Problem Set#[1]

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Problem 1: Classify a model from a journal

Part (a). The research investigated on media influences on childbearing. The key is to investigate whether there was a more rapid decline in rates of teen childbearing starting after the show, *16 and Pregnant*, which is an "hour long documentary series focusing on the controversial subject of teen pregnancy, was introduced in locations in which the show was more widely viewed.

Part (b). Kearney, M. S., & Levine, P. B. (2015). Media Influences on Social Outcomes: The Impact of MTV's 16 and Pregnant on Teen Childbearing. American Economic Review, 105(12), 3597-3632. doi:10.1257/aer.20140012

Part (c).

$$\ln(B_{jt}) = \beta_0 + \beta_1 Rate16P_j \times post_t + \beta_2 U_{jy} + \mathbf{X}_{jy}\Upsilon + \theta_t + \delta_{js} + \varepsilon_{jt}$$

where t indexes quarters, j indexes media markets(DMAs), and s indexes season of the year.

Part (d).

Endogenous variables: The outcome variable ln(B). It represents the natural logarithm of the teen birth rate, defined as births to girls between ages 15 and 19 in DMAs j conceived in quarter t scaled by the population of women age 15-19.

Exogenous variables: θ_t:quarter fixed effects, δ_{js}:DMA season fixed effects, $Rate16P$:Nielsen ratings for the show among those between ages 12 and 24, $post$:an indicator variable for calendar quarters after June 2009 when the show began, U_{jy}:average unemployment rate in the DMA in the year (y), $\mathbf{X}_{jy}$:black and percent Hispanic in the DMA in the year (y),Υ: female teen population, ε_{jt}:standard errors adjusted for clustering at the level of media market, β: the effect of the show relative to a base year just prior to its introduction.

Part (e).

It is dynamic because it includes multiple time variables for example quarter and season effects.

It is linear because each term is either a constant or the product of a parameter and a predictor variable.

It is stochastic because it allows a random error in its output, ε_{jt}

Part (f). They did not take policy change variable into consideration. For example, if welfare policy changes over the research period, the change in the birth rate might not be the effect of the show, but because of the policy change.

Problem 2: Make your own model

Part (a-c).
The predicted lifespan(in years) of a popular musician is generated by the following process:

$$lifespan = g \times age_{fam} + \theta_t + \rho \times hours + \beta \times bp_t + \varepsilon$$

where the output variable lifespan is the predicted lifespan(in years) of a popular musician. age_{fam} is the average lifespan of the musician's family. g reflects some positive dependence of one's lifespan on their family's average lifespan. θ is the gender fixed effects on one's lifespan in year t. $hours$ is the average working hours. bp is the blood pressure that is used to measure one's current health condition in year t. ρ and β is the coefficient. ε is an error term.

Part (d-e).
I think the key factors that influence a musician's longevity is genetics, gender, current health condition, which is correlated with lifestyle. First of all, family history plays a big role in one's lifespan. If there is a history of cancer, then the musician will have a larger chance of getting a cancer, and thus decreasing lifespan. Secondly, in terms of gender, women outlive men, sometimes by a margin of as much as 10 years. In the U.S., life expectancy at birth is about 79 years for women and about 72 years for men. Thirdly, the intense work pace of musicians makes average working hours pretty important when evaluating lifespan. For example, increase in working hours might lead to decrease in sleeping time and thus lead to depression and increase in suicide rates. Research shows that there is a high suicide rates among popular musicians. Furthermore, the musicians are likely to be under high stress level because of the nature of their job, also, they are more likely to be exposed to drugs which are all related to their health and thus lifespan, so here we use blood pressure to measure their current health condition. In this model, we emphasize on these factors instead of others like geography because the uniqueness of their job. They have higher chance of exposure to stress and anxiety and they are more likely to live under unhealthy lifestyle. So we think these factors will influence the outcome more than others.

Part (f).
Since our goal is to estimate lifespan, we can do the preliminary test on musicians that have already passed away or who have disease and are in the hospital (therefore we will know their real or estimated lifespan). We will select musicians from different genres and test if there is any difference in their lifespan. By asking the musicians' friends or themselves, checking their schedules and health history, we can know their average working hours, their health condition, therefore we can test whether the factors are significant in real life.