Synopsis of Dissertation

Aditi Sengupta

My primary research interests are in the areas of Industrial Organization, Microeconomics, and Environmental Economics. My PhD dissertation broadly studies the effect of environmental policies on technological change and market outcomes.

The first chapter of my dissertation titled "*Competitive Investment in Clean Technology and Uninformed Green Consumers*" focuses on investment in clean technology in a market with strategic competition between firms and when some consumers are environmentally conscious (willing to pay more for the cleaner product) but uninformed about the actual production process of the firms. Though investment is publicly observed, the outcome of investment is uncertain and observed only by the firm. Firms may signal their private information about the realized technological outcome of investment through product prices. The incentive to invest is generally higher compared to the full information benchmark, so that requiring mandatory disclosure or public dissemination of information may *discourage* investment in clean technology. I study the effect of changes in consumer consciousness and environmental regulation on the incentive to invest in clean technology. Competition has a positive effect (relative to monopoly) on the incentive to invest, and this incentive is generally increasing in the level of regulation as well as consciousness. However, high consciousness and/or regulation may lead to multiple equilibrium with zero and high investment outcomes where the latter is Pareto dominant.

The second chapter of my dissertation titled "*Investment in Cleaner Technology and Signaling Distortions in a Market with Green Consumers*" (revise and resubmit from the *Journal of Environmental Economics and Management*) studies the monopoly version of the framework in the first chapter (outlined above), but with a richer demand structure. It focuses on the effect of increasing regulation on the nature of signaling and the incentive to invest in clean technology in the presence of high market power. I find that while a clean firm charges higher price when regulation is weak, this may not hold when regulation is sufficiently stringent. With weak regulation, a monopolist has *no incentive* to invest in the development of a potentially less damaging technology even though consumers are willing to pay more for the clean product; but this incentive is positive if regulation is strong enough. With weak regulation, the incentive of the firm to directly disclose its environmental performance (say, through eco-labeling) rather than signal it through price is increasing in the level of regulation, but the opposite holds when regulation is sufficiently stringent.

In the third chapter of my dissertation, "*Environmental Regulation and Industry Dynamics*" (published in *The B.E. Journal of Economic Analysis & Policy* 10(1), 2010), I examine how increasing stringency of environmental regulation affects investment in technological change and how that, in turn, affects intertemporal changes in size distribution, entry, and exit of firms. In a dynamic deterministic perfectly competitive industry subject to exogenous environmental regulation, *ex ante* identical firms decide whether to invest in improvement of the compliance technology. The market equilibrating process generates differences in investment, inter-firm heterogeneity and shake-out (exit of firms). Firms that exit earlier, invest less, are smaller, and have higher cost of compliance. The main contribution of the paper is to provide conditions under which more stringent regulation generates an equilibrium path that is characterized by higher shake-out of firms and higher investment in compliance technology. Apart from relating regulation and industry dynamics, the paper provides some justification for the ambiguous empirical effect of environmental regulation on market structure.