

Research Statement  
Renato Molina

Overview

My main interests relate to topics at the intersection between institutional settings, game theory, and sustainability. My current research explores the role of common property regimes in the economic impact of natural disasters, the use of conservation strategies to control for competitive incentives in the commons, and the effectiveness of international treaties managing transboundary natural resources. In addition, I am also involved in collaborative efforts studying political incentives for conservation; the use of marine resources for food security; and the relationship between environmental variability, risk preferences, and institutional regimes. The core of my work, however, relies on using economic insight to inform responsible policymaking for environmental and natural resources management.

Natural Disasters

My job market paper, “Why Natural Disasters are a Disaster in Common Property Resources,” examines how competitive incentives in the extraction of a common resource contribute to increasing the impacts of natural disasters. To credibly perform this analysis, I frame the problem both theoretically and empirically. In the first stage, I generalize a model of resource extraction and capital investment to accommodate for differences in the property right regime. From this model, two clear predictions arise: i) common property resources provide incentives that result in more capital exposed to natural disasters; and ii) after a natural disaster occurs, common property resources encourage investment pulses that increase short-term costs of the disaster. In the second stage, I test these predictions empirically by studying the effects of a tsunami in Chilean small-scale fisheries. I construct several datasets that allow me to explore production behavior for the entire sector from 2003 to 2013. Exploiting the circumstance that the Chilean regulation has two different property right regimes for the same subset of resources, I can trace investment behavior across regimes. Moreover, by using geo-spatial data of the physical characteristics of the tsunami recorded by weather monitoring stations, I create a measure of impact with geographical variation across organizations and regimes.

After controlling for all available observables, I find that firms operating under the common property regime invest on average 15 percent more than those operating under exclusive access. These differences extend dramatically after the tsunami. Everything else equal, firms operating in the common regime invest more than double their counterparts in capital that provides them with competitive advantage such as engine power. In the Chilean context, these responses contributed to increase the cost of the disaster by augmenting both the nominal and real cost of capital. In addition, a significant fraction of these investment strategies was financed with public funds, which allows the problem to be beholden to political interests that encourage even more socially undesirable recovery profiles. As these systems recover and converge to their pre-disaster equilibriums, they also go back to the same exposure levels, and the problem is effectively perpetuated.

I intent to extend this line of research in two main directions. The first, focuses on the exploration of the political economy behind common property settings and natural disasters. I am currently working on the development of theoretical insights regarding political incentives and their effect in recovery efficiency. The second relates to further empirical exploration of natural disasters and their impact in common property settings. For example, Hurricane Irma recently left a veil of massive destruction in the Caribbean island of Barbuda. The island, however, maintains common property regimes for its natural resources, as well as for land allocation. With a collaborator from UC Santa Barbara, I recently submitted a grant proposal to study the socio-economic effects of the prevailing institutional regimes in the island before and after the disaster, as well as the implications for other island nations working under similar conditions.

### Institutional Regimes for Transboundary Resources

My other two chapters relate to the study of international institutions for commonly shared resources. The first chapter explores the theoretical feasibility of using conservation strategies for the management of transboundary resources. By solving a dynamic non-cooperative game between sovereign nations, Professor Christopher Costello and I show that under a wide range of scenarios first-best outcomes could be fully replicated by adequate spatial conservation. Moreover, second-best outcomes achieved by bilateral negotiations are also replicated by proper conservation design, even if countries behave non-cooperatively. These insights are not only novel, but also highly relevant in the recent wave of conservation measures worldwide, especially in marine environments. Consider for example the recently announced effort to establish a binational marine protected area by Argentina and Chile; our model provides decision makers with methods to optimally design this area so economic and conservation objectives can be effectively considered when designing the marine protected area. Furthermore, our model provides a framework to expand the analysis to an increasing number of countries, a feature that becomes highly relevant as conservation efforts gain momentum in the international policy agenda.

The third chapter is a collaborative effort to identify competitive incentives, and the effectiveness of treaties for transboundary resources. I frame this problem theoretically and derive the structure of incentives for aggressive extraction by individual nations. We then proceed to construct a data set that allows to trace the overlap of more than one thousand marine fishery resources and nations' EEZs globally. Our preliminary results demonstrate the role of competitive incentives across virtually all groups of resources and geographic regions. More importantly, however, is the fact that the same incentives do not prevail in the high seas. These measurements shed light on two important issues, the importance of competitive incentives at the national level, and how even partial steps for collaborative management can lead to remarkable improvements in terms of economic performance and sustainability.

### Ongoing projects

Besides my dissertation work, I am also involved in several collaborative efforts with other economists, biologists, ecologists, and engineers. In particular, I am currently involved in projects that address political incentives for conservation, the use of mariculture to tackle food security issues, the overlap between conservation interests and spatial rights-based management regimes, and the relationship between environmental variability, sustainability and institutional regimes. Lastly but not least, I continue to be involved in a long-term effort to conduct field experiments with fishers in Chile, with the objective of identifying how risk preferences evolve over time as a function of target species and institutional regimes.

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