	11	59.2
13	51.45	12	56.74	12	57.14	12	64.3	12	59.29
14	51.45	13	56.76	13	56.6	13	64.3	13	59.19
15	51.45	14	55.7	14	57.04	14	64.28	14	60.6
16	51.87	15	55.33	15	57.3	15	64.73	15	61.34
17	51.88	16	55.14	16	57.3	16	63.73	16	61.68
18	52.04	17	56.55	17	57.3	17	63.97	17	61.68
19	51.29	18	56.55	18	57.16	18	63.95	18	61.72
20	51.47	19	56.55	19	57.46	19	63.37	19	62.38
21	51.47	20	56.09	20	58.09	20	63.37	20	61.9
22	51.47	21	56.83	21	58.36	21	63.37	21	61.68
23	51.9	22	58.02	22	58.47	22	63.49	22	62.77
24	52.47	23	58.38	23	58.47	23	64.47		
25	52.18	24	58.95	24	58.47	24	65.61		
26	52.64	25	58.95	25	58.59	25	65.51		
27	53.9	26	58.95	26	59.97	26	66.14		
28	53.9	27	58.11	27	59.64	27	66.14		
29	53.9	28	57.99	28	59.84	28	66.14		
30	54.15	29	57.3	29	60.42	29	65.56		
31	54.38	30	57.4	30	60.42	30	64.5		
		31	60.42	31	64.73				

TABLE 2 RUPEE-DOLLAR EXCHANGE RATES FOR THE TIME SPAN OF OCTOBER 2,2017 TO FEBRUARY22, 2018

Oct-17		Nov-17		Dec-17		Jan-18		Feb-18	
Date	\$	Date	\$	Date	\$	Date	\$	Date	\$
2	65.31	1	64.565	1	64.49	1	63.875	1	64
3	65.49	2	64.575	2	64.49	2	63.465	2	64.12
4	65.03	3	64.57	3	64.49	3	63.505	3	64.12
5	65.145	4	64.57	4	64.403	4	63.4	4	64.12
6	65.4	5	64.57	5	64.39	5	63.39	5	64.07
7	65.4	6	64.625	6	64.535	6	63.39	6	64.255
8	65.4	7	65.04	7	64.575	7	63.39	7	64.26
9	65.355	8	64.92	8	64.44	8	63.49	8	64.275
10	65.25	9	64.97	9	64.44	9	63.67	9	64.36
11	65.16	10	65.19	10	64.44	10	63.59	10	64.36
12	65.055	11	65.19	11	64.355	11	63.69	11	64.36
13	64.915	12	65.19	12	64.3975	12	63.59	12	64.3
14	64.915	13	65.47	13	64.46	13	63.59	13	64.275
15	64.915	14	65.455	14	64.37	14	63.59	14	64.07
16	64.72	15	65.27	15	64.05	15	63.515	15	63.935
17	65.03	16	65.325	16	64.05	16	64.03	16	64.215
18	65.07	17	65.015	17	64.05	17	63.885	17	64.215
19	65.005	18	65.015	18	64.24	18	63.843	18	64.215
20	65.04	19	65.015	19	64.025	19	63.845	19	64.25
21	65.04	20	65.01	20	64.115	20	63.845	20	64.835
22	65.04	21	64.915	21	64.03	21	63.845	21	64.76
23	65.0225	22	64.88	22	64.05	22	63.91	22	65.02
24	65.105	23	64.575	23	64.05	23	63.77	23	64.76
25	64.925	24	64.68	24	64.05	24	63.695	24	64.76
26	64.84	25	64.68	25	64.05	25	63.565	25	64.76
27	65.04	26	64.68	26	64.05	26	63.615	26	64.785
28	65.04	27	64.4875	27	64.155	27	63.615	27	64.875
29	65.04	28	64.41	28	64.08	28	63.615	28	65.21
30	64.84	29	64.03	29	63.875	29	63.5775		
31	64.755	30	64.47	30	63.875	30	63.66		
		31	63.875	31	63.5825				

4. CALCULATION

TABLE 4 PARAMETERS INVOLVED

Parameters	Cost
The price of crude oil on February 3,2018	\$65.45 per Barrel
Rupee-Dollar Exchange Rate on February 3,2018	Rs.64.12

The price of crude oil on February 3,2018	Rs.26.39737 per litre
Entry Tax, Refinery Processing, Landing Cost & Other Operational Costs along with Margins costs	Rs.4.75 per litre.
OMC Margin, Transportation and Freight cost	Rs.3.31 per litre
Petrol price before excise duty and road cess	Rs.34.45737 per litre
Petrol price after excise duty and road cess	Rs.53.93737 per litre
Petrol price after commission to petrol pump dealer	Rs.57.43737 per litre
Petrol price after VAT	Rs.76.9660758 per litre

TABLE 5 If GST Is Implemented

Parameters	Cost
The price of crude oil on February 3,2018	\$65.45 per Barrel
Petrol price before excise duty and road cess	Rs.34.45737 per litre
Petrol price after commission to petrol pump dealer	Rs.37.95737 per litre
Petrol price after GST (28%)	RS. 48.58543 per litre
Petrol price after GST (22%)	RS. 46.30799 per litre
Petrol price after GST (18%)	RS. 44.7897 per litre
Petrol price after GST (12%)	RS. 42.51226per litre

TABLE 6 PETROL PRICES WITH REFINING COST

Date	Petrol Prices	Crude oil price in rupees per litre	Petrol cost(with refining cost and commission/pump dealers)	Date	Petrol Prices	Crude oil price in rupees per litre	Petrol cost (with refining cost and commission/pump dealers)	Date	Petrol Prices	Crude oil price in rupees per litre	Petrol cost (with refining cost and commission/pump dealers)
Oct-02	74.51	20.77858724	32.33888724	Dec-01	72.83	23.673647	35.233647	Feb-01	76.8	26.488665	38.048665
Oct-03	74.57	20.76994465	32.32994465	Dec-02	72.83	23.673647	35.233647	Feb-02	76.86	26.3973707	37.9573707
Oct-04	71.94	20.44407724	32.04407724	Dec-03	72.82	23.673647	35.233647	Feb-03	76.86	26.3973707	37.9573707
Oct-05	71.97	20.81214335	32.37214335	Dec-04	72.74	23.28117002	34.84117002	Feb-04	76.92	26.3973707	37.9573707
Oct-06	71.95	20.27659151	31.83659151	Dec-05	72.84	23.33222355	34.89722355	Feb-05	77.21	25.8528777	37.4128777
Oct-07	67.09	20.27659151	31.83659151	Dec-06	72.83	22.71593031	34.27593031	Feb-06	77.15	25.6203576	37.1803576
Oct-08	71.98	20.27659151	31.83659151	Dec-07	72.82	23.02652378	34.58652378	Feb-07	77.29	24.9756284	36.5356284
Oct-09	72.04	20.38181469	31.94181469	Dec-08	72.78	23.24995849	34.80995849	Feb-08	77.28	24.7227088	36.2827088
Oct-10	72.04	20.899439	32.459439	Dec-09	72.79	23.24995849	34.80995849	Feb-09	77.26	23.9659831	35.5259831
Oct-11	72.07	21.02596553	32.58596553	Dec-10	72.79	23.24995849	34.80995849	Feb-10	77.23	23.9659831	35.5259831
Oct-12	72.07	20.7064222	32.2664222	Dec-11	72.7	23.47431406	35.03431406	Feb-11	76.98	23.9659831	35.5259831
Oct-13	72.02	21.00815669	32.56815669	Dec-12	72.67	23.14550981	34.70550981	Feb-12	76.76	23.9800415	35.5400415
Oct-14	71.97	21.00815669	32.56815669	Dec-13	72.65	22.94902503	34.50902503	Feb-13	76.76	23.9302084	35.4902084
Oct-15	71.92	21.00815669	32.56815669	Dec-14	72.65	23.0951365	34.6551365	Feb-14	76.69	24.4222041	35.9822041
Oct-16	71.87	21.11602969	32.67602969	Dec-15	72.68	23.08507359	34.64507359	Feb-15	76.51	24.6683413	36.2283413
Oct-17	71.84	21.21212608	32.78212608	Dec-16	72.71	23.08507359	34.64507359	Feb-16	76.25	24.9137074	36.4737074
Oct-18	71.90	21.0980375	32.8580375	Dec-17	72.74	23.08507359	34.64507359	Feb-17	75.94	24.9137074	36.4737074
Oct-19	71.92	20.97186093	32.53186093	Dec-18	72.7	23.0568327	34.6568327	Feb-18	75.77	24.928641	36.488641
Oct-20	71.99	21.05679205	32.61679205	Dec-19	72.86	23.1404988	34.7004988	Feb-19	75.61	25.2101837	36.7701837
Oct-21	72.03	21.05679205	32.61679205	Dec-20	72.95	23.4270995	34.9870995	Feb-20	75.41	25.2439709	36.8039709
Oct-22	72.18	21.05679205	32.61679205	Dec-21	73.04	23.50478551	35.06478551	Feb-21	75.4	25.1251528	36.6851528
Oct-23	72.20	21.22699553	32.78699553	Dec-22	73.07	23.55644421	35.11644421		75.38	25.6718166	37.2318166
Oct-24	72.20	21.48735281	33.04735281	Dec-23	73.21	23.55644421	35.11644421				
Oct-25	72.22	21.30951378	32.86951378	Dec-24	73.19	23.55644421	35.11644421				
Oct-26	72.25	21.44922632	33.02922632	Dec-25	73.3	23.60478991	35.16478991				
Oct-27	72.33	22.0592464	33.61092464	Dec-26	73.26	24.16076551	35.72076551				
Oct-28	72.45	22.0592464	33.61092464	Dec-27	73.3	24.06720468	35.62720468				
Oct-29	72.54	22.0592464	33.61092464	Dec-28	73.45	24.11989298	35.67989298				
Oct-30	72.69	22.08507988	33.64507988	Dec-29	73.55	24.27555353	35.83555353				
Oct-31	72.76	22.14981067	33.70981067	Dec-30	73.59	24.27555353	35.83555353				
Nov-01	72.75	22.0523048	33.6123048	Dec-31	73.62	24.27555353	35.83555353				
Nov-02	72.86	22.15322997	33.71322997	Jan-01	73.62	24.20323111	35.76323111				
Nov-03	72.96	22.59828154	34.15828154	Jan-02	73.62	24.09977387	35.65977387				
Nov-04	73.09	22.59828154	34.15828154	Jan-03	73.62	24.61827368	36.17827368				
Nov-05	73.18	22.59828154	34.15828154	Jan-04	73.62	24.72911058	36.28911058				
Nov-06	73.32	23.31264153	34.87264153	Jan-05	73.65	24.49793433	36.05793433				
Nov-07	73.82	23.40098126	34.96098126	Jan-06	73.8	24.49793433	36.05793433				
Nov-08	73.44	23.19854825	34.75854825	Jan-07	73.95	24.49793433	36.05793433				
Nov-09	73.49	23.36535566	34.92355566	Jan-08	74.08	24.65239464	36.21239464				
Nov-10	73.49	23.26632658	34.82632658	Jan-09	74.13	25.21488992	36.77488992				
Nov-11	73.45	23.26632658	34.82632658	Jan-10	74.21	25.42720028	36.98720028				
Nov-12	73.42	23.26632658	34.82632658	Jan-11	74.24	25.55932822	37.11932822				
Nov-13	73.4	23.37449491	34.93449491	Jan-12	74.32	25.71919109	37.27919109				
Nov-14	73.37	22.93271795	34.49271795	Jan-13	74.66	25.71919109	37.27919109				
Nov-15	73.33	22.71599635	34.27599635	Jan-14	74.7	25.71119134	37.27119134				
Nov-16	73.28	22.65706693	34.21706693	Jan-15	74.76	25.86064882	37.42064882				
Nov-17	73.26	23.12616839	34.68616839	Jan-16	74.87	25.6675802	37.2275802				
Nov-18	73.21	23.12616839	34.68616839	Jan-17	74.99	25.70589665	37.26589665				
Nov-19	73.18	23.12616839	34.68616839	Jan-18	75.17	25.68096522	37.24096522				
Nov-20	73.14	22.93628695	34.49628695	Jan-19	75.32	25.44884671	37.00884671				
Nov-21	73.16	23.20492798	34.76492798	Jan-20	75.52	25.44884671	37.00884671				
Nov-22	73.1	23.67805762	35.23805762	Jan-21	75.72	25.44884671	37.00884671				
Nov-23	73.05	23.71297333	35.27297333	Jan-22	75.88	25.52299597	37.08299597				
Nov-24	73.02	23.98343188	35.54343188	Jan-23	76.04	25.86018304	37.42018304				
Nov-25	73.02	23.98343188	35.54343188	Jan-24	76.09	26.28650742	37.84650742				
Nov-26	72.94	23.98343188	35.54343188	Jan-25	76.15	26.19287426	37.75287426				
Nov-27	72.92	23.71321108	35.131321108	Jan-26	76.3	26.46556862	38.02556862				
Nov-28	72.87	23.49437602	35.05437602	Jan-27	76.39	26.46556862	38.02556862				
Nov-29	72.87	23.07786514	34.63786514	Jan-28	76.45	26.46556862	38.02556862				
Nov-30	72.85	23.2770034	34.8370034	Jan-29	76.48	26.21802051	37.77802051				
				Jan-30	76.6	25.82758838	37.38758838				
				Jan-31	76.6	25.888132	37.448132				

TABLE 7 PETROL PRICES IF GST IS IMPLEMENTED

Petrol price with GST(18%)	Petrol price with GST(12%)	Date	Petrol price with GST(28%)	Petrol price with GST(22%)	Petrol price with GST(18%)	Petrol price with GST(12%)	Date	Petrol price with GST(28%)	Petrol price with GST(22%)	Petrol price with GST(18%)	Petrol price with GST(12%)
38.159533	36.219218	Dec-01	45.099068	42.985049	41.575703	39.461685	Feb-01	48.702549	46.419617	44.897662	42.614731
38.149335	36.209538	Dec-02	45.099068	42.985049	41.575703	39.461685	Feb-02	48.585435	46.307992	44.789697	42.512255
37.764811	35.844567	Dec-03	45.099068	42.985049	41.575703	39.461685	Feb-03	48.585435	46.307992	44.789697	42.512255
38.199129	36.256801	Dec-04	44.596698	42.506227	41.112581	39.02211	Feb-04	48.585435	46.307992	44.789697	42.512255
37.56713	35.656937	Dec-05	44.668446	42.574613	41.178724	39.08489	Feb-05	47.888483	45.643711	44.147196	41.902423
37.56713	35.656937	Dec-06	43.873191	41.816635	40.445598	38.389042	Feb-06	47.590858	45.360036	43.872822	41.642001
37.56713	35.656937	Dec-07	44.27075	42.195559	40.812098	38.736907	Feb-07	46.765604	44.573467	43.112041	40.919904
37.691341	35.774832	Dec-08	44.556747	42.468149	41.075751	38.987154	Feb-08	46.441867	44.264905	42.813596	40.636634
38.301672	36.354129	Dec-09	44.556747	42.468149	41.075751	38.987154	Feb-09	45.473258	43.341699	41.92066	39.789101
38.451439	36.496281	Dec-10	44.556747	42.468149	41.075751	38.987154	Feb-10	45.473258	43.341699	41.92066	39.789101
38.073458	36.137519	Dec-11	44.843922	42.741863	41.340491	39.238432	Feb-11	45.473258	43.341699	41.92066	39.789101
38.430425	36.476335	Dec-12	44.423053	42.340722	40.952502	38.870171	Feb-12	45.491253	43.358851	41.937249	39.804846
38.430425	36.476335	Dec-13	44.171552	42.101011	40.72065	38.650108	Feb-13	45.427569	43.298152	41.87854	39.749123
38.430425	36.476335	Dec-14	44.358575	42.279267	40.893061	38.813753	Feb-14	46.057221	43.898289	42.459001	40.300069
38.557715	36.597153	Dec-15	44.345694	42.26699	40.881187	38.802482	Feb-15	46.372277	44.198576	42.749443	40.575742
38.68189	36.715015	Dec-16	44.345694	42.26699	40.881187	38.802482	Feb-16	46.686345	44.497923	43.038975	40.850552
38.774568	36.850298	Dec-17	44.345694	42.26699	40.881187	38.802482	Feb-17	46.686345	44.497923	43.038975	40.850552
38.387596	36.435684	Dec-18	44.360939	42.28152	40.89524	38.815821	Feb-18	46.707026	44.517634	43.05804	40.868648
38.487815	36.530807	Dec-19	44.416638	42.334609	40.946589	38.864559	Feb-19	47.065835	44.859624	43.388817	41.182606
38.487815	36.530807	Dec-20	44.783488	42.684262	41.284778	39.185552	Feb-20	47.109083	44.900845	43.428686	41.220447
38.487815	36.530807	Dec-21	44.882925	42.779038	41.376447	39.27256	Feb-21	46.956996	44.755886	43.28848	41.087371
38.688655	36.721435	Dec-22	44.949049	42.842062	41.437404	39.330418	22-Feb	47.656725	45.422816	43.933544	41.699635
38.995676	37.013035	Dec-23	44.949049	42.842062	41.437404	39.330418					
38.786026	36.813855	Dec-24	44.949049	42.842062	41.437404	39.330418					
38.974487	36.992733	Dec-25	45.010931	42.901044	41.494452	39.384565					
39.660891	37.644236	Dec-26	45.72258	43.579334	42.150503	40.007257					
39.660891	37.644236	Dec-27	45.602822	43.46519	42.00102	39.902469					
39.660891	37.644236	Dec-28	45.669994	43.529213	42.102026	39.961245					
39.701194	37.682489	Dec-29	45.869509	43.719375	42.285953	40.13582					
39.775777	37.754988	Dec-30	45.869509	43.719375	42.285953	40.13582					
39.66255	37.64581	Dec-31	45.869509	43.719375	42.285953	40.13582					
39.781611	37.758818	Jan-01	45.776938	43.631144	42.200615	40.054821					
40.306772	38.257275	Jan-02	45.644511	43.504924	42.078533	39.938947					
40.306772	38.257275	Jan-03	46.30819	44.137494	42.690363	40.519667					
40.306772	38.257275	Jan-04	46.450062	44.272115	42.82115	40.643804					
41.149717	39.057359	Jan-05	46.154156	43.99068	42.548363	40.384886					
41.253958	39.156299	Jan-06	46.154156	43.99068	42.548363	40.384886					
41.015087	38.929574	Jan-07	46.154156	43.99068	42.548363	40.384886					
41.209772	39.11436	Jan-08	46.351866	44.179121	42.730626	40.557882					
41.095065	39.005486	Jan-09	47.071859	44.865366	43.39437	41.187877					
41.095065	39.005486	Jan-10	47.343616	45.124384	43.644896	41.425664					
41.095065	39.005486	Jan-11	47.51274	45.28558	43.800807	41.573648					
41.222704	39.126634	Jan-12	47.717365	45.480613	43.989445	41.752694					
40.701407	38.631844	Jan-13	47.717365	45.480613	43.989445	41.752694					
40.445676	38.389116	Jan-14	47.707125	45.470853	43.980006	41.743734					
40.376139	38.323115	Jan-15	47.89843	45.653192	44.156366	41.911127					
40.929679	38.848509	Jan-16	47.651303	45.417648	43.928545	41.69489					
40.929679	38.848509	Jan-17	47.700348	45.464394	43.973758	41.737804					
40.929679	38.848509	Jan-18	47.668435	45.433978	43.944339	41.709881					
40.705619	38.635841	Jan-19	47.371324	45.150793	43.670439	41.449908					
41.022615	38.936719	Jan-20	47.371324	45.150793	43.670439	41.449908					
41.580908	39.466625	Jan-21	47.371324	45.150793	43.670439	41.449908					
41.622109	39.50573	Jan-22	47.466235	45.241255	43.757935	41.532955					
41.94125	39.808644	Jan-23	47.897834	45.652623	44.155816	41.910605					
41.94125	39.808644	Jan-24	48.44353	46.172739	44.658579	42.388088					
41.94125	39.808644	Jan-25	48.323679	46.058507	44.548392	42.283219					
41.454959	39.34708	Jan-26	48.672728	46.391194	44.870171	42.588637					
41.364164	39.260901	Jan-27	48.672728	46.391194	44.870171	42.588637					
40.872681	38.794409	Jan-28	48.672728	46.391194	44.870171	42.588637					
41.107664	39.017444	Jan-29	48.355866	46.089185	44.578064	42.311383					
		Jan-30	47.856113	45.612858	44.117354	41.874099					
		Jan-31	47.933609	45.686721	44.188786	41.941908					

5. ESTIMATING PETROL PRICES USING NEURAL NETWORK

Estimating the petrol prices with the help of Neural Networks for the month of February1 to February22, 2018 from the petrol prices during October 2,2017 to January 31,2018 using nntool in MatLab.

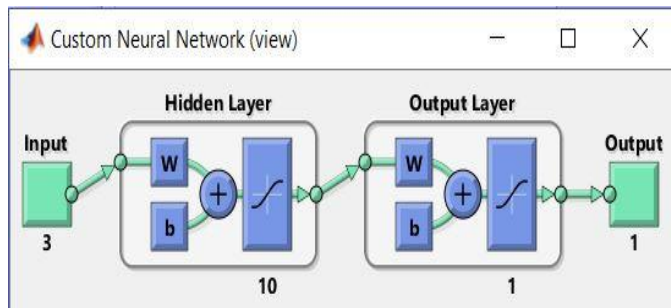


Fig 1 Neural Network Schematic Diagram

Neural Network Training (nntool)

Neural Network

Input: 3, Hidden Layer: 10, Output Layer: 1, Output: 1

Algorithms

Data Division: Random (dividerand)
 Training: Gradient Descent with Momentum & Adaptive LR (traingdx)
 Performance: Mean Squared Error (mse)
 Calculations: MEX

Progress

Epoch: 0 **26 iterations** 1000
 Time: **0:00:00**
 Performance: 22.1 **4.81** 0.00
 Gradient: 18.4 **6.78** 1.00e-05
 Validation Checks: 0 **6** 6

Plots

Performance (plotperform)
 Training State (plottrainstate)
 Regression (plotregression)

Plot Interval: 1 epochs

Opening Regression Plot

Stop Training Cancel

Fig 2 Training Interface of nntool in MatLab

The neurons are trained until they give the targeted value.

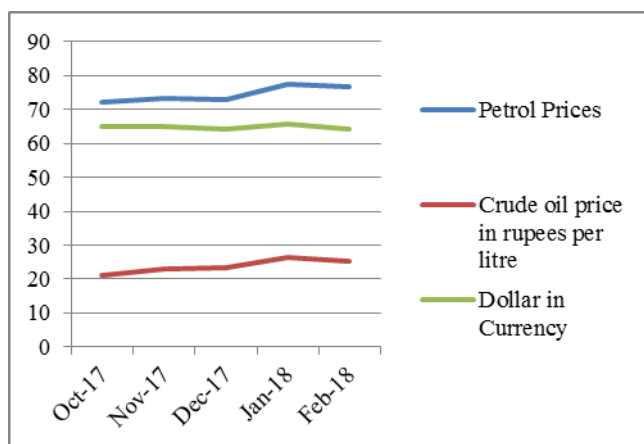
Table 8

This table summarizes the percentage of error between the Predicted prices using neural networks and the actual petrol price during February1 to February22, 2018.

Feb	Original Petrol Price	Predicted Prices Using Neural Networks	Error Percentage
1	76.8	76.23271688	0.74%
2	76.86	76.18333267	0.88%
3	76.86	76.20307335	0.85%
4	76.92	76.22185756	0.91%
5	77.21	76.26907416	1.22%
6	77.15	76.19349638	1.24%
7	77.29	76.23572276	1.36%
8	77.28	76.25616689	1.32%
9	77.26	76.23004602	1.33%
10	77.23	76.24811578	1.27%
11	76.98	76.26429008	0.93%
12	76.76	76.27568194	0.63%
13	76.76	76.27543474	0.63%
14	76.69	76.31284133	0.49%
15	76.51	76.34457989	0.22%
16	76.25	76.36367567	-0.15%
17	75.94	76.37235582	-0.57%
18	75.77	76.38045427	-0.81%
19	75.61	76.38277234	-1.02%
20	75.41	76.29823839	-1.18%
21	75.4	76.33817728	-1.24%
22	75.38	76.21015634	-1.10%

6. RESULTS AND DISCUSSION

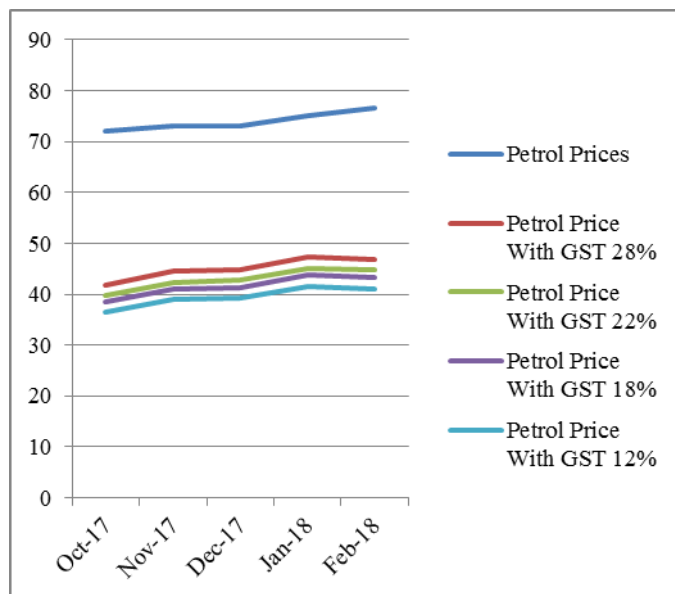
Petrol Vs Crude Oil Vs Rupee-Dollar Exchange Rate for the time span of October 2,2017 to February22, 2018



Graph 1

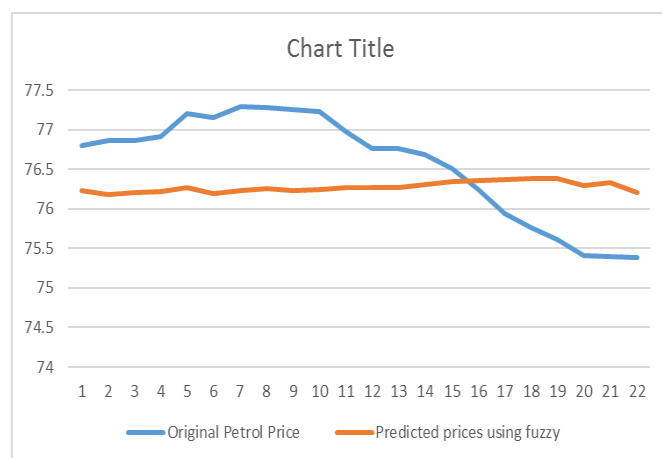
Graph 1 represents the relationships between the Petrol Prices, Prices of Crude oil per litre in Rupees and Rupee Dollar Exchange Rate. It clearly shows that how the Prices of Crude oil per litre in Rupees and Rupee Dollar Exchange Rate influences the Petrol Price in India.

Petrol Prices Vs Revised Petrol Prices



Graph 2

Graph 2 shows how implementation of GST affects the Petrol Price India. It also reveals that there is a considerable amount of decrease in the petrol price if the GST is implemented in India.



Graph 3

Graph 3 represents the difference between the Predicted prices using neural networks and the actual petrol price during February1 to February22, 2018.

7. CONCLUSION

Thus, this study probes the revised petrol price if GST is implemented in India and also reveals that there is a considerable amount of decrease in the petrol price if the GST is implemented in India. It also reveals that not the only the Central Government is imposing heavy taxes on the petrol but also the State Government does the same thing. Implementing of GST in petrol has its own positive and negative impact. Thus, this study also highlights that implementing neural networks in price predictions in timely

varying environments will be helpful not only for investors but also for the common man to plan his budget according to his/her salary. Thus, neural networks can be used as an effective tool in predicting the costs of the fuels. The positive thing is the people may get the petrol at a cheaper rate so there saving will be increased thus the amount of deposit in the bank savings will also be increased. Moreover, the vegetables and other goods price may drastically drop down since for their transportation charges will fall due to the fall in fuel price. The medical expenses may also drop. But what the economists are fearing is Petroleum is one of the major components in state revenues. Between FY12-FY17, for all states put together, revenue from taxes on petroleum constituted 16.6% of the state's own tax revenues. That is a sizeable number. If you bring these products under GST, then states will not have any taxation powers left with them. Moreover, central government is as highly dependent on petroleum products for revenue [15]. The negative impacts will be there will be an increase in usage of fuels and it will increase the air pollution. The Government tax revenues may cut down drastically and there will be a shortage of money to execute the public welfare or any developmental activity.

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[15] <http://www.livemint.com/Politics/EHuffev8PhDYxLVO1mwTUN/Govt-favours-inclusion-of-diesel-petrol-under-GST-Arun-Jai.html>