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*Estimating the Effects of
Pharmaceutical
Innovations on Patient's
Employment Outcomes*

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Dedicated to my parents

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ABSTRACT

In recent years, advances in medical technologies have been a major source of the increasing cost of health care in the United States. Increasingly, the society and policy makers must confront hard choices in allocating limited resources among competing uses, making it increasingly urgent to evaluate the benefits and costs of new technologies. Current approaches to evaluating the benefits of medical technologies very often ignore employment-related benefits, thus undervaluing interventions that improve functioning and productivity among the population of working age.

This dissertation reviews evidence of employment-related benefits from effective treatment. I set up a microeconomic model of a patient's decision regarding labor supply when treatment technology improves. The model shows that observed incremental labor supply is a result not only of more effective treatment, but of other factors such as eligibility for employment-based or public health insurance, both of which are tied to one's employment status. Using the insights provided by the model, I critique three approaches in the existing literature.

I conduct two empirical studies exemplifying econometric and statistical strategies to consistently estimate the employment effects of treatment. First, an analysis of the effect of the Highly Active Antiretroviral Therapy on HIV patients' employment transitions uses an instrumental variable approach. This approach identifies the effect of a particular therapy when patients self-select into the treatment according to unobserved severity, personal behavioral traits, and other factors. Second, an analysis of the effect of recent improvements in pharmacological therapies for hypertension (relative to therapies used in the 1970's) provides an example in which panel data and instrumental variables are not available. The "difference-in-difference" approach

employed aims to difference out the unobserved selection factors in hypertension treatment. I discuss pitfalls of the approach and implications for data collection to inform future research in this area.

Finally, to translate estimated employment effects into employment-related benefits, one has to be aware of possible labor market adjustments associated with the change and base the analysis on labor market equilibria.