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2022-2023

Name of the Department/Society: Finance and Economics Research Cell

Name of the Event: Research Lecture Series

Date of the Event: 2nd May, 2023

Description of the event-

The Finance and Economics Research Cell at Hansraj College organized the sixth installment of their esteemed 'Research Lecture Series,' featuring Mr. Prantik Bagchi, an accomplished Assistant Professor at the Madras School of Economics.

The session revolved around the thought-provoking topic, "Emission, PAT, and Net-Zero: An Analysis of Indian Manufacturing Sector." In this engaging lecture, Mr. Bagchi delved into the intricate dynamics of emissions, the Perform, Achieve, and Trade (PAT) scheme, and the concept of achieving a Net-Zero emission status within the context of India's manufacturing sector.

Students who attended this session had the opportunity to gain profound insights into the critical areas of Energy and Environmental Economics, as well as the practical application of research software tools. They learned about the complexities of emissions management, policy frameworks, and strategies aimed at achieving sustainability goals in the manufacturing sector. Additionally, Mr. Bagchi's expertise shed light on the broader economic implications and environmental responsibilities faced by industries today.

Overall, this session not only expanded the horizons of knowledge for the attendees but also underscored the significance of research and data-driven decision-making in addressing pressing issues like emissions and sustainability in the Indian manufacturing sector.



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GLIMPSES:

Performance, Achievement, and Trade (PAT)

- National Action Plan on Climate Change (NAPCC) – National Mission for Enhanced Energy Efficiency (NMEEE)
 - Perform Achieve and Trade Scheme (PAT)
- Industries
 - Aluminium
 - Cement
 - Chlor- Alkali, Fertilizer
 - Iron & Steel
 - Paper & Pulp
 - Thermal Power Plant
 - Textile
 - Petrochemicals

Average Treatment Effect

PAT vs Non-PAT

Covariates	Coefficients
ATT	-0.37
$\Delta \ln(\text{Sales})$	0.17
$\Delta \ln(\text{Sales})^2$	-0.03
$\Delta \ln(\text{R\&D})$	-0.14
$\Delta \ln(\text{Profit})$	0.04
$\Delta \ln(\text{ENV})$	0.02
$\Delta \ln(\text{Tax})$	-0.15
Constant	0.04

Note: $\Delta \ln(\text{emission})_t$ is the dependent variable

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Estimation Strategy

- The counterfactuals are estimated in three steps
 - 1. $(\hat{\beta}, \hat{P}, \hat{\lambda}_{Co}) = \underset{\beta, P, \lambda_{Co}}{\operatorname{argmin}} \sum_{i \in Co} (Y_i - X_i \beta - \hat{P} \lambda_i)' (Y_i - X_i \beta - \hat{P} \lambda_i); \text{ s. t. } \hat{P}' \hat{P} = I_r; \hat{\lambda}_{Co}' \hat{\lambda}_{Co} = \text{diagonal}$
 - 2. $\hat{\lambda}_i = \underset{\lambda_i}{\operatorname{argmin}} (Y_i^0 - X_i^0 \hat{\beta} - \hat{P}^0 \lambda_i)' (Y_i^0 - X_i^0 \hat{\beta} - \hat{P}^0 \lambda_i) = (\hat{F}^0 \hat{F}^0)^{-1} \hat{F}^0 (Y_i^0 - X_i^0 \hat{\beta})$
 - $\hat{\beta}$ and \hat{F}^0 are estimated from the first step and "0" represents the pre-treatment period. In the following step, we estimate $\hat{\beta}, \hat{P}, \hat{\lambda}$:
 - 3. $\hat{Y}_{it}(0) = x_{it}' \hat{\beta} + \hat{\lambda}_i' \hat{P}$
- Using this value, we estimate the ATT:
 - $ATT_{t > T_0} = \frac{1}{N_{T_0}} \sum_{i \in 1} [Y_{it}(1) - \hat{Y}_{it}(0)]$ (5.6)

5/2/2023

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21 others

Prantik Bagchi, Punya Malhotra, Sanjana Rastogi, Ashutosh Ku..., Ashutosh Singh, Tanya Agarwal, You

LIST OF PARTICIPANTS:

Karan Chhabra	Shantanu Salil
Piyush Kohli	Tanushree Jha
PARAS DHIMAN	RAGHAV MADAAAN
Samaksh Garg	Dhaarna Gupta
Tushit Kapur	Rupam
Sarthak Rohilla	SWARAJ SWAIN
ANSHU PRIYA	Vishal Gandhi
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muskan jain	sahil singh
isha agarwal	vivek gangwar
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