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Computational Economics

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Comprehensive Examinations Completed:

(Oral) Macroeconomics
(Oral) Econometrics
(Written) Macroeconomic and Microeconomic Theory

Dissertation Title:

Modeling, Measuring, and Understanding the Sources of Household Income Risk

Committee:

Professor Joseph G. Altonji
Professor Anthony A. Smith, Jr.
Professor Fabian Lange

Expected Completion Date:

May 2007

Degrees:

Ph.D., Economics, Yale University, May 2007 (expected)
M.Phil., Economics, Yale University, 2003

M.A., Economics, Yale University, 2002

B.A., Economics, Macalester College, 1997, *Summa Cum Laude*

Fellowships, Honors and Awards:

Yale University John F. Enders Award, 2003

Yale University Dissertation Fellowship, 2004

Yale University Graduate Fellowship, 2000-2004

Yale University Summer Fellowship, 2001 & 2002

Robert L. Bunting Prize in Economics, Macalester College, 1997

John M. Dozier Prize in Economics, Macalester College, 1997

De Witt Wallace Scholarship, Macalester College, 1994-1997

Phi Beta Kappa (in junior year), Macalester College, 1996

Teaching Experience:

Applied Econometrics, Professor J. G. Altonji, Yale University, Fall 2002 & 2003

Econometrics and Data Analysis, Professors J. Chao and Y. Whang, Yale University, Spring 2003 & 2004

Intermediate Macroeconomics, Professor A.A. Smith, Jr., Yale University, Spring 2005

Research Experience:

Research Assistant, Professor Joseph G. Altonji, Yale University, Summer 2003 & 2004, Spring & Fall 2006

Research Assistant, Professor Anthony A. Smith, Jr., Yale University, Summer 2006

Research Assistant, International Food Policy Research Institute (IFPRI), Washington D.C., 1998-1999

Economic Consultant, Ministry of Economic Development and Andean Development Corporation (CAF), La Paz, Bolivia, 1998

Economic Consultant, International Fund for Agricultural Development (IFAD), La Paz, Bolivia, 1998

Papers:

"Understanding Fluctuations in Labor Income: A Panel VAR Analysis", mimeo, Yale University, September 2004

"Modeling Earnings Dynamics" (with Joseph G. Altonji and Anthony A. Smith, Jr.), mimeo, Yale University, November 2006

"Household Welfare, Precautionary Saving, and Social Insurance under Multiple Sources of Risk", mimeo, Yale University, November 2006 [job market paper]

Research in Progress:

"Experience, Seniority, Job Mobility, and Wage Dynamics", with Joseph G. Altonji

"Household Income and Changes in Family Structure: Assessing the Risks", with Joseph G. Altonji

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References:

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Dissertation Abstract

My dissertation studies the sources of household income risk (such as disability, illness, unemployment, and wage shocks) and their effects on household precautionary saving behavior and economic welfare. There is a substantial literature in labor economics, macroeconomics, and public finance which estimates idiosyncratic risk in labor and family income. Very few papers, however, present a unified framework for studying the economic sources that underlie income uncertainties. Identifying these sources is important for understanding the risks faced by workers and families, the relative importance of different risks for households' economic well-being, and the actual and potential gains provided by private and social insurance.

Studying the sources of risk and quantifying their effects on household welfare is difficult for at least two reasons. First, households face a large number of risks which differ in their predictability, insurability, and relative importance over the lifecycle. Second, households can partially self-insure by adjusting their savings, labor supply, job-search effort, and timing of retirement. To preserve computational tractability of a model, one faces a trade-off between allowing for multiple sources of risk and accounting for a rich set of endogenous responses. I follow most previous studies by considering the case in which income is exogenous and households self-insure only by saving, but I advance the existing literature by allowing for a rich specification of uncertainty, where households face risks associated with disability, health, medical expenditures, unemployment, job changes, wages, hours, and family income.

The first two chapters of my dissertation deal with the estimation of the joint evolution of all variables driving and affecting income, allowing for a rich set of dynamic interactions. Estimation is difficult because of the presence of both discrete and continuous variables, state dependence in several equations, multiple sources of unobserved heterogeneity, and measurement error. The use of conventional maximum likelihood or method-of-moments approaches is impractical. Chapter I provides an initial examination of the data by estimating an extension of a VAR on the subset of continuous variables in the system, while Chapter II (joint with J. Altonji and A. Smith) addresses the estimation difficulties by applying generalized indirect inference techniques to estimation of the full multi-equation model.

The third chapter studies the implications of a related multi-equation model of income for household welfare and precautionary behavior in the context of a lifecycle consumption model. Specifically, I quantify the welfare value of insurance against each source of risk and measure the contribution of each source of uncertainty to the accumulation of precautionary savings. I find that although overall uncertainty is moderately important, the gains from insuring against individual sources of risk are small. Among these, the gains are largest from insuring against shocks to the wage and shocks to a persistent component of family income. These two shocks account for more than 60% of precautionary wealth. Gains from insuring disability and health risks are very small.

Chapter I: "Understanding Fluctuations in Labor Income: A Panel VAR Analysis"

The first chapter studies variation in labor income over time using an extended panel VAR in income, wage rates, work hours, and unemployment hours. The framework is used to explore the dynamic effects of unanticipated changes in all variables in the system, investigate their interactions, and assess their contribution to short-run and long-run income movements. The model is estimated on a sample of male household heads from the Panel Study of Income Dynamics (PSID). I find that income innovations not related to the other variables in the model, which capture mostly measurement error but also real factors such as bonuses and commissions, are very important in the short run. Most of the long-run variation in income, however, is due to innovations in the wage rate, which are strongly persistent. Innovations in unemployment explain a rather small fraction of income variance but have an important and very persistent level effect on income, which operates mostly through the wage rate.

Chapter II: "Modeling Earnings Dynamics" (joint with J. Altonji and A. Smith)

The second chapter builds and estimates a joint model of labor earnings, employment, job changes, wage rates, and work hours over a career. The model incorporates state and duration dependence in several variables, multiple-factor unobserved heterogeneity, job-specific error components in both wages and hours, and measurement error. We estimate the model on a highly unbalanced sample from the PSID using generalized indirect inference. The application of indirect inference to estimation of a large multi-equation model with continuous and discrete variables with a highly unbalanced panel is a significant contribution of the paper. We provide estimates of the dynamic response of wage rates, hours, and earnings to various shocks, and measure the relative contributions of the shocks to the variance of earnings in a given year and over a lifetime. We find that shocks associated with job changes make a large contribution to the variance of career earnings. These shocks operate through the job-specific error components in wages and hours. Unemployment shocks are also important and operate mostly through the wage rate. Unobserved heterogeneity also plays a significant role.

Chapter III: "Household Welfare, Precautionary Saving, and Social Insurance under Multiple Sources of Risk" [job market paper]

The third chapter studies the effects of a number of sources of risk on household welfare and precautionary saving. To that end I propose a lifecycle consumption model where households face risks associated with disability, health, medical expenditures, unemployment, job changes, wages, work hours, and family income. I use PSID data to estimate the parameters which govern the stochastic evolution of these variables and use the parameterized consumption model to: (i) quantify the welfare value of insurance against each source of risk and (ii) measure the contribution of each source of uncertainty to the accumulation of precautionary savings. I find that although overall uncertainty is moderately important, the gains from insuring against individual sources of risk are small. Among these, the gains are largest from insuring against shocks to the wage and shocks to a persistent component of family income. These two shocks account for more than 60% of precautionary wealth. Gains from fully insuring disability and health risks are very small.