CHAPTER 22

ECONOMICS

Doctoral Theses

01.   CHOUDHRY (Sujayata)
The Different Facets of Agricultural Productivity and Climate Change in India.
Supervisor: Prof. Surender Kumar
Th28689

Abstract

Agriculture and climate are seen to have a dynamic interplay since climate has always played an important role in agricultural development. In the context of India, agriculture is incredibly important to the Indian economy. Numerous studies document that climate change has already reduced crop yields and staggered agricultural productivity growth. This calls for seasoned research to understand the potential future impacts of climate change. The empirical bent of this thesis is to put more emphasis on the identification of climate change or weather effects and on the degree to which adaptation in the Indian agriculture is captured and represented using observational data. The thesis is a confluence of climate science, agronomy, animal science, and economic analysis. The empirical and conceptual framework in the first study is based on the premise that average crop yield in a given district is dependent on climatic factors whose effects differ across different regions, productivity zones and crops. Therefore, the study intends to unravel the distributional, temporal and crop heterogeneity to capture the differential impact of climate change. The second study deals with agricultural production and presents the determinants of average crop yield and acreage at the district level for two important cereal crops- rice and wheat. The study focuses on average crop yield in a given district which is dependent not only on climatic factors but also influenced by land acreage decisions of the farmers. The third study analyzes milk productivity in the dairy sector which is dependent on climatic factors and influenced by dairy management practices, technological innovations and socio-economic factors. The results obtained in the thesis bear testimony to the fact that climate change has significant differential impacts on crop yields, acreage decisions as well as milk productivity in case of India which calls for customized adaptation strategies by farmers.

Contents

1. Introduction 2. Determining the Heterogeneous Impact of Climate Change and Adaptation in Indian Agriculture: a Quantile Regression Approach 3. Deciphering the Responsiveness of Agricultural Production to Climate Change: The Indian Agriculture Experience. 4. The Different Facets of Milk Productivity and Climate Change in India: a Multi-Input Multi-Output Approach 5. Conclusion.

02.   JAIN (Mukta)
Essays on Time Preferences, Divergence, and Welfare Targeting in Developing Countries.
Supervisors: Prof. Mausumi Das and Prof. Ayona Bhattacharjee
Th28690

Abstract

Artificial Intelligence (AI) is viewed as the next industrial revolution and future's "engine of growth". Given the scale and scope, the avoidance of AI is unrealistic, but we can assess how to distribute its gains, especially when these technologies replace labour with capital in the production process. Acemoglu and Restrepo, 2020 shows that displacement of labour due to machines has exceeded the creation of new, labour intensive tasks. Thus, rising inequality in markets may not deliver fair outcomes and extended welfare measures are needed. However, countries often hesitate to raise them. They fear that lower profits and guaranteed subsistence under redistribution would disincentivise investment, innovation, and work. A further concern arises because evidences from developed countries confirm that rich save more than the poor. If income is redistributed, savings might drop in the economy, leading to lower growth rates. However, these concerns are not universal. Policies can be adjusted to retain incentives, and lower income households might not prefer to save less across different regions. In order to evaluate the savings preferences between rich and poor, Chapter 1 of this thesis uses data from India. It shows that rich are more patient than poor, but only marginally. Hence, any aggregate savings loss from redistribution is likely to be modest. Building on these preferences, Chapter 2 develops a growth model of automation and AI. The model predicts that trickle-down effects are unlikely and that income divergence between rich and poor will emerge. It therefore recommends complementary welfare policies targeted at the poor. Responding to this need, Chapter 3 proposes a novel machine-learning based method to identify poor households when incomes are volatile, as in India. This method minimizes the loss of incentives to work and innovate by enabling everyone (poor or non-poor) to frequently transition in and out of poverty.

Contents

1. Introduction 2. Income Di!erentials & Rate of Time Preference 3. Automation, Impatience and Growth 4. Identifying Vulnerable Households 5. Conclusion.

03.   KHARI (Bhavna)
        Three Essays on Digitalisation, Governance and Development.
        Supervisor: Prof. Dibyendu Maiti
        Th 28265

Abstract

My thesis presents three chapters in which we establish an interlinkage between digitalisation, governance and development. In chapter 1, we formulate a theoretical model consisting of households, firms and government - endogenous and exogenous, to show the effect of digitalisation on the formal - informal labour. Results reveal that there exists a positive relationship between taxation and digitalisation under endogenous e-governance but this is not true under exogenous e-governance. The policy to raise informal wage or productivity exogenously may lead to a rise in informality. In order to reduce the size of the informal sector, digitalisation along with strong governance would be required. In chapter 2, we investigate the impact of ICT on the share of informal employment using panel data from 1996-2017 and the results show that ICT is effective in reducing the size of the informal sector, but it would be difficult to do so without the presence of strong governance. Lastly in chapter 3, we investigate the impact of ICT along with corruption and rule of law on the growth rate of an economy using panel data from 1990-2019 and the results show that ICT along with better rule of law and control of corruption helps in enhancing the growth rate.

Contents

1. Introduction: 2. Digitalisation, Governance and the Informal Sector 3. ICT, Governance and Informality: A Cross Country Study 4. Digitalisation, Corruption and Growth. 5. Conclusions. Bibliography.

04.   NAVEEN KUMAR
        Essays in Climate Macroeconomics.
        Supervisor: Prof. Dibyendu Maiti
        Th 28266

Abstract

Extensive scientific evidence and broad consensus within the research community indicate that climate change is occurring at an unprecedented pace, affecting every geographic region and all components of the climate system. Climate change has emerged as one of the most profound macroeconomic challenges of the twenty-first century, reshaping the trajectory of growth, productivity, and welfare across nations. Rising global temperatures, driven largely by fossil fuel consumption and industrial emissions, have already inflicted measurable damage on ecosystems, human health, and the productive capacity of labour and capital. The dissertation is set against this backdrop and examines the impact of rising temperature on total factor productivity, economic growth, well-being & social progress, and wealth inequality. The dissertation consists of four self-contained essays on different aspects of Climate macroeconomics. The first chapter outlines the broader context of the research and situates the study within the climate–macroeconomics literature. Emerging economies (EMEs) often ignore effective mitigation strategies for climate risks to prioritise growth acceleration. In Chapter 2 titled Long-run Macroeconomic Impact of Climate Change on Total Factor Productivity: Evidence from Emerging Economies, we show that EMEs cannot sustain their economic growth trajectory due to the adverse impact of climate change on total factor productivity (TFP). In the third chapter titled Climate Change, State Capacity, and Uneven Growth: A Disaggregated Panel Analysis of India, we examine how rising temperatures affect India's long-term economic growth, both at the aggregate and disaggregated levels across regions, sectors, and seasons. In Chapter four titled Beyond GDP: Quantifying the Heterogeneous Impact of Climate Change on Well-being and Social Progress, we examine the relationship between well-being and global warming across 167 countries from 1990 to 2019, employing the Social Progress Index (SPI) as a measure of well-being. The fifth chapter, Distributional Impacts of Global Warming on Wealth Inequality: Evidence from a Global Panel of Regions examines the understudied relationship between anthropogenic global warming and wealth inequality, two defining challenges of the 21st century, by focusing on the impact of temperature on subnational wealth inequality across 1,000 regions worldwide, using Global Data Lab data spanning 1992 to 2021.

Contents

1. Introduction 2. Long-run macroeconomic impact of climate change on total factor productivity - Evidences from Emerging Economies. 3. Climate Change, State Capacity and Uneven Growth: A Disaggregated Analysis of India 4. Beyond GDP: Quantifying Heterogeneous Impact of Climate Change on Well-being and Social Progress 5. Distributional Impacts of Global Warming on Wealth Inequality: Evidence from Global Panel of Regions. Bibliography.

05.   NEERAJ KUMAR
        Financial Derivatives in India: An Analysis.
        Supervisor: Prof. Pami Dua
        Th28267

Abstract

The rapid expansion and growing complexity of financial derivatives markets, particularly in emerging economies like India, have raised important questions about their role in enhancing market efficiency, managing risk and contributing to economic growth. This thesis investigates these issues through three interrelated research strands, offering an analysis of the evolving role of financial derivatives in shaping price discovery and macroeconomic outcomes, with a primary focus on India and complementary international evidence. First research issue examines the price discovery process in India's financial futures market. The analysis confirms that Nifty 50 futures consistently lead the spot market in incorporating new information. Additionally, asymmetric volatility patterns, where negative shocks cause greater volatility, highlight the maturity and informational efficiency of the futures market. Second research issue explores how macroeconomic and global factors influence futures pricing. By developing a macro-integrated pricing model and employing cointegration, variance decomposition and impulse response analysis, the study shows that futures prices are shaped by both short-term market sentiment and long-term macroeconomic fundamentals, including interest rates, inflation, and capital flows. Third research issue assesses the impact of derivatives market development on economic growth across G7 and BRICS economies. Panel estimations reveal a positive and significant relationship, with the effect being more pronounced in emerging markets, underscoring the developmental potential of well-regulated derivatives markets. The policy implications are wide-ranging. The findings support the case for deepening India's capital markets, improving real-time risk monitoring and enhancing investor protection. They also highlight the need for coordinated policy action among regulators and macroeconomic authorities. Globally, the study advocates for investing in financial infrastructure and regulatory capacity, particularly in emerging economies. In sum, this thesis positions financial derivatives as key instruments for market development and economic growth, provided that innovation is matched by institutional robustness and sound regulation.

Contents

1. Introduction 2. Price discovery and market efficiency in India's financial futures market: an empirical analysis 3. Dynamics of futures prices in India's financial derivatives market. 4. Derivatives and economic growth: an analysis of developed and emerging markets 5. Conclusion and policy implications.