How to Reduce Unemployment Without Creating Poverty

2014 Summer Term

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Problem Set 5

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Question 1 (Wage Distribution)

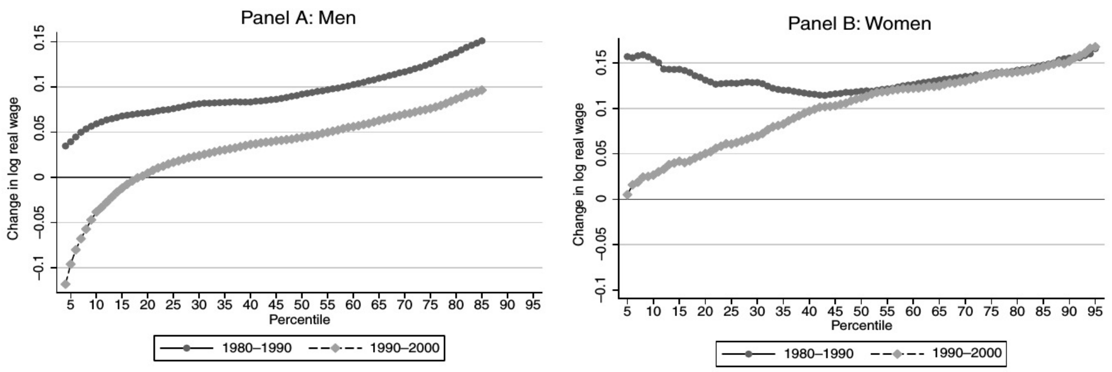
a) Plot an example of a wage distribution (resembling the log-normal distribution in a very first approximation).

b) Define and show where the 10th percentile and the 90th percentile are.

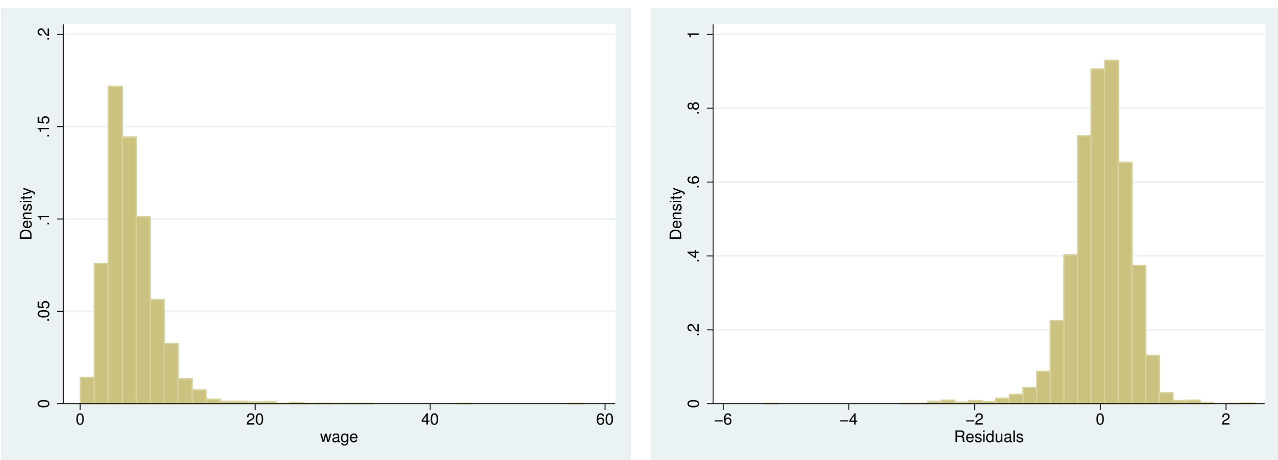
c) Plot a second wage distribution and imagine it is the distribution 10 years later.

d) Plot a picture of the growth rates of the 10th percentile, the median and the 90th percentile.

e) Compare this to figure III in Dustmann et al (2009):



f) Compare results above to the real data histograms:



Question 2 (Cahuc and Zylberberg (2004))
Suppose that the discounted expected utility of an employed person receiving wage w is denoted by $V_e(w)$. An unemployed agent has the discounted expected utility V_u consuming the net instantaneous income z. The arrival rate of job offers is λ. The job destruction rate is q. Parameter r denotes the exogenous real instantaneous rate of interest.

Given the wage distribution $H(\cdot)$, find

a)
$$rV_u = z + \lambda \int_x^{+\infty} [V_e(w) - V_u] dH(w) \tag{1}$$

that defines a job-seeker's discounted expected utility;

b) an implicit expression that characterizes the reservation wage x,
$$x = z + \frac{\lambda}{r+q} \int_x^{+\infty} (w - x) dH(w) \tag{2}$$

Question 3 (Hosios 1990)
Let an unemployed worker spend s on search and enjoy leisure z in any period. Let $p(s)$, $p_s > 0$, denote the probability that a worker will find a vacant job. Output per period y for any randomly chosen worker and firm is drawn from continuous distribution $F(y)$. Value $a(y^*) = 1 - F(y^*)$ denotes the probability that a randomly chosen worker-firm pair will produce $y \geq y^*$. Let $\bar{y} = E[y|y \geq y^*]$ and $\bar{w} = E[w(y)|y \geq y^*]$. Each period a randomly selected fraction b of employed workers lose their jobs.

Find the maximal steady-state income flow of an unemployed worker $Y_u = \delta W_u(s)$:
$$Y_u = z - s + ap(s)[\bar{w} - Y_u]/b. \tag{3}$$