Research Statement

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I am a microeconomic theorist. My interests are broad, but the questions I find most exciting are related to innovation, law, and organizations. I take applications seriously. I find value in more abstract constructions when they help explain the underlying forces driving the phenomena of interest.

In this statement, I summarize my current research agenda, introducing an element that is common to most of my projects, then presenting my projects according to the literatures that they contribute to. I also discuss potential research avenues and future plans.

Information shapes decision-making in different ways. When designing laws, patent rights, and other institutions, information can be used to affect the incentives of participants *directly*, by making outcomes depend on the information held by them. For example, patent rights can be granted as a function of information acquired; liability can, in principle, depend on the information that the injurer had before the damage occurred (how safe the injurer thought their actions were). In my research, I explore how this use of information shapes the way research and development is conducted, the legal and economic institutions that prevail, and the way firms are organized.

Innovation and R&D

In my job-market paper, "*The Timing of Complementary Innovations*," I study the dynamic allocation of costly and scarce resources across different R&D projects. The projects' feasibility and difficulty are uncertain, but this uncertainty is gradually resolved as the agents work on the projects. I analyze the efficient allocation of resources for complementary projects and characterize the situations where it is optimal to work on the projects in sequence and simultaneously. I exploit a simplifying feature of working with complements, that makes the problem of dynamic allocation equivalent to a static problem. I compare the efficient solution to the equilibrium allocation with many agents in the context of patent races.

In an ongoing project, "*Optimal Publication Bias*," I analyze the trade-off between doing basic research and applied developments. Basic scientific discoveries are valuable because they guide subsequent applied developments

which, in turn, improve our quality of life. A positive scientific result (that proves that a project is feasible) is valuable because it guides resources toward the project. A negative result (that proves that a project is unfeasible) is valuable because it guides resources away from that project.

In some contexts, learning about the feasibility of a project before development is efficient. When development is competitive, firms might jump to the development stage too early. A planner that wants to restore efficiency can do so by rewarding discoveries about the feasibility of projects directly. I analyze how these discoveries should be optimally rewarded to restore efficiency, and show that restoring efficiency involves asymmetric payoffs: positive results are rewarded more handsomely than negative results.

Tort Law and Liability Rules

Liability rules cause agents to internalize the potential consequences of their actions. With unlimited liability, making agents liable for all damages perfectly aligns agent incentives with social welfare. Bounded liability induces agents not only to take socially inefficient actions but also to acquire less information than what is socially optimal.

In joint work with Bruno Strulovici, we consider the design of liability schemes that induce the agent to acquire information about the riskiness of their actions. The setting is as follows: An agent decides whether to launch a risky product. The agent has private information about the risks associated with the product and can acquire information before making a decision. If the product is launched, it may create a harm. The designer decides how much to make the agent liable when damage occurs, subject to a liability ceiling. We characterize the liability rule that maximizes social welfare when the agent has private information, liability is capped, and the regulator can penalize the agent only when damage occurs.

A more general question is whether the ability to contract ex ante improves efficiency. We examine this question in a companion paper. A principal-agent model with private information and moral hazard in which the intervention of the principal is only triggered by certain outcomes. We introduce a property of social choice functions *identifiability*, and show that a function satisfying this property is implementable if and only if is implementable by a tariff, i.e., a transfer that depends only on the realized outcome.

Mechanisms Based on Aggregate Outcomes

In joint work with Quitzé Valenzuela-Stookey, we look at the possibility of using aggregate data to inform a decision when the data itself might me affected by the expectations of such decision. The problem of decision making in the presence of these feedback effects appears in a wide range of economic environments.

In our model, a principal commits to a decision rule (a map from the market outcomes to the set of actions). There is a payoff relevant state that is unknown to the principal, and we require the agents' belief about the principal's action to be consistent with the principal's announced decision rule, given the realized equilibrium price. Rather than studying the choice of decision rules, we focus on the induced mappings from states to actions and prices and ask which action and price functions are implementable. This approach greatly simplifies the study of optimal policies.

Looking Forward

I am interested in pursuing several research avenues related to my job-market paper. One in particular looks at resources within organizations. Organizations are sometimes composed of different units working toward a common goal. What is the optimal information scheme for a manager who oversees different units? In particular, what information should be shared about the progress to date or the outcomes achieved in each of the units? In which contexts is transparency optimal?