



**SRI VENKATESWARA COLLEGE  
(UNIVERSITY OF DELHI)**

**FDP EVENT REPORT**

<b>NAME OF THE ACTIVITY:</b>			
<b>DATE:</b> 11/10/2021-16/10/2021	<b>FACULTY</b> <i>Social Science</i>	<b>DEPARTMENT/COMMITTEE</b> <i>Economics</i>	<b>COORDINATOR NAME</b> <i>D. Brahma Reddy &amp; Amit Kumar Jha</i>
<b>TIME</b> 12 p.m. – 7:30 p.m.	<b>VENUE</b> <i>Online</i>	<b>NUMBER OF PARTICIPANTS</b> 63	<b>NATURE:</b> <i>Indoor</i>
<b>SUPPORT</b>	Collaboration with Hansraj College, University of Delhi		

BRIEF INFORMATION ABOUT THE ACTIVITY (CRITERION NO. - 6.3.3 ):

TOPIC/SUBJECT OF THE ACTIVITY	<b><u>One Week Interdisciplinary Online Faculty Development Programme on</u></b>  <b><u>'PANEL DATA ANALYSIS USING STATA'</u></b>
OBJECTIVES	<i>Panel data and its analysis is one of the most important tools in research and are significant for researchers/professionals in academia to produce quality research papers. The objectives of the FDP is to train and put into practice panel data analysis using suitable methodological tools for hands-on usage and application in teaching, learning and research. It further aspires to make participants acquainted with hands-on application of the Stata software. Basic Econometric knowledge is a must for participating in the FDP.</i>
METHODOLOGY	Lectures, Discussion, Case Study , Q & A
INVITED SPEAKERS WITH AFFILIATION DETAILS	<b>1. Dr. Smruti Ranjan Behera</b> Associate Professor, IIT Ropar
	<b>Dr. Ruchi Sharma</b> Associate Professor. School of Humanities and Social Sciences · Indian Institute of Technology, Indore
	<b>Dr. Deb Kusum Das,</b>

	Professor, Ramjas College, University of Delhi
	<b>Mr. Pilu Das,</b> Assistant Professor, Kidderpore College, Kolkata
	<b>Dr. Suresh Chand Aggarwal,</b> Professor, Department of Business Economics, University of Delhi
	<b>Dr. Abdul Azeez Erumban,</b> Assistant Professor, University of Groningen, Netherland
Outcomes	<i>The participants learnt about the panel data and its applicability. All the sessions were hands on session; therefore, they also learnt to use STATA. The participants' also learnt about KLEMS data in panel framework.</i>

**PROOFS & DOCUMENTS ATTACHED (Tick mark the proofs attached):**

1. Notice & Letters	<b>2. list of participation</b> √	<b>3. Activity Report</b> √	<b>4. Photos</b> √	5. Feedback form and analysis √
6. News clip with details	7. Sample copy of the Certificate √	8. Poster/invites √	9. Event report Attested by Event Coordinator & IQAC Coordinator √	10. Video clips √

IQAC Document No: IQAC/SVC/2021-22/Economics/06	Criterion No: III
Departmental file no: IQAC/SVC/2021-22/Economics/SOC/06	IQAC file No: SVC/ 2021-22/Economics

NAME OF TEACHER & SIGNATURE	NAME OF HEAD/ COMMITTEE INCHARGE & SIGNATURE	IQAC COORDINATOR (SEAL & SIGNATURE)
Amit kumar jha	D. Brahma Reddy Amit kumar jha	

**For Reference**

Criterion I	Curricular Aspects (planning & Implementation)	Criterion V	Student Support & Progression
Criterion II	Teaching Learning & Evaluation	Criterion VI	Governance
Criterion III	Research, Innovations & Extension	Criterion VII	Institutional Values & Best Practices
Criterion IV	Learning Resources and Infrastructure		

## 2. List of Participants

Sl.No.	Name	Qualification (Post Doc./Ph.D/PG)	Designation	Name of College / Institution	Affiliated with (University)
1	A. Vijay Kumar	Post-Doctoral Fellow	Asst professor	Ramjas college	Delhi University
2	Aashi Gupta	PG	Research Scholar at Delhi School of Economics	Delhi School of Economics	Delhi School of Economics
3	Abdul Majeed	Ph.D	Assistant Professor	Govt First Grade College Bhatkal	Karnatak University Dharwad
4	Abhinav Parashar	PG	Assistant Professor	Sri Aurobindo College(Evening )	University of Delhi
5	Aishwarya M	PG	Student	Symbiosis college of arts and commerce	savitribai phule pune university
6	Akansha Gupta	PG	PhD scholar	Delhi school of economics	Delhi university
7	Akhum David	PG	Asst. Professor	sri ram college of commerce	delhi university
8	Alok Kumar Singh	Ph.D	Assistant Professor	Sri Venkateswara College	University of Delhi
9	Amulya Kumar Sahoo	PG	ASSISTANT PROFESSOR	SPM COLLEGE	DU
10	Anil Varma R	PG	Assistant professor	anil vr	University of Calicut
11	Ankit Joshi	PG	Assistant Professor	Sri Venkateswara College, Delhi University	Delhi University
12	Apra Sinha	Ph.D	Assistant Professor	Arasd college	University of Delhi
13	Balbhadr a Birua	PG	Assisntent Professor	SATYAWATI COLLEGE (EVE)	DELHI UNIVERSITY
14	Bhawana Pareek	Ph.D	Assistat Professor	Shaheed Bhagat Singh College	Delhi University

15	Chejarla Sanjeev Kumar	PG	Assistant Professor	Government College ( Autonomous) Rajahmundry	Adi Kavi Nannayya University Rajahmundry
16	D Appala Naidu	Ph.D	Assistant Professor	A R S D College	University of Delhi
17	Deepali Gupta	PG	Student	Indira Gandhi Institute of Development Research	Indira Gandhi Institute of Development Research
18	Dhulika Arora	PG	Research Scholar,DMS,IIT Delhi	IIT Delhi	IIT Delhi
19	Diya Devare	PG	Assistant professor	Symbiosis College of Arts and Commerce	Pune University
20	Fayaz Ahmad Bhat	Ph.D	Assistant Professor	Sheikh-ul Alam Memorial Degree College, Budgam	University of Kashmir
21	Gagan Swamy	PG	Assistant Professor	Lakshmibai College	University of Delhi
22	Gajendra Kumar Sahu	Ph.D	Assistant Professor	Banaras Hindu University	Banaras Hindu University
23	Harishwar Dayal	Ph.D	Associate Professor	St. Xavier's College, Ranchi	Ranchi University
24	Hemanth Kumar Molapat a	Ph.D	Assistant Professor	Hindu College	University of Delhi
25	Ishu	PG	Research scholar	Maharshi dayanand university	Maharshi dayanand university
26	Jitesh Rana	PG	Assistant Professor	Sri Venkateswara College	University of Delhi
27	Kalithasammal Nachimuthu	PG	Assistant professor	Sri Venkateswara College	University of Delhi
28	Kiran Kumar Paidipati	Post Doctoral Fellow	Assistant Professor	Lady Shri Ram College for Women	University of Delhi
29	Lalitha P S	Ph.D	RESEARCH SCHOLAR	SRI VENKATESWARA UNIVERSITY-TIRUPATI	SRI VENKATESWARA UNIVERSITY-TIRUPATI

30	M. Rabert	Ph.D	Assistant Professor	The Madura College (Autonomous), Madurai-11	Madurai Kamaraj University, Madurai
31	M. Venkateswaran	Ph.D	Assistant Professor	THE MADURA COLLEGE (AUTONOMOUS), MADURAI	MADURAI KAMARAJ UNIVERSITY, MADURAI
32	M.Sindhu	Ph.D	Assistant Professor	Sree Keralavarma College, Thrissur, Kerala	Calicut University
33	Madhuri Singh	PG	Assistant Professor	Kalindi College	University of Delhi
34	Mauli Shivram Kathule	PG	Masters Of Science	Gokhale Institute Of Politics and Economics Pune	Gokhale Institute Of Politics and Economics, Deemed University Pune
35	Meenakshi Sharma	PG	Assistant Professor	Sri Venkateswara College	University of Delhi
36	Mohit Saini	PG	Ph.D. Scholar	Department of Commerce	Maharshi Dayanand University
37	Namita	PG	Ph.D Scholar	HEMVATI NANDAN BAHUGUNA GARHWAL UNIVERSITY	HEMVATI NANDAN BAHUGUNA GARHWAL UNIVERSITY
38	Naveen Kumar	Ph.D	Research scholar	Delhi school of economics	University of Delhi
39	Neha Verma	PG	Assistant Professor	Kirori Mal College	University of Delhi
40	Piyush Swain	PG	Research Scholar	Jawaharlal Nehru University, New Delhi	Jawaharlal Nehru University, New Delhi
41	Prafulla Kumar Nath	PG	FPM(RM)	Institute of Rural Management Anand	AICTE
42	Prof. C.R. Bishnoi	PG	Head	IIS (Deemed to be University), Jaipur	IIS (Deemed to be University), Jaipur

43	Pummy	PG	Assistant Professor	Kalindi College	University of Delhi
44	Ramachandra Rao K	Ph.D	Assistant Professor	School of Economics	University of Hyderabad
45	Ranjeet Kumar Rana	PG	Assistant Professor	Shiv Prasad Sanskrit Degree College, Rampur, Buxar	Kameshwar Singh Darbhanga Sanskrit University, Darbhanga, Bihar
46	Reema Jain	PG	Research scholar	Jamia millia Islamia	Jamia Millia Islamia
47	Renu Bansal	Ph.D	Associate Professor	Shri Ram College of Commerce	Delhi University
48	Richika	PG	Research Scholar	CUH	CUH
49	Rohin Gaddam	PG	Research Scholar	School of Economics	University of Hyderabad
50	Saachi Bhutani Bhagat	PG	Assistant Professor	Daulat Ram College, University of Delhi	University of Delhi
51	Shalaka Sarwate	PG	Research Scholar	Gokhale Institute of Politics & Economics	GIPE
52	Shalini Saksena	Ph.D	Professor	Delhi College of Arts & Commerce	University of Delhi
53	Shilpa Ahuja	PG	Research Scholar	IIT	IIT
54	Siddhant Chandra Bhupesh	PG	Assistant Professor	Kirori Mal College	University of Delhi
55	Smita Dayal	PG	Faculty Associate	Lal Bahadur Shastri Institute of Management	Aicte
56	Sneha Bhardwaj	PG	Assistant Professor	Sri Venkateswara College	Delhi University
57	Sonia Mudel	PG	Assistant Professor	Ramanujan College	University of Delhi
58	Sonu Kumar	PG	Assistant professor	Ramanujan College	Delhi University

59	Surabhi Sharma	PG	Teaching Assistant	Gokhale Institute of Politics & Economics, Pune	Deemed University
60	Swapan Chakraborty	Ph.D	Assistant Professor	St.Xavier's University, Kolkata	St.Xavier's University, Kolkata
61	Tanu Vaidya	PG	Research Scholar	IIS deemed to be University	IIS deemed to be University
62	Vinay Kumar Yadav	Ph.D	Assistant professor	Ram Lal Anand college	Delhi university
63	Yogita Yadav	PG	Assistant Professor	Sri Venkateswara College	University of Delhi

### **3. Activity Report**

**One Week Interdisciplinary Online Faculty Development Programme on  
PANEL DATA ANALYSIS USING STATA**

**Organised by**

**Department of Economics, Sri Venkateswara College, University of Delhi**

**In collaboration with**

**(MHRFDC) Hansraj College during 11<sup>th</sup> – 16<sup>th</sup> October 2021**

#### **REPORT**

The FDP was started by Mr. Amit kumar jha (FDP Coordinator) discussing its importance and terming it as having ‘pan India presence’. This was followed by words of inspiration from the Principal of Sri Venkateswara College, Prof C. Sheela Reddy. She welcomed the efforts of Mr Jha and Teacher in Charge (TIC) Mr. D. Brahma Reddy and pondered over the physical form of the FDP rather than the online version. This was followed by speech from the TIC where he discussed the importance of having the collaboration with the Hansraj College, University of Delhi and importance of learning. Then Mr jha gave a brief introduction of the resources person **Dr. Smruti Ranjan Behera** and subsequently, open the floor for the event.

***On the first day***, Dr. Behera began with a brief overview of panel data, their benefits and the types. Unobserved data and their fixed and random effects were looked into. Estimation of the beta coefficient and asymptotics as well as their assumptions in regression were covered. Pooled regression, OLS with first differences, leapfrog estimator, GLM, FEM, LSDV (least square dummy variable), Instrumental variable method and within group estimation model were looked into in detail. The sessions were hands-on session. It started with an explanation of how to plot graphs using STATA. The normal plot, density plots, etc. were explained. Further, Dr. Behera discussed how to do the fixed effects model under the least square dummy variable model (LSDVM) and how to interpret the dummy variables was also discussed. Thereafter, he discussed how to use STATA to undertake a random-effects model. The role of unobserved heterogeneous factors is obtained with the random-effects model. When the individual effect is a random variable and uncorrelated with regressors, it is a Random Effects Model. The Generalised Least Square method of regression is followed for the same. Pooled

OLS works well for a random effect model. When the individual effect is correlated with regressors, it is Fixed Effects Model. Pooled OLS and between estimators are inconsistent for fixed effects. Within estimator of fixed effects model is consistent.

Dr. Behera also discussed about first difference estimator of FE model. The Hausman test is used mostly to choose between the random effects and fixed effects models. It was further discussed how to run the test to check heteroskedasticity and autocorrelation as well as interpreting the results. Further, there was a discussion on how to see if time-fixed effects have a role or not. The resource person also examined the applicability of random effect model by undertaking the Brush pagan LM test. There are possibilities to have cross-sectional dependence in panel data. There was also discussion on the methods to detect the same through the cross-sectional dependence test. Pesaran's CD test is used for this purpose.

Dr. Behera started the second day with a discussion on Instrumental variables and their estimation and Dynamic panel models- System GMM, Difference GMM. The Speaker in the 2nd session of the second day discussed unit root testing on panel data and suggested that there are 1<sup>st</sup> generation as well as 2<sup>nd</sup> generation testing tools available in Stata. Dr. Behera explained that Stata implements a variety of tests for unit roots or stationarity in panel datasets with **xtunitroot**. The Levin-Lin-Chu (2002), Harris-Tzavalis (1999), Breitung (2000; Breitung and Das 2005), Im-Pesaran-Shin (2003), and Fisher-type (Choi 2001) tests have as the null hypothesis that all the panels contain a unit root. The Hadri (2000) Lagrange multiplier (LM) test has as the null hypothesis that all the panels are (trend) stationary. There is the option that allows you to include fixed effects and time trends in the model of the data-generating process.

Dr. Behera also dealt with non-parametric tests using quantile regression and its types, on the third day of this FDP. Also, exemplifies the output diagrams of Hang root residuals for QR (less liberal ( $RF \leq 0.5$ ) specified, moderate liberal ( $0.5 \geq RF \leq 0.75$ ), high liberal ( $\geq 0.75$ ) and symmetrical distributions of liberal using model. Then, the speaker elucidated about MM-QR Method of Moment Quantile Regression and IV-QR Instrumental Variables Quartile Regression with an example of data set and illustrated using scatter plots. The resource person further explained why MMQR approach/method is much more efficient than IVQR. He also touched his research works on “**Urbanization, Immigration and Crime-Evidence from OECD Economics**” that was related to Homicide deaths, unlawful border disputes and giving temporary shelter to illegal entries. Another work was on “**Religious Freedom and Trade**

**Openness**” which considered religious beliefs as having any significant role in overall economic development.

*On the fourth day*, **Dr Ruchi Sharma** covered the concept of count data and problems in count data as compared to continuous data. Dr. Sharma explained that count data are discrete and non negative integers. The standard problem in the count data models are unobserved heterogeneity, problem of excess zeros and truncation. She explained concepts related to count data models theoretically. She covered non-linear model, Poisson distribution and Negative Binomial distribution and explained in details use of pooled regression and use of fixed effects and random effects models using panel count data.

Dr. Sharma made a point that in case of count data models, negative binomial distribution works better than Poisson distribution as the former can take care of over-dispersion and smaller mean. The method of estimation for the count data models is maximum likelihood estimation. Afterwards, she explained the application of count data models in cross-section data with the help of STATA software using data given by A. Colin Cameron and Pravin K. Trivedi.

The 2<sup>nd</sup> session on the 4<sup>th</sup> day demonstrated use of count data models with respect to panel data. A presentation of both Poisson and Negative Binomial distributions was undertaken. Maximum Likelihood regressions with both Fixed and Random Effects were taught with both the distribution types. Subsequently, the interpretations of goodness of fit, Standard errors, maximum likelihood and coefficient estimates were explained by the speaker. Dr. Sharma also touched her research project on “**Knowledge Spillovers of Foreign Patenting on Firms: Econometric Analysis using Patent Citation Data**” that tried to understand the impact of patents by Non-Residents on the knowledge spillovers on regional firms using count data panel techniques.

*On the Fifth day*, the session was conducted by **Dr. Deb Kusum Das**. It was based on the KLEMS dataset. KLEMS stands for capital, labor, energy, material, and services used in the production process. It is a panel database for all the variables related to the production process that are needed to analyze growth-related thesis in an economy. The purpose of the KLEMS database is to generate and provide industry-level data on outputs, inputs, and productivity to researchers, policymakers and academicians all over the world. The follow up session was

conducted by **Mr. Pilu Chandra Das**. He extensively talked about the construction of Gross Value Added (GVA) and Gross Value of Output (GVO) in the KLEMS database. For the GVO series, the basic data is collected from WPI, Office of the Economic Advisor, Ministry of the Commerce and Industry. For the service industry, WPI is not available; hence implicit GDP deflators were used. For certain benchmark years, supply use tables by Brookings India are also used. The intermediate goods are classified into three categories – Energy, Materials and Services. They have five energy inputs, sixteen service inputs and other intermediate inputs which are not included in these two heads come under the materials. For the GVA series, Mr. Das explained that for an individual firm and industry, productivity measure can be based on a value added concept where the value added is considered as an industry's output and only primary inputs such as labor and capital are considered as industry inputs.

*On the Sixth day*, **Prof. Suresh Chandra Aggarwal** focused on the methodology adopted to compute figures for labour input, quality and income share for the KLEMS India database. As opposed to the norm in existing databases of using 'number of persons employed' as a measure of labour input, KLEMS measure of labour input combines data on 'number of persons employed' and the extent of 'embodied human capital' (captured in terms of number of years of education). Sources of data used (keeping in mind the existing comparability issues across sources) to construct the series on labour input were discussed. The relatively broader measure of employment, i.e. Usual Principal and Subsidiary Status (UPSS) is used in India KLEMS. Methodological steps such as drawing of concordance between India KLEMS and different NICs, interpolation and extrapolation after data cleaning etc. to compute employment figures for 27-industries were explained.

The second half of the talk focused on the construction of the Labour Quality Index based on Jorgenson et al. (1987) methodology using the Tornqvist translog index, for which 5 education categories are used. Data requirement includes employment and earnings figures - by education categories for each industry. Use of the Mincer wage equation (correcting also for sample selection bias using Heckman's 2-step procedure) to arrive at earnings of self-employed in India was explained.

Further, **DR Abdul Azeez Erumban** talked about the KLEMS Database particularly focusing on Capital where the objective is to construct asset-wise capital stock and aggregate capital services by industries for the India-KLEMS database. He began the lecture by explaining the issues in measurement of aggregate capital for productivity analysis namely co-existence of

multiple vintages and heterogeneity of capital assets. The standard practice of perpetual Inventory Method and its problems were explained in detail. Afterwards, he explained the use of user cost of capital as an appropriate weight to aggregate capital assets, measuring capital service growth rates for growth accounting and the challenges in measuring rental prices or user costs. Thereafter, he moved on to discuss the India KLEMS Approach.

The last section of the presentation focused on attempt to measure capital services for Indian industries. The data requirements, data sources and strategies were discussed in detail.

In the end, Mr. Jha proposed vote of thanks and summed up the entire proceedings of this FDP.

## 4. Photos

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Leave Zoom 30:55 Q&A Unmute Start Video Share Content Participants 61 More

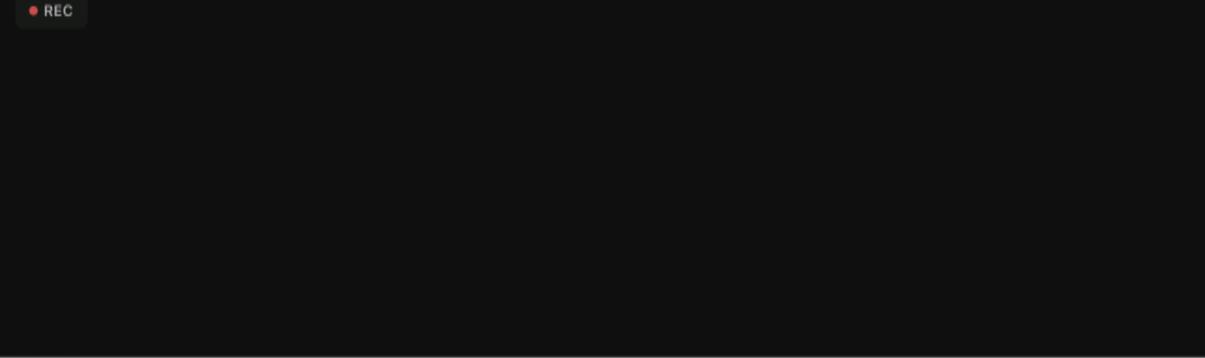
REC

### Panel Data Sets

- Longitudinal data
  - British household panel survey (BHPS)
  - Panel Study of Income Dynamics (PSID)
  - ... many others
- Cross section time series
  - Penn world tables
- Financial data by firm, by year
  - $r_{it} - r_{it} = \beta_i(r_{mt} - r_{it}) + \epsilon_{it}$ ,  $i = 1, \dots, \text{many}$ ;  $t = 1, \dots, \text{many}$
  - Exchange rate data, essentially infinite T, large N

15-3/65 Part 15: Panel Data-1

Dr. Smruti Ranjan Behera



Stata/SE 14.2

File Edit Data Graphics Statistics User Window Help

Review

Filter commands here

```

# Command      _rc
1  tsset industry year
2  xtabond lpd k kl rdi...
3  estat sargan
    
```

Number of instruments = 196

Wald chi2(6) = 90.87  
Prob > chi2 = 0.0000

One-step results

	lpd	Coef.	Std. Err.	z	P> z	[95% Conf. Interval]
lpd	li.	.3921689	.0514729	7.63	0.000	2908918 493446
	k	-.0197811	.0878469	-0.23	0.822	-.1919578 .1523956
	kl	-.0091869	.0234836	-0.39	0.698	-.0866059 .0372322
	rdi	21.09349	11.53709	1.83	0.069	-1.518791 43.70878
	tmi	10.37797	3.687553	2.81	0.005	3.150505 17.60544
	fp	-2.2728	.9957038	-2.38	0.017	-4.145648 -.393846
	_cons	6.679918	1.212718	5.51	0.000	4.303033 9.056802

Instruments for differenced equation  
QSE-type: L(2/1)\_lpd  
Standard: D.k D.kl D.rdi D.tmi D.fp k kl rdi tmi fp fpo rdio

Instruments for level equation  
Standard: \_cons

```

. estat sargan
Sargan test of overidentifying restrictions
H0: overidentifying restrictions are valid

chi2(189) = 245.9514
Prob > chi2 = 0.0033
    
```

Command

Variables

Filter variables here

Name	Label
industry	industry
year	
lpd	Lpd
k	
kl	
rdi	RDI
tmi	TMI
fp	FP
fpo	FPO
rdio	RDIO
tmio	TMIO
mcon	MCON

Properties

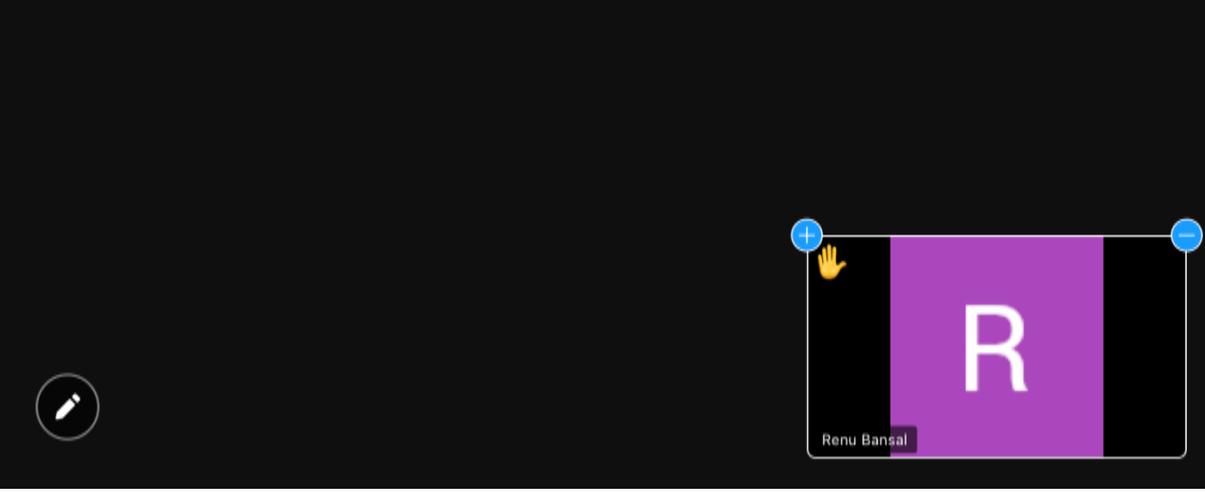
Variables

Name	Label	Type	Format	Value label	Notes

Data

Filename	Label	Notes

Variables: 13  
Observations: 276  
Size: 12.94K





Stata/SE 14.2

File Edit Data Graphics Statistics User Window Help

Review Filter commands here: Command \_rc  
1 tsset industry year

Special Edition

Single-user Stata perpetual license:  
Serial number: 10699959  
Licensed to: Andrey

Notes:  
1. Unicode is supported; see  
2. Maximum number of variables

\*(13 variables, 276 observations p  
tsset industry year  
panel variable: industry (sh  
time variable: year, 1990 to  
delta: 1 unit

Command

ivregress - Single-equation instrumental-variables regression

Model by/f/a Weights GMM SE/Robust Reporting

Dependent variable: lpd  
Independent variables: k kl rdi tmi fp fpo  
Endogenous variables: lpd k  
Instrumental variables: tmi fp fpo rdi tmo mcon

Estimator  
 Two-stage least squares (2SLS)  
 Limited-information maximum likelihood (LIML)  
 Generalized method of moments (GMM)

Treatment of constant  
 Suppress constant term  
 Has user-supplied constant

Variables

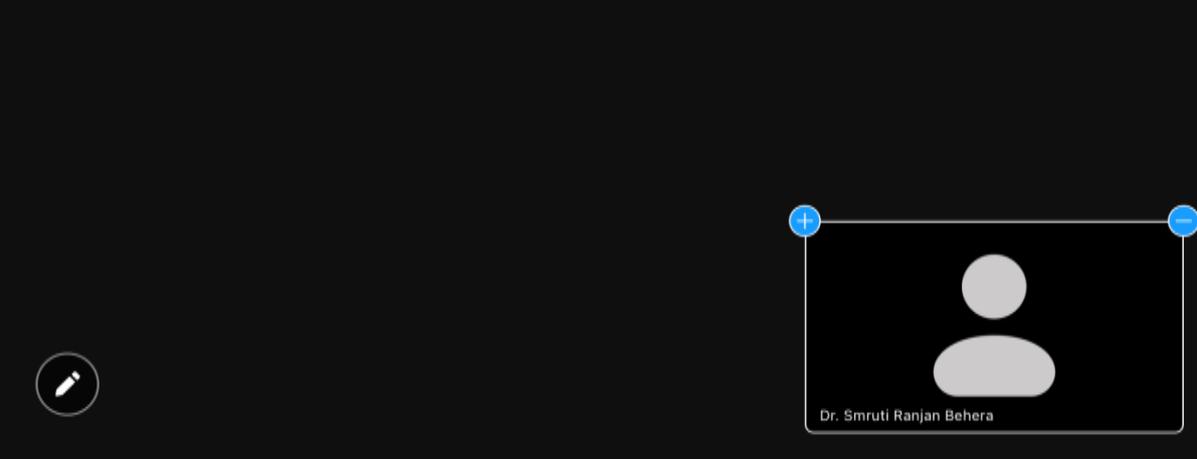
Name	Label
industry	industry
year	
lpd	Lpd
k	
kl	
rdi	RDI
tmi	TMI
fp	FP
fpo	FPO
rdio	RDIO
tmo	TMO
mcon	MCON

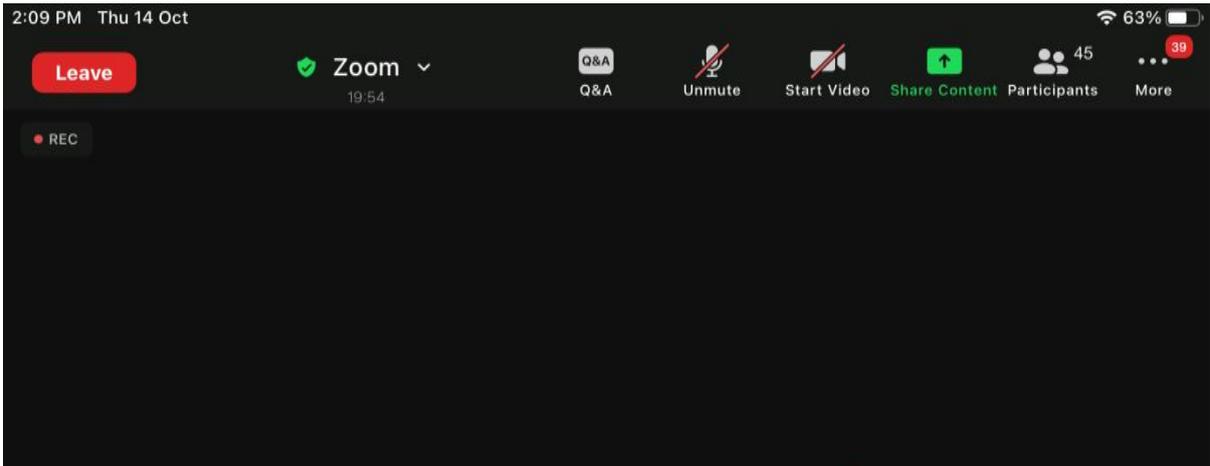
Properties

Name	Label	Type	Format	Value label	Notes
industry	industry				

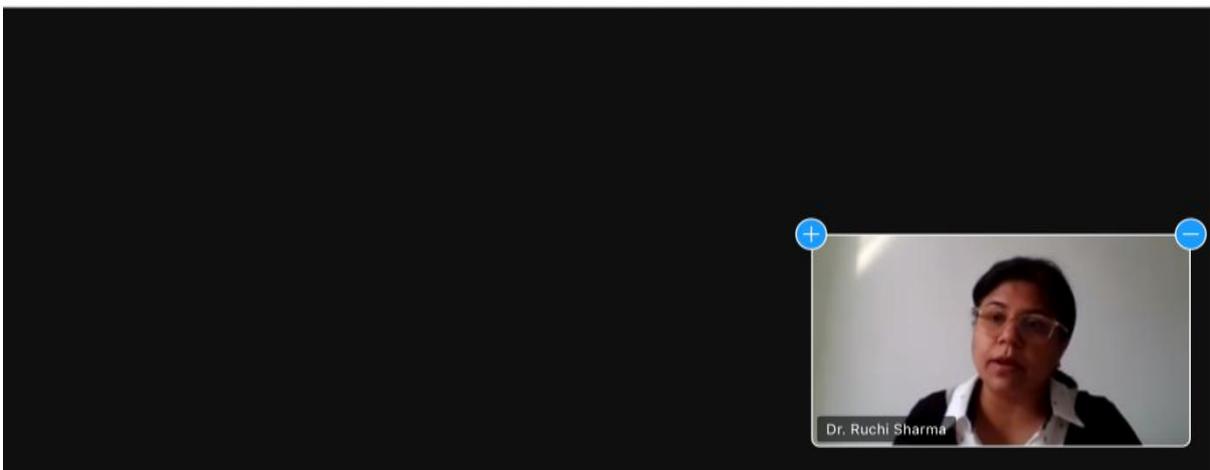
Data

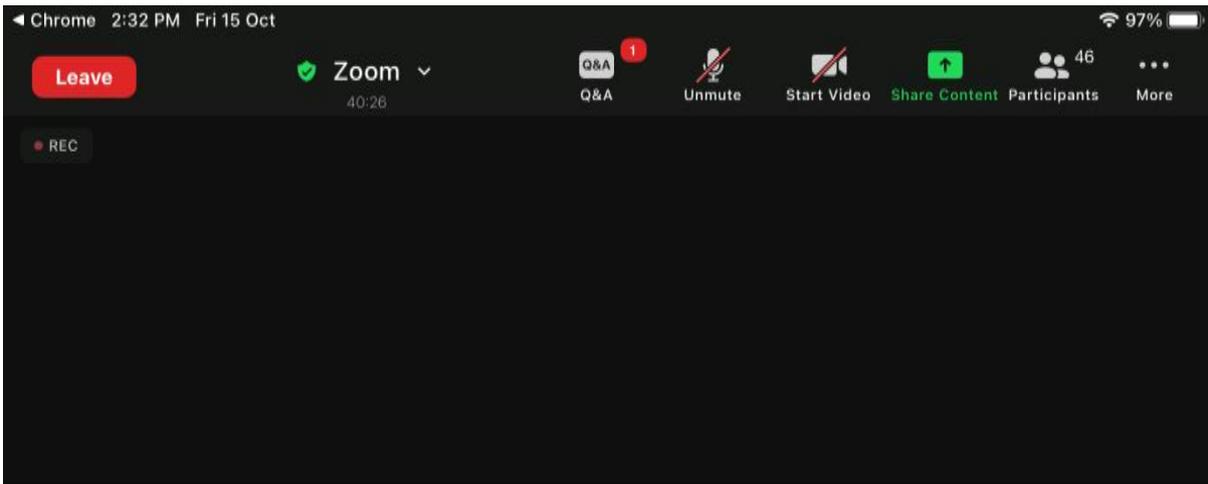
Filename	Label	Notes	Variables	Observations	Size
			13	276	12.67K



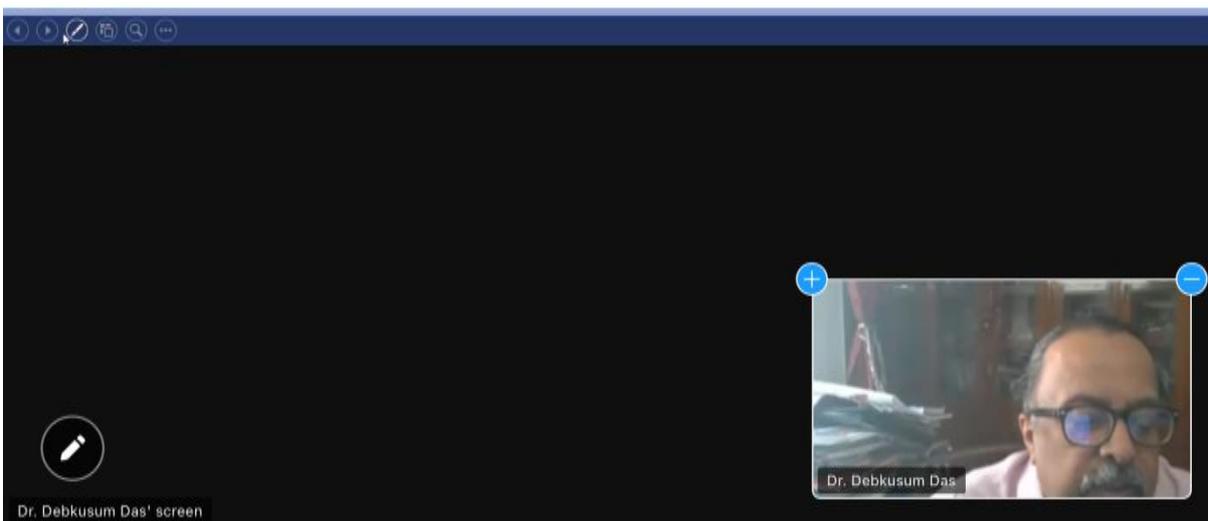
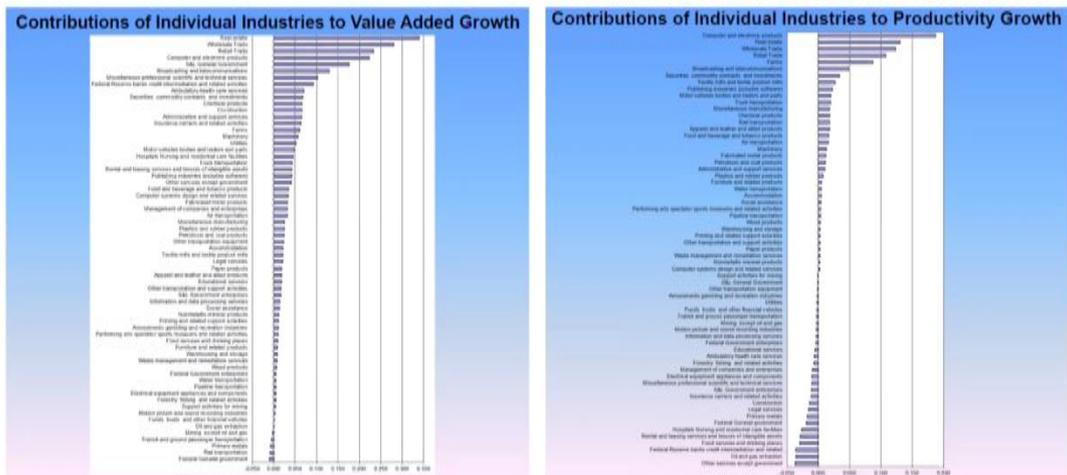


Count Data Model [Poisson / Negative]  
↓ Outcome - non negative integer  
Poient  $\hat{=}$   $(y_i)$   $y_i \in \mathbb{N}_0 = \{0, 1, 2, 3, \dots\}$   
→ regression setting --  
theory. K set variable - independent  $\hat{=}$





3. Share weighted contribution of industries to – VA growth (using average industry VA share in aggregate VA) and TFP growth (using the Domar weighting scheme).



Leave

Zoom  
02:22:35

Q&A

Unmute

Start Video

Share Content

Participants 45

More 72

REC



## Structure of the Presentation

- > **Issues in the Measurement of aggregate capital for productivity analysis**
  - Aggregation across vintages and assets | Issues with past approaches | Comparing the role of capital in production with that of labour
- > **What is the user cost of capital?**
  - The user cost as an appropriate weight to aggregate capital assets | Measuring capital service growth rates for growth accounting | Challenges in measuring rental prices or user costs | The India KLEMS approach
- > **Attempt to measure capital services for Indian industries**
  - Data requirements | Data sources and strategies
    - Data sources | Strategies: use of ASI and NSSO | The final GFCF dataset
  - Constructing capital stock for each asset by industry | Estimating capital services – an example | Challenges after 2016 Remaining challenges



Dr. Abdul Azeez Erumban

## 7. Sample Certificate

	 सत्यमेव जयते Ministry of Education Government of India	S.No. FDP63	
<p align="center"><b>Mahatma Hansraj Faculty Development Centre</b> A Centre of MoE, Govt. of India Under Pandit Madan Mohan Malaviya National Mission on Teachers and Teaching (PMMMNTT)</p>			
<p align="center"><b>Certificate</b></p>			
<p align="center"><i>This is to certify that Prof./Dr./Mr./Ms.</i></p>			
<p align="center"><i><u>Name</u></i></p>			
<p align="center"><i>from</i></p>			
<p align="center"><i><u>College Name</u></i></p>			
<p align="center"><i>has successfully completed</i></p>			
<p align="center"><i>One week (Online) Faculty Development Programme on</i></p>			
<p align="center"><i>“Panel Data Analysis using STATA”</i></p>			
<p align="center"><i>(11<sup>th</sup> October– 16<sup>th</sup> October 2021)</i></p>			
<p align="center"><i>organised by</i></p>			
<p align="center"><i>Department of Economics</i></p>			
<p align="center"><i>Sri Venkateswara College, University of Delhi</i></p>			
<p align="center"><i>in collaboration with</i></p>			
<p align="center"><i>Mahatma Hansraj Faculty Development Centre</i></p>			
<p align="center"><i>Hansraj College, University of Delhi</i></p>			
<p>Prof. C. Sheela Reddy Principal, Sri Venkateswara College</p>	<p>Dr. Jyoti Bholā Coordinator, MHRFDC</p>	<p>Prof. Rama Chairperson, MHRFDC</p>	

## 8. Posters

07:34 85%



**DEPARTMENT OF ECONOMICS**  
**SRI VENKATESWARA COLLEGE**  
(NAAC ACCREDITED 'A' GRADE)  
**University of Delhi**  
Benito Juarez Road, Dhaula Kuan, New Delhi  
<http://www.svc.ac.in/>  
*is organising*

**Oct 11-16, 2021**

**LIVE SESSIONS**  
2:00 p.m.- 5:30 p.m.

**One Week Interdisciplinary Online Faculty Development Programme**  
on  
**PANEL DATA ANALYSIS USING STATA**

in collaboration with

**Mahatma Hansraj Faculty Development Centre**  
(A Centre of MoE, Govt. of India under PMMMNMTT Scheme)

**HANSRAJ COLLEGE**  
(NAAC ACCREDITED 'A' GRADE )  
University of Delhi  
Malka Ganj, New Delhi-110007  
<https://www.hansrajcollege.ac.in>

<https://www.mhrfdc.in>  
[fdp.hrc@gmail.com](mailto:fdp.hrc@gmail.com)

@hrcduofficial

**Register by 6<sup>th</sup> October 2021**

**About PMMMNMTT**

The Pandit Madan Mohan Malaviya National Mission on Teachers and Teaching emphasises the need to change the role and working of a teacher from mere disseminator of information and knowledge to the one who advances frontiers of existing knowledge by actively developing and creating new insights into diverse social and physical phenomena.

**About Hansraj College**





1961 - 2021

Trimula Hirupati Devasthanams

**Sri Venkateswara College**

(University of Delhi)

## **CERTIFICATE**

This is to certify that One Week Interdisciplinary Online Faculty Development Programme on 'Panel Data Analysis Using Stata' was successfully conducted on 11 October 2021- 16 October 2021 from 12:30- 7:30 pm by Department of Economics in the Online mode and its event report has been submitted to IQAC for records.

*C. Suresh Reddy*  
Principal

PRINCIPAL  
Sri Venkateswara College  
Dhaura Kuan, New Delhi-110021

*Vaibhava Pathak*

**IQAC Coordinator**  
Coordinator, IQAC  
Sri Venkateswara College  
(University of Delhi)  
Dhaura Kuan, New Delhi-110021