

## **Jisong Wu**

*Curriculum Vitae, December 2008*

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### **Graduate Education**

Vanderbilt University, Department of Economics  
Ph.D. candidate in Economics  
Expected completion date: May 2009

Dissertation Title: “Distributions of Treatment Effects in Switching Regimes Models: Partial Identification, Confidence Sets, and an Application”

#### References

Professor Yanqin Fan (Primary Advisor): yanqin.fan@vanderbilt.edu, (615) 322–3796  
Professor Tong Li: tong.li@vanderbilt.edu, (615) 322–3582  
Professor Ronald Masulis: ronald.masulis@owen.vanderbilt.edu, (615) 322–3687  
Professor Bryan Shepherd: bryan.shepherd@vanderbilt.edu, (615) 322-2001

### **Undergraduate Education**

University of Science & Technology of China, Special Class for the Gifted Young  
B.E. in Electronic Engineering and Information Science, 1999

### **Research and Teaching Fields**

Primary Field: Econometrics  
Secondary Fields: Industrial Organization, Corporate Finance

### **Awards and Memberships**

National Mathematical Olympiad, Twice First Prize Winner, China, 1993 and 1994  
University Fellowship and Teaching Assistantship, 2004-2008  
Kirk Dornbush Summer Research Grant, 2006  
Member of Harpeth View Toastmasters Club, 2007-Present  
Competent Toastmaster (CTM) Award, Toastmaster International, 2008  
Household International Research Support, Vanderbilt University, 2008  
Graduate Student Travel Grant for Presentation of Research, Vanderbilt University, 2008

### **Teaching Experience**

Vanderbilt University, Teaching Assistant, Graduate Courses  
Statistical Analysis: 2005, 2006, 2007  
Econometrics: 2006, 2007, 2008  
Econometric Theory: 2006, 2007  
Nonparametric Statistics: 2007

Vanderbilt University, Teaching Assistant, Undergraduate Courses  
Corporate Finance: 2004, 2005  
Financial Management: 2004

## Working Papers and Current Research

“Partial Identification of the Distribution of Treatment Effects in Switching Regimes Models and its Confidence Sets” (with Yanqin Fan) [[Job Market Paper](#)]. Revised and resubmitted to the [Review of Economic Studies](#).

**[Abstract]** In this paper, we establish sharp bounds on the joint distribution of potential outcomes and the distribution of the treatment effects in parametric switching regimes models with generalized hyperbolic errors and in the semiparametric switching regimes models of Heckman (1990). Our results for parametric switching regimes models with generalized hyperbolic errors extend existing results for Gaussian switching regimes models and our results for semiparametric switching regimes models supplement the point identification results of Heckman (1990). Compared with the corresponding sharp bounds when selection is random, we observe that self selection tightens the bounds on the joint distribution of the potential outcomes and the distribution of treatment effects. These bounds depend on the identified model parameters only and can be easily estimated once the identified model parameters are estimated. We demonstrate the feasibility of inference on the distribution of treatment effects by constructing an asymptotically uniformly valid and non-conservative confidence set in a semiparametric switching regimes model.

“Simple Estimators for Treatment Parameters in Switching Regimes Models with Normal Mean-Variance Mixture Copulas”, manuscript.

**[Abstract]** In this paper, I propose a general class of switching regimes models in which the joint distribution of each outcome error and the selection error follows a bivariate distribution with a normal mean-variance mixture copula. It includes the commonly used switching regimes models with Gaussian errors and Student’s  $t$  errors. In addition, it allows the outcome errors and the selection error to have asymmetric, multi-modal, and fat-tailed distributions. We develop simple two-step estimators of various average treatment effect parameters in our model and establish their asymptotic properties. An extensive simulation study indicates that the biases of estimators of the average treatment effect and the treatment effect for the treated are mostly affected by the presence of asymmetry in the distributions of the outcome errors, a finding that has not been reported in the existing literature.

“Re-Assessing the Long-Run Performance of Firms Following Debt and Equity Offerings”, in progress.

**[Abstract]** In this paper, I study the impact on a firm’s long-run performance of private information in its decision to issue debt or offer equity. Ritter (1991), Loughran (1993), Loughran and Ritter (1995), Spiess and Affleck-Graves (1995, 1999) find that firms making debt or equity issuings significantly underperform non-issuing firms for up to three to five years. Their findings are based on matching techniques which assume the private information is irrelevant to the outcomes. We challenge this assumption by adopting the switching regimes model (SRM) in Fan and Wu (2007) to evaluate the long-run performance of firms following debt or equity offerings and document the impact of private information in issuing firms on their long-run performance. In addition to evaluating the average treatment effects, we are also interested in the distribution of performance difference of a firm with and without issuing (treatment effect) based on its propensity score of issuing. The econometric methodologies developed in Fan and Wu (2007) for bounding the distribution of treatment effects are used in the paper to partially identify the probability of a firm under-performing in the long run with observable covariates, producing results that have not been reported in the literature.

“Sensitivity Analyses Comparing Outcomes Only Existing in a Subset Elected Post-Randomization via Copulas” (with Bryan Shepherd), in progress.

**[Abstract]** In this paper, we consider estimation, from a double-blind randomized HIV vaccine trial, of treatment effect on viral load after infection. A standard test that compares the distribution of viral load between the infected subgroups of vaccine and placebo recipients does not assess a causal effect of vaccine, because the comparison groups are selected after randomization. Instead of using a weighting function and a class of logistic selection bias models proposed by Gilbert, Bosch and Hudgens (2003) to address the selection issue, we adopt the switching regimes model (SRM) of Fan and Wu (2007) to evaluate the causal effect of vaccination on viral load of those who would be infected regardless of randomization assignment (always infected). We establish distribution bounds on viral load of those always infected via copula when the identification conditions in SRM are not met. We show that with covariates in the selection the distribution bounds can be tightened and eventually reach identification when identification conditions are satisfied through covariates. By using a Gaussian copula, we also show how a sensitivity analysis can be conducted in our model that quantifies how the causal effect of vaccination varies with the presumed magnitude of selection bias when the identification conditions in our SRM are not met.

“A Simple Regression Framework to Address Selection Issues in Switching Regimes Models”, in progress.

**[Abstract]** In this paper, I consider a regression specification for unobserved covariates in the selection equation in switching regimes models. In this regression framework, I only specify the functional form of the means of outcomes conditional on observable and unobservable covariates and the distribution of the selection error. This specification allows linear and non-linear relationships between the unobserved covariates and the conditional means of outcomes. I develop simple two-step estimators of various parameters of interest in our models and establish their asymptotic properties. Monte-Carlo simulations are carried out to study their finite sample performance.

### **Other Research Experience**

Research Assistant for Professor Bryan Shepherd, 2008-2009  
Research Assistant for Professor Yanqin Fan, Summer 2008  
Research Assistant for Professor Ronald Masulis, Summer 2006  
Research Assistant for Professor David Parsley, Summer 2005 and 2006  
Research Assistant for Professor Chris Ahlin, Summer 2005

### **Professional Activities**

Referee for *Journal of Financial Econometrics*  
Paper Presentation at the Midwest Econometrics Conference, October 2008  
Paper Presentations at Vanderbilt University, April 2007 and April 2008

### **Computer Programming Skills**

Pascal, C/C++, Visual Basic, Matlab, Gauss, Stata, SAS