

University of Oslo
Department of Economics

Inequalities in the Labor Market

Ph.D. course 6 –14 August 2007

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and
Professor Per Krusell, Princeton University

1 Course Summary and Objectives

Summary: This topics course is motivated by the striking changes that have taken place in various dimensions of labor market outcomes in the U.S. and Europe in the past three decades. These changes can be summarized as follows: on the one hand, wage inequality increased dramatically in the U.S., together with a decline in the real wage of the bottom-earners of the wage distribution, and a reduced labor force attachment in large segments of the low-wage male population. On the other hand, in Europe the wage structure changed very little, but the unemployment rate rose steadily and the labor share of income fell significantly.

We will argue that technological change played a special role in shaping all these facts, particularly when interacted with various labor market institutions. We will give sound economic content to buzzwords like the "IT revolution" and the "productivity slowdown" and we will relate them to the transformations occurred in the labor markets.

This course sits at the boundary between labor economics and macroeconomics: from labor economics we will borrow the empirical tools needed to measure and illustrate the facts. From macroeconomics, we will borrow the equilibrium models and the theory to interpret the facts and draw policy and welfare implications.

Objectives: The aim of this set of lectures is threefold: 1) to describe in details the facts, 2) to learn a few theoretical models that are the current workhorses of the research in macro-labor and, 3) to use these models to help interpreting and accounting for the facts.

Preliminary Readings: The following three comprehensive surveys are useful readings to do during the course. They complement nicely the material taught in class and represent good sources for lots of additional references.

- Acemoglu Daron (2001): "Technical Change, Inequality and the Labor Market", *Journal of Economic Literature*, vol. XL, pp. 7-72.
- Hornstein, Andreas, and Per Krusell, and Gianluca Violante (2004); "The Effects of Technical Change on Labor Market Inequalities," in *Handbook of Economic Growth* (Philippe Aghion and Steve Durlauf, Editors), chapter 20.
- Katz, Lawrence, and David Autor (2000): "Changes in the Wage Structure and Earnings Inequality", in *Handbook of Labour Economics*, (O. Ashenfelter and D. Card, Editors), chapter 26.

2 Course Information

- **Credit:** The course is credited with 5 ECTS in the Ph.D. program in economics at the University of Oslo.
- **Lectures:** There will be 15 hours of lectures, divided in two parts;
 1. Gianluca Violante:
 - (a) Monday August 6, Time: 9:15-12:00. Room: 1220
 - (b) Tuesday August 7, Time: 9:15-12:00. Room: 1220
 - (c) Wednesday August 8, Time: 9:15-12:00. Room: 1220
 2. Per Krusell:
 - (a) Monday August 13, Time: 9:15-12:00. Room:1220
 - (b) Tuesday August 14, Time: 9:15-12:00. Room:1220
- **Exam:** There will be a 24-hour take-home exam starting August 17 at 9:00 am for those who take the course for credit.
- **Contact:** The course is open to PhD students from all the Nordic countries. Subject to space limitations, the course is also open to Ph.D. students from other countries, as well as other interested economists. There is no course fee. If you are interested in following the course, please send an e-mail to Marie Naalsund Ingvaldsen <m.n.ingvaldsen@econ.uio.no>, before June 30, 2007. Later registration is possible subject to availability. Please also indicate whether you intend to take the exam.

3 Course Outline

(1) Introduction to the Measurement of Capital-Embodied Technical Change

Technology is at the heart of the explanations of the changes in the wage structure, so we start by learning how to measure the pace of technological improvement in the economy. There are three approaches: the first is based on quality-adjusted relative price of capital, the second is based on direct estimation of vintage effects in the production function, the third is based on Engel curves.

- Nelson, Richard R. (1964); "Aggregate Production Functions and Medium-Range Growth Projections," *American Economic Review* 54(5), 575– 606.
- Sakellaris P., and Dan Wilson (2003): "The Production Approach to the Measurement of Embodied Technical Change", *Review of Economic Dynamics*, 7, 1-26.
- Cummins, Jason and Gianluca Violante (2002); "Investment-Specific Technological Change in the US (1947-2000): Measurement and Macroeconomic Consequences", *Review of Economic Dynamics*
- Greenwood, Jeremy, Zvi Hercowitz and Per Krusell (1997); "Long-Run Implications of Investment-Specific Technological Change", *American Economic Review*, 87(3), 342-62.
- Bils, Mark and Pete Klenow (2001); "The Acceleration in Quality Growth" , *American Economic Review* 91, 274-280.

(2) Reconciling Accelerations and Slowdowns in Productivity: Organization Capital

We will discuss the concept of organizational capital, its measurement, and how organizational capital is affected by drastic technological revolutions. This helps us reconciling how a capital-embodied technological acceleration can coexist with a measured slowdown in TFP.

- Hall, Robert (2001); “The Stock Market and Capital Accumulation,” *American Economic Review*, Vol. 91, No. 5, December, 1185-1202.
- Atkeson, Andrew and Patrick Kehoe (2004), The Transition to a New Economy After the Second Industrial Revolution, NBER wp 8676.

(3) Inequality Dynamics in the U.S. (1900-2000): Facts

There has been a large rise in cross-sectional wage inequality in the US since the early 1970s, documented in a number of papers. The crucial feature is that inequality increased both between groups (defined by experience, education, etc.) and within group of observationally equivalent workers (the so called *residual* inequality due to differences in unobserved ability, or unmeasured human capital). In a historical perspective that looks back at the past 100 years, this recent rise in inequality follows a decline which started early in the 20th century.

- Juhn, Chinui, Kevin Murphy and Brooks Pierce (1993): “Wage Inequality and the Rise in Returns to Skill,” *Journal of Political Economy*, 101, pp. 410-442
- Katz, Lawrence and David Autor (2000): “Changes in the Wage Structure and Earnings Inequality”, in O. Ashenfelter and D. Card, eds. *The Handbook of Labour Economics*, Volume 3, Amsterdam: Elsevier.
- Eckstein, Zvi and Eva Nagypal (2004); “U.S. Earnings and Employment Dynamics 1961-2002: Facts and Interpretations”, mimeo Northwestern University.
- Goldin Claudia and Larry Katz (1999): "The Returns to Skill across the Twentieth Century in the United States", NBER Working Paper No. 7126
- Krueger, Dirk and Fabrizio Perri (2006), “Does Income Inequality Lead to Consumption inequality: Evidence and Theory”, *Review of Economic Studies*, vol. 73, 163-193
- Piketty Thomas and Emmanuel Saez (2001): "Income Inequality in the U.S. (1913-1998)", NBER wp 8467

(4) The Measurement of Transitory and Permanent Shocks to Earnings

It is crucial to distinguish between the permanent and transitory components of the rise in inequality, for a number of reasons. First, different theories have different implications for which component will be affected by, say, a technology shock. Second, the implications for consumption and labor supply of permanent and transitory shocks are very different. Third, the welfare implications of a rise in labor market risk depend on whether the additional risk is permanent/insurable or transitory/uninsurable. Here we review the different approaches to this issue.

- Gottschalk, P. and R. Moffitt (1994): "The Growth of Earnings Instability in the U.S. Labour Market", *Brookings Papers of Economic Activity*, 2, pp. 217-272.
- Heathcote, Jonathan, Kjetil Storesletten and Gianluca Violante (2004): "The Macroeconomic Implications of Rising Wage Inequality in the U.S.", mimeo NYU
- Blundell, Richard and Ian Preston (1998): "Consumption Inequality and Income Uncertainty", *Quarterly Journal of Economics*, vol. 113, 603-640.

(5) Skill-Biased Technical Change and Capital-Skill Complementarity

A lot can be learned about the dynamics of the skill premium (i.e., wage differences explained by education or ability differentials) through simple supply-demand frameworks. The relative supply of skilled work has increased throughout the period, so the conjecture is that the relative demand for skilled labor has increased at an even faster rate, due to technological change.

- Katz, Larry and Kevin Murphy (1992): "Changes in Relative Wages: Supply and Demand Factors", *Quarterly Journal of Economics*, pp. 35-78.
- Krusell, Per, Lee Ohanian, Jose-Victor Ríos-Rull and Gianluca Violante (2000): "Capital-Skill Complementarity and Inequality: A Macroeconomic Analysis", *Econometrica*, 68:5, pp. 1029-1054.
- Nelson, Richard and Edward Phelps (1966): "Investment in Humans, Technological Diffusion, and Economic Growth", *American Economic Review*, 61, pp. 69-75.
- Caselli, Francesco (1999); "Technological Revolutions," *American Economic Review*, vol. 89 (1), pp.78-102.
- Violante, Gianluca (2007); "Skill-Biased technical Change," *The New Palgrave Dictionary of Economics*, 2nd edition edited by L. Blume and S. Durlauf, MacMillan.

(6) Skill-Biased Technical Change as a Source of Deunionization

Over the past 25 years, together with the rise in inequality, the US and the UK experienced sharp rapid deunionization. There is a variety of evidence that unions compress the structure of wages, thus many economists suspect that their decline may have been an important factor in the increase in inequality in the Anglo-Saxon economies. Recently, some economists have advanced the hypothesis that skill-biased technical change is at the root of deunionization as well as the rise in inequality.

- Acemoglu, Daron, Philippe Aghion and Gianluca Violante (2002); "Deunionization, Technical Change and Inequality," *Carnegie-Rochester Conference Series of Public Policy*, vol. 55(1), December 2001, 229-264.
- Ortigueira, Salvador (2006); "The Rise and Fall of Centralized Wage Bargaining," mimeo EUI.

(7) Occupational Mobility and Inequality

We analyze a paper by Kambourov and Manovskii on occupational mobility and wage inequality that is built on the Lucas-Prescott framework. In their main paper, Kambourov and Manovskii develop a quantitative assessment of the conjecture that a rise in the variance of reallocation shocks across occupations, together with occupation-specific human capital, can explain the increase in U.S. wage inequality.

- Lucas, Robert E. and Edward Prescott (1974); “Equilibrium search and unemployment” *Journal of Economic Theory* 7, 188–209.
- Kambourov Gueorgui, and Iourii Manovskii (2004); “Occupational Mobility and Wage Inequality”, mimeo University of Pennsylvania.
- Violante, Gianluca (2002): “Technological Acceleration, Skill Transferability and the Rise in Residual Inequality,” *Quarterly Journal of Economics*, 117(1), 297-338.

(8) U.S. and Europe: Comparative Labor Market Experiences

We begin by studying the different labor market experiences of US and Europe and argue that they can be explained by a unified framework where the same shock interacts with different institutions. Next we analyze the Ljungqvist-Sargent paper. This paper represents the classical “labor supply” view of European unemployment based on the conjecture that the technological shock accelerated the depreciation of human capital and in response European workers chose unemployment over employment due to the generosity of the welfare state. Finally, we move to the Hornstein-Krusell-Violante paper which models the U.S.-Europe comparison from the point of view of “labor demand” shocks, based on the article by Aghion and Howitt.

- Ljungqvist, Lars and Thomas J. Sargent (1998); “The European Unemployment Dilemma”, *Journal of Political Economy*, 106(3), pages 514-50.
- Aghion, Philippe and Peter Howitt (1994); “Growth and Unemployment,” *Review of Economic Studies*, 61, 477-494.
- Hornstein, Andreas, Per Krusell, and Gianluca Violante (2007), “Technology-Policy Interaction in Frictional Labor Markets”, *Review of Economic Studies*, forthcoming.