Climate Change, Analyst Forecasts, and Market Behavior

1.What are the research questions?

This study focuses on the question whether sell-side equity analysts successfully incorporate the impact of global climate change on firm performance in their earnings forecasts.

2. Why are the research questions interesting?

The relationship between climate change and firm performance is not obvious. Not all analysts are likely to see the impact of climate change on firm performance. Therefore, it's unclear so far how and to what degree this will impact the analyst forecasts.

3. What is the paper's contribution?

This study contributes to the literature that examines how climate change affects financial outcomes. Previous studies find unusually warm climate negatively affects firm earnings, while this study finds that the impact of abnormally climate on the earnings of firms is heterogeneous, the impact is greater for the firms with greater sensitivities to temperature increases.

The study also expands the literature that examines the factors that affect analyst forecasts. Previous papers researched the effect of depression, limited attention and extreme negative events on analyst forecasts, this study establishes that large increases in temperature can affect analyst forecasts and accuracy.

4. What hypotheses are tested in the paper? list them explicitly.

H1: Analysts located in areas where firms exhibit greater sensitivity to climate changes would be more aware to large temperature changes.

H2: Treated analysts are more likely to issue relatively less optimistic forecasts following periods of abnormally warm temperatures, as firm earnings could be adversely affected.

H3: Abnormally warmer climate can influence the accuracy of affected analysts, treated analysts would become more accurate following the temperature events.

H4a: Forecasts made by analysts located in high-TS states that are predominantly Democrat are lower and more accurate than the states that are predominantly Republican.

H4b: The increased accuracy of treated analysts is driven by their superior comprehension of climate-related risks for firms.

5.Do these hypotheses follow from and answer the research questions?

Yes.

6. Do these hypotheses follow from theory or are they otherwise adequately developed? Please explain the logic of the hypotheses (use visualization if possible).

The development of these hypotheses is motivated by the recent evidence which suggests that abnormally hot and cold climates have differential effects on individuals' awareness about

climate change, and builds upon the accounting and finance literature that examines how climate changes affect financial markets and the economy.

7. Sample: comment on the appropriateness of the sample selection procedures.

This study obtains data from Authoritative agency and follows the analyst literature and impose several restrictions on our sample to filter for potential entry errors and mitigate the influence of outliers.

8. Dependent and independent variables: comment on the appropriateness of variable definition and measurement (focus on the key dependent and independent variables).

The main independent variable *HTSA* is a dummy variable indicate whether an analyst is located in a high-TS state and issues a forecast during the event. The setting of the time span of event impact and the definition of the event is subjective. The study defines the abnormal climate change event as the temperature of a certain month is greater (less) than the sample average temperature plus (minus) 1.96 times of the standard deviation of the temperature. But this kind of change in temperature may be caused by natural seasonal changes.

The main dependent variable *Relative optimism* depends on the consensus forecast which is the average value of forecasts issued by untreated analysts, but average value may be greatly affected by outliers if there are few observations in the untreated group.

9. Regression/prediction model specification: comment on the appropriateness of the regression/prediction model specification.

The study uses the difference-in-differences (DID) method which can better capture the net effect of the extreme changes in temperature and the model includes the analyst, firm and time (year-quarter) fixed effects which well controlled the individual and time differences.

10. What difficulties arise in drawing inferences from the empirical work?

There is an endogeneity problem---it is possible that prior to the events, treated analysts already exhibit a greater propensity to issue lower forecasts. Therefore, we need to control the treated and control analysts have the similar trend in their forecasts before the events happen.

11. Describe at least one publishable and feasible extension of this research.

In the further research, it would be interesting to examine whether corporate managers, investors, or other market participants are also aware of climate-related risks.

The measurement method of abnormal climate change can be improved. The temperature fluctuation amplitude may be considered as a better indicator.