The Macroeconomic Impact of Climate Change on the Stability of the Financial System

Growing number of academic literatures have theoretically and empirically contributed on the relationship between climate change and finance (Batten et al., 2016; Scott et al., 2017, Dafermos, Nikolaidi and Galanis, 2018). Recent data from Intergovernmental Panel on Climate Change (IPCC) shows that there is continuous increase of greenhouse gasses (GHG) in the atmosphere due to the high carbon dioxide (CO2) emissions from countries around the world (Ciais et al., 2013). Literatures from (Prudential Regulation Authority, 2015; Batten, S., Sowerbutts, R. & Tanaka, M., 2016 and Dietz) have also argued with evidence that human induced climate shocks such floods, fire and storms does not only impacts human survival as traditionally established always but it does also threatens the financial stability of countries. Why are countries still very reluctant to cut down their emissions, to limit the global average temperature to well below 2 degrees Celsius (3.6 degrees Fahrenheit) as agreed in the Paris Agreement. The continuous growing evidence of financial risks being posed by climate change to the financial system has led to central banks like that Bank of England who has the responsibility of maintaining monetary and financial stability, to start researching into the consequences of climate change and low-carbon transitions in the financial sector (Campiglio et al., 2018).

Despite the plethora of research on the relationship between climate change and finance and their impacts on the financial stability of a country. Most of the existing literatures (Carbon Tracker Initiative, 2011; Johnson, 2012; Battiston et al., 2017; Stolbova et al., 2018; Trinks et al., 2018) have attributed the risks pose by climate change as ‘Transitional Risks’. According to (Campiglio et al., 2018) the reason why countries are finding it difficult to transition their economies into low-carbon is because reducing climate shocks will create other risks of its own. Two risks have been align with climate change, namely physical risks and transitional risks. Physical risks emanate from weather related activities such as heat waves, floods and droughts which results in damaging of properties and subsequently nterrupts supply chains globally. They have negative impacts and can also lead to reduced productivity in human labour, physical assets and agriculture which often highly likely results in huge financial losses in various economies (O’Neill et al, 2017; Deryugina and Hsiang, 2014).

However, to avoid the physical risk and its threat of financial instability, a transition to a low-carbon economy is inevitably necessary which also leads us to the second risk of transitional risk. A transition risks takes place during the shift to climate change mitigation policies like the introduction of new technologies such as renewal energy, to replace higher emission fossils fuels (coal, natural gas and oil) energy can create huge uncertainties of economic dislocation which can eventually cause more harm than the good it was meant to be (Schankerman & Pakes 1986; Gambardella et al. 2008). For example, adhering to the proposed 2 °C temperature threshold, will lead to a large untapped high Co2 emission natural resource reserves like oil, gas and coal having to remain in the ground. This
will pose huge financial liabilities for countries and companies that own such resources and other significant losses in the economy. Not only that, but also a drop-in value of their physical assets and unemployment (Meinshausen, M. et al., 2009; McGlade, C. & Ekins, P., 2015). This will result in the redistribution of trillions of dollars of investments (Bank of England, 2017) with investors of these stocks subjected to ‘carbon risk’ and a possible deluge effects throughout the financial system of countries.

The depth of understanding of the financial effects of climate risk is still at initial stages, as evidence from national geographic reports also proves that despite the continuous efforts by governments in making climate change their number one political agenda, with 196 countries being signatories of the 2015 Paris agreement global carbon emissions raised from 1.7% in 2017 to 2.7% in 2018, with a further estimate predicting 2019 to have the highest rate of increase on record. The aim of this research is to examine the impact of climate change on the financial stability of the economies of countries across the world and the role of financial markets and financial institutions in addressing it, and to make recommendations on how countries can transition to a low-carbon economy to address the current climate crisis. This will be achieved using the Macro level data of the world bank and Eurostats data of selected countries across the world such as high emission countries like China and United States who account for 40% of the world’s emission, the United Kingdom which has reduced its emissions by 44% between 1990 to 2018 and other selected countries such the EU, Indian, Russia, Japan, Saudi Arabia, Canada, South Korea, Brazil, South Africa and Ghana.

This project will shed lights and provide several important outcomes by outlining pragmatic measures and solutions to economic managers, financial markets and financial institutions on how to stabilize their finances in the mist of current climatic crisis. Firstly, most central banks around the world will see the need and be able to fully align their monetary policy tools with environmental sustainability goals instead of on interest rates. Secondly it will provide evidence and prove to governments and corporations how climate change decreases their profitability and destablizes their financial positions, this will lead to increase in debt defaults and systemic bank losses. Thirdly, the evidence provided on reduced profitability cum increasing climate crisis causes physical damages, which can affect investors confidence in countries and businesses with poor environmental practices. Fourthly, it will establish a clear understanding of how climate change mitigation practices of organizations can enhance financial performance. Fifth, the researcher and Kaetozena Compunet Limited will also benefit from the sales of their environmentally friendly products and also set up consultancy services to advice financial institutions and corporate business on how good environmental practices would not only enhance their financial performance but attract investors and access to credits from all over the world. Finally, it will also add to the reputation of Bournemouth University for sponsoring such a research of high global impact. Importantly, part of it can be used or cited as evidence by future REFs in 2025.

ACADEMIC IMPACT

This proposed research will contribute immensely towards climate change and finance academic literature. It will provide evidence for the first time on how the roles of the financial market and financial institutions can address the impact of climate change on the financial stability of a country by analysing the effects of climatic shocks on the financial sector. Not only that it will also contribute to the growing list of academic literature of environmental management which becomes a solution to the climate crisis when treated as an opportunity but not a constraint. This line of literature provides evidence that with the implementation of the right policies, incentives and skills to boost eco and climate friendly businesses such as renewable energy, sustainable transportation and energy efficiency, will not only address the global environmental crisis but also create millions of new jobs in those
countries.

Finally, it will also add to the list of literature in environmental finance. The UNDP Environment and Energy Group has labelled climate change as “the greatest market failure the world has seen”. This is because despite the growing list of researches and huge investments being injected in various areas such as advertisement, polices and regulations, climate change seems to be increasing the more. This paper aims not to repeat the cycle of just another academic paper on climate change but to produce practical, solution-based evidence that governments and heads of corporations can implement to achieve considerable results. This will also feed into universities for further research. The outcome of the research is expecting to be published in academic journals like the Banking and Finance, UNDP Environmental Finance Services or Review of Finance.

SOCIETAL IMPACT

The Project's aim is to achieve global country level impact of climate change on the financial stability of the economy, and the roles the governments, financial markets and financial institution are playing to address it. It also examines the consequences associated with those countries's transition to low-carbon economy, to mitigate the rising climatic crisis. The project will do this by addressing the research questions of ‘can green investment foster low-energy production and technologies’ and ‘how and when does it pay to be green’ in relation to carbon emissions and climate change mitigation, to provide empirical pragmatic evidence whether it truly pays to mitigate climate change.

The Fourth Assessment Report of the Inter-governmental Panel on Climate Change (IPCC) published in 2007 stated that climate crisis, example is the current bush fires across Australia, will increase in the future and the governments and corporations are not tackling it effectively as they should. This study will pile up the pressure on government to establish firm policies and regulations which will drive businesses for accurate climate risk disclosures of their operations, which would help financial regulators and central banks to access their exposure and impact they will have on the financial system. Not only that it will also help central banks to assess climatic risks of their own asset portfolios, and help investors understand acceptable green investments and its benefits when they invest in it. It will also create the need for researchers to develop prompt and pragmatic useful methodologies for appraising climate-related crisis and their impact on the economy of countries.

DEVELOPMENT OPPORTUNITIES

The research will develop the researcher in: (a) quantitative and qualitative methods of empirical data collection and examination (b) planning and implementing a research project (c) Sampling principles (d) Presentation and data analysis skills including use of complex econometric methodologies like progressive panel data techniques and methods of statistical analysis (e) Disclosing of research findings, including academic writing and the preparation of manuscripts for publications and PhD Dissertation (f) Collaborative and interpersonal skills, including presentations of research findings. This will help the student gain adequate experience by working as a member of a research team. Student will be trained in different areas by the research supervisory team made available by the BU postgraduate training opportunities.

SUPERVISORY TEAM

| First Supervisor | Dr Ishmael Tingbani |
**Additional Supervisors**

| Dr Nikolaos Papanikolaou |

**Recent publications by supervisors relevant to this project**


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**INFORMAL ENQUIRIES**

Please contact the lead supervisor on the following email for informal enquiries: itingbani@bournemouth.ac.uk

**ELIGIBILITY CRITERIA**

The BU PhD Studentships are open to UK, EU and International students.

Candidates for a PhD Studentship should demonstrate outstanding qualities and be motivated to complete a PhD in 4 years and must demonstrate:

- outstanding academic potential as measured normally by either a 1st class honours degree (or equivalent Grade Point Average (GPA) or a Master’s degree with distinction or equivalent
- an IELTS (Academic) score of 6.5 minimum (with a minimum 6.0 in each component, or equivalent) for candidates for whom English is not their first language and this must be evidenced at point of application.

**ADDITIONAL ELIGIBILITY CRITERIA**

Knowledge of panel data econometrics is essential.

**HOW TO APPLY**
Please complete the online application form by 27th April, 2020.

Further information on the application process can be found at: www.bournemouth.ac.uk/studentships