A quantity-based approach to constructing climate risk hedge portfolios

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1 Research questions

Can quantity-based method for constructing portfolios hedge against emerging risks, especially climate risks? How does this new method identify which stocks should be held in a hedge portfolio?

2 Why are the research questions interesting?

• The physical effects of climate change and regulatory efforts to mitigate carbon emissions significantly disrupt economic activity.
• Demand for financial instruments that hedge these risks is also increasing among retail and institutional investors.
• Currently, only a few tools are designed to directly hedge against various climate risks.
• Existing various methods for constructing investment portfolios typically rely on long-term time series data.

3 What is the paper's contribution?

(1) **Literature on studying the interaction between climate change and asset markets**
Previous: Climate risk affects prices in equity real estate markets and municipal bond markets:

- High-pollution firms are valued at a discount;
- Retail investors expect high-ESG firms to under-perform the market;
- Stocks of carbon-intensive firms underperform during periods of abnormally warm weather.

This: Quantity-based approach to forming hedge portfolios builds on prior work of individuals form beliefs based on experiences, and how such beliefs translate into actions.

(2) **Literature using quantity and holdings data in asset pricing**
Previous: Ability of quantity information to predict assets is limited, and its application scope is also narrow.
This: Showing quantity info can be useful for predicting price movements in response to aggregate shocks.

4 What hypotheses are tested in the paper?

H1: Quantity-based method can effectively identify climate risk hedging assets.
H2: Quantity based methods outperform traditional methods in hedging emerging risks.

a) Do these hypotheses follow from and answer the research questions?
• Both of these hypothesis are crucial hypos based on the research question in the paper.
Do these hypotheses follow from theory or are they otherwise adequately developed?
• Changes in beliefs about climate risk affects trading behavior, captured by observing changes in holdings;
• Empirical results show effectiveness of this methods in constructing climate risk hedging portfolios.

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

Sample may not represent all investors, especially those who do not publicly report their holdings.

6 Dependent and independent variables: comment on the appropriateness.

Non-linear relationship between implementation of climate risk and trading response of fund managers.

7 Regression model specification: comment on the appropriateness.

The model assumes that the error terms are independent and identically distributed, but in practice, the behavior of fund managers may exhibit clustering effects, such as fund managers in the same region may have similar responses to extreme climate events.

8 What difficulties arise in drawing inferences from the empirical work?

Text-based disclosure analysis may be subjective, and different analysis methods lead to different results.

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

- Can other types of extreme weather events also serve as shocks to investors' climate risk beliefs?
- How do these extreme weather events affect fund managers' trading behavior and asset allocation?
- Can considering these extreme weather events improve performance of climate risk hedging portfolios?