9th Seminar Series Retreat

MADRAS SCHOOL OF ECONOMICS

(Institution of Special Importance in Economics & Management as recognized by Govt. of Tamil Nadu)

GANDHI MANDAPAM ROAD, CHENNAI – 600 025

9th Seminar Series Retreat

Book of Abstracts

28 – 29 April 2022

MSE Auditorium, Ground Floor, New Academic Block

MADRAS SCHOOL OF ECONOMICS

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Program Schedule

*Presenters are marked in **bold l**etters. Each paper is scheduled for a maximum of 30 minutes out of which 20 minutes are for presentation followed by 10 minutes of discussion.*

Day 1: 28.04.2022 (Thursday)

Registration and taking seats – 9.00 am – 9.15 am

Welcome address

***Dr. K R Shanmugam**, Director MSE*

Inaugural address

***Hon'ble Dr. C. Rangarajan,** Chairman MSE, Former Governor – RBI, and Former Chairman of PMEAC*

Technical Session 1.1: Health, Gender, and Demographic Economics (10.45 am - 12.15 pm)

Paper 1: Money and more: health advice complements cash to improve child outcomes in India
Sowmya Dhanaraj, Vidya Mahambare and Vibhu Jain

Paper 2: Do Gender Differences in Research Performance Explain the Leaky Pipeline In Indian Academia? Some Evidence on Agricultural and Applied Economics
Brinda Viswanathan**,** J.V. Meenakshi and Sangeeta Bansal

Tea/Coffee Break: 10.45 am -11.00 am

Paper 3: Effect of Fertility on Paid Work Status of Women in India: Evidence from NFHS-4
Amrita Chatterjee and Gunjan Khandelwal

Paper 4: Determinants of ethnic identity among adolescents in Auckland
Mohana Mondal, Michael P. Cameron and Jacques Poot

Lunch Break: 12.45 pm- 1.30 pm

Technical Session 1.2: Cartels, Choice theory and Firm Financing (1.30 pm- 3.00 pm)

Paper 5: Collusion under Product Differentiation
Neelanjan Sen, Urvashi Tandon and Rajit Biswas

Paper 6: What do patterns in voting with and without a NOTA option reveal?
P Srikant, Raghav Kumar and Sudarsan Padmanabhan

Paper 7: A Text-Based Index for Financial Constraint of Listed Indian Manufacturing Firms
Amal Jose and Saumitra Bhaduri

Tea/Coffee Break: 3.00 pm -3.15 pm

Technical Session 1.3: Federalism (3.15 pm- 6.00 pm)

Paper 8: Equalization Transfers Based on Normatively Determined Revenues and Expenditures of State Governments in India
K. R. Shanmugam and K. Shanmugam

Paper 9: Determinants of Non-Performing Assets of Commercial Banks in India
K. Ravirajan and K.R Shanmugam

Tea/Coffee Break: 4.15 pm - 4.30 pm

Paper 10: Impact of Fiscal Transfers Policy on Regional Growth Convergence in India
K. Shanmugam and K. R. Shanmugam

Paper 11: Monetary and Fiscal Policy Interactions in India
Mathew Koshy Odasseril and K. R. Shanmugam

Paper 12: An Empirical Investigation of Indian Public Debt Scenario
Magulsha George and Dr. K. R Shanmugam

Day 1 concludes

Day 2: 29.04.2022 (Friday)

<u>Registration and taking seats: 9.15 am – 9.30 am</u>

<u>Technical Session 2.1: Energy and Environment (9.30 am-11.00 pm)</u>

Paper 13: Analysis of carbon productivity for firms in the manufacturing sector of India
Prantik Bagchi, Santosh Kumar Sahu, Ajay Kumar, Kim Hua Tan

Paper 14: Medium-term Projections of Vehicle Ownership, Energy Demand and Vehicular Emissions in India
B. Ajay Krishna

Paper 15: Assessing the Socio-economic Resilience of Urban Slum Clearance Households to Heatwaves in SPIN countries
Zareena Begum Irfan

Tea/Coffee Break: 11.00 am -11.15 am

<u>Technical Session 2.2: Pandemic, Climate Change, Environment (11.15 am- 12.45 pm)</u>

Paper 16: COVID Mobility (loss) Indicator and Its Impact on the Indian Economy
Saumitra N. Bhaduri

Paper 17: Determinants of Household Water Efficient Technology Adoption: Understanding Household Behaviour and Environmental Attitude for Demand Side Management Policies
S. Ashwin Ram and Zareena Begum Irfan

Paper 18*:* Investigating the Effect of Renewable Energy Adoption: An Environmental Economic Perspective
Salva K K and Zareena Begum Irfan

Lunch Break: 12.45 pm- 1.30 pm

Technical Session 2.3: Emerging Markets I (1.30 pm-3.00 pm)

Paper 19: Monetary Response to Oil Price Shock in Asian Oil Importing Countries: Evaluation of Inflation Targeting Framework
Devasmita Jena and Ishika Kataruka

Paper 20: Multiple Dimensions of Cyclicality in Investing
Thillaikkoothan Palanichamy and ***Parthajit Kayal***

Paper 21: Analysis of the Impact of Country Specific Macro Risk Variables On Gold Futures Contract and its Position as an Asset Class: Evidence from India
Rupel Nargunam, William W. S. Wei and N. Anuradha

Tea/Coffee Break: 3.00 pm -3.15 pm

Technical Session 2.4: Emerging Markets II (3.15 pm-5.15 pm)

Paper 22: Trade continuity and global production sharing in emerging economies: evidence from panel gravity analysis
Sanjeev Vasudevan and Suresh Babu Manalaya

Paper 23: Elementary Education Outcome Efficiency in Indian States
Jyotsna Rosario and K.R Shanmugam

Paper 24: Public capital, private capital, human capital, household capital and Regional Income in Indian regions: Augmented Spatial Mankiw-Romer-Weil Model
Vivek Jadhav

Paper 25: The Impact of COVID-19 Pandemic on Indian Stock Market: An Empirical Analysis of Sectoral Indices

Srinivasa Rao Gangadharan and Mathew Koshy Odasseril

Vote of Thanks

Hi-Tea: 5.30 pm

Day 2 concludes

Medium-term Projections of Vehicle Ownership, Energy Demand and Vehicular Emissions in India

B. Ajay Krishna[1]

Rapid growth of private vehicle ownership in emerging economies like India has serious implications on its existing transport infrastructure, future energy demands and emission reduction targets. While vehicle ownership in India is considerably low compared to advanced economies, an expected economic growth, along with rising population and inability of public transport to meet the travel demands would lead to increase in future private vehicle stock, subsequent fuel demand and resulting vehicular emissions. This study contributes to the literature by projecting various medium-term future scenarios of vehicle stock, fuel demand and vehicular emission projections based on multiple economic growth rate and electric vehicle (EV) adoption scenarios. A non-linear Gompertz function has been estimated to describe the association between economic growth and vehicle ownership using time series data ranging from 1960 to 2019. Using an incremental addition to the vehicle stock approach, study forecasts an addition of 104-140 million new private vehicles to the existing stock by 2030. Subsequently, fuel demand is predicted to peak around 60 million metric tons per annum and CO2e emission from private vehicle use to peak at 208 million tons per annum. Additionally, CO2 emissions from road infrastructure development is projected. Further, appropriate transport policy measures and investment spheres in terms of road network requirement have been explored which would facilitate reducing private vehicles dependency and regulate vehicular emissions.

Keywords: Vehicle Ownership; Carbon Emissions; Fuel Demand; Gompertz Function; Transport Policy

JEL Classification Codes: Q47, Q54, R48, R49

[1] Madras School of Economics, Chennai

Trade Continuity and Global Production Sharing in Emerging Economies: Evidence from Panel Gravity Analysis

Sanjeev Vasudevan[1] and Suresh Babu Manalaya[2]

This article examines whether trade continuity is a determinant of global production sharing in emerging economies. Following the existing literature, we use the lagged imports of intermediate goods to measure trade continuity. We estimate an augmented gravity model using the Poisson pseudo maximum likelihood method with an unbalanced panel dataset of finely disaggregated bilateral exports of 29 emerging economies for 2004 to 2017. The study has two important findings. First, our results show that trade continuity has a positive effect on global production sharing. Second, we provide new empirical evidence that trade continuity in global production sharing is stage-specific and may vary between parts and components and assembly stages. Our findings have important policy implications on maintaining trade relations and formulating policies focused on the stage-specific nature of global production sharing.

Keywords: Global production sharing, parts and components, trade continuity, gravity model, Poisson pseudo maximum likelihood, emerging economies

JEL Classification Codes: F10, F14

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Collusion under Product Differentiation

Neelanjan Sen[1], Urvashi Tandon[2] and Rajit Biswas[3]

We study the formation and stability of cartel under vertical and horizontal product differentiation in the presence of cost asymmetry. The possibility of stable cartel is lesser for an agreement that allows the lower quality-product to be produced if the quality difference (net of cost) increases or the horizontal product differentiation decreases when the firms maximizes joint profit. Moreover, in the presence of side payments, for a cartel agreement that does not allow the lower quality product to be produced, the possibility of stable cartel falls if the quality difference (net of cost) falls or the horizontal product differentiation increases. As a cartel that involves side payment has greater chances of being detected, the firms may avoid side payments and joint profit maximization. It is shown that if the firms do not maximize joint-profits and reduce output equally in the absence of side payments, the possibility of stable cartel falls if the horizontal product differentiation falls, but it is independent of the quality difference net of cost. Welfare may increase after cartel formation if the lower quality good is not produced in the absence of side payments. A similar impact on welfare is observed if the firms do not maximize joint-profits and reduce output equally in the absence of side payments.

Keywords: Cartel Stability; Horizontal and Vertical product differentiation; Cournot competition, Welfare

JEL classification Codes: L 24, L 13, D 24

[1] Madras School of Economics, Chennai
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Analysis of the Impact of Country Specific Macro Risk Variables On Gold Futures Contract and its Position as an Asset Class: Evidence from India

Rupel Nargunam[1], William W. S. Wei[2]and N. Anuradha[3]

The gold futures contract is an emerging investment option in India which is affected by macroeconomic factors and other types of investments. This paper discusses the dependence of gold futures prices on systemic macro risk factors and its investment characteristics, using multiple linear regression models. For the convenience of analysis, we control for the effect of domestic and global gold spot market on the derivative, and we introduce variables to represent country specific macro risk factors and conventional forms of investment. Recently introduced uncertainty indexes such as geopolitical risk index and economic policy uncertainty index are included in this study. We examine the investment nature of gold futures contract by constructing a portfolio with bonds and stocks, to assess if the gold futures contract behaves like other financial contracts or if it has the market characteristics of its underlying asset. The results provide insights on the influence of these inter-related macro-economic variables on a financial derivative contract in an emerging economy and its unique position in portfolio allocation, which are aimed to help practitioners and policy makers.

Keywords: Gold futures contract, Macro risk factors, Multiple linear regression, Investment nature.

JEL Classification Codes: G130, G010, G110.

[1] Madras School of Economics, Chennai

[2] Fox School of Business, Temple University

3 Department of Management Studies, GITAM University

Determinants of Household Water Efficient Technology Adoption: Understanding Household Behaviour and Environmental Attitude for Demand Side Management Policies

S. Ashwin Ram[1] and Zareena Begum Irfan[2]

Cities across India are highly susceptible to extreme weather events such as drought and flood as a result of increasing urbanization and inefficient urban planning. Climate change further exacerbates the situation leading to recurrent periods of intense and prolonged drought. About 600 million people in India face water shortages and it is expected that large cities such as Delhi, Mumbai, Hyderabad, Bangalore and Chennai will soon run out of groundwater and face high risk of day zero. There is a growing consensus that the recurrent water scarcity faced by Indian cities are purely a case of mismanagement of the resources resulting from poor governance and weak institutional structure. India for long has relied on conventional supply driven approaches to manage its water resources which time and again have proved to be inefficient, unsustainable and expensive. Given that the urban water demand is expected to substantially increase as a result of population growth and climate change, there is an urgent need to shift focus from supply side to demand side management. In this context, this paper has made a novel attempt to understand the determinants of household Water Saving Technologies (WST) adoption using Chennai as a case study. Based on a primary survey, the paper examines factors influencing household decision to adopt WST. Binary logistic regression was used to understand the household adoption behavior. We hope that the results of the paper will stir debate on urban water security leaving scope for water demand management policies.

Key Words: Urban Water Security, Water Scarcity, Water Demand Management, Water Saving Technologies, Water Use Efficiency

JEL Classification Codes: Q20, Q25, Q28, Q51, Q53

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Public Capital, Private Capital, Human Capital, Household Capital and Regional Income in Indian regions: Augmented Spatial Mankiw-Romer-Weil Model

Vivek Jadhav[1]

The neoclassical theoretical framework places a strong focus on 'convergence,' with little consideration of how initial income differences across regions effect regional income. It pays only cursory consideration to how the spill-over effects of physical and human capital affect regional income. This study sought to address these questions in the context of Indian regions. Empirical studies on regional economies in India have primarily focused on the district or state level. The focus of this research is to define the 'region' that exists between the state and district levels in India. There are 103 regions in 20 Indian states that have been recognised. Because these 103 Indian regions are made up of districts, regional inequality is determined using district-level income data. While traditional theories considered two capitals: physical and labour, this study differentiates physical capital into public and private capitals as the effects of private and public investment on regional income might differ. While defining public and private physical capital along with human capital, 'amenities' at the household level are defined as household capital in order to understand how household level access to facilities like drinking water, electricity, and toilets impacts regional income. Spatial econometric models are used to better understand how spill-over effects impact regional income. This study finds that human capital and public capital have a positive spill-over effect on per capita gross regional domestic product in Indian regions. It is also found that household capital has a direct and significant positive impact on per capita regional product. This study also shows that initial regional inequality has a positive impact on regional income, lending credence to Myrdal's and Hirschman's (1957) theoretical argument (1958). In the lack of human and household capital, regional inequality within a region can exacerbate differences across regions. Public, household and human capital, which have a spill-over and direct impact, tend to balance out regional differences. The positive spill-over effect of public capital, human capital, and the direct beneficial impact of household capital underline the relevance of public policy not just at the macro-level but also at the household level.

Keywords: Public capital, Household capital, Augmented Spatial MRW model, Regional Inequality.

JEL Classification Codes: O47, R11, R53, C21.

[1] Madras School of Economics, Chennai

Do Gender Differences In Research Performance Explain The Leaky Pipeline In Indian Academia? Some Evidence on Agricultural and Applied Economics

Brinda Viswanathan[1], J.V. Meenakshi[2] and Sangeeta Bansal[3]

Relying on the AISHE database of the Ministry of Education this study finds that among Indian universities, fewer women go up the seniority ladder, a phenomenon known as leaky pipeline. Public universities are a shade worse than the private universities but there is not much difference across disciplines or states of India. We then examine whether the leaky pipeline can be accounted for by differences in the number and quality of research output across men and women. This is based on an exhaustive web scraping exercise for faculty profiles who have google scholar pages in two large publicly funded institutions: the agricultural and applied economics departments in state agricultural universities (AU) and institutions supported by the Indian Council of Social Science Research (ICSSR). It is perhaps a first study of its kind to carry out an in depth analysis for India. We find that: First, there is clear evidence of a leaky pipeline, the extent being greater in AU than in ICSSR institutions. Second, women seemingly underperform relative to men in terms of numbers of publications, especially early in their career, but are either able to narrow the differential or even surpass men with time and seniority. Third, women are either more quality conscious, or are held to a higher quality standard than men: their citation metrics, and journal publications and rankings are better than those of men. Fourth, women are more likely to write single-authored papers and have fewer collaborators than men. These findings are broadly consistent with international literature in several aspects.

Keywords: Gender in academia; leaky pipeline; agricultural and applied economics; India

JEL Classification Codes: J16, J21, Q10

[1] Madras School of Economics, Chennai

[2] Delhi School of Economics, University of Delhi

[3] The Centre for International Trade and Development, Jawaharlal Nehru University

Money and More: Health Advice Complements Cash to Improve Child Outcomes in India

Sowmya Dhanaraj[1], Vidya Mahambare[2] and Vibhu Jain[3]

We present the first comprehensive evidence on the complementarity between the ‘cash’ and the ‘cash-plus’ component, namely health advice (HA) from community health workers (CHW) under one of the world’s largest maternal conditional cash transfer (CCT) programs, India’s Janani Suraksha Yojana. We construct a dataset for 41,890 children born in public health facilities between 2012 and 2016 in India’s low-performing states by combining information from a national representative survey and administrative database. The results of the instrumental variable regression model indicate that the best child health outcomes are achieved when mothers receive both CCT and HA. Receiving both reduces the infant mortality rate by 3.1% while receiving only CCT leads to a reduction by 2.4% and only HA by 1.1% compared to the group who did not receive either. Further, HA has a significant incremental effect on improving child health inputs not directly targeted under the scheme - breastfeeding and full immunisation amongst both CCT and non-CCT recipients. Our results imply that along with CCT, expanding the access to HA by CHWs which currently reaches only about half of the expectant mothers is critical for improving the child health outcomes and inputs, especially of children whose mothers have lower levels of education.

Keywords: cash, cash plus, community health workers, child health, instrumental variable regression

JEL Classification Codes: I11, I38

[1] Madras School of Economics, Chennai
[2] Great Lakes Institute of Management, Chennai
[3] Madras School of Economics, Chennai

Monetary Response to Oil Price Shock in Asian Oil Importing Countries: Evaluation of Inflation Targeting Framework

Devasmita Jena[1] and Ishika Kataruka[2]

Oil price fluctuation can serious inflation consequences and elicit timely response from the Central Banks (CB). Our paper analyses the monetary policy response to oil price fluctuations in 5 Asian EMDEs during 2008-2019. Not only these countries are heavily dependent on oil imports for their increasing demand for oil, but also the CBs of these countries have gradually adopted inflation targeting (IT) framework of monetary policy. Therefore, it is also imperative to examine the weightage the CBs assign to oil price shock, while operating in IT-framework as against in non IT-framework. This forms the second important objective of our paper. We estimate the CBs' decision on interest rates as response to Brent crude oil price fluctuations using augmented Taylor rule, in a macro panel data framework. We employ estimators that allows for heterogeneity across countries and are robust to cross sectional dependence. Oil importing Asian countries face a negative supply shock, due to trade linkages, that exerts a greater impact on inflation. Consequently, our finding, that CBs raised interest rates to prevent subsequent negative demand effects in the long run, is intuitive. Interestingly, our results also reveal that CBs following IT framework resorted to interest setting at a lower level as a response to oil price fluctuations. This asserts the efficacy of the IT-regime in terms of absorbing oil shocks.

Keywords: Inflation targeting, monetary policy, oil shocks, Asian markets

JEL Classification Codes: E0, E31, E52, E58

[1] Madras School of Economics, Chennai
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Fiscal Transfers, Climate Risks, and Partisan Politics:
Does the Nature of Climate Risk Matter?

K.S. Kavi Kumar[1] and Anubhab Pattanayak[2]

Natural calamities such as drought, floods and cyclones are not uncommon in India, with almost all states affected by one or the other form of hydro-meteorological risks every year. Potential changes in climate are expected to manifest in the form of increased frequency and severity of the climate risks. In a federal system of governance, the transfers from the Central government serve as an important mechanism for the State governments to effectively address the adverse impacts of the natural disasters. Interestingly, there is often a significant gap between the relief sought by the states to cope with the hydro-meteorological risks and the assistance provided by the Centre. Taking note of some recent evidence in the literature on the role of partisan politics in the context of fiscal transfers from the Centre to different states affected by natural calamities, this study explores whether the nature of climate risk provides scope for the Central government to exhibit favoritism towards states that are politically aligned than those that are not aligned. The empirical analysis based on total and non-plan fiscal grants from the Centre to different states over three decades and occurrence of drought and floods across different states over the same period, suggests that while grant allocation in response to drought is higher for the politically aligned states, no evidence for partisan politics could be established in case of grant allocation in response to flood. The study argues that the nature of risk – viz., relatively slow emergence of drought compared to sudden manifestation of flood events, could perhaps provide scope for partisan politics. In the context of changing landscape of political alignment and the dynamically changing nature of climate risks in India, the evidence from this study provides crucial inputs for better understanding of the political economy of disaster management.

Keywords: Fiscal Federalism; Fiscal Transfers; Political Alignment; Climate Risk; Drought; Floods; India

JEL Classification Codes: D72, H77, O23, Q54

[1] Madras School of Economics, Chennai
[2] Indian Institute of Technology, Kharagpur

Effect of Fertility on Paid Work Status of Women in India: Evidence from NFHS-4

Amrita Chatterjee[1] and Gunjan Khandelwal[2]

Abstract: The current study throws light on the relationship between fertility and women's paid work status in India using nationally representative NFHS-4 data. Controlling for the endogeneity of fertility by using district-level fertility rate as an IV, the paper suggests that women are less likely to join paid work with a greater number of children. The paper contributes by adding the dimension of women empowerment in the fertility-working women relationship. Results indicate that if women enjoy high freedom of mobility and high autonomy in terms of decision-making in the household, they can continue to work even after childbearing. Rural women are more likely to be affected by the responsibility of childcare rather than urban women. Women from the reproductive age group of 15-35 are more likely to stay back home with younger children at home rather than older women. Women empowerment at the household level, better maternity benefits, and a women-friendly work environment are the policy implication of the current study.

Keywords: FLFP; women empowerment; fertility; IV probit model

JEL Classification Codes: C25, C26, J13, J16, J21, J12

[1] Madras School of Economics, Chennai

[2] Delhi School of Economics

Determinants of Ethnic Identity among Adolescents in Auckland

Mohana Mondal[1], Michael P. Cameron[2] and Jacques Poot[3]

Auckland is among the most ethnically diverse cities in the world. Like most large cities, its population is also quite youthful. In this paper, we focus on the dynamics of self-declared ethnic identities of adolescents in Auckland, by using New Zealand Linked Census data for four inter-censual periods between 1991 and 2013. Our dataset links the same young person across two consecutive Censuses (i.e., those aged 13-17 in one Census are aged 18-22 in the following Census five years later). We aim to capture the first conscious ethnic identity affiliation of adolescents, assuming that their ethnic identities are initially recorded by their parents, but subsequently determined by the adolescent themselves when they transition to adulthood. We classify our predictor variables into individual, family and neighborhood-level variables. We find that an adolescent's ethnicity stated at the previous census, parents' ethnicity, and the ethnic makeup of the neighborhood are all major determinants of ethnic-identity choices among adolescents in Auckland.

Keywords: Ethnic identity, Ethnic transition, Adolescents, Linked data, New Zealand

JEL Classification Codes: J15, R23, Z13

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[3] National Institute of Demographic and Economic Analysis (NIDEA) and School of Accounting, Finance and Economics University of Waikato and Department of Spatial Economics Vrije Universiteit Amsterdam

A Text-Based Index for Financial Constraint of Listed Indian Manufacturing Firms

Amal Jose[1] and Saumitra Bhaduri[2]

Quantifying the degree of financial constraint is critical for assessing the firms' capital structure and investment decisions. Conventional methods use financial variables and firm characteristics to quantify the degree of financial constraint. These conventional measures are biased towards small and fast-growing firms. Text-based indexes evolved as an alternative to these biased indexes. Existing text-based indexes use word dictionaries or machine learning algorithms to classify firms. However, these text-based indexes perform poorly in the Indian context. So we develop a novel measure of financial constraint using textual analysis of firms' annual reports. We calculate the percentage of constraining phrases using the n-gram method and use it as a proxy for the degree of financial constraint. Our text-based index has a very low correlation with other traditional measures of financial constraint. It also has a higher accuracy and F score compared to other extant measures of financial constraints, indicating that our text-based index outperforms other financial constraint measures in identifying the constrained firms. Our text-based index predicts the liquidity events like dividend omission and dividend increase better than other measures of financial constraint. The high accuracy score for the cross-validation test reaffirms the superiority of our text-based index.

Keywords: Financial constraints; textual analysis; cross-validation; benchmarking test; liquidity events

JEL Classification Codes: G31, G32, D92

[1] Madras School of Economics, Chennai
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The Impact of COVID-19 Pandemic on Indian Stock Market: An Empirical Analysis of Sectoral Indices

Srinivasa Rao Gangadharan[1] and Mathew Koshy Odasseril[2]

Soon after COVID19 was identified to be a threat, there were speculations that most of the world economy and financial markets would be affected due to lockdown and social distancing. The market risk aversion resulted due to the economic impact of the global spread of the pandemic was the largest since the global financial crisis. Even now, after the shock of Omicron, unfortunately, a significant and severe new variant emerges, the "XE" variant. Speculations about lockdowns and fresh restrictions temper the optimism. Examining the financial market effects of the COVID-19 pandemic is useful to investors when accounting for future volatility and implementing hedging strategies. In this context, this study aims to investigate the volatility dynamics of the Indian sectoral stock market indices before, during and after the COVID-19 outbreak using GARCH models with historical data covering 1st March 2017 to 31st March 2022. Furthermore, the impact of the COVID-19 pandemic on the stock markets of 5 major countries are also compared with that of NIFTY50.

Keywords: COVID-19, financial markets, lockdown, stock market, volatility

JEL Classification Codes: E44, G12, C58

[1] Madras School of Economics, Chennai
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Elementary Education Outcome Efficiency in Indian States

Jyotsna Rosario[1] and K.R Shanmugam[2]

The State Governments in India allocate considerable public resources to provide universal elementary education. However elementary education outcomes vary across Indian States. This study uses panel data of 28 Indian States from 2012-13 to 2019-20, to estimate the technical efficiency of States in improving education outcome. Stochastic frontier estimation method developed by Battese and Coelli (1995) is used to simultaneously estimate the frontier production function and inefficiency effects function. Evidences indicate that while some States have lower outcomes due to a lack of resources, some States can improve outcomes without increasing expenditure. The mean efficiency of States was estimated to be 80%. Himachal Pradesh and Meghalaya were found to be the most efficient States whereas Goa and West Bengal were the least efficient. Results also indicate that rural population and literacy rates have a positive impact on efficiency scores. The study identifies best practices and separates the resource poor States from the inefficient ones.

Keywords: technical efficiency, public expenditure, elementary education outcome, stochastic frontier analysis.

JEL Classification Codes: H52, I18, I21, C14

[1] Madras School of Economics, Chennai
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Investigating the Effect of Renewable Energy Adoption: An Environmental Economic Perspective

Salva K K[1] and Zareena Begum Irfan[2]

Growing energy demand in the context of unprecedented changes in the climatic pattern is a challenge facing by the world. Renewable energy has been considered as an alternative for meeting the growing energy demand. However, its impact on economic growth and environment would be worth examining. In this context present study intends to find out the relation between renewable energy consumption, environment, and economic growth using a panel of 20 Asian countries from 1990 to 2018. Unlike most of the existing literature, this research work has considered ecological footprint consumption as a proxy for environmental degradation, in addition to CO2 emission. Due to the existence of panel-specific heterogeneity and cross-sectional dependence, the Panel Auto-Regressive Distributed Lag approach of Pooled Mean Group was used as the methodological framework. The analysis inferred that the renewable energy consumption reduces environmental degradation and encourages economic growth and hence it can be promoted for having energy security in line with environmental sustainability.

Keywords: Renewable energy consumption, Ecological footprint, CO_2 emission, Economic growth

JEL Classification Codes: Q42, O13, Q56, C23

[1] Madras School of Economics, Chennai
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An Empirical Investigation of Indian Public Debt Scenario

Magulsha George[1] and Dr. K. R Shanmugam[2]

Many developing countries including India face a scarcity of financial resources to invest in growth. In order to bridge this resource gap, they resort to borrowings. In the context of fiscal consolidation attempts by both developed and developing economies, debt sustainability has received a lot of attention in recent years, both from academics and policymakers. Over the years, many countries have designed fiscal rules as an institutional mechanism to enforce prudent fiscal policy. In this context, it's worth noting that fiscal and debt sustainability has been a primary concern for Indian authorities since July 1991. As a result, the authorities proposed a fiscal correction and consolidation process in the 1990s and thereafter. Recently, the fiscal adjustment programme has been further strengthened both at the national and sub-national level through enactment of fiscal legislation.

Against the above backdrop, we study the Indian debt situation over the last three decades. The present paper examines the sustainability of India's public debt within the context of fiscal rules. This paper examines the asymmetry and non-linearity in the public debt-economic growth nexus for India. Further, efforts were made to identify a threshold (if one exists) and quantify the extent of the relationship below and above the estimated threshold. The study suggests that a ratio of 60percent of debt to GDP for India. In addition, an effort is being made to comprehend the nature of the causal relationship between debt and economic growth.

Keywords: Debt sustainability, Economic growth, Threshold, Non-linearity

JEL Classification Codes: E62, H63, C24, C22, O11

[1] Madras School of Economics, Chennai
[2] Madras School of Economics, Chennai

Monetary and Fiscal Policy Interactions in India

Mathew Koshy Odasseril[1] and Dr. K. R. Shanmugam[2]

The interaction between monetary and fiscal policies is crucial for a country's economic stability. The post-pandemic recession has reinforced existing challenges and sparked much interest in the field of monetary-fiscal policy linkages. In the real world, both the monetary and fiscal policies work together and therefore the isolated study of monetary or fiscal policy rules ignores the outcomes that are a result of joint policy actions. We relax the assumption that the policy regimes are fixed and employ a Markov switching model to estimate monetary policy and fiscal policy rules that switch stochastically between two regimes, for the period 2000Q1–2020Q4. We also investigate the behavior of select macroeconomic variables under the estimated policy regimes. As the basis for monetary policy, we estimate a variant of the monetary policy rule proposed by Taylor (1993). For the fiscal policy rule, we use the framework proposed by Davig and Leeper (2007).

Keywords: Monetary-Fiscal interactions, Regime switching, Indian economy

JEL Classification Codes: E52, E62, E63, C22

[1] Madras School of Economics, Chennai
[2] Madras School of Economics, Chennai

Analysis of Carbon Productivity for Firms in the Manufacturing Sector of India

Prantik Bagchi[1], Santosh Kumar Sahu[2], Ajay Kumar[3], Kim Hua Tan[4]

Emission estimation and carbon productivity at the firm level for India's manufacturing sector are scanty. We fill this gap by estimating CO2 emissions at the firm level and further determining the optimal and the actual trade-offs between emissions and output at the firm level. We use data from the center for Monitoring Indian Economy (CMIE) Prowess IQ, and MoEF&CC, Government of India. Between 1998 and 2019, growth in CO2 emission and output is estimated to be 3 and 9%, respectively. This indicates a case of weak decoupling for the manufacturing sector where technology, export promotion strategies, environmental taxes, energy mix at the firm level, and cap-and-trade policy are the significant determinants of carbon productivity for the sample firms in India's manufacturing sector. We conclude that improving carbon productivity is necessary for better decoupling and R&D intensity to be complemented with R&D efficiency to gain carbon productivity for the manufacturing industry. These findings are crucial for better energy and climate policy for the Indian economy.

Keywords: Carbon productivity. Energy efficiency. Decoupling growth. Threshold regression. Club convergence

JEL Classification Codes: Q53. Q54. Q55. Q57

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Equalization Transfers based on Normatively Determined Revenues and Expenditures of State Governments in India

K. R. Shanmugam[1] and K. Shanmugam[2]

This study addresses an important policy issue of designing equalization transfers to Indian states. It empirically estimates the effect of transfers on revenue expenditures and own revenues of General Category States (GCS) and Special Category States (SGS) using the panel data methodology. Results indicate a strong crowding-in effect of transfers on public spending of States and a strong crowding-out effect on own revenues. Using two alternate benchmarks (average of top 3 States and average of all States), the total revenue expenditure needs for all states is estimated at about ₹.16143 billion (with benchmark 1) and ₹.6545 billion (with benchmark 2). The overall mean own revenue efficiency score for GCS is 74.67% and for SCS is only 29.19%, indicating that there is a greater possibility for these Indian States to improve their own revenues. This study also derives the amounts of additional transfers required to provide benchmark level of public services for all 29 States in four alternative scenarios, based on alternate benchmarks of fiscal capacities and expenditure needs, ranging between ₹.3.54 lakh crore to 14.77 lakh crore We hope that these results will be useful to policymakers and other stakeholders to design appropriate fiscal transfer strategies such that all citizens can avail a standard level of public services in India.

Keywords: Fiscal equalization, expenditure needs, fiscal capacity, Indian states

JEL Classification Codes: H77, H73, H72, C23.

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Impact of Fiscal Transfers Policy on Regional Growth Convergence in India

K. Shanmugam[1] and K. R. Shanmugam[2]

This study is an attempt to empirically analyze the effect of fiscal transfers on growth and regional growth convergence in India during 2005-2019, using the standard growth convergence model for panel data. Results indicate the growth convergence across Indian States. The regional income gaps reduced at a rate of 17.7-31.9% per annum. The fiscal transfers contribute to the growth of 22 out of 29 States and also contribute significantly to the convergence. Moreover, there is strong evidence for convergence across General Category States and across Special Category States. The average income growth is higher in Special Category States and higher in post global crisis period. It is our hope that these results will be useful to policymakers and other stakeholders to take appropriate strategies to design fiscal transfer policy such that it will speed up the convergence process in India.

Keywords: Growth Convergence, Fiscal Transfers, Indian States, Panel Data Methods

JEL Classification Codes: E22, E62, R11, R12, R23, C23

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Determinants of Non-Performing Assets of Commercial Banks in India

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Banks's credit growth continues to decelerate in India due to huge non-performing assets (NPAs) overhangs in banks. Using panel data methodology, this study empirically analyzed the determinants of NPAs of scheduled commercial banks in India during 2009-2020. Results indicated that the excessive credit growth in the past increased the surge in the current NPAs. The economic slowdown also aggravated loan delinquencies in Indian commercial banks. While higher priority sector lending created higher loan delinquencies, higher bank size and higher profitability reduced it. This study suggested that counter capital buffer, dynamic provisioning and sound credit appraisal NPA improved the financial stability and monetary policy effectiveness. These findings will be useful for policymakers, bankers and other stakeholders to make appropriate strategies to resolve NPA issue in India.

Keywords: Bank credit, Indian banking sector, non-performing assets/loans, panel regression.

JEL Classification Codes: C23, E51, G11, G21.

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Multiple Dimensions of Cyclicality in Investing

Thillaikkoothan Palanichamy[1] and Parthajit Kayal[2]

Returns on Equity as an asset class tend to be erratic and uneven. Contrary to popular opinion, such fluctuations in returns cannot be attributed to business cyclicality alone. Historically, investors' attitude towards risk has had ramifications on how individual stocks and indices are priced. Commonalities across market up-cycles and down-cycles are examined using data on the Nifty-50 index. Based on firm-level characteristics, the investible universe is segregated into two categories: quality and Cyclical. The performance of the Quality and Cyclical portfolio across market cycles is analyzed. Although markets are 'efficient' in the long run, investor perception plays an important role in short-term pricing. The Price to Earnings (P/E) ratio in spite of its shortcomings serves as a useful tool for evaluating prospective investments.

Keywords: Quality, Cycle, Investment, Portfolio

JEL Classification Codes: G11, G12, G15

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COVID Mobility (loss) Indicator and Its Impact on the Indian Economy

Saumitra N Bhaduri[1]

Ever since the break out of the COVID-19 pandemic, analysts and experts across the world are attempting to forecast the impact of the pandemic on economic activities. However, one of the imperative challenges faced by the researcher is to develop an index for COVID incidence that truly reflects the loss of mobility, and could be a useful coincidence or a lead indicator for the policymakers. Therefore, the objective of this paper is two folds: First, the paper proposes a unique indicator using the “Community Mobility Reports” (GCMR) published by Google. This data typically shows mobility (trends) by region, across different categories of places over time. Following the literature, on Mutli Criteria Decision Making (MCDM) and using the GCMR data we propose a parsimonious COVID Mobility Indicator (CMI) using the CRITIC (Criteria Importance Through Inter-Criteria Correlation) method. Second, using the proposed index the paper attempts to assess the impact of COVID-19 on the Indian economy in the short term and the long term. Using a conventional ADR model the paper estimates both the short and long-term elasticities of CMI towards the Industrial Index of Production (IIP).

Keywords: Mobility Indicator, COVID, IIP

JEL Classification Codes: C02, C22

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Assessing the Socio-economic Resilience of Urban Slum Clearance Households to Heatwaves in SPIN countries

Zareena Begum Irfan[1]

Heatwaves, identified as a Silent Disaster have become prominent and significant threat on the human health, environment and the economy. Climate change is expected to enhance the intensity and frequency of extreme weather events that indefinitely becomes a biggest challenge that humanity is faced with today. Evidences show that heatwaves claimed many lives across nations and induced heat related morbidities. Ever since the implementation of the Sendai Framework by the United Nations in 2015, disaster risk reduction had been a prevalent topic among countries. The disaster risk reduction mainly focuses on building strong community resilience in urban areas which are more prone to extreme weather events. Hence, measuring the socio-economic resilience of urban slum clearance households to heatwaves is pivotal to arrive at policy insights about building strong resilient practices in urban residential areas. Hence, this paper is an attempt made to measure socio-economic resilience of urban slum clearance households to heatwaves across the cities Colombo, Karachi, Chennai and Katmandu in SPIN countries (Sri Lanka, Pakistan, India and Nepal). The geographical-socio-economic-institutional dimensional impacts caused due to urban heat stress in SPIN (Sri Lanka, Pakistan, India and Nepal) countries was examined. The resilient characteristic and the policy preparedness of the SPIN countries was assessed. Sri Lankan urban slum cleared households are found to be highly resilient to heatwaves and better prepared than the other three countries.

Keywords**:** Heatwaves, Resilience, slum clearance households

JEL Classification Codes**:** Q54, R22

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What do patterns in voting with and without a NOTA option reveal?

Raghav Kumar[1], Sudarsan Padmanabhan[2], P. Srikant[3]

We look at patterns of voting before and after the introduction of a NOTA (none of the above) option in electronic ballots in India. Consistent with other studies, we find that introducing a NOTA option leads to a small increase in electoral participation, suggesting that some voters who signal protest by not voting now do so by selecting the NOTA option. We find that the salient non-party choice is often the NOTA option, and that the gain in NOTA votes is often at the expense of the salient independent candidate. We correlate position on the ballot with ranking in the election, and find that voters who choose not to vote for parties tend to pick the last positions on ballots. We construct a simple statistic that measures performance by position to quantify this effect. We also qualitatively study cases of elections from the state of Tamil Nadu, where the absence of a NOTA option might have led to a different electoral outcome. Our analysis suggests that in certain cases, NOTA has a material effect on outcomes, and that it is unnecessary to meet demands that NOTA be the first option on a ballot.

Keywords: protest voting, NOTA, voter choices

JEL Classification Codes: D72, D91

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