HUIYU LI

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EDUCATION

Ph.D. in Economics, Stanford University,
      Expected Completion: June 2015
      DISSERTATION: "*Firm Dynamics, Financing and Aggregate Productivity*"

M.A. in Economics, University of Tokyo (Japan), 2008-2009
B.A. in Economics, University of Tokyo (Japan), 2003-2007
High school and primary school (grade 5-6) in Australia
Primary school grade 1-4 in China

CITIZENSHIP   Australia

DISSERTATION COMMITTEE

Prof. Peter Klenow (Co-primary)
Economics Department, Stanford University
(650) 725-8196
klenow@stanford.edu

Prof. Martin Schneider (Co-primary)
Economics Department, Stanford University
(650) 721-6320
schneidr@stanford.edu

Prof. Nick Bloom
Economics Department, Stanford University
(650) 725-7836
nbloom@stanford.edu

Prof. Takeo Hoshi
Freeman Spogli Institute for International Studies,
Stanford University
(650) 723-9744
tkohoshi@stanford.edu

RESEARCH AND TEACHING FIELDS

Primary field: Macroeconomics.
Secondary fields: Finance, Econometrics.

TEACHING EXPERIENCE

2011-12   Teaching Assistant for Prof. Manuel Amador, Martin Schneider, Stanford University, Graduate Core Macroeconomics Sequence.

2008-09   Teaching Assistant for Prof. Toni Braun, Julen Esteban-Pretel, Fumio Hayashi, University of Tokyo, Graduate Core Macroeconomics Sequence.

RELEVANT POSITIONS

2014   Research visitor, Federal Reserve Bank of Minneapolis
2013   Dissertation Internship, Federal Reserve Bank of St Louis
2011,2012   Research visitor, Federal Reserve Bank of Atlanta
2010-12   Research Assistant for Prof. Peter Klenow, Stanford University.
2008-09   Research Assistant for Prof. Toni Braun, Stanford University.

SCHOLARSHIPS, HONORS AND AWARDS

2014-15   Leonard W. Ely and Shirley R. Ely Graduate Student Fund Fellowship, Stanford SIEPR,
2013-14   Dissertation Fellow, IRiSS Stanford
2013-14   Japan Fund Dissertation Fellowship, FSI
2012-13   Shultz Graduate Student Fellowship in Economic Policy, SIEPR,
2012-13   Shorenstein Predoctoral Fellowship in Contemporary Asia
2009-10   Stanford Department Fellowship
2009   JSPS Research Fellowships for Young Scientists
2008   CEMANO-COE Distinguished TA Award for Core Graduate Macroeconomics II,
            The University of Tokyo
2007-09   Japanese Government Scholarship for Master Studies in Economics,
2007   Presidential Award, The University of Tokyo
2002-06   Japanese Government Scholarship for Undergraduate Studies in Economics
2001   Ministerial Award for Outstanding Performance in NSW High School Certificate
            Examination, Australia,
1997   High Distinction in the Australian Mathematics Competition, Special
            Achievement Award for the School's Best Standardized Score

CONFERENCE PRESENTATIONS

Stanford 7th Annual STAJE Conference, June 2014
SED, Seoul, June 2013
Initiative for Computational Economics, University of Chicago, 2012
7th Dynare Conference, Federal Reserve Bank of Atlanta, September 2011
17th Annual Conference on Computing in Economics and Finance, San Francisco, July 2011
10th World Congress of the Econometric Society, Shanghai, August 2010
Far East and South Asia Meeting of the Econometric Society, Tokyo, August 2009

PUBLICATIONS

**Li, Huiyu, "Policy Error Bounds for Strongly Concave Stochastic Dynamic Programming
with Non-interior Solutions", forthcoming, *Computational Economics*.**

This paper derives explicit error bounds for numerical policies of strongly concave stochastic dynamic
programming problems, without assuming the optimal policy is interior. We demonstrate the usefulness of
our error bound by using it to pinpoint the states at which the borrowing constraint binds in a widely used
income fluctuation problem with standard calibrations and a firm production problem with financial
constraints.

Li, Huiyu and John Stachurski, "<u>Solving the income fluctuation problem with unbounded rewards</u>" , *Journal of Economic Dynamics and Control*, 45, Aug 2014, 353-365.

This paper studies the income fluctuation problem without imposing bounds on utility, assets, income or consumption. We prove that the Coleman operator is a contraction mapping over the natural class of candidate consumption policies when endowed with a metric that evaluates consumption differences in terms of marginal utility. We show that this metric is complete, and that the fixed point of the operator coincides with the unique optimal policy. As a consequence, even in this unbounded setting, policy function iteration always converges to the optimal policy at a geometric rate.

Braun, Anton, Huiyu Li and John Stachurski, "<u>Generalized Look-Ahead Methods for Computing Stationary Densities</u>", *Mathematics of Operations Research*, 37(3), Aug 2012, 489-500.

The look-ahead estimator is used to compute densities associated with Markov processes via simulation. We study a framework that extends the look-ahead estimator to a broader range of applications. We provide a general asymptotic theory for the estimator, where both L_1 consistency and L_2 asymptotic normality are established. The L_2 asymptotic normality implies root-n convergence rates for L_2 deviation.

RESEARCH PAPERS

Leverage and Productivity (Job Market Paper)

Financial frictions can reduce aggregate productivity, in particular when firms with high productivity but low collateralizable assets cannot borrow against their current and future profits. This paper investigates the quantitative importance of this channel using a large panel of firms in Japan. The firms are young and unlisted, precisely the firms for which credit frictions may be most severe. In this data, I find that firm leverage and firm output-to-capital ratios rise with firm productivity, both over time in a firm and across firms of the same age and cohort. I use these facts in indirect inference to estimate a standard general equilibrium model where financial frictions arise from the partial pledgeability of profits and capital. In this model more financially constrained firms have higher output-to-capital ratios. The model matches the empirical pattern when firms can pledge half of their current profits and one-fifth of their collateralizable assets. Compared to the common assumption that firms can only borrow up to a constant fraction of their collateralizable assets, the aggregate productivity loss due to financing frictions is one-third smaller when current and future profits are pledgeable to the degree seen in Japan.

Entry Costs Rise with Development
with Albert Bollard and Peter Klenow, working paper 2014

Looking at manufacturing industries over time and across countries, the number of firms and establishments is closely tied to employment. Relative to employment, the number of businesses is at best weakly increasing in output per worker. In many models of firm dynamics, trade and growth, these facts imply that the cost of creating a new firm or plant increases sharply with productivity. This increase in entry costs can stem from rising cost of labor used in entry, as well as higher output costs of setting up a business to use more sophisticated technologies. How entry costs vary with development matters for welfare in many settings, such as in love of variety models and in span-of-control models. Our findings suggest that the welfare impact of productivity-enhancing policies is not significantly amplified through an increase in the number of firms or plants.

The Asymptotic Distribution of Estimators with Overlapping Simulation Draws
with Tim Armstrong, Ron Gallant and Han Hong, R & R, *Journal of Econometrics*

We study the asymptotic distribution of simulation estimators, where the same set of draws are used for all observations under general conditions that do not require the function used in the simulation to be smooth. We consider two cases: estimators that solve a system of equations involving simulated moments and estimators that maximize a simulated likelihood. Many simulation estimators used in empirical work involve both overlapping simulation draws and non-differentiable moment functions. Developing sampling theorems under these two conditions provides an important compliment to the existing results in the literature on the asymptotics of simulation estimators.

The Impact of Bank Failure and Resolution Procedures on Firms
with Satoshi Koibuchi, 2014

In this paper, we study the impact of bank failures and resolution procedures on small business enterprises (SME) during Japan's financial crisis in the late 1990s. We match a panel of over 0.25 million Japanese firms to their banks and estimate the impact of bank failures on firm survival, employment and production. We also use the variation in government resolution procedures to investigate how resolution procedures affect the disruption rate of bank-firm relationships, the timing of the disruption, and the subsequent performance of client firms (profitability; number of employees, etc.). Given the large sample of our data, we study the impact of the bank failure on aggregate employment and output.

Patent Protection Length and Firm Innovation
working paper 2014

In 2001, the Japan Patent Office shortened the length of patent examination deferment from 7 to 3 years. Consequently, the average number of days between application and examination request declined from 4 years before the reform to 2.5 years after the reform. As Japan patent law follows the first-to-file principle, this reform arguably shortened the effective patent protection length by 4 years. This paper investigates the impact of the reform on firm innovation. In particular, we study whether innovation with longer lag between creation and commercialization and innovation with more uncertain profitability were disproportionally reduced.

Why Did Aggregate Volatilities Decline in the US, UK, and Japan?
with Hikaru Saijo, working paper 2009

In the last two decades, the US, UK, and Japan all experienced substantial declines in output and inflation volatilities. A DSGE model is estimated via Bayesian methods to investigate the contribution of shocks to monetary policy, neutral technology, investment-specific technology, and energy price as well as changes in the monetary policy regime and structure of the economies to these declines. For the US and Japan, a drop in the volatility of neutral technology shocks produces the largest output and inflation volatility declines, while for the UK it is less volatile monetary policy shocks.

SKILLS

Speaking, reading and writing in English, Chinese and Japanese

Matlab, Stata, LaTex, R, Python, Unix