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Foreign Direct Investment and Climate Change

How climate change is shaping foreign direct investment flows

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Abstract

Through the early 2000s, development economists begun to shine a light on the importance of FDI in promoting economic development, improving access to international markets, and sharing technology and know-how to increase innovation. Most countries now have a government body committed to attracting investment into their economy and much literature has examined the factors that attract or reduce inbound foreign direct investment flows. The existing discourse on the factors that promote greater direct investment have, for the most part, not viewed climate as a critical independent variable worthy of inclusion. However, climate change is increasingly being factored into firms' investment behaviour including the location of overseas subsidiaries. This research hopes to build on the recent attention being paid to the relationship between global FDI flows and climate change. It uses a generalised least squares static model and a generalised method of moments dynamic model to assess the changes in FDI inflows per country between 2011-2019 based on a recipient country's exposure and vulnerability to climate change. This study is the first to make a distinction between exposure and vulnerability to climate risks when examining the impact on FDI. By doing so, it hopes to shed light on whether adapting to the increasing physical impacts of climate change can help countries mitigate the economic consequences of these climate risks. As a significant contributor to economic development and innovation, understanding how climate factors promote or reduce FDI inflows will contribute to the wider discourse on climate, trade and development.

Key Words

Climate change, foreign direct investment, natural disasters, environmental vulnerability, carbon leakage

Research Questions

This study addresses the following research questions:

- How does a country's climate risk exposure and climate risk vulnerability impact on inward FDI?
- How do these impacts differ between developing, emerging and developed economies?

Overview

Foreign direct investment (FDI) can increase employment, productivity, and innovation in the host country, with foreign ownership of firms correlated with introducing new innovations and improved processes (Tuhin 2016; Borensztein De Gregorio & Lee 1998). FDI helps finance the gap between government savings and investment, accelerating national income growth (Makin & Chai 2018). FDI is also critical to achieving the United Nation's Sustainable Development Goals (SDGs) and improving climate change adaptation and mitigation targets (UNCTAD 2021). While FDI may be a critical factor in helping to mitigate and adapt to the impacts of human induced climate change, conversely climate change may be impacting on how firms make decisions about their international investments. Anthropomorphic (human induced) climate change is increasing the severity and frequency of extreme weather events and increasing global average temperatures which is making environmental and climate factors more volatile. The climato-economic theory argues that people have cultural adaptations to both the climate of their surrounding environment as well as to the economic resources available within a given location, and that these cultural adaptations shape the behaviour of people and organizations (Budde-Sung & Peacock 2019).

Previous literature related to FDI and the environment has focused on externalities and FDI, such as the extent to which regulation on carbon emissions might increase costs to a firm and therefore make the location a less attractive destination (Cole 2004; Stern 2004; Nguyen *et al* 2021; Omri *et al* 2014). There has also been mention of the positive externalities of inbound FDI such as investigating whether foreign firms have better environmental performances than indigenous firms (King & Shaver 2001) and how foreign firms can spread cleaner environmental technologies in recipient countries (Zarsky & Havens 1999). More recently the literature on physical climate risk has looked at the financial impact of climate change on firm performance, cost of capital, and asset value or price in general (Bernstein *et al* 2018); (Addoum *et al* 2021); (Kling *et al* 2021) & (Huang *et al* 2018) but little attention has been paid to physical climate risks and FDI with even less attention paid to climate vulnerability and FDI.

This research contributes to the existing discourse by taking a multinational approach, looking at all countries that have sufficient data available to analyse. Instead of looking at the number of natural disaster events or the changes in temperatures, this research includes both climate risk exposure and climate risk vulnerability variables. This study is the first to make a distinction between exposure and vulnerability to climate risks when examining the impact on FDI. By doing so, it hopes to shed light on whether adapting to the increasing physical impacts of climate change can help countries mitigate the economic consequences of these climate risks. It also incorporates climate vulnerability as a variable to assess whether policies to mitigate exposure to climate risks can help mitigate losses of FDI if climate risk exposure is found to decrease FDI inflows. The existing literature has only begun to really delve into this topic and more research will help explore how climate change interacts with the complexities of firm behaviour and consequently FDI flows.

This is also one of the first studies to look specifically at greenfield and M&A investment rather than World Bank FDI indicators. Ashraf, Doytch and Uctum (2020) is the only other known study that looked specifically at greenfield investment and the environment. This study provides a more recent examination of the relationship between climate change and FDI, examining the time period of 2011-2019.

Methodology outline

This study tested the significance of a host country's climate related exposure and vulnerability on GFDI and M&A activity over time using panel data from 108 countries for the nine-year period between 2011-2019. This study employs a panel Generalised Least Squares estimator and a Panel Generalised Method of Moments (GMM) Generalised Least Squares estimator. This study runs the models on the full sample of 108 countries and then breaks the model into 4 sub-groups based on countries' economic development classification – developed; emerging & developing; developing; and emerging. The grouping of developing and emerging reflects the developed versus developing classicisation used in traditional trade and investment studies. However, with the accelerated development of many economies, grouping developing and emerging economies together may be masking distinct characteristics about each sub-group.

Preliminary results

Overall, the results of both models find statistically significant negative correlations between climate vulnerability and inbound FDI. This suggests that a higher vulnerability to climate risks decreases inbound greenfield and M&A into a host country. This was found to be statistically significant in the overall sample group, but more-so in developed economies. Conversely, vulnerability had a positive correlation with developing countries' inbound FDI that was not statistically significant.

The results for the developed countries sub-group are significant and have implications for FDI promotion. The results indicate that Investment promotion agencies (IPAs) in developed countries should monitor climate/environmental vulnerability and exposure metrics more closely and consider incorporating them into their promotional strategies.