Problem Set 1

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Problem 1

In "The Effects of Rent Control Expansion on Tenants, Landlords, and Inequality: Evidence from San Francisco", Diamond, McQuade and Qian study the effect of a 1994 law change in San Francisco that changed the rent control system where some buildings in San Francisco based on when each building was built. Through combing multiple sources of data, the authors are able to conduct a quasi-experiment and examine how the rent control law influence tenants' housing decisions, the landlords' reaction to this law change, and how in the long term this law change will influence the housing market in San Francisco.

The 1994 law change was based on a 1979 law. The 1979 law imposed rent control on buildings built as of 1979 with five or more apartments, while smaller multi-family buildings were exempt from rent control. This was changed in 1994 – small multi-family housing became rent-controlled if the building was built before 1980. Thus, the researchers are able to design a quasi-experiment where the treatment group consists of renters who lived in small multi-family buildings built before 1980 (with rent control) and the control group consists of renters who lived in small multi-family buildings built before 1980 (without rent control).

For this research, Diamond et al. combined data from multiple sources, including address history from Infutor, property records from DataQuick, parcel data from the San Francisco Planning Office and the Assessor's Office. With these data, they established two similar models to examine the tenant effects and parcel and landlord effects of rent control.

To study whether rent control keeps renters stay in the same address or stay in San Francisco, they established the following model:

$$Y_{iszt} = \delta_{zt} + \alpha_i + \beta_t T_i + \gamma_{st} + \epsilon_{it}$$

In this model, i refers to tenant i; z refers to zipcode z; s represents the year when the tenant moved into their address that they had at the end of 1993 (the year before the law change); and t represents the calendar year. The variables are:

- Y_{iszt}: the outcome variables that equal to 1 if the tenant i is still living at the same address as he or she was by the end of 1993, or if the tenant is still living in San Francisco.
- δ_{zt}: zipcode-by-year fixed effects. This is to control for any differences in the geographic distribution of treated buildings versus control buildings.
- α_i: individual tenant fixed effects.
- T_i: denotes treatment. $T_i = 1$ if on December 31, 1993, the tenant is living in a multi-family building with less than or equal to four units built between the years 1900 and 1979.

- γ_{st}: fixed effects, denoting the interaction of dummies for the year s with calendar year t time dummies. This is needed because the the researchers believe that older buildings are mechanically more likely to have long-term and low-turnover tenants.

Among these variables, δ_{zt}, α_i, T_i, and γ_{st} are exogenous variables. Y_{iszt} is an endogenous variable.

This model is a static, linear and deterministic model.

To study what influence the tenant's decision in staying in the same address, another variable that is missing in the model is one that reflects the relative rental price in the housing market. For example, the apartment's rental price relative to similar apartments in the same neighborhood (with the same zipcode). No matter whether the apartment is or is not rent controlled, its price may be higher or lower than similar housing in the same neighborhood for many different reasons, such as accidents that happened in the apartment or the structure of the apartment (like a bedroom with no sunlight). This is not accounted by any of the exogenous variables in the model.

With this model, the researchers find that the beneficiaries of rent control are 10 to 20 percent more likely to stay in the same address and more likely to stay in San Francisco in the medium to long term. On the other hand, however, they find through a similar model that landlords respond to the imposition of rent control by converting the properties to condos or Tenancy-In-Common units or by redeveloping the building to be exempt from rent control, which results in reduction in rental supply that may drive housing prices to go up and contribute to the gentrification of San Francisco. This is the exact opposite of the rent control policy's goal.

References

[1] Diamond, R., Mcquade, T., & Qian, F. (2019). The Effects of Rent Control Expansion on Tenants, Landlords, and Inequality: Evidence from San Francisco. American Economic Review, 109(9), 3365–3394. doi: 10.1257/aer.20181289

Problem 2

Below is my model of whether someone decides to get married:

$$\begin{aligned} Y_i =& \beta_0 + \beta_1 G + \beta_2 A_i + \beta_3 E_i + \beta_4 I_i + \beta_5 M_i + \beta_6 C_i \\ &+ \beta_7 PM_i + \beta_8 H_i + \beta_9 R_i + \beta_{10} AC_i + \beta_{11} V_i + \epsilon_i \end{aligned}$$

For an individual i, the variables are:
Dependent endogenous variable:

- Y_i: a dummy variable that equals to 1 if individual i decides to get married, 0 otherwise.

Independent exogenous variables:

- G_i: gender of individual i. $G_i = 1$ if individual i is female, 0 otherwise.
- A_i: age of individual i.
- E_i: education level. For example, years of schooling.
- I_i: income level. For example, annual real income.
- M_i: number of previous marriages.
- C_i: number of children.
- PM_i: marriage status of individual i's parents. $PM_i = 1$ if his or her parents are married, 0 otherwise.
- H_i: health status. For example, health status can be quantified simply as "very healthy" ($H_i = 2$), "more or less healthy" ($H_i = 1$), "not healthy" ($H_i = 0$). Of course, there are more ways to quantify a person's health status.
- R_i: how individual i views his or her current relationship – how stable, loving, committed their relationship is in individual i's opinion. Similar to the health status variable, this variable can also be quantified with a scale.
- AC_i: families/friends/colleagues' acceptance of individual questions i's relationship and future marriage. This can also be quantified as a scale.
- O_i: how optimistic individual i is about the social policy and economic situation, such as his or her view on healthcare policy, maternal or paternal benefits, retirement policy, unemployment situation in the society, etc. This can also be quantified as a scale.

After we obtain the parameters $\beta = (\beta_0, \ldots, \beta_{11})$ with sufficient data, we can simulate data with these parameters.

Among the exogenous variables in my model, I think age, income, number of previous marriages, and one's view on his or her current relationship are import factors to consider. But these are more or less obvious since they are the most common things that people consider without any surprise. Besides these factors, I personally think that a person's attitude towards relevant social policy and the general economic situation (O_i) also plays a significant role in the decision-making process. This is because marriage is a decision about the long-term future that comes with a series of future responsibilities. So how optimistic one person is about the social environment must be important for him or her to assess whether he or she is able to take those future responsibilities or not.

To do a preliminary test on whether these factors are significant in real life, I can take a subset of the data and use the model with these variables to see if they are significant. I can also conduct surveys that ask people among all the different factors, which ones they think are the most significant ones.