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Curriculum Vitae Fall 2005

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Major Fields of Concentration

Macroeconomics, Public Economics, Game Theory, Mechanism Design

Education

<i>Degree</i>	<i>Field</i>	<i>Institution</i>	<i>Year</i>
Ph.D.	Economics	University of Minnesota (expected)	2006
M.A.	Economics	University of Minnesota	2003
B.S.	Economics	Wuhan University	2000
B.S.	Mathematics	Wuhan University	2000

Dissertation

Title: "Dynamic Contracting, Persistent Shocks and Optimal Taxation"
Dissertation Advisor(s): Professor V. V. Chari and Professor Larry E. Jones
Expected Completion: Summer 2006

References

Professor V. V. Chari	(612) 204-5518 chari@econ.umn.edu	Department of Economics University of Minnesota 1035 Heller Hall
Professor Larry E. Jones	(612) 624-4553 lej@econ.umn.edu	271 - 19 th Avenue South Minneapolis, MN 55455
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Dr. Christopher Phelan	(612) 204-5615 cjp@minneapolisfed.org	Research Department Federal Reserve Bank of Minneapolis 90 Hennepin Avenue South Minneapolis, MN 55408-0291

Honors and Awards

2003 Prescott Summer Fellowship, Department of Economics, University of Minnesota
2001-2002 Graduate School Fellowship, University of Minnesota

Teaching Experience

Fall 2004 *Teaching Assistant*, Department of Economics, University of Minnesota, Minneapolis, Minnesota. Led recitation sections for *Principles of Microeconomics*.
Summer 2004 *Math Refresher Course Instructor*, Department of Economics, University of Minnesota, Minneapolis, Minnesota. Instructor for math refresher course given to graduate students beginning the Ph.D. program during the Fall term.
2002-2003 *Teaching Assistant*, Department of Economics, University of Minnesota, Minneapolis, Minnesota. Led recitation sections for the graduate level Macroeconomics sequence.

Research Experience

2004 - present *Research Analyst*, Research Department, Federal Reserve Bank of Minneapolis, Minneapolis, Minnesota.
2003- present *Research Assistant*, Department of Economics, University of Minnesota, Minneapolis, Minnesota. Research Assistant to Professor V. V. Chari.

Papers

(Papers can be downloaded from <http://www.econ.umn.edu/~zhangyz/research.html>)

“Dynamic Contracting, Persistent Shocks and Optimal Taxation,” Federal Reserve Bank of Minneapolis Working Paper 640.

“Stability in Models with Aggregate and Idiosyncratic Shocks,” University of Minnesota, 2004.

“Stochastic Optimal Growth with a Non-Compact State Space,” Federal Reserve Bank of Minneapolis Working Paper 639.

Dissertation Abstract

Essay 1: “Dynamic Contracting, Persistent Shocks and Optimal Taxation” (Job Market Paper)

In this paper I develop continuous-time methods for solving dynamic principal-agent problems in which the agent’s privately observed productivity shocks are persistent over time. I characterize the optimal contract as the solution to a system of ordinary differential equations, and show that, under this contract, the agent’s utility converges to its lower bound—immiseration occurs. I also show that, unlike in environments with i.i.d. shocks, the principal would like to renegotiate with the agent when the agent’s productivity is low—it is not renegotiation-proof. I apply the theoretical methods I have developed and numerically solve this (Mirrleesian) dynamic taxation model. I find that it is optimal to allow a wedge between the marginal rate of transformation and the low-productivity agent’s marginal rate of substitution between consumption and leisure. This wedge is significantly higher than what is found in the i.i.d. case. Thus, using the i.i.d. assumption is not a good approximation quantitatively when there is persistence in productivity shocks.

Essay 2: “Stability in Models with Aggregate and Idiosyncratic Shocks”

This paper studies stability issues in dynamic economic models with both aggregate and idiosyncratic shocks. Typically this type of dynamic systems has a cross-section distribution in the state variable, which is an immense object for both theoretical study and numerical computation. By using the irreducible Markov chain theory and the

Euler equation technique proposed by Nishimura and Stachurski [*JET* 122 (2005)], I am able to establish the existence of an invariant distribution. I also obtain sufficient conditions under which the system converges to this invariant distribution globally.

Essay 3: “Stochastic Optimal Growth with a Non-Compact State Space”

This paper studies the stability of a stochastic optimal growth economy introduced by Brock and Mirman [*JET* 4 (1972)] by utilizing stochastic monotonicity in a dynamic system. The construction of two boundary distributions leads to a new method of studying systems with non-compact state space. The paper shows the existence of a unique invariant distribution. It also shows the equivalence between the stability and the uniqueness of the invariant distribution in this dynamic system.