Creative Assnignment

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The impact and significance of the double reduction policy on the equity of education in China

-Problem statement

This study focuses on a real education issue in China, it aims to find whether the double reduction policy has a positive effect towards both the financial pressure to the family due to extracurricular courses outside of school and the pressure given to the students. As known to all, China is a country with huge population and with number, there comes competition. The competition inside middle school students caused huge pressure between them as everyone wanted to go to the best high schools and to do that, they need to do better on the important exams, and this is where the expensive extracurricular training came to help. The wealthier families are able to gain more benefits and they have enough money and resources to operate for their kids, and so the rather poor people have to work much harder in order to catch up. As a result of this, the Chinese government released the double reduction policy to ban the classes outside of school and reduce the amount of pressure given to the students by the exams and in-school work. Our objective is to find out after about 1 year of this policy, to what extent was the problem solved and had it actually given a rather positive effect to the situation.

-Literature review

Due to the fact that China had only released this policy for about 1 year, there is yet any analysis about the specific effect of the double reduction policy. However, based on the findings of a few articles about the double reduction policy, they all seem to have agreement on predicting that the policy will bring positive feedback in the long run. Based on Wang Yan's article (Wang, 2021), reducing the burden of students will enhance the cognitive and learning abilities of the students because reducing the load

encourages the students to explore their own interests and maintain their passion of learning in the long run. According to Yi Dong's article (Dong, 2021), the double reduction policy is likely to fulfill its goals to alleviate the pressure and anxiety felt by students and furthermore, reduce the financial pressure faced by the families and the amount of inequality in the society. However, from "China's 'Double Reduction' Policy: Impacts of the new regulations for off-campus tutoring in core school subjects" by the CGTN, it also claimed that this policy brought great pressure to the education tutoring sectors which provides jobs for about 10 million of people (CGTN, 2021). As this is not a part of our consideration of the study, it will not be discussed. Generally speaking, the public as a whole sees the potential the double reduction policy could be to help Chinese students and their parents, but a huge amount of data and study is still to be conducted in order to draw a conclusion about its actual effects.

-Data Collection

The study aims to find out the impact of the double reduction policy on the equity of education in China. The data of education-related indicators as independent variables from 100 cities from China are collected, such as the data before and after the double reduction policy, including the percentage of household education expenditure, the number of the students who graduated from local Top3 high schools and are currently enrolled in key universities of China as a percentage of the overall number of the students in the region, the number of enrollment of key universities of China in the region, and other indicators related to education equity. City characteristics factors such as GDP, city population related data will also be collected. In addition, questionnaires on indicators related to the double reduction policy include the average number of children in the household, whether parents are satisfied with the double reduction

policy, and the occupation of household members.

-Data Cleaning

The variables are collected include both categorical variables and continuous variables, which for the categorical variables such as occupation of household members and the extent of satisfaction of parents with the double reduction policy will be coded using numbers; for the continuous variables such as the percentage of household education expenditure, the number of the students who graduated from local Top3 high schools and are currently enrolled in key universities of China as a percentage of the overall number of the students in the region, the number of enrollment of key universities of China in the region, and the average number of children in the household will be binned with equal frequency binning method in order to ensure the stability of the model.

Simultaneously, for the treatment of missing variables, the features with missing parts more than half of the total will be removed. In addition, the distribution of missing values in the data visualization and the correlation between missing values need to be counted and analyzed. For cities with more missing values, the decision to delete them will be made after examining whether they are the key cities or not.

- Model selection and analysis of results

K-means algorithm will be used, which will group similar individuals together and separate those with poor similarity. The silhouette coefficient is an important indicator to judge the goodness of the model. Based on the idea that the similarity within groups is as large as possible and the variability between groups is as large as possible, the data of existing cities will be analyzed by clustering to get the better performing n values, and the cities will be divided into education-related n-clusters. k-means will also be

used to analyze the data after the promulgation of the double reduction policy.

Among n clusters, if the results show that economically developed cities and economically deficient cities fall into separate clusters, it confirms that the degree of educational equity in each region is influenced by the city's economy, and as the city's economy grows stronger, the degree of educational equity in the region becomes higher.

On the other hand, if it presents a situation that some underdeveloped regions are divided into one category with developed regions, we can do further research on the region and dig out the unique characteristics of the region. The comparison of the results of cluster analysis of cities before and after the double reduction policy is a significant factor in determining whether the double reduction policy has an impact on educational equity.

Furthermore, logistic regression will be used to investigate the relationship between indicators mentioned above and the educational equity issue. It is crucial to fit the indicators as independent variables to the indicators of educational equity as dependent variables, which is worth emphasizing because educational equity indicators usually depend on the requirements of local governments.

-Expected results discussion:

As we discussed above, the expected results will be showed by n clusters. If educational equity is affected by the level of economic development, Chinese government should consider setting forth a program to re-allocate the admission quota of key universities. It means that Chinese universities need to give more opportunities to students from underdeveloped areas, such as Xinjiang, Qinghai and Tibet. After-school classes are established by private educational institution, and they usually charge high tuitions. These educational institutions have more money to hire teachers with high

qualification. Family income is lower in developed areas than that in developed areas, so teachers with high qualification may not be willing to stay in underdevelopment areas. Even students in underdeveloped areas spend a lot of money in after-school classes, they may not achieve their goal. The after-school classes became a cheating way for students in economically developed areas. Because of Double Reduction Policy, educational institution outside schools is imposed to be shut down in both developed and underdeveloped regions. The policy encourages every student to study well in school and requires teachers in schools to fulfill their responsibilities towards their students.

However, if the educational equity is not affected by the level of economic development, we need to consider more factors. Some families emphasize on fostering their kids' business ability, or training their kids skills of art, music, or sports. However, the Double Reduction Policy does not restrict the extracurriculars of art, music, and sports. If we cannot conclude educational equity is affected by the regions' economy, more evidence is needed to show whether the Double Reduction Policy has influence on the educational equity.

Using logistic Regression, we have filtered the important variables that closed influence education equity. After the Double Reduction Policy came out, we are expecting to see how it affect the educational equity by changing the related variables. For instance, the mean and median of family expenses on education decreases, we can conclude that is alleviate the pressure of low-income families. In this way, the policy will promote the educational equity and vice versa.

-Conclusion

In the past ten years, extracurricular classes are pandemic in China. In schools, teachers are not willing to teach a lot in school and they encourage students to take after-school classes. If most people in schools take after-school classes, students who cannot afford the cost of after-school classes will not learn enough materials and they are not able to get good grades in tests. This phenomenon became a vicious circle, and it led Chinese family spend more and more money on education. However, for low-income families, they don't have enough money. Because of the double reduction policy, many after-school classes focused on math, Chinese literature and English are forced to be shut down. Meanwhile, some public schools start to open the self-study on campus. Students can finish their homework in schools and if students have any questions, teachers are available to help.

We must admit that exams are important in education because it is a fair way to test students' ability in logical analysis and critical thinking. However, after-school classes harm the fairness of the exams, because low-income families cannot afford the cost of after-school classes and undeveloped areas don't have good teachers for after-school classes. Therefore, double reduction policy aims to promote the fairness by restricting extracurricular classes outside schools. Also, the essentials of education not only mean getting good grades, but also mean teaching students according` to their aptitude. It is the reason why the policy restricts after-school classes on the subjects which encourages students get grades, but it does not restrict extracurricular classes on art, music, dance and so on.

Although the policy represents the original intention of promoting educational equity, there is a possibility that the policy will deteriorate the inequality of education. The reason is that Chinese students from different province are required to achieve different scores for admission to key universities. Some provinces with higher

enrollment cut-off points for admission to key universities will lose more opportunities to enroll in key universities. Since it is a newly policy, we will keep following the future, to see how Double-Reduction Policy affect educational equity.

Reference:

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