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Impact of Renewable Energy Production on Indian fiscal Deficit

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ABSTRACT

India is one of the most populous countries in the world, and along with this comes high energy requirements to meet the country's demand. There has always been a disparity between the energy supplied India and their mammoth demands of energy. One of the trends observed in the recent thirty year history is that, these disparities between supply and demand are ever rising and increasing at an alarming rate. In order to facilitate the energy needs of the country it turns to importing crude oil from Oil Producing and Exporting Countries. The volatility of crude oil prices have a significant impact on the fiscal deficit of India. India is the third largest importer of Crude oil behind USA and China.

India has been trying to bridge this gap by engaging in the production of renewable and sustainable energy. Due to diverse geographical landscape clubbed with technology available to harness and store energy, India is moving towards a energy sufficient nation.

1. Introduction

Fiscal deficit of India has been continuing to be moving at a constant rate and is only significantly disturbed when there is a rise in price of crude in the international market. India's imports of oil are increasing. Our dependence has reached 80% and is likely to keep growing. At the same time 2008 saw an unprecedented rise in oil price on the world market. Oil price volatility has also increased. Through future oil prices are difficult to predict, they are generally expected to rise. India's import dependence on oil rose to 81% in 2015-16 from 78.5% in the previous year.(Soundarapandiyan & Ganesh)

2. Review of Literature

a. Renewable energy in India: Historical developments and prospects.(Bhattacharya & Jana, 2008)

During the period of 1995-2005, India had the second highest growth rate after China. India mainly depends on coal and oil majority of which is imported, to meet its energy requirements contributing to greater trade deficits. A number of renewable energy sources are well established in India, but these energy sources are not used to their fullest potential. Also, the rate of growth of these energy sources are not satisfying.

b. Energy in Iceland. Historical Perspective, Present Status, Future Outlook(Thorarinsdottir, 2006)

Prior to 20th century most widely used fuels for meeting energy requirements in Iceland were peat and dried sheep dung. In the early 20th century first hydropower generators were built. At present more than 70% of primary energy use in Iceland is from hydropower and geothermal power and only 30% percent from fossil fuels which are being imported, major reason for country's trade deficit being lower. Per capita energy consumption is one of the highest in the world and the proportion of this, provided by renewable energy sources is greater than in any other countries. Renewable energy generation also contributes to the country's exports further reducing the trade deficits. Government of Iceland is making continuous efforts to reduce the import further and make the country self-reliant as Iceland is rich in renewable energy sources (mainly geothermal and hydro).

c. Electricity reforms in developing and transition countries: A reappraisal (Williams & Ghanadan, Electricity reforms in developing and transition countries: A reappraisal, 2006)

Reforms in electric power sector all rounds the world is a tedious and continuous process. There is unique constraints and challenges faced by every country. These paper aims to highlight a widespread Standard policy model adopted by majority of the countries. However the reform processes undertaken by various countries across Asia, Europe, America has not always been satisfactory. The paper studies such scenarios through case studies of countries spread all across the world. It also highlights financial burden of implementing such electricity reforms and the mismanagement of resources leading to vulnerability to volatile international financial conditions. It also provides concrete suggestion through which reforms can be implemented.

d. Impact of Rising Oil prices on the macroeconomy(Yanagisawa, 2012)

The impact of rising oil prices on the macro economies of various countries differs depending on individual economies tagged along with their energy supply and demand structure. Those countries that are mostly affected are characterised as having the following

- High Net Imports of Oil per GDP
- Large Marginal propensities to consume and invest and small propensity to import
- A low level of exporting to Oil Exporting nations.

e. The US Oil Supply Revolution and the Global Economy

(Mohaddes & Raissi, January 2016)

The United States Oil Supply revolution has greatly impacted the oil prices in a very short time period resulting in

drastic drop in oil prices. This has lead to strong economic reaction all around the world to adjust to the new circumstances. This paper aims to use a Global VAR model for 38 countries to understand the responses of each country to a US supply driven Oil price shock. It has been found that the global economy grew at a faster rate due to the price fall. This is mainly because of increased expenditure by oil importing countries higher than the actual reduction in oil prices. The GDP of several oil importing countries grew at faster rate. The Commodity exporting countries have faced a slowdown and also overall inflation has also come down. The USA propelled energy production by engaging intensive oil extractions and using a diverse and potent non-conventional energy resources.

3. Research Design

a. Statement of problem

- Ever growing gap between energy production using inhouse resources and energy consumed.
- The dependency of India on oil producing nations in order to bridge the incapacity of conventional sources of energy has an impending and negative effect on the economy of the country in the form of a widening trade deficit.

b. Sources of data

For the purpose of this research secondary data has been taken for this research article. The secondary data gathered relates to imports of crude oil, fiscal deficit of India and installation capacity of renewable energy resources. Historical data has been collected from the following websites;

- https://data.gov.in
- https://mnre.gov.in

c. Objectives of Study

- To analyze the impact of renewable energy sources on the fiscal deficit of India
- To determine the impact of increased production of renewable energy on India's fiscal deficit

d. Limitations of study

- Foreign exchange currency fluctuations are ignored in arriving at fiscal deficit.
- The impact of discovery of inhouse energy sources (Conventional Sources) which will have an impact on imports are ignored.
- The research is restricted to analyzing the impact of non-conventional energy resources.
- Cost of Development of Renewable resources are ignored.
- The research studies the trend of fiscal deficit crude oil imports limited to the end of 2017; restricted to 10 years.

e. Hypothesis

- H0= There is no significant relationship between fiscal deficit and installed capacity of renewable energy sources.
-
- H1 = There is significant relationship between fiscal deficit and installed capacity of renewable energy sources.

4. Method of Analysis

In this chapter we run analytical tests in order to determine the relationship and impact of installed capacity of renewable energy resources and fiscal deficit of India, using an inverse curve estimation.

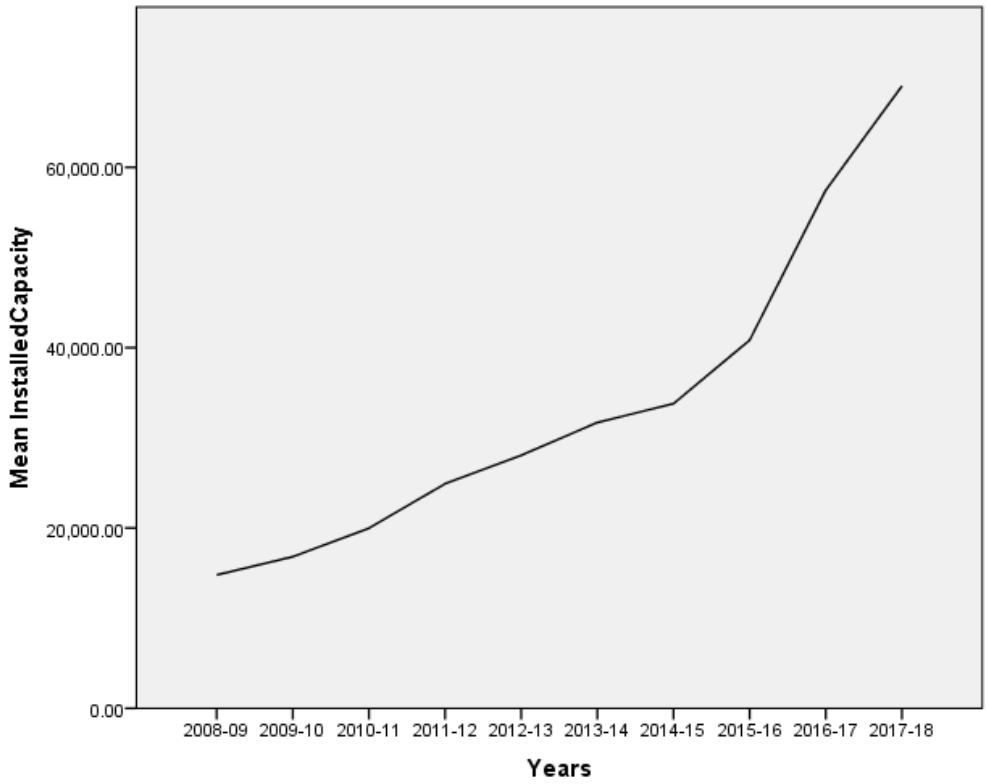
a. ANALYSIS 1.0

Descriptive statistics of the main components of the energy; (i) Fiscal Deficit (ii) Crude Oil Imports (iii)Installed Capacity of Renewable energy Sources

Descriptive Statistics

	N	Minimum	Maximum	Mean	Std. Deviation
Crudeimports	10	404701.00	926987.00	620777.7000	184997.77287
FiscalDeficit	10	336992.00	591456.00	482901.4000	81120.43231
InstalledCapacity	10	14792.00	69022.00	33738.5000	17661.97045
Valid N (listwise)	10				

The above table implicates an average spending of 620,777 Crores on crude oil imports creating a massive blow to the fiscal deficit.



This graph depicts the rate at which India's has been building infrastructure to cater the energy needs of India. The installed capacity has been increasing at a constant rate initially and further reforms led to an increase at increasing rates.

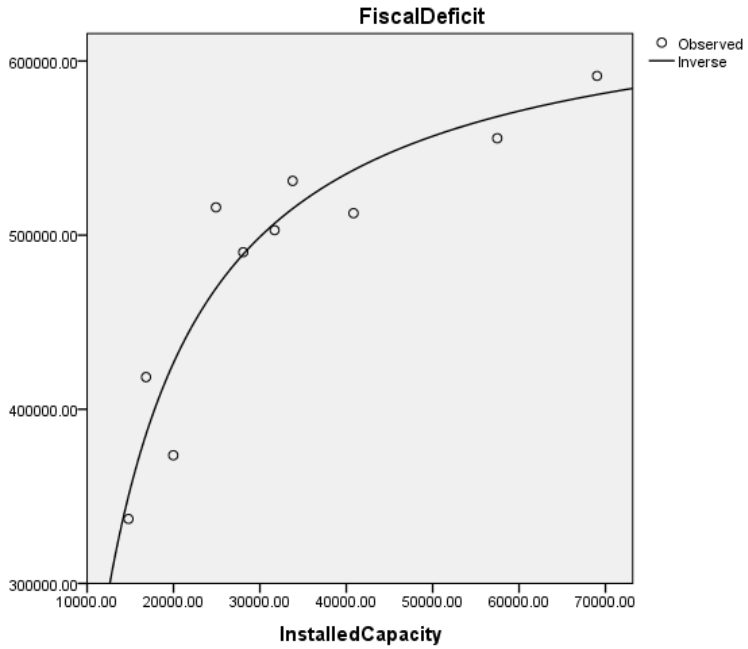
b. ANALYSIS 2.0

Model Summary and Parameter Estimates

Dependent Variable: FiscalDeficit

Equation	Model Summary					Parameter Estimates	
	R Square	F	df1	df2	Sig.	Constant	b1
Inverse	.876	56.349	1	8	.000	643593.285	-4338161947.319

The independent variable is InstalledCapacity.



We have arrived at an inverse regression equation; Y=643,593.285+(-4338161947.319/X). And the possibility of the null hypothesis occurring is less than 0.05, hence making the relationship a significant one.

c. ANALYSIS 3.0

The following analysis tests the regression between Installed capacity and Fiscal Deficit.

Variables Entered/Removed[a]

Model	Variables Entered	Variables Removed	Method
1	InstalledCapacity[b]	.	Enter

a. Dependent Variable: FiscalDeficit
b. All requested variables entered.

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.834[a]	.696	.658	47462.68195

a. Predictors: (Constant), InstalledCapacity

ANOVA[a]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	41203071420.543	1	41203071420.543	18.290	.003[b]
	Residual	18021649425.857	8	2252706178.232		
	Total	59224720846.400	9			

a. Dependent Variable: FiscalDeficit
b. Predictors: (Constant), InstalledCapacity

- From the above analysis it can be determined that a variation in fiscal deficit, ie the dependent variable, can be explained to an extent of 69.6% to the variations in Installed capacity.

5. Findings and Suggestions.

After the analysis of the above tests, we can infer the following:

- There is an increase at an increasing rate for installed capacities of Non Conventional energy sources in India.
- The inverse curve estimation equation has a significant value less 0.05 implying that the null hypothesis is rejected and hence there exists a significant relationship between Fiscal Deficit and Installed capacities.
- The regression analysis also possesses a significant value less than 0.05, implying that variations in Fiscal deficit can be accounted and explained up to 69.6% to a variation in Installed capacities.
- SUGGESSTIONS:
- India has become a front runner for electric vehicles and aims at making a major shift to Electric vehicles by 2030. (Industry, 2018)
- India's automobile industry is ranked the 5th largest in the world, and is aiming to be the third largest in the world by 2030.(Norway), the main objectives behind these government incentivised schemes and plans is to propel the nations domestic production levels, and also to reduce the dependency of vehicles that run through conventional resources.
- Harnessing the renewables into electric mobility plans is one of the main objectives of the National Energy Storage Mission. The dependency and demand on conventional fossil fuels can be reduced to large extent.(India, 2018)

References

1. Bhattacharya, S., & Jana, C. (2008). Renewable energy in India: Historical developments and prospects. *International Energy Initiative*.
2. India, P. I. (2018, August). *Press Information Bureau India.* Retrieved from pib.nic.in/newsite/PrintRelease.aspx?relid=181698
3. Industry, D. o. (2018). *National Electric Mobility Mission Plan 2020.* Government of India.
4. *Ministry of Non-Conventional and Renewable Energy*. (2018). Retrieved from https://mnre.gov.in/scheme-documents
5. Mohaddes, K., & Raissi, M. (January 2016). The US Oil Supply Revolution and the Global Economy. *International Energy Initiative*.
6. Norway, I. (n.d.). *India Electric Vehicle Story: Emerging Oppurtunities.* Innovation Norway.
7. Soundarapandiyan, K., & Ganesh, M. (n.d.).
8. Thorarinsdottir, R. (2006). *Energy in Iceland. Historical Perspective, Present Status, Future Outlook.* National Energy Authority and Ministries of Industry and Commerce.
9. Williams, J., & Ghanadan, R. (2006). Electricity reform in developing and transition countries: A reappraisal. *ENERGY*.
10. Williams, J., & Ghanadan, R. (2006). Electricity reforms in developing and transition countries: A reappraisal.
11. Yanagisawa, A. (2012). Impact of Rising Oil prices on the Macroeconomy. *Energy Demand and Supply Forecast Group*.

