Research Statement

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Oct. 2017

There is nothing certain but the uncertain. Before 2008, people did not expect Greece would enter an endless government-debt crisis as a developed country. Before September this year, Houston residents did not expect the destructive hurricane Harvey could leave them homeless. In a variety of important economic aspects, our future is increasingly uncertain, and understanding the way people respond to this defines my research fields. I examine bargaining strategies under uncertainty about the future available surplus, and examine behavior in social dilemmas where people can collectively insure against a common future loss. Using laboratory and field experiments, I provide empirical evidence informing extant economic theories, and as necessary also develop extensions to these theories. My research not only explores micro-foundations of decision making, but also yields implications for policy makers, especially those involved in discussions over the impact of climate change.

Bargaining processes that involve uncertainty, and often delays prior to agreement, are commonly seen, for example, in the formation of coalition governments in parliamentary democracies or sovereign debt renegotiations. One important bargaining theory developed by Merlo and Wilson (1995) (hereafter MW) highlights the roles that uncertainties over the size of the surplus and bargaining power of the involved parties play in this environment, and draws out its implications for delay in agreement and economic efficiency. Despite its use and influence in empirical studies, there has not yet appeared any direct test of the model's micro foundations. My dissertation fills this gap by providing the first controlled laboratory test of the MW model. The design of four MW two-stage games in either the gain or loss domain not only speaks to the model's equilibrium predictions, but also enables detection of framing effects and gender differences in stochastic bargaining behavior.

The main findings are that although a considerable number of agreements are equal splits in the stage with a larger surplus, when the stationary subgame perfect equilibrium exists in such stages, the proposer is significantly more likely to make an unequal offer favoring himself (in the direction of the equilibrium). Framing has an effect in that proposers are significantly more likely to select a proposal with more to himself when bargaining over losses compared to gains. Moreover, this framing effect is much stronger on male than female proposers: gender differences in equal splits only exist in the loss domain, with male proposers significantly less likely to propose equality.

My chapter on bargaining under surplus uncertainty makes both methodological and substantive contributions. Methodologically, it implements a novel stochastic bargaining design. Substantively, the finding that proposers behave more according to the equilibrium predictions in the loss domain suggests that empirically, the MW model provides powerful approach to modeling bargaining over losses, such as may occur in debt renegotiations. The finding that males bargain more aggressively than females in the loss domain may help to explain part of the persistent gender wage gap if males perceive wage negotiation as bargaining over losses, which can happen when overconfident male candidates expect to be offered more than their perspective wage.

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A related chapter in my dissertation examines gender differences in ultimatum bargaining using participants from both US and Chinese universities. There is little evidence of gender differences in proposer or responder decisions among either location's participants. Key findings reported by Solnick (2001), particularly that more is demanded from female proposers and less is offered to female responders, are not replicated. It is difficult to pin-down the precise reasons for non-replication, because our subject pools are different from her's in many ways. What these current findings demonstrate is that gender differences in bargaining seem to be highly context-specific and lack a universal or constant pattern.

Despite the absence of gender effects, there exist differences between countries. In particular, US proposers are more generous and US responders are more demanding than Chinese participants. Cultural differences may have played a role in this, while at the same time differences in the composition of the two subject pools might also underlie the effects (e.g., in China more of the participants were engineering majors, and in the US more were majoring in humanities). This paper has been accepted subject to minor revisions at *Journal of the Economic Science Association*.

A second major strand of my research stems from a potentially important risk to economic prosperity - climate change. The increasing frequency of extreme weather events raise the risk of future catastrophic losses that may eliminate all gains realized over the last several decades, especially to agriculture. My project focuses on how governments can help to combat the detrimental impacts of climate change to small farmers without creating increased risk-seeking behavior among the impacted constituencies. Based on a model of threshold public goods games, this study uses laboratory experiments to test the predictions under different types of subsidies, where the experiments are framed as making decisions over renovating irrigation channels in an effort to avoid the risk of loss from drought. In the baseline, there is no government subsidy. In another two treatments, the local government either provides a lump-sum subsidy or a one-to-one matching subsidy. Whether the risk of loss is low or high is another dimension of the design.

The laboratory data show that no matter whether the risk of loss is low or high, government subsidies increase the likelihood that irrigation channels will be constructed. Further, a lump-sum subsidy appears to be more effective than matching grants. Of course, data from a laboratory always leave open the question of external validity, and I have already begun to address this critical concern using a field experiment.

I have designed an approach to take the experiment into the field using rural farmer participants who have various levels of exposure to drought. The first location is the farming villages in the Yellow River Basin in rural Henan, China. Grant applications to NSF and the National Natural Science Foundation of China (NSFC) are being prepared. This research promises to yield a better understanding of how government policies can be designed to affect people's behavior in social dilemmas in general, and climate change in particular.

Over the next years, I intend to continue my research on the impact of future uncertainty on economic decision making. In addition to my research on climate change, I will extend my investigations into other events that may have extremely detrimental impact on economic outcomes, such as regional or global conflict, or natural disasters such as earthquakes. I expect to use the theory tools I have developed during my graduate work, while also drawing from the catastrophe literature (e.g. Weitzman, 2009; Michel-Kerjan, 2010). Following the strategy I have used with during my dissertation work, I will develop new theories, or take advantage of existing

theories, in order to formulate hypotheses that can be tested in lab and field environments. This work will contribute to both basic knowledge of economic decision making in times of great uncertainty over the future, while also providing policy advices to all levels of governments. I am confident that this research program will find support from both public and private agencies, including the NSF and the Sage foundation. I intend to submit applications to each of these during the Spring of 2018.

References

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