

Stylized Facts About Inequality

Felix Wellschmied

UC3M

Macroeconomics III

Felix Wellschmied

Office: 15.2.33

Office hours: When I am in my office.

fwellsch@eco.uc3m.es

- Associate Professor at the Universidad Carlos III de Madrid.
- Research interests:
 - Labor/Macro.
 - Inequality.
 - Optimal insurance.
 - Firm dynamics.

Course Outline

What You Gain from the Course

- Gain a deeper understanding of inequality.
- Learn how risk shapes inequality.
- Study policy responses against risk.
- Learn numerical tools to solve heterogeneous agent models.
- Get research ideas.
- Improve your presentation skills.

Outline of this Course

- 1. Heterogeneity across households. **Today.**
- 2. Modeling earnings risk.
- 3. A model of idiosyncratic risk and imperfect insurance.
- 4. Numerical tools to solve models.
- 5. Labor market search.

Outline of this Course II

- 6. From earnings to consumption risk.
- 8. Idiosyncratic and aggregate risk.

- 10% homework.
- 10% presentation.
- 15% project.
- 15% midterm exam.

Remarks on Presentations

- What is the big question and why is it interesting.
- What is the approach of the authors.
- What identifies what??? Which mechanisms are at work.
- Try to speak freely.
- Duration: 20–30 minutes.
- 4 groups of students.

Example: Kydland Prescott

- Business cycles impose large volatility in output, consumption, hours worked, and inflation.
- Usually associated with inefficiency.
- They show that TFP moves with macroeconomic aggregates.
- Build a structural model based on Neoclassical growth model.
- Increase in TFP leads to optimally higher K_t , inducing workers to work more.
- Exogenous movements in TFP explain most of business cycle fluctuations (no inefficiency).

Homework

- Numerical and analytical exercises.
- I want you to talk with others.
- Do not copy!

Why is Heterogeneity Interesting?

- Heterogeneity may be interesting in itself:
 - Interesting whenever welfare theorems fail (always).
 - Allows us to make welfare statements.

Why is Heterogeneity Interesting? II

- May be interesting because of its effects. When policy functions are non-linear in the state variables, the distribution of agents over the state space matters...
- for aggregates and equilibrium prices.
 - E.g., if MPC is high for low and high wealth individuals, more unequal wealth distribution lowers K and raises r .
- for aggregate dynamics.
 - E.g., with a high MPC of low wealth individuals, cash transfers raise spending.

Which Type of Inequality?

- Different dimensions:

Heterogeneity across individuals at point in time.

Changes in heterogeneity over time (years).

Changes in observables and conditional on observables.

Which Type of Inequality? II

- Individual wages:

Determined by human capital and firm risk.

- Individual earnings:

Wage and hours changes.

- Household earnings:

After insurance within the household.

- Household net income:

After governmental transfers.

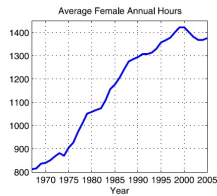
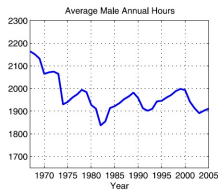
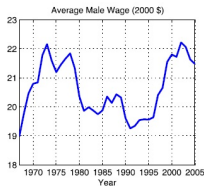
Heathcote et al. (2010) Stylized facts from the US

- Current population survey:
 - Large monthly survey on employment and earnings (March supplement).
 - 4 month panel dimension.
- Panel study of income dynamics:
 - Annual 1968-1997 and biannual from there following families.
 - Detailed information on family income, assets, and employment.
- Consumer expenditure survey:
 - Quarterly since 1980 with short panel dimension.
 - Information on expenditures, income and employment.

Sample Selection

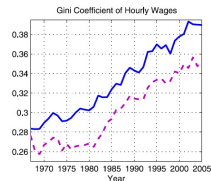
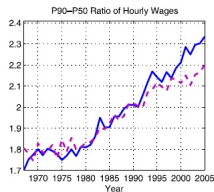
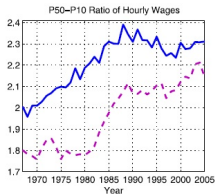
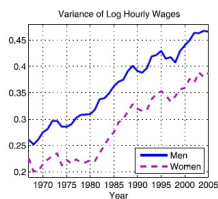
	PSID (1967–1996, 1998, 2000, 2002)		CPS (1967–2005)		CEX (1980–2006)	
	Dropped	Remaining	Dropped	Remaining	Dropped	Remaining
Initial Sample		123,788		2,217,997		638,237
Missing/miscoded household info ^a	1516	122,272	8993	2,209,004	104,302	533,935
Implausible consumption ^b					2723	531,212
Pos. labor inc. and zero hours	299	121,973	17,599	2,191,405	179	531,033
Wage < 0.5 × minimum wage	4298	117,675	121,367	2,070,038	47,046	483,987
Sample A		117,675		2,070,038		483,987
Head age 25–60	32,322	85,353	524,609	1,545,429	137,356	346,631
Sample B		85,353		1,545,429		346,631
Total individuals age 25–60 in sample B ^c		147,540		2,578,035		552,683
Individuals age 25–60 with hours >260	30,164	117,376	599,544	1,978,491	97,574	455,109
Sample C		117,376		1,978,491		455,109

Time Trends in Mean Wages and Hours



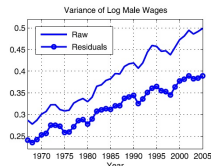
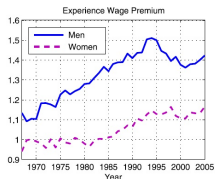
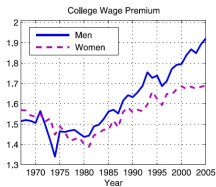
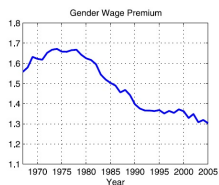
- Average male wages grew by 14% over 4 decades.
- Rising female wages.
- Males decreased their hours worked.
- Females increased their hours worked.

Wage Inequality over Time



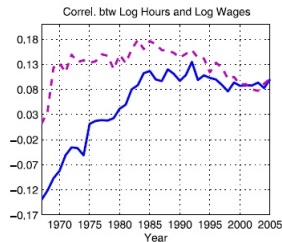
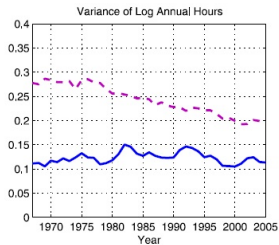
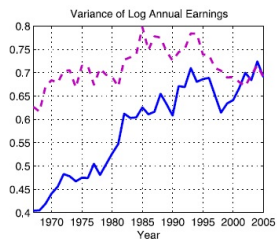
- Wage inequality increased over last 40 years.
- Since mid 80s, growth mostly in top inequality.

Observables vs Non-Observables



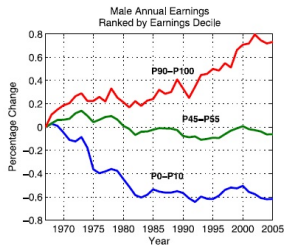
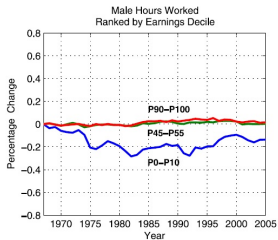
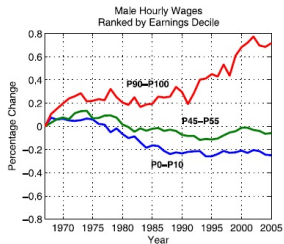
- Falling male premium.
- Rising college premium.
- Rising experience premium.
- Most inequality and its increase due to unobservables!

From Wages to Earnings



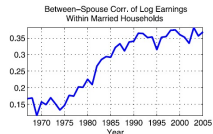
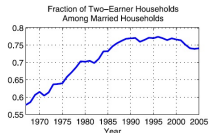
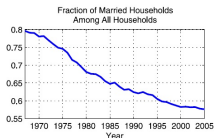
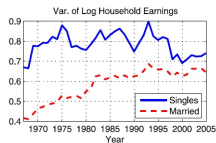
- Earnings inequality rose for males, flat for females.
- Hours dispersion decreased for females.
- Sharp rise in correlation between wages and hours for males during 70s.

Changes in Wages and Hours



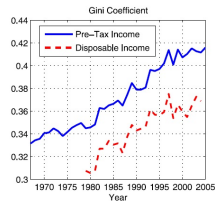
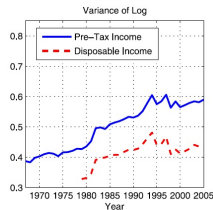
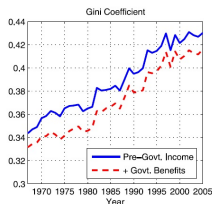
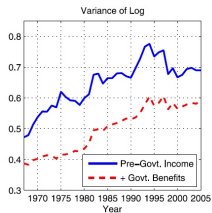
- Averages wages grew by 14% over 4 decades.
- Wage growth was large (80%) for top earners.
- Wage growth was negative for median and low earners.
- Hours growth was negative for low earners.

Role of Marriage on Earnings



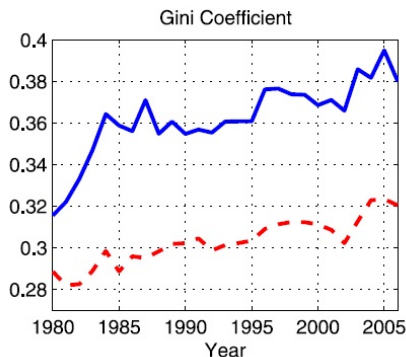
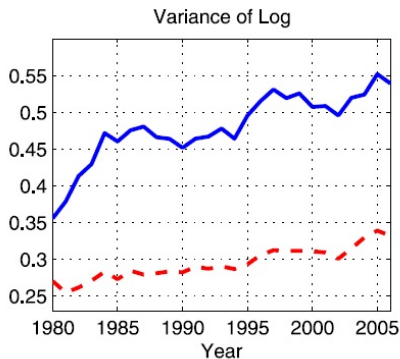
- Inequality larger among singles.
- Share of singles has increased.
- Share of two earner households has increased.
- Associative mating has increased.

From Earnings to Income



- Government transfers reduce inequality at the bottom.
- Taxes reduce inequality throughout the distribution.
- Neither significantly slowed down the increase in inequality.

From Income to Consumption



- Consumption inequality lower than income inequality.
- Suggests some insurance against income risk.

Life-Cycle Patterns

- Suppose we are interested in the life-cycle.
- Cross-sectional moments may be driven by.

Age effects (e.g., inequality grows with age).

Cohort effects (e.g., later cohorts have more inequality).

Time effects (e.g., inequality increased in 1993).

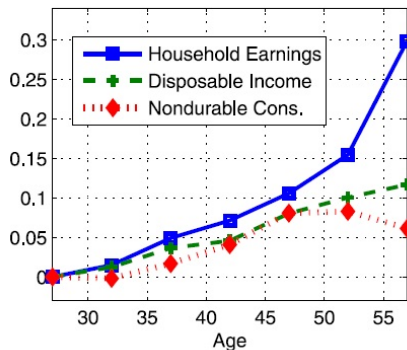
- Impossible to tell apart with repeated cross-sections.

Consider a moment of interest $m_{a,c,t}$. Report age effects from two regressions:

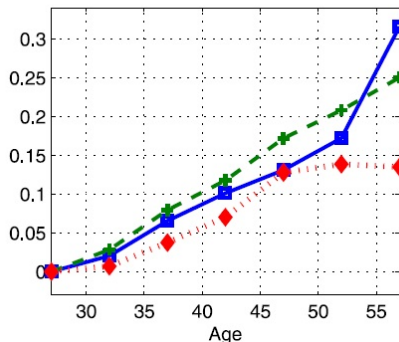
$$m_{a,c,t} = \beta_a D_a + \beta_t D_t + \epsilon_{a,c,t} \quad m_{a,c,t} = \beta_a D_a + \beta_c D_c + \epsilon_{a,c,t}$$

Life-Cycle Patterns II

Variance of Logs
Control for Year Effects

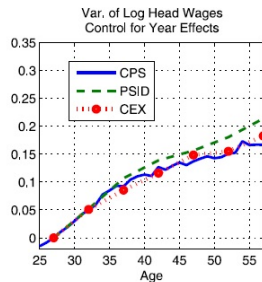
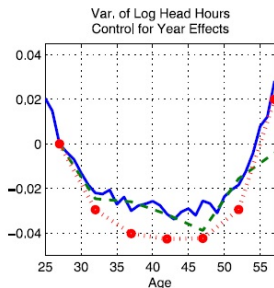
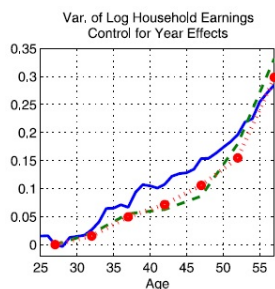


Variance of Logs
Control for Cohort Effects



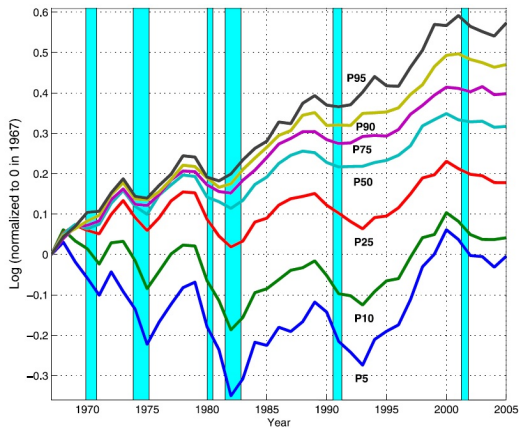
- Irrespective of method, inequality increasing over the life-cycle.
- Increase larger with cohort effects.

Life-Cycle Patterns III



- Earnings dispersion increases close to linear.
- Hours dispersion is U-shaped.
- Wage dispersion is slightly concave.

Heterogeneity in Business Cycle Dynamics



- Business cycles visible throughout earnings distribution.
- Quantitatively, business-cycles affect low earning households.

Binelli and Attanasio (2010) Stylized facts from Mexico

Why the developing economy context is interesting:

- Large macroeconomic volatility (1994 pesos crisis in Mexico).
- Different household structures.
- Large informal sectors (50% in Mexico).
- More households at subsistence level.

- Encuesta Nacional del Empleo Urbano:
 - Similar to U.S. CPS. Starts in 1987.
 - Allows for identification of formal vs informal sector.
- Encuesta Nacional de Ingresos y Gastos de los Hogares:
 - Bi-annual survey starting 1992 (starts 1984).
 - Rural and urban households.
 - Information on expenditures, income, and assets.

Time Trends in Mean Wages

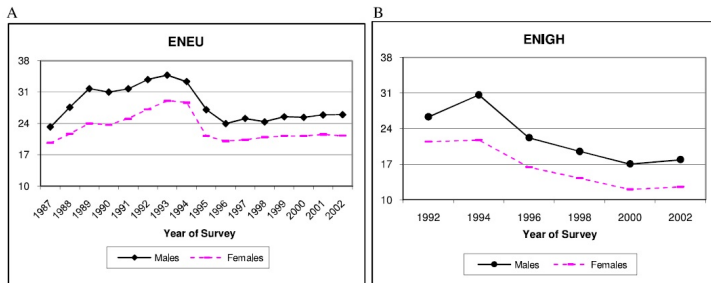


Fig. 1. Mean real hourly wages (source: ENEU and ENIGH, urban data).

- Wages peaked before the pesos crisis.
- Little wage gain over sample period.
- Little convergence between male and female wages.

Time Trends in Employment

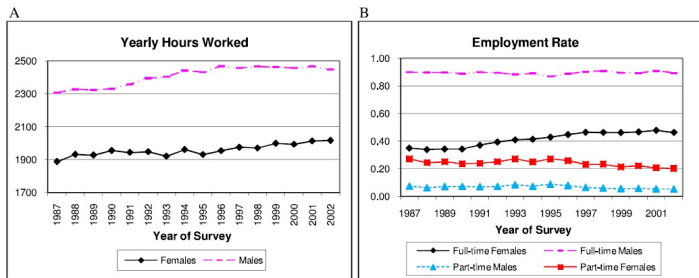
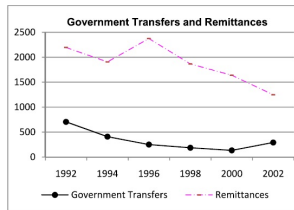
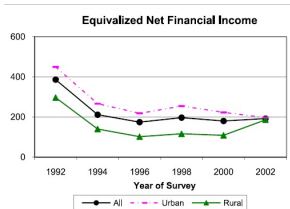
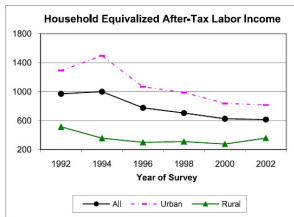


Fig. 2. Yearly hours worked and employment rate (source: ENEU).

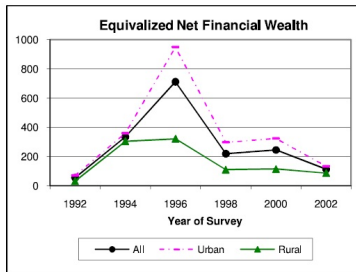
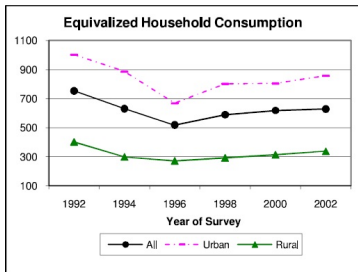
- Increasing hours worked over time.
- About ten percent more hours than in the US.
- Increasing trend in female full time.

Time Trends in Mean Income



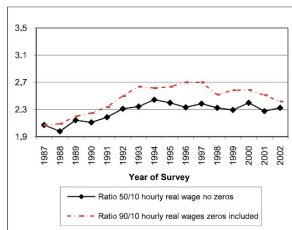
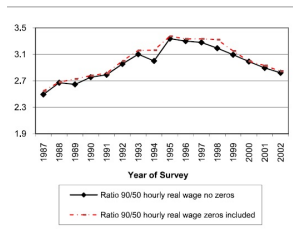
- Income in urban larger than rural.
- Average real earnings declining since pesos crisis.
- Asset income is small share of income.
- Governmental transfers are important.
- Transfers from abroad are important.

Time Trends in Mean Consumption and Savings



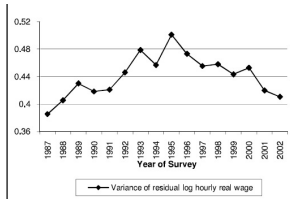
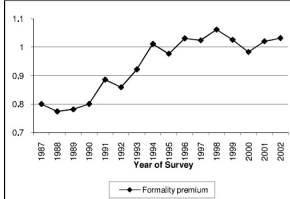
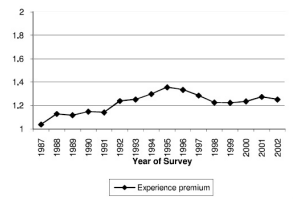
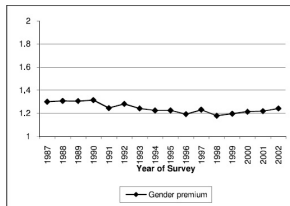
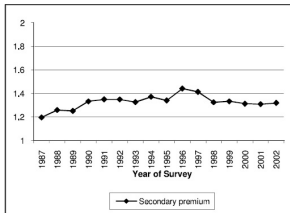
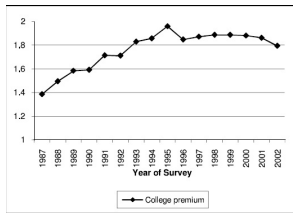
- Average consumption close to flat through sample period.
- Urban consumption declined during pesos crisis.
- Financial savings spiked after the pesos crisis.

Time Trends in Wage Dispersion

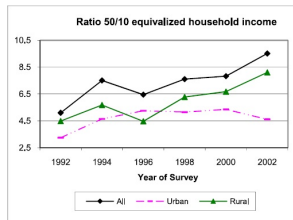
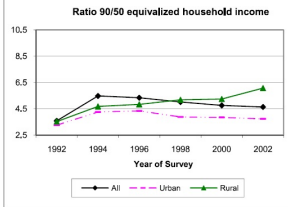
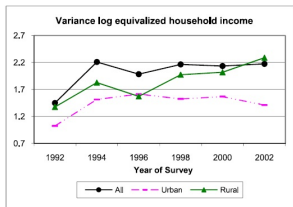


- Wage inequality rose sharply from 87-96.
- Increase driven by upper and lower inequality.
- Inequality decreasing since 96.
- Because of decreasing upper inequality.

Observables vs. Non-Observables

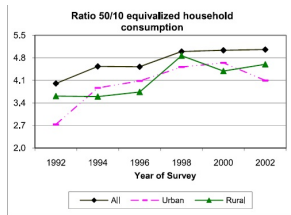
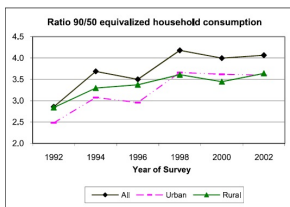
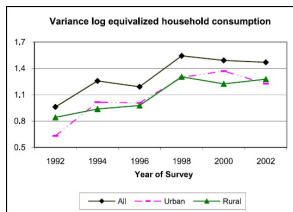


Time Trends in Earnings Dispersion



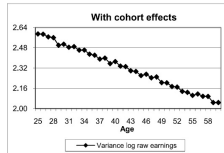
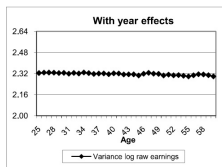
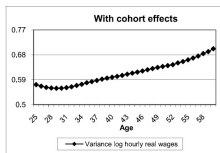
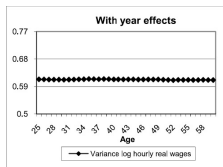
- Earnings dispersion higher in rural than urban.
- Overall inequality stable since 94.
- Increasing top and bottom inequality in rural.

Time Trends in Consumption Dispersion



- Increase in consumption inequality over time.
- In rural and urban.
- Upper and lower inequality rising.

Life-Cycle Dispersion



- No effect with time dummies.
- Increasing wage dispersion with cohort dummies.
- Decreasing earnings dispersion with cohort dummies.

- BINELLI, C. AND O. ATTANASIO (2010): "Mexico in the 1990s: The Main Cross-Sectional Facts," *Review of Economic Dynamics*, 13, 238–364.
- HEATHCOTE, J., F. PERRI, AND G. L. VIOLANTE (2010): "Unequal we Stand: An Empirical Analysis of Economic Inequality in the United States, 1967–2006," *Review of Economic Dynamics*, 13, 15–51.