

Evaluation of profit and loss occurs to Government by imparting Goods and Services Tax on Compressed Natural Gas

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Abstract—On 1st of July 2017, Goods and Services Tax (GST) was launched by Government of India after many deliberations. GST was implemented with a motive of converting multiple taxes into a single tax would be very useful. In India petroleum products, alcoholic drinks and electricity are not considered under GST regime. Studies on petrol and diesel have already done, but the impact of GST on Compressed Natural Gas (CNG) has not yet done. The consumption rate of CNG in India has grown 3.3 % in 2021-22. Also in consumption of CNG, India stands within 14 globally. The study mainly focused on variations in prices of CNG and the main aim is to identifying the effect of GST on CNG if decided to let it under GST regime. So, the first objective of this study is to analyze the current trends and variation in price of CNG and to analyze the price effect of CNG after implementing GST. Second objective is to quantify the customer benefit on CNG price by implementing GST and to conduct a cost benefit analysis of GST implementation for different stakeholders. The analysis will give a clear idea about the benefits and losses occurred to government and consumers while implementing GST.

Keywords—GST implementation, benefits of stakeholders, CNG price analysis.

I. INTRODUCTION

The awareness of moving towards GST was proposed in the Budget speech for 2006-07 by the Union Finance Minister. In the field of indirect tax reforms in India, the introduction of the Goods and Services Tax (GST) is a very substantial step. The ill effects of cascading or double taxation in India will diminish through the implementation of GST as it integrates a several number of taxes of both central and State to unite into a single tax and overlay the way for a common national market.

Compressed Natural Gas (CNG) is an environment-friendly alternative automotive fuel. The cleaner fuel plays an important role in reducing vehicular greenhouse gas emissions and environmental pollution significantly. As its name suggests, CNG is natural gas compressed

under pressure so that more of it occupies lesser volume in your fuel tank. CNG is compressed to a pressure of 200 to 250 kg/cm². In this compressed form, it occupies less than 1 per cent of its volume at atmospheric pressure. CNG differs from Liquefied Petroleum Gas (LPG) in its constituents. CNG is gaseous, consisting of about 80 to 90 per cent methane, whereas LPG is a liquid, consisting of a compressed mixture of propane and butane in liquid form.

CNG has following advantages: It is green fuel, safe fuel and it has high auto ignition temperature, low operational cost, dual facility, increased life of oils.

II. OBJECTIVES

To study the impact of GST on CNG, first we want to study the current trends of CNG on selected period. Then the pre and post GST price variation is study. The impact of GST on different stakeholders is analyzed. In order to support this we are analyzing the price variation CNG with respect to natural gas price. To quantify the loss and benefits occurred to government.

III. LITERATURE REVIEW

In the paper titled "Technical overview of compressed natural gas (CNG) as a transportation fuel," Muhammad Imran Khan examines the history, potential, and difficulties of natural gas fuel and vehicles that run on it around the world, as well as the environmental and financial implications. Technical features of compressed natural gas qualities, storage issues, safety issues, and its impact on engine performance, efficiency, and emissions are covered in detail, as well as any obstacles to the adoption of natural gas automobiles. The economic, emission performance and safety aspects have been chosen as the major indicators for the comparative evaluation of natural gas as a fuel for vehicles. The findings indicated that CNG offers a number of advantages over diesel and petrol fuel, including significant cost and pollution savings.

The effects of producing crude oil and natural gas in emerging nations on the economy and ecology are covered in Stanley Ngene's article. The purpose of

the present taxes and then different slabs should be applied.

For example, if a product cost is Rs.100 which includes multiple taxes of 30% (which includes customs tax, excise tax and VAT). So for applying GST for 0% slab, we should exclude the 30% tax. So a price of Rs.70 is obtained without GST. Rs.70 itself be the 0% slab. While applying 5% slab, multiply the amount Rs.70 with 0.05 and get the price for 5% slab GST price. In a similar way the 12%, 18% and 28% slabs are find out.

C. Cost Benefit Analysis

Cost Benefit analysis is done to ascertain that the losses and profits occurred to the stakeholders. In the study 3 main stakeholders are considered: Consumer, State government and Central Government. For finding the C/B ratio following equations are to be done.

For consumers,

$$C/B \text{ ratio} = \text{present cost} / \text{cost after GST}$$

For Central Government,

$$C/B \text{ ratio} = \text{Revenue after GST} / \text{Present revenue}$$

For State Government,

$$C/B \text{ ratio} = \text{Revenue after GST} / \text{Present revenue}$$

If C/B ratio > 1, efficient

If C/B ratio < 1, inefficient

So if the ratio is less than 1, it indicates the system or the stakeholder is having loss and in similar way, if the ratio is greater than 1, it indicates the stakeholder is having profit. And if the ratio is equal to 1, it indicates that the system is neither profit nor loss, the system is stable. From this one can identify whether the system is in profit or loss.

V. RESULTS AND DISCUSSION

From the results and discussion the quantification of profit and loss to state and central government can be computed. From the steps mentioned in methodology the objectives can be accomplished.

A. Price variation of CNG

Price variation of CNG is done by plotting price of CNG against the time period. From doing so the price variations and trends of CNG price can be analyzed. The period of price hike taken place is marked. The reason behind the hike can be analyzed by analyzing the variations of price.

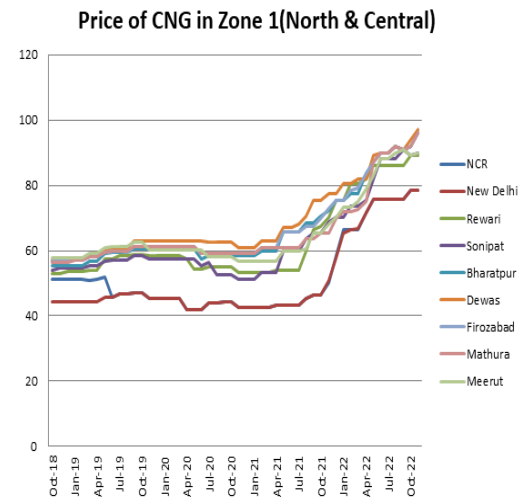


Figure 1: Price variation of CNG in zone 1

The price variation of CNG during the selected period and places are done in figure 1. From the figure 1, it is clear that during the periods of COVID-19 and Russia-Ukraine war the price of CNG was more or less slightly increasing. But after their effects, the price increases steeply.

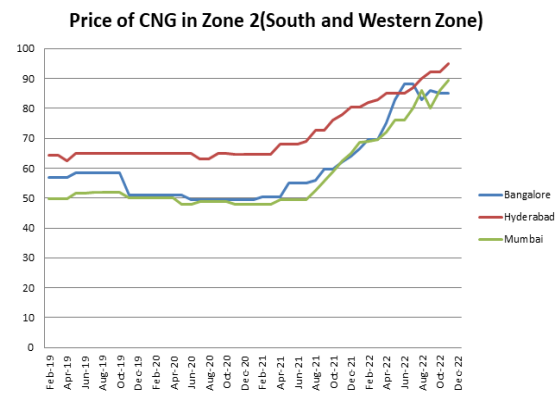


Figure 2: Price variation of CNG in zone 2

The price variation of zone 2 is figured in figure 2. From the graph, it is similar to the zone 1 scenario. In Bangalore there shows a high during April 2022 than in other cities, but decreases to lower price afterwards. The selected cities for CNG price variation in zone 2 is varied widely than zone 1 cities.

From analysing both zones, the situation is similar. So the combined effects of GST implementation can be done. The results will not alter by combining the two zones.

B. GST implementation

There are 5 GST slabs in current Indian tax system. They are 0%, 5%, 12%, 18% and 28%. The 0% GST means there is 0% tax for the commodity. So the 0% GST

slab is not considered for calculation. In that slab the revenue to the Government will be null.

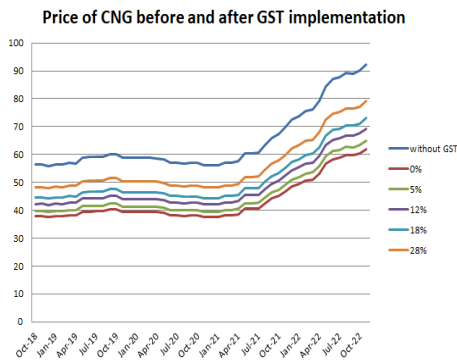


Figure 3: Price of CNG before and after GST implementation

The price variation before and after the application of GST is shown in figure 3. From the figure it is seen that even by applying the highest prevailing GST slab, the price of CNG will be less. So the consumers will get CNG at lower price than current situation. The topmost line (dark blue) shows the price of CNG before applying CNG. Other lines below that are the price of CNG after applying GST in various slabs.

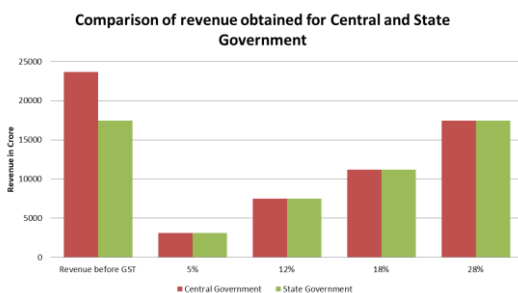


Figure 4: Comparison of revenue obtained for Central and State Government

The revenue obtained by state and central government before and after applying GST is expressed in bar diagram. The maroon colour indicate the revenue obtained by central government and green colour indicates the revenue obtained by state government. Before application of GST, the revenues obtained by both governments were different, but after applying GST, the revenue obtained by both the governments is equal. If the GST slab is 5%, then 2.5% of tax goes to Central government and rest 2.5% goes to state government. The tax is divided to 50% and given to both governments.

C. Cost benefit Analysis

To ascertain the loss and profit, the Cost benefit analysis is done. It confirms whether the system is in profit or

loss. Thus by knowing the ratio, one can confirm the status of system.

Table 2: The price structure of CNG

Price structure of CNG	
Custom duty	5%
Excise duty	14%
Average VAT(except Delhi)	14%
VAT in Delhi	0%

There are different tax structures for different commodities. For the price of CNG, the price structure is shown in table 2. From the table one noticeable thing is that, there is 0% tax in Delhi. This is done to preventing the worse air pollution. CNG is a fuel which emits less pollution. So for promoting the use of CNG, Delhi government, exempts the tax on CNG.

Table 3: Cost benefit ratio for different stakeholders

C/B Ratio			
GST slabs	For consumer	For Central Govt.	For State Govt.
5%	1.42	0.13	0.18
12%	1.33	0.32	0.43
18%	1.26	0.47	0.64
28%	1.17	0.74	1.00

From the table 3, the Cost benefit ratio can be found out. From the table, for consumers the ratio is greater than 1 and it implies that the system is profitable. The consumer will get the fuel at lower cost when GST is implemented. But for both the central and the state government, the revenue obtained through the sales of CNG will decreased considerably. The next step of our study is to quantify the loss obtained by the central and state governments.

D. Quantification of profit and loss

Table 4: Percentage of revenue loss by Government

GST slab	5%	12%	18%	28%
Central Govt.	86.84	68.42	52.63	26.32
State Govt.	82.14	57.15	35.71	0

From table 4, the loss obtained by both central and state government is visible by the implementation of GST. As the slab goes increasing the loss percentage will also get reduced. For State government, in 28% slab 0 is the loss percentage. This is because without applying GST, the state government is now levying 14% of GST. This is the reason the value zero comes in state government loss percentage.

VI. CONCLUSION

The implementation of GST is considered to be a boon. From the work done it is concluded that the price of CNG is going on increasing day by day. By analysing the variation of its price, it is seen that during COVID-19 and Ukraine war period, the price of CNG increased slowly. After the effect, the price increases rapidly towards the end of 2022.

From applying GST one can view that the price of CNG decreases considerably. This means that the current prevailing tax for CNG is much higher than 5 slabs of GST. Hence by implementing GST government (both central and state government) will have to face a loss and the customers will enjoy the benefits as the price goes decrease. So by the application of GST the common people will be benefited. As the CNG price decreases by applying GST, the people will prefer the usage of CNG. And thus air pollution can also be reduced as in Delhi. The results is ascertained by the cost benefit analysis.

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