[Factors influence innovativeness of U.S. citizens]

Project proposal

Principal Investigators: Yanni Zhang (yzhang2232@wisc.edu), Zheng Su

Questions to be addressed

No matter from a common-sense perspective or professional literature reviews, it is evident to see that technological advances always bring ground-breaking economic growth, evidenced by past industrial revolutions. So, it is natural for us to ask what factors could potentially affect the emergence of innovators, and therefore further influence policy making to help more children become innovative in the future, especially at the time economic growth was impacted by the global pandemic. This research aims to find if there is correlation between potential factors and innovativeness. Our main interest lay in following questions:

1. Whether there is a notable gender difference between the number of male and female innovators?
2. Is there geographical distribution of the number of innovators?
3. Do parent income and family socioeconomic status affect the children's innovativeness?
4. Is there a higher percentage of innovators in college compared to the general public?
5. Does the influence of these possible factors differ when shrinking sample to children with patent citations in top 5% of their birth cohort?

These questions could help us to understand the relationships between factors and innovativeness. As it could determine whether there is something that professionals and policy makers could do to interfere and help cultivate more innovators.

Data

The data is from the dataset in *Who Becomes an Inventor in America? The Importance of Exposure to Innovation* on Opportunity Insights (https://opportunityinsights.org/data/). Most columns are percentages in specific populations, so there are no units. The dataset covers patenting outcomes of children who were born from 1980 to 1984, categorized by geography, gender, and parent income. One downside of the dataset is that it is based on information from children born relatively early, who were born before an era of information explosion. So, the research could not examine the influence of things such as accessible internet on children's innovativeness. This could result in the findings from this research having limited reference value to policy making process.

Preliminary results

After preliminary research, we have found that in every state, the number of male innovators is significantly higher than female innovators. Besides, after graphing a U.S. map indicating the numbers of innovators in every state, there is a clear geographical distribution of it. If we only consider the total number of innovators in each state, California is unsurprisingly the top one, with New York, Michigan and Texas following. But the result could be influenced by the population of states. So if we generalize the scale of population by finding the number of innovators in every 10000 children, the northern part of the states seems to have a higher rate of innovators than the southern part.

Work plan

1. We will continue using the dataset to visualize the differences in innovation rates under the effects of socioeconomic classes, and college.

    We have analyzed gender and geographical locations so far, and we will continue to complete the analysis of the rest subsequently.

2. We will specifically do the analysis for children whose total patent citations ranked in the top 5% of their birth cohort.

    This step should be similar to the above questions, because the data set shows the percentage of top innovators (individuals whose total patent citations ranked in the top 5% of their birth cohort) for different classes of variables, so this step of the study can be implemented with only minor modifications to the code from the previous step.

3. We will conclude with all the factors that could affect innovativeness based on the research.

    As shown in the pre-proposal, there are significant differences in innovation capacity across regions. We intend to use the factors we find that influence innovation to analyze the regions that currently have the highest innovation rates and find the reasons for their high innovation rates. Also, we prepare to examine where Wisconsin stands on each of these factors to suggest where Wisconsin should further improve.