ECO-261 Project Synopsis
Impact of odd-even transportation policy on Pollution in Delhi

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I. Introduction:

To plot the pollutant data over time and to note down whether peak level of pollution comes down when odd even is implemented and to fit a model ranging from rdd and spatial analysis using other factors which affect pollution level in Delhi(Electricity in Delhi, Price of Petrol, price of Diesel, ban on Diwali crackers, buildup of western and eastern peripheral Highway, dummy for odd-even scheme, width of the road, congestion).

II. Literature review:

1) Mathur et al. studied the impact of the odd-even transportation policy, among other controlled factors on Delhi's pollution levels using panel data. They used spatial regression and parametric rdd. Finally they suggested some policy measures which should be undertaken for reducing pollution levels in Delhi.
2)Keshav Singhania , G. P. Girish,Emodi Nnaemeka Vincent investigated the impact of Odd-Even rationing of vehicles plying on the roads of Delhi, India on air pollution levels by considering both residential and industrial areas of Punajbi Bagh, R.K. Puram, Anand Vihar, Mandir Marg, NSIT Dwarka and Shadipur of the city and have analyzed its impact by employing event study techniques and by utilizing daily data of NO_2 , SO_2 , O_3 ,PM-10 and PM-2.

III. Data :

Daily data from the website of office of CPCB of pollutants like CO_2, CO, SO_2, NO_2, NO, AQI, O_3 of pm-10 and pm-2.5 size

IV. Methodology:

Model Fitting:

1) Spatial Method(SAR Model):

$Y = \rho$ WY + X β + u

ρ = scalar spatial autoregressive parameter (measuring the degree of dependence)

W = spatial weight matrix of dimension (n×n)

WY = (Nx1) dimensional vector of spatially lagged dependent variable

β = coefficient for independent variable i.e. Wind speed, Rainfall

u = (n x1) dimensional vector of error terms

2) RDD Design:

The following equation is used to describe the relation of each pollutant with the policy parameter:

$Yit = \Theta + \rho\, Dt + \varepsilon_{it}$

Final equation without any polynomial terms will be:

$Yit = \alpha + \rho\, Oddevenrule + \beta 1 rainfall + \beta 2 windspeed + \beta 3 avgtemp + \beta 4 r\hbar + \beta 5 \hbar ig\hbar way + \beta 6 crackerban + \beta 7 petrol + \beta 8 diessel + \beta 9 agriresidual + \beta 10 electriccar + \beta 11 privateve\hbar icles + \beta 12 Publicve\hbar icles + \varepsilon_{it}$

References:

1) Mathur et al. (2019), “The impact of odd even transportation policy and other factors on pollution in Delhi: A spatial and RDD analysis,” ARTNeT Working Paper Series, No. 182, March 2019, Bangkok, ESCAP.

2)Singhania, K., Girish, G.P. and Vincent, E.N. (2016) Impact of Odd-Even Rationing of Vehicular Movement in Delhi on Air Pollution Levels. Low Carbon Economy, 7, 151-160.

3)Effect of ODD EVEN SCHEME to combat air pollution in NCT OF DELHI. Aparna Katiyar , S. K. Singh and A. K. Haritash