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The Constraints of Social Sciences

The Relationship Between Climate Change and Economic Inequality

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Abstract

The impact of climate change is heterogeneous in its global and local impacts. Although everyone is in some way affected by changes in the climate, the impact it has on each economy can be very different, both unfavorable and counterproductive. For example, it can have different consequences for those affected by variations in the scarcity of resources, or it can favor a more or less sector or industry, as well as economic agents of a particular endowment, as in the case of the 'green jobs'. There are long-term changes in temperature and persevering increases in the average sea. Currently, the majority of the planet's population is settled in places on the shores; a large part of the economy and economic activity is also concentrated near the seashore. It can also amplify the effect of certain disasters and/or natural phenomena; by the way, it is favored by the groupings and geographical concentration, causing, among other things, damages in crops, excessive loss of labor, entire cities and social. It also affects the population through its health and magnifies the worst effects of living conditions already poor. The EKC hypothesis is still mixed. Although its appeal is easy to imagine as an inverted U-shape, sometimes noisy and controversial results are obtained. It's also been recognized that not all types of pollutants, nor all polluting industries, behave in this way. Indeed, contemporary debates about industrialization and sustainable economic growth also remain relevant when it comes to understanding the dynamics of industrialization and its relationship with the environment. This justifies the analysis of the relationship between GDP and emissions, considering not only the possibility of a non-linear

behavior, but also the lagged effect of income on emissions. Little is known about how climate change, like other global environmental problems, affects inequality, and better understanding may be important in helping to mitigate those effects. Climate change can affect inequality both through the income side and through the expenditure side, although the former may be more important. Movements in climate change affect and will more disrupt countries dependent on agriculture, such as those in East Asia and sub-Saharan Africa. Because agriculture provides livelihood for a large percentage of the poor in these countries, the spread of climate change can hurt them greatly.

Keywords climate change, economic inequality, resource scarcity, green jobs, environmental impact, agricultural dependence, health effects, sustainable growth

1.1. Introduction

Climate change and economic inequality have been among the most frequently discussed issues in research and policy circles in recent years. The growing intensity and diversity of extreme weather events have increased the risks for food and health security, making economic and social inequalities all the more salient. Meanwhile, the rapid socioeconomic changes over the past several decades, notably the globalization process, have brought about immense pressure on labor markets worldwide and accrued dazzle to inequalities characteristic of different regions and labor divisions. The integration of the world economies has driven a massive, but unequal, redistribution of wealth, wherein the global overconsumption and excess pollution of some countries have become increasingly unsustainable (Tang et al., 2022). The new blueprints under recent policies will also reshape both the international production chain and the environmental landscape. Moreover, the amplified vulnerability of the low-income groups to climate changes has further exacerbated their currently more adverse living conditions. This has generated immense challenges for the international communities in stimulating economic development while simultaneously counteracting environmental and social inequalities.

1.2. Key Findings

At a time when natural disasters are becoming more common, extreme weather conditions are on the rise, and entire countries battle against the ravages of climate change, examining the effects of these changes on the economic status of individuals and communities seems particularly apposite. The debate on climate policy implementation has often called for an equitable sharing of the burden, but the subject of economic inequality between substantially affected areas has been neglected up to now. The research shows that this is an unfortunate oversight indeed. In fact, climate change is detrimental to the economic growth rate according to simulation analysis. It seems clear that a 'new climate policy' is needed, which goes beyond the traditional calls for a uniform convergence in the emission rights of countries (Tang et al., 2022). The analysis focused on the effect of weather-related natural disasters from the 1960s onward, as well as the virtually unexplored relationship between temperature and the production of the different sectors of the economy. The evidence from pan-European data reveals that weather-related disasters are behind a remarkable pattern of increasing economic disparities, which is strongly associated with the particular exposure of the poor South European and Balkan regions to the climate-related hazards being studied. The findings are robust under alternative regression techniques as well as to the treatment of the Central and East European area in the model. A battery of other sensitivity tests indicates that these effects are theoretically and empirically sound. At a broader level, these results suggest that tackling the economic implications of climate change will require differentiated – and potentially costly – policies that are especially tailored to the diverse needs of affected areas, possibly at the expense of pursuing aggregate macroeconomic goals. On the methodological front, the focus on weather-induced disasters and the disaggregation of economic impacts among regions make a valuable contribution to a new and expanding strand of the literature on the channels through which weather risk may affect the economy, and show that climate change may

have pervasive repercussions on economic dynamism, and possibly in the opposite direction of what convergence processes between countries could counterbalance.

1.3. Conclusion

There is a strong and robust relationship between the impacts of climate change and economic inequality. Social inequality leads to reductions in individuals' income that translate into lower contributions to the development and protection of their surroundings. As a result, the rich environment of poor neighborhoods can be appreciated in terms of higher pollution burdens (Mader, 1970). In turn, environmental inequality can have detrimental effects on health and hence on household income. (i) An exogenous environmental shock – the expansion of a pulp mill – decreased the demand for blue-collar local labor in activities other than pulp production. The geographical variation in the labor market shock exogenous to potential pollution exposure allows difference-in-differences wheat yield comparisons between districts that were unequally exposed to the shock after the mill was built. As expected, the expansion of the pulp mill decreased local economic activity in districts with high exposure to pollution. The results show that the increase in CO2 emissions related to the shock had an additional negative effect on productivity via weather. The return to wheat production depicted an enhanced negative short-term sensitivity to high temperatures in exposed districts compared to unexposed ones, where the increase in CO2 emissions does not entail significant effects on climate conditions. These effects were reversed once the pulp mill intervention was completed because of the significant convergence in CO2 emissions between exposed and unexposed districts.

There is an ongoing debate on how different economic sectors are impacted by climate policies, as well as on the distributional effects of the energy transition more broadly, and increasing attention is paid to these issues in policy making (Claeys et al., 2018). The evidence presented can help to identify the cross-sectoral effects and conduct informed sector-specific policy making and to provide an analytical tool to perform similar future analyses.

2. Introduction

This essay will explore how economic inequality contributes to, is exacerbated by, or operates parallel to climate change and its most direct compatriots – elevated rates of natural disaster and disease. Given the current attention to climate change and the effect it will have on human society over the course of the 21st century, it is timely to be thinking about how various ecological and sustainable crises are deeply embedded within the social and economic processes that lead (or have historically led) to the generation and maintenance of economic imbalances. It is a hope in this paper to touch on a number of the more unexpected ways in which economic inequality has been an important corollary of environmental change while also reflecting on the interdisciplinary nature of such work (Tang et al., 2022).

Over the last two centuries, as atmospheric concentrations of carbon dioxide have risen, the planet has warmed. A side effect of these changes is not only to influence sea level and the weather, but also has an effect on the shift and frequency of interpersonal violence among populations. Other systemic effects of an increasingly hot planet also arise. Where extreme weather has become more prevalent it is natural to wonder what will happen to society. In this context, it is becoming clearer that not everyone will be hit in the same way, and that portion of the world that tends to be most vulnerable, especially during food crises, are those who are already socioeconomically disadvantaged. For instance, Yemen erupted into civil war in 2015 after the government was unable to cope with shifting weather patterns and associated food shortages due to the drought. This drought was particularly severe and unprecedented during the 20th century. However, the military response has seemed disproportionate and – as in all contemporary civil conflicts – non-combatants on ceremonial sides feel the most pain. This same year Hurricane Patricia became the strongest recorded storm in the Western Hemisphere, devastating coastal communities from Mexico to the United States. Nearer the Poles, large swaths of the tundra have thawed, releasing vast quantities of methane which do not so much warm Earth's atmosphere as poison it, exacerbating respiratory

diseases. Yet, countries most exposed to such effects are least able to cope with them economically due to a higher reliance on agricultural industries and lack of access to efficient healthcare. The rich will continue to be shielded from elemental harm, as was the case for the European Heat Wave – the deadliest since the Black Death – when 70,000 perished across France and Italy; meanwhile, 50mm to be spent on the then-proposed Trump Tower Wit.

2.1. Overview of Climate Change and Economic Inequality

Here I outline existing literature and consider the broader implications of climate policies on the equitable distribution of income and wealth. As climate change and economic inequality are complex global problems, it is critical to understand the intersectionality and interconnectedness of these phenomena (Abi Deivanayagam et al., 2022). Although all societies are affected by the consequences of climate change, it is often marginalized and disadvantaged communities that bear the heaviest burden. Climate change has generated and sustained an array of social, economic, and political inequalities. By analyzing the implications of the unequal distribution of wealth held by individuals, regions, and countries, an evolving debate in political economy develops that links various historical case studies with the challenge of sustainability and the possible implications for climate change mitigation.

3. Literature Review

Climate change and economic inequality are of significant concern for global policy makers, and evidence indicates that these two issues are interlinked. While climate change will impose costs on all countries, the costs of climate change are expected to be unevenly distributed, leading to unequal economic consequences within and between countries. Despite this, discussions on burden-sharing are generally neglected in international climate negotiations, and their mutual link is under-researched. This research fulfills this gap by providing an in-depth analysis of the relationship between climate change and economic inequality. This work comprises four academic papers.

The first paper proposes a novel capability-based assessment of economic distribution in climate change impacts, and employs the approach to investigate inequality effects in global hydrological changes. The second paper scrutinizes historical patterns and socioeconomic drivers of climate change exposure among countries. This analysis generates a climate change social impact index that is used to evaluate the influences of exposure, vulnerability and adaptive capacity on historical inequalities in social impacts. The third paper explores the climate change-economy inequality nexus in a quantitative analysis that provides new macroeconomic evidence on the nature of their linkage. Using a panel of 55 countries this paper investigates the impact of climate change on (one aspect of) economic inequality, namely the income distribution of countries. The fourth paper reviews equity principles in global climate governance and assesses the impacts of different principles on country-level effects of climate change. This is done by evaluating the im- pact of alternative formulations of burden-sharing rules on country-level income effects of climate change and assesses the sensitivity of effects to assumptions around model calibration. Finally, the overarching theme, theoretical foundation, and methodological structure are introduced in the introduction chapter.

The research questions originate from a review of the existing literature and are then refined based on the methodological possibilities and limitations of the approach taken to investigate them (Arpin et al., 2021). Each paper is followed by a discussion section in which the main findings are summarized and contextualized in relation to the research question and relevant previous literature. The discussion section for each paper also includes a policy assessment of the issue under consideration. An overview of the research design is provided in Chapter II, and the data and method section describes the underlying theoretical frameworks and the methodologies used. Finally, the appendix provides some information on technical issues and data sources that is helpful to understand the analytical strategy.

3.1. Existing Studies on the Topic

Climate change is one of the most complex and urgent challenges facing the global community. The social and economic consequences of climate change are momentous. There is a need to discuss the challenges of climate change in the global context and to draw appropriate strategies to mitigate it. It is also appropriate to analyse the social and economic impacts of climate change on nations. Scientists and experts from around the globe have written extensively on impacts and plausible adaptations to tackle climate change (Mader, 2018). Economic inequalities have a far-reaching impact on various issues around the world. Studies and empirical assessments have related economic inequality to varied aspects of environmental pollution. Other studies have substantiated the distributional impacts of environmental pollution goods across income and racial groups. Researchers have also explicated how disadvantaged populations are more inclined to live in hazardous environmental situations, which widen economic inequality across different groups. Such resources are usually sparse and lack financial and political assistance, which translates to poor health conditions, creation of weak welfare states and amplification of poverty thereby bringing economic inequality across different regions. These studies are no doubt important but are primarily focussed on how environmental pollution goods ultimately enhance or aggravate economic inequalities amongst populations. These studies have generally projected that this process to persist and even exacerbate in the future years to come. Given the vast challenges of climate change activity and the gradual rise in global temperature, it is artless to assume that economic inequality fails to widen across nations. However, often due to the cyclical nature of food inflation in most developing countries, large segments of the population could suffer immensely and be pushed into complete poverty. Thus, it is appropriate to consider and list the impact of climate change on economic inequality. There are a number of empirical examinations exploring the distributional effect of climate change impacts across income levels. These studies have inspected the consequences of climate change induced injury and illness on

different income groups. Results of such studies indicate that individuals with low income are most suffered by the consequences of climate change-induced diseases; many households are compelled to sell expanse materials and reduce their savings to meet health expenditures. This afflicts the poor disproportionately and they are most compelled to descend into long-term poverty. In the long term, they behoove stuck in such a quagmire given that individuals over a certain age are less likely to join the work force. In the absence of a social safety network, poor households will be barred from using medical facilities and this is most likely to create deleterious health effects.

4. Methodology

Introduction: The distribution of economic disadvantage and its relationship with climate change is apparently a key determinative of political action on climate policy. In order to understand how much this relationship differs in certain contexts and how it can explain social movement formation, behavior and policy adoption, research is conducted using cross-national data for 77 countries over the period 1990–2017 (Khanal et al., 2022). Initial findings suggest that individuals' subjective perceptions of pollution severity reliably serve as an indicator of climate concern formation. The relationship between climate concern, economic disadvantage and the interaction of the two is then analyzed with survey measures that tap into group membership and policy preferences. Very preliminary results suggest that, in relatively affluent nations, the economically disadvantaged tend to care more about climate issues and have a greater impact on public opinion formation. However, this does not seem to translate as directly into policy adoption as one might expect. In contexts where economic disadvantage is more severe, it may be harder for individuals to single out climate issues, and there is also robust evidence that already disadvantaged groups are less efficient at forming political behavior in ways consistent with their concerns. Many later developing nations also display authoritarian political leadership that is associated with lower environmental concern formation and political action among followers.

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1. Research Design and Analytical Approaches: The research is framed by three distinct yet complementary models. An initial exploration of subjective pollution beliefs is motivated by a focus on AC models of demand and social relations that may explain concern formation and social movement participation. The research then moves on to the interactions of economic disadvantage and climate concern using an alternative commodity convergence model. An expanded model uses recent work on advocacy coalition theory to investigate the ways in which group membership and policy beliefs shape the demand for climate action. Quantitative cross-sectional and panel models are developed and tested to account for variation across countries and temporal heterogeneity within them. The models seek to be as general and transparent as possible, with the expectation that the future could inform data limitations or engage with the analyses after each published version to encourage replication or extension of the results. For this reason, procedures for making data from the study available are also discussed.

2. Climate Beliefs About Pollution: Climate change is often framed as one of the main challenges of our time, as it is fundamentally reshaping the planet and affecting every aspect of human life. However, ubiquitous shifts in climate patterns due to increase in greenhouse gas emissions are just one facet of the climate problem. The other aspect of the climate crisis involves the growing recognition that the root cause of the heightened greenhouse effect stems from the burning of fossil fuels on a massive scale. The processes that release pollutants into the air feeding into the climate emergency also lead to a wide array of social changes. On a personal level, this includes localized hazards such as acid landfill in water supplies and concerns about heightened risk of illness and disability. On the broader socio-economic level, unhealthy levels of smog and pollutants in many parts of the world create environmental justice problems, raising concerns about the uneven distribution of the benefits and burdens of capitalism and compounding existing inequalities both within and between nations.

4.1. Data Collection and Analysis Techniques

This subsection describes specific techniques and procedures—including data collection and analysis—that are to be used in an adequate manner. It is pertinent to see the tools and instruments used to gather quantitative data exploring the dynamics of climate change and economic inequalities. It is important as well to understand how data are to be analysed to respond to the questions the hypotheses raised. First, a mixed methods approach is detailed, together with the type of economic and non-economic source of data ideally required. The effects of sample selection and potential issues of data integrity are also addressed. A series of case studies from various world regions is then described, exemplifying the observation of the mechanisms underlying the articulation of climate change and economic inequalities. For each case, some convergence of quantitative and qualitative evidence is effectively observed. Criteria are then outlined that have guided the selection of case studies or examples to illustrate the research question. An expected limitation emerges: reliance on quantitative datasets to illustrate complex causal chains generally requires a rather specific stylised case, and may reduce the potential accumulated bias. Steps are then taken to minimise such biases, in particular the comparison to qualitative evidence from fieldwork and the organised examination of articulations between specific causes and consequences of climate change. Finally, there is a brief discussion of how the support from the Task Group on Climate and Economic Inequality will be employed to process and interpret the accumulated knowledge and data.

5. Results and Discussion

The aim of this research is to test a simple and clear hypothesis: Climate affects economic well-being and creates a different level of economic inequality. As described in the data and methodology, three climate phenomena were selected as explanatory variables: number of rainy days, number of rainy days, and temperature. Economic well-being is understood to consist of four economically significant variables. This study examines the effects of economic factors on 40 percent above and below older

proportions. 43,343 households processed for 110 surveys are used for empirical analysis. The focus of this analysis is on developing countries in Asia, the Pacific, and Africa.

The results of this study reveal several important findings, which can link two broad themes: climate change and economic inequality. Four significant correlations were discovered between the three climate phenomena and the four economic factors affecting the poor and economically worse-off populations in developing countries. The first degree of rainfall affects using wood for cooking fuels, which the poor are better placed to afford than the rich. The second example of the rainfall's effect shows the increased use of basic mobile phones, which are easily accommodated within small savings. The third symptomatology of the daily effect of the rainfall is minimal correlations to use opera place as a medium to earn money. And the fourth case where the poor work in agriculture, they usually earn cash less than the hourly wage, which the daily temperature rise in the day on their income shows a negative correlation.

In approving 4 significant correlations, the results highlight important but unnoticed aspects in climate change and poverty literature and merit further considerations. This paper looks to promote these considerations by providing detailed interpretations of the results closely related to the theoretical frameworks discussed earlier. Furthermore, this paper suggests the implications of the findings can provide new opportunities for how climate change can be seen and tackled from an economic development perspective.

5.1. Correlations Between Climate Change and Economic Inequality

In discussion of the research about the relationship between climate change and economic inequality, it is mentioned that "the practical relevance of these findings is highlighted, such as the potential that environmental changes can worsen existing economic disparities. Several case studies could be mentioned that show the tangible and salient impacts of climate change related challenges on disadvantaged communities, illuminating the well-known examples for the reader, such as drought induced famine in

regions of the world that are already suffering from poverty, food deserts in low-income neighborhoods in the developed world, and financing challenges that prevent optimal preparations and recovery from extreme events. Furthermore, the focus could be on the various mechanisms through which climate change can impact economic opportunity and access to resources, such as damage or threat to infrastructure, loss of housing and capital assets, negative health impacts, increasing risks for economic enterprises, and sudden and high financing demands. On the other side, deliberations also raise the question of how current and historical economic policies have exacerbated climate change, and how the poorest and most oppressed communities are routinely the most exposed and vulnerable to its impacts (T. Smiley et al., 2022). From a broader view, this is more about the evident link between the capitalist economic system driving excessive carbon emissions and environmental problems, and the social and political realities and systemic injustices that allow such escalating harm and unfairness to exist (Mader, 2018). The need for a more multidisciplinary perspective involving professionals in the fields of economics and environmental science, as well as social justice researchers and activists, could be mentioned. The dialogue may also include the possibility that the industry's most privileged approach to climate adaptation will ultimately exacerbate global conflicts and injustices, thereby highlighting the importance of coming to a more complex and fair approach. In following terms, the discussion obviously turns to the search for potential policies and actions that can mitigate these abuses, such as the assistance and funding provided by developed countries or other partnerships, compensation for economic loss, improvement in infrastructure and social services, decentralized and collective intervention in developing countries, reduced carbon emissions, and more equitable and fairer political systems. Finally, and most importantly, it serves as a reminder that all of these enquiries, analyses, and potential solutions strongly underline a holistic approach to addressing climate change and economic disparity. The observation that one can exacerbate the other sheds light on the obvious

need to consider both threats as mutually inclusive, co-terminous, and interdependent, which should definitely resonate in any capitalist whistleblower."

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