

Team ID: NMSA134

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Area of Science: Environmental Science—Pollution Sources and Their Control

Project Title: The Effect of EFCA

**The problem:** In current times, companies are competing with other companies to have the cheapest prices encouraging the cheapest the companies to use the cheapest methods for obtaining and storing their goods. Unfortunately, cheaper shipping materials, containers, and production of products are often more damaging to the environment than more expensive ones. In an attempt to fix this, environmental scientists came up with the idea of environmental full-cost accounting (EFCA, also called full cost pricing or true cost accounting). This concept requires that the government taxes corporations extra based on the environmental cost of their actions. The money that the government would get from this would then replace some of the personal tax rate, so although prices may go up on products, the consumers would pay less tax, and thus, have more money to buy these products. The main difference before and after implementing this is that companies and consumers have to pay more for environmentally harmful materials. The problems with this idea are that firstly, there is no dollar-defined “environmental cost”, and secondly, it could cause economic decline—maybe even to the point of economic collapse.

**Our solution:** First, we have to come up with a dollar-defined “environmental cost.” To do this, we decided to use the cost of returning an environmentally harmful substance back to its natural state. For example, we will use the cost of removing CO<sub>2</sub> from the atmosphere to determine the amount that companies should be taxed based on their coal energy use and gasoline use for shipment. Of course, if it were dollar for dollar, it could have catastrophic effects on the economy, so we will use a manipulatable variable as the rate by which each of these dollar for dollar costs should be multiplied. We plan to find the optimum rate at which these companies could be taxed without harming the economy. Our focus will be the United States. Since we can’t get data from every company and every city in the country, we will use selective sampling, choosing the companies and cities we believe are most likely to have the data we need. Secondly, we will analyse the output or make a program to more accurately analyse the output if we have time. This analysis will help us determine what the optimum tax rate, based on our determined environmental cost, is to find the best solution for the environment and the economy.

**Our progress:** We’ve written code that creates an output file of dollar-defined environmental cost in different locations based on input files of the location and the companies in that location. The file with company data requires shipping data, packaging data, and natural resource (land and water) degradation. We hope to also add energy data; this may actually be the main data we use since it should be the easiest to obtain and it is a major factor of CO<sub>2</sub> emissions. The file with location data requires an approximation of the amount of total products bought in the location as well as the amount of products bought from each brand in the other file. The program also includes constants containing the cost per unit of pollutant/ degradation as well as a manipulatable variable, as mentioned before, to multiply these costs by to get a plausible cost that these companies would be taxed. We haven’t gotten much of the data yet, so that along with output analysis is what we plan to spend most of the remaining time doing.

**Predicted result:** We predict that we will find a rate at which companies can be taxed for their environmental degradation that will improve the state of the global environment as well as keep the economy stable. We definitely think it will be below the cost of fixing the environmental cost of the company actions. We do not have a good estimate of what the rate would be yet because we don't know the full extent of the environmentally harmful actions companies are doing.

**References:**

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