Problem Set #1

MACS 30100, Dr. Evans

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Problem 1 Part (a). Found a model from Microeconomics Origins of Macroeconomic Tail Risks in the American Economic Review

Part (b). A detailed citation: Acemoglu, Daron, Asuman Ozdaglar and Alireza Tahbaz-Salehi. 2017. "Microeconomic Origins of Macroeconomic Tail Risks." American Economic Review, 107(1): 54-108 DOI: 10.1257/aer.20151086

Part (c).

$$y_i = (A_i l_i)^{\beta} \prod_{j=1}^{n} x_{ij}{}^{w_{ij}}$$

$$\sum_{j=1}^{n} w_{ij} = 1 - \beta$$

$$u(c1, ..., c2) = \sum_{i=1}^{n} log(c_i)$$

$$v_i = \sum_{j=1}^{n} L_{ji}$$

Part (d). Exogenous variables are: A_i. Endogenous variables are: $y_i, l_i, \beta, x_{ij}, w_{ij}, c_i, L_{ji}$

Part (e). The model is static, nonlinear and deterministic.

Part (f). I believe a variable T representing the level of technology of the company could be added to the model to better describe the production of the company. Nowadays the amount of labor is not necessarily related to technology level. So a new varible to describe the technology is needed.

Problem 2 Part (a). The model is shown below:

$$pl_i = x_i - \alpha y_i + \beta c_i + \theta z_i$$

pl indicates the predicted lifespan of a particular musician. x indicates average lifespan of subject's family which capture the pre-determined lifespan by DNA. y indicates years of drug usage. c indicates level of success in their career,which is measured by number of prize they get.z indicates their annual income.

Part (d). I believe the key factors here are the pre-determined lifespan by DNA, year of drug usage, how successful they are in their career and their annual income.

Part (e). I decide those factors based on my amateurish knowledge of the career as a musician.

Part (f). A preliminary test can be done by collecting data of the variables x,y,c,z and do a linear regression to see whether the model fit into the data.