


Discussion
Attention to Global Warming

Wing Wah Tham

UNSW School of Banking and Finance

Trumpology



Donald J. Trump 
@realDonaldTrump



In the East, it could be the COLDEST New Year's Eve on record. Perhaps we could use a little bit of that good old Global Warming that our Country, but not other countries, was going to pay TRILLIONS OF DOLLARS to protect against. Bundle up!

10:01 AM - Dec 29, 2017

 203K  197K people are talking about this



Evidences of Climate Change



Evidences of Climate Change



Climate Change and Environmental Economics

1. Idealistic response to dramatic climate change is to preserve the environment at **all costs**
 2. **Trade-off between economic benefits and environmental costs**
 - ⇒ Need to price the environmental damage and evaluate the cost and benefit of each corporate and governmental policies
 - Coal-burning factories and alleviation from poverty trap through education and employment
- ⇒ Serious risks for corporations and capital markets
- Changes in business risks
 - Regulatory uncertainty
 - Production cost uncertainty
 - But also provide opportunities for innovation

This Paper

Measures people's reaction to abnormally high local temperature via google search for keywords "climate change" and show that movements of "climate-sensitive" stock prices coincide with abnormal temperature

I Like This Paper

1. Contribute to debate among environmental economists by measuring the cost of a particular environmental damage across different firms
 - Will have important corporate and regulatory policy implications on environmental-related decisions
2. Providing potential evidence of experiential learning and decision making behavior in financial markets
3. Compile a comprehensive new data set on weather conditions mapping this to cities around the world, facilitating future weather-related research
 - Accepted for the call for Climate Finance Research Proposals, in-principle acceptance in RFS - Well Deserved!!

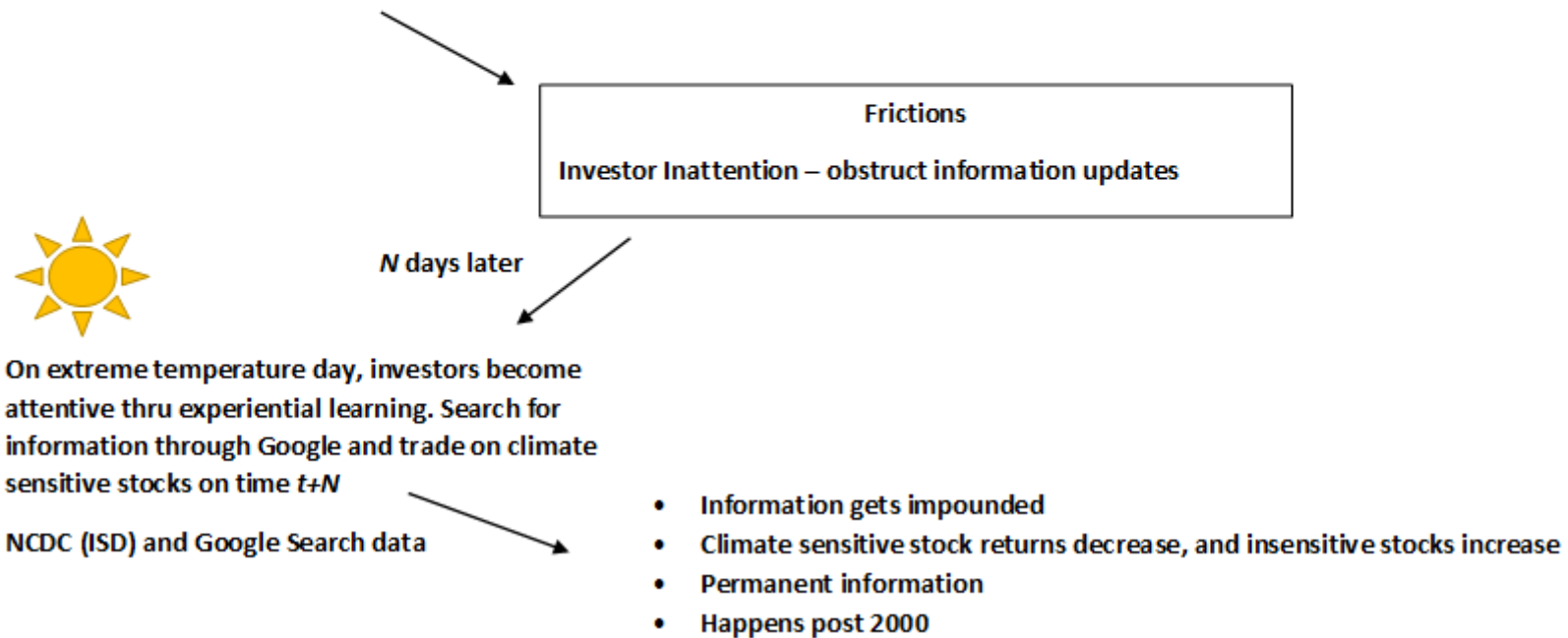
Short Summary

Information Arrival (Public or Private), Climate Change @ time t

Systematic Risk - Bansal, Kiku and Ochoa (2016 a,b)

Production Cost, i.e. Paris Agreement

Constrained institutional investors - Hong & Kacperczyk, 2009



Clarify the Economic Mechanism

- This paper suggests that **investors are distracted all the time** but are reminded by extreme weather to monitor market information
 - Subtle difference from literature, where investors are attentive most of the time but are distracted occasionally
- Why are investors distracted all the time given that the monitoring cost is so low?
- What is the nature of the information environment here? Public versus Private information and information production
- Which type of investors in your mind is distracted? Sophisticated, retail or both?

Sophisticated Investors?

- Sophisticated investors are professionals and they do not Google search “global warming” whenever there is an abnormal temperature day
- Media reports on climate change issues via newspapers, TV, Billboards, radio,...every single day
- Information is public and the cost of monitoring is so low (google search)
- It takes some convincing to believe that distracted investors are professionals

Retail Investors?

- Google search and psychological response to weather evidence suggests that individual investors are more likely to be the distracted investors
- **Interesting and unexpected insights** - Individual investors are **not noise traders** and engage in information production but they are often distracted!

Some unresolved questions

- What kind of private information do individual investors have?
- If they do not have private information, why aren't the sophisticated investors updating public news into asset prices?

Suggestions

- Clarify with a simple model or improve exposition of economic mechanism
- Narrow down to US for investors' sophistication and better quality data such as Ancerno (or any other institutional investors) to check institutional investors' distraction over cities like Amman, Lagos, Skopje...
- Do more microanalysis by studying price adjustments to climate news rather than long-short returns of climate sensitive stocks
- Combine it with daily Google Trend SVI data
- Use constituents of related ETFs for classifications of high emission firms

Human's Thermoreceptors

- Do you know what is the difference in abnormal temperature between Singapore and Hong Kong now or this month?
- Can you feel the difference in temperature between yesterday and today?

What does it take to gather your attention?

- From distribution of abnormal temperature Table II, P10=-2.83, median=0.247, P90=3.45 degree Fahrenheit \Rightarrow 1-1.5 degree Celsius from expected temperature about 36°C
- From academic findings in somatosensory and thermal dynamics, human's thermoreceptors is very sensitive when temperature changes very rapidly, 0.1°C/s and skin is in contact with object.
- If the temperature changes very slowly, for example at a rate of less than 0.5°C per minute, then a person can be unaware of a 4 – 5°C change in temperature.

- Relate to literature in somatosensory literature in determining the threshold (99.5%) for what the paper determines as abnormal temperature (use tail of abnormal temp distribution)

Suggestions

- Refine the abnormal weather measure
- NCDC climate data comes at daily level
- Use daily extreme rather than monthly average
- Use duration of successive extremes.
- Why not use information about extreme snow, wind days?
- Help readers overcome the question of how investors can detect $3^{\circ}C$ difference across cities, as it will earn them about 6% abnormal returns a year

Panel B: Equal-weighted EMC returns

EW(%)	EMC		EMC_Raw		EMISSION	CLEAN
	(1)	(2)	(3)	(4)	(5)	(6)
Ab_Temp	-0.058 (-3.18)		-0.067 (-2.65)			
Ab_Temp Quintile 2		-0.150 (-1.19)		-0.286 (-1.65)	-0.039 (-0.48)	0.112 (1.90)
Ab_Temp Quintile 3		-0.136 (-0.96)		-0.302 (-1.54)	-0.043 (-0.43)	0.093 (1.67)
Ab_Temp Quintile 4		-0.134 (-1.18)		-0.203 (-1.59)	-0.085 (-1.39)	0.049 (0.85)
Ab_Temp Quintile 5		-0.479 (-4.01)		-0.597 (-3.72)	-0.283 (-3.29)	0.195 (3.97)
EMC (%)	<i>t + 1 to t + 3</i>		<i>t + 1 to t + 6</i>			
	(1)	(2)	(3)	(4)		
Ab_Temp	-0.049 (-1.43)				-0.014 (-0.47)	
Ab_Temp Quintile 2			-0.281 (-1.26)			-0.067 (-0.24)
Ab_Temp Quintile 3			-0.192 (-1.45)			-0.049 (-0.21)
Ab_Temp Quintile 4			-0.430 (-2.67)			-0.117 (-0.46)
Ab_Temp Quintile 5			-0.365 (-1.55)			-0.092 (-0.39)

A More Plausible Story? - Reverse Causality

- Media may report newsworthy market developments and relate it to “juicy” explanation for readership
- \Rightarrow Stock prices movements + abnormal temperature \Rightarrow Google search by retail investors?
- Is this more plausible than retail investors are information producers and able to drive non-transient price changes?
- Do they google search for tickers of high Emission stocks with “global warming” ?
- Why contemporaneous and predictive regressions have same num. obs.?

Few other Quibbles

- Clarify how you deal with missing SVI data of Amman, Belgrade, Bogota, Dhaka, Lagos, Lima, Muscat, Skopje, Karachi, Kiev among many? Shanghai is dropped but has SVI data.
- Are low emission firms associated with growth firms?
- Use risk adjusted returns over size adjusted returns. See Sohnke and Grinblatt or Fama-French Global factors
- How are your results related to underpricing for firms with litigation risk?

Conclusion

- Important questions with an interesting story.
- Wish I could have told such a story and have written such a paper
- Congrats to a fantastic publication!!