Problem Set 1

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1.

(a) "How Do Hours Worked Vary with Income? Cross-Country Evidence and Implications" from *American Economic Review.*

(b) APA citation style:

Bick, A., Fuchs-Schündeln, N., & Lagakos, D. (2018). How Do Hours Worked Vary with Income? Cross-Country Evidence and Implications. *American Economic Review*, *108*(1), 170–199. https://doi-org.proxy.uchicago.edu/10.1257/aer.20151720

(c) First build a world dataset containing all individual observations from all 46 core countries, and regress hours worked of individual i living in country c on the individual wage (w) and country GDP per hour worked (GDPph), including as controls age and age squared, and clustering standard errors at the country level:

$$\log(h_{ic}) = \alpha + \beta_w \log(w_{ic}) + \beta_{GDP} \log\left(GDP_{ph_c}\right) + \delta_1 age_{ic} + \delta_2 age_{ic}^2 + \varepsilon_{ic} \quad (1)$$

How does the hours-income elasticity vary from country to country? To answer this question, we follow Costa (2000) and regress within each country the logarithm of individual hours worked on the log wage and age and age squared, separately for men and women.

$$\log(h_i) = \alpha + \beta_w \log(w_i) + \delta_1 age_i + \delta_2 age_i^2 + \varepsilon_i \quad (2)$$

(d) Exogenous variables: w_{ic}, GDP_{ph_c}, age_{ic}, age_{ic}^2, w_i, age_i, age_i^2.

Endogenous variables: h_{ic}, h_i

(e) (1) and (2) are static models because they describe the structure of a distributed parameter system at a specific time.
(1) and (2) are nonlinear models because they have logarithm and square in their variables.
(1) and (2) are deterministic models because they are fully determined by the parameter values and the initial conditions.

(f) Whether the individual have kids may be a missing variable. After having kids, people may pay more attention to their family and work less hours.

2.

(a)

$$\Pr(Y = 1|X) = G(\beta_0 + \beta_1 age + \beta_2 edu + \beta_3 inc + \beta_4 \log(GDP) + \beta_4 pol)$$

Y is the dependent endogenous variable. Y=1 if get married. Y=0 if not get married.
Age indicates the difference between individual's age and the legal age of marriage.
Edu is a binary variable. Edu=1 if the individual has a bachelor degree. Edu=0 if the individua does not have a bachelor degree.
Inc indicates the individual's income.
GDP indicates the country's GDP. We take the logarithm to make it more precise.
Pol is a binary variable. Pol=1 if there exists policy that encourages marriage or having children. Pol=0 if there is no policy that encourages marriage or having children.

(b) Y is the dependent endogenous variable. Y=1 if get married. Y=0 if not get married.

(c) The model is a complete data generating process.

(d) Age, education and income may be the key factors.

(e) Because these three have specific influences on individuals. GDP and policy have nation-wide impact, but their magnitude may shrink when it comes to person.

(f) For the preliminary test, I will design a survey and recruit participants in randomly several countries that include developing and developed ones. The participants will need to fill the questionnaire about their age, education level, income and marital status. Then I'll collect the GDP data in the countries' statistics website. For the policy, I will find out whether these countries have marriage-related policy published in recent years. After collecting these data, I will run a regression analysis to see if the variables are significant.