Perspective Problem Set 1

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1 Classify a model from a journal

a)-b) He, Guojun, and Shaoda Wang. "Do College Graduates Serving as Village Officials Help Rural China?." American Economic Journal: Applied Economics 9, no. 4 (2017): 186-215.
c)

$$\gamma_{it} = \alpha \times CGVO_{it} + X'_{it} \times \beta + \rho_t + \mu_i + \epsilon_{it}$$

- γ_{it}: an outcome of interest for village i in year t.
- $CGVO_{it}$: a dummy indicator,which equals 1 if village i in year t has a CGVO (College Graduate Village Officials),and 0 otherwise.
- X'_{it}: a set of time-varying control variables, including precipitation and temperature in each village-year pair.
- ρ_t: a time effect common to all villages in period t.
- μ_i: a time-invariant effect unique to village i.
- ϵ_{it}: a village time-varying error distributed independently of μ_i and ρ_t.

d)
Exogenous Variables:
$CGVO_{it}$, X'_{it}, ρ_t, μ_i.
Endogenous Variables:
γ_{it}
e)
This model is dynamic, linear, and deterministic.
f)
The endogenous variable this model examines is outcome of interest instead of economic growth. I believe evaluating economic growth can better show if college graduates serving as village officials help rural China. While it can be hard to obtain village-level economic growth data, there should be data representative of economic growth of each village that can be used.

2 Make your own model

a) - b)

$$Pr(Y_i = 1|X_i t) = \frac{e^{x_{it}}}{1 + e^{x_{it}}}$$

$$x_i t = \beta_0 + \beta_1 \times age_i t + \beta_2 \times gender_i t + \beta_3 \times education_i t + \beta_4 \times religion_i t + \beta_5 \times income_i t + \beta_6 \times race_i t$$

$$Y_i = \begin{cases} 1 & \text{if } x_{it} > 0.5 \\ 0, & \text{otherwise} \end{cases} \tag{1}$$

Y_i is the dummy variable that is 1 for get married and 0 for not get married. $X_i t$ represent the willingness of an individual i at time t to get married, given factors including age, gender (0 for male and 1 for female), education (years of education after elementary school), religion (0 for Republican, 1 for Democratic, and 2 for others), income (in thousand dollars), and race (0 for white, 1 for black, 2 for Asian, and 3 for others).
c)
This model is a complete data generating process.
d)
I think all factors are key factors for the outcome.
e)
I have decided that these factors are important based on my personal life experience and psychological factors.
Based on my understanding, decision to marry represents the willingness to stabilize, which is related complex factors shaping the psychological world of people. However, I am confident that the factors I list, age, gender, education, religion, income, and race, must be some key factors related to the decision to marry.

f)
Since all the variables in the model are demographic information, census dataset such as General Social Survey can be employed for the preliminary test. We can also conduct a small survey including all needed variables to gather data for a preliminary test.
The preliminary test can be then performed by running a regression according to the model form, and thus we can determine the statistical significance of all β and if significant, their values according to real life dataset.