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Research Statement

I specialize in the empirical evaluation of the theories of industrial organization. In particular, my focus lies in the use of patent statistics to answer questions on the economics of innovation. To answer these, I collect novel data, extract relevant and new information from texts, and employ advanced empirical techniques to draw policy-relevant conclusions. My current work studies the patenting activity of small entities. Small innovating entities are responsible for about 30 percent of patents in the United States. Yet, their incentives to innovate and the costs they face are not fully understood and characterized. In my job market paper, I contribute to bridging this gap by studying the patents by small entities around a significant change in patenting rule in the United States, the America Invents Act (AIA) of 2011.

My job market paper asks the following question: "Did small entities increase their patenting activity post-AIA relative to large entities pre-AIA?" The AIA harmonizes the patent system of the United States with the rest of the world by changing its patenting rules from First-to-Invent (FTI) to First-Inventor-to-file (FITF). FTI provided room for flexibility on the date of filing by allowing an inventor to invent first and file later. But, this came at a cost of litigation and uncertainty in validity of patents. The AIA aims to reduce uncertainties and make the patenting process less ambiguous by granting patent rights to the first filer of an invention as opposed to the first inventor. But, this also means that inventors will now have to rush to the patent office. This cost adds to the already constrained budget of small entities. Evidence on the AIA's effect on small entities was inconclusive, partly due to limitations in the data and partly because a lot of questions involving small entities remain unexplored. Because new and established entities have different patenting strategies, it is possible that changing the incentives to patent could have differential effects based on the types of entities and the invention categories in which they specialize. My paper tries to disentangle these and provides evidence of the effects of the AIA on patenting activity by small entities.

Using patent-level information and augmenting it with applicant-level characteristics, the paper indicates a drop in the quantity of patents filed by small entities relative to larger entities, measured by the number of patents filed before and after the AIA. However, the average quality of inventions for small entities relative to large entities do not change significantly after the AIA's enactment, measured by citations adjusted by technology and year. But, among the entities that operate in areas prone to litigation, I observe a further drop in the number of patents filed and their citations as compared to other entities with lower litigation exposure. Among small entities, I do observe the same and additionally a pronounced effect, i.e. the exposed small entities reduce their number of patents post-AIA, as compared to entities unexposed to litigation, and the drop in patenting is greater as compared to a large entity exposed to litigation. This indicates that the AIA may have triggered a "defensive stance", especially for the entities operating in areas that are historically involved in a higher rate of patent lawsuits.

My job market paper studies the total effect of the AIA on small entities. The AIA is complex legislation that can be used to highlight heterogeneous effects on different entities and can also be used as a potential candidate in answering a few previously unsolved questions that provide direction for further improvement of the innovation landscape of the United States. Therefore, as a part of my future agenda, I aim to devote a substantial amount of my time to answer the unsolved questions that arose during my Ph.D., but could not be answered. One example question follows:

In my JMP, I estimate the total effect of AIA on the small entities which masks heterogeneity within small entities. But, the AIA created a sub-group of small entities, called "micro entities", who would receive a 75 percent discount on all filing fees. To qualify as a micro-entity, an applicant has to have four or lower number of patents prior to the enactment of the AIA, and have an income of not more than three times the median household income. As a result, these entities would mostly be first-time individual patent filers. First-time patentees at the USPTO were on the decline since 2006, and their number dropped from 10.17 percent in 2006 to 7.74 in 2011. However, since 2012, they have steadily increased and are now at 19.2 percent, which is the highest after the passage of the Bayh-Dole Act of 1980. First-time patentees are known to bring revolutionary inventions to signal their inventive capabilities to the market. Using the Patentsview disambiguated inventors' database, I plan to follow the inventors before and after implementation of the AIA, and the definition of micro entity of four or lower number of patents allows me to use a discontinuity design to study the patenting behavior of independent inventors.

In previous work, I have used patent-level data scraped from the Indian Patent Office's published patents and augmented it with patent-level statistics from Derwent World Patent Index (DWPI) database to answer questions on the pendency of patent applications by foreign applicants relative to domestic, which is a longstanding concern among researchers interested in questions on the National Treatment clause of the Trade Related Intellectual Property Rights (TRIPS). The Indian Patent documents are rich in information but are less studied in the literature. We do not know how inventions from and to developing countries are adopted elsewhere, and patents from India can be the best candidate to answer such questions. As a part of my future agenda, I would also like to develop an Indian patent-level database.