

Short Report

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1. Framework and Analysis

The research project topic is about creating a framework to evaluate the influence of Canadian researchers who signed into the Energy Modeling Initiative program as a sample in literature. First of all, the topic is about the influence of literature. The key factors that can affect the power of the literature include the number of publications, the number of citations, the number of readings, and the number of participating projects. I collected these data about each person according to the researcher's name in the provided samples and store the collected data in a data set. Since DIKW Model (Data, Information, Knowledge, and Wisdom) is used, the analysis process is divided into four steps. 1. Data Collecting 2. Data to Information. 3. Information to Knowledge 4. Knowledge to Wisdom. After finishing the data set (which is to complete the first step, we start to do data cleaning. To delete all the data rows with missing critical data (number of documents and number of citations) to ensure the validity of the analysis. According to these researchers, the work organization classifies and performs data statistics for each category. 1. To count the total number of researchers in each category 2. The effectiveness of each category of data (how many pieces of data are available, and the effective ratio of each category of data). After finishing the statistics, we can know the basic information of each type of data. It converts data to information—the third step: information to knowledge. Knowledge is the application of information. The number of article citations mainly measures a researcher's influence. During the second step, we find that the number of participating projects is not a significant value for this research because it lacks too much data. Therefore, we mainly consider the relationship between article citations and the number of publications and readings. Linear regression is an appropriate method to assess the relationship between them. We separately consider the

relationship between the number of publications, the number of readings, and citations.

According to the image, it can be seen that the number of readings is largely inconsistent with the model (its regression line is almost flat), and most of the observation points of the number of published articles are close to the regression line. Creating an OLS regression summary confirms this conjecture by its $P > |t|$ value. The $P > |t|$ values of Intercept and Reading Volume are more significant than 0.05. Therefore, we can predict the number of citations for each article published. This model better helps us to quantify the influence of researchers. The last step is knowledge to wisdom. We use the linear regression model to predict the number of times that each article will be cited after publication. According to this formula, a researcher's influence can be evaluated, because judging the influence of a researcher needs to consider both the number of articles published and the number of citations. Therefore, we cannot continue to use linear regression to classify the influence of researchers. The tree model can solve the problem of nonlinear features, and the tree model does not require the standardization and unified quantification of features. A decision tree regressor is required to classify the level of influence of researchers. (Use Decision Tree Classifier). The nodes of the regression tree return the mean of a group of training data. Hence, the nodes represent the range of citation numbers by the number of publications. If the researcher's article is within the range of citations, then consider this level. If it is higher than the range, to transfer to the next level. If it is lower than the range, it will transfer to a lower level. (With the same number of articles)

2. Interactions and Improvement

My supervisor, Benjamin Poirier, helped me a lot throughout the project. We set up a weekly meeting to discuss questions about the project. Whenever I put forward an idea, he will ask a few questions to guide me to think and improve my thinking. Each feedback will provide me with a new idea to improve my report. For example, to consider the pros and cons of this research and judge whether a researcher is correct based on popularity/influence. In this research project, I realized how to start research. First, I will create a rough framework to determine the research sequence, then fill in/delete elements in the framework in the subsequent process to ensure the accuracy of the research, and I promptly communicate with the supervisor after each step is carried out/finished. It improves my follow-up thinking to avoid more deviations. This project taught me how to apply Econometrics to real problems. Otherwise, I will convert data to helpful information to analyze by the linear regression model. After completing the research, it is also essential to verify my result by evidence. To suppose the research results are inconsistent with the verification conclusions. In that case, it can only prove that the viewpoint is inaccurate, and it is necessary to change the thinking or re-examine the research steps to re-verify.

3. Related to Economics Policy

With the global climate change, Canada's locations were close to the North Pole are more affected than the other places on the earth. Therefore, the Canadian government has realized the importance of clean energy (renewable energy). The clean energy industry can create more jobs and stimulate economic development to reduce the impact of COVID-19 in Canada, so Canada is accelerating its transition to a clean energy society. In the process, oil companies or plastic companies may face bankruptcy and reorganization in response to new policies. Then, the employees of these companies will be forced to face unemployment and they are difficult to find a job again. This will lead to an increase in its unemployment rate and a decrease in GDP. Another factor leading to the decline in GDP is the decline in turnover due to the transformation or closure of large-scale energy companies, which directly affects GDP and the stock market. Therefore, the Canadian government hopes that the results of Canadian energy researchers will be widely known by their peers to expand the scope of policy influence and reduce the loss of transition to the lowest possible level. The clean energy industry will create more job opportunities than ever before. Clean energy will reduce the cost of use and extraction, it will attract more people to use, and stimulate economic growth. According to the Bandwagon effect, people tend to listen to the opinions of well-known/influential people. Due to their research results being often adopted by many peers, more people in the energy field are familiar with the clean energy policy. They can help enterprises accelerate their transformation to clean energy enterprises to reduce the possibility of employee unemployment and the loss of company profits. Colleagues tend to adopt researchers who have a higher reputation in the field, so it is essential to assess a researcher's influence by creating a framework to evaluate a researcher's influence to judge his popularity. This will help the Canadian government selects more well-known researchers

to help promote the new policy. Similarly, using this framework, the government can select well-known researchers in other fields to help expand the scope of the new economic policy.