Cournot Duopoly Model Program

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Abstract

The following paper is about a program in C++ which given the right numbers can calculate the reaction functions, the price, the quantities and the profits of a Cournot duopoly game between 2 firms.

1 Introduction

The program can be helpful to any case considering a duopoly Cournot game. It can be used to quickly solve any Cournot duopoly game and used calculate the motives for cartel forming given the right variables by the user!

2 The Program Structure

2.1 1st Part

In the first part the User receives a message asking him to give certain numbers for 4 variables. The 2 costs of the firms and the variables a,b in order to form the function P=a-b*Q!

This is a very important step to form the main idea of the problem.

2.2 2nd Part

The program examines with an if statement if the user enters zero prices for everything requested above and pops out the following message: "Zero prices will lead to zero outputs. Please enter valid numbers and try again."

```
if (a==0 && b==0 && c1==0 && c2==0)
{
    cout << "Zero prices will lead to zero outputs. Please enter valid numbers and try again." << endl;
    return 0;
}
```

Figure 1: This is a picture of the C++ source code!

2.3 3d part

Moving to the 3rd and last part, the program calculates the reaction function of the firms, the Cournot quantities, the prices and the profits with the following types:

$$R_1 = \frac{a - b * q_2 - c_1}{2 * b}(SameforR_2) \tag{1}$$

$$q_1 = \frac{a - 2 * c_1 + c_2}{3 * b}(Sameforq_2) \tag{2}$$

$$P = \frac{a + c_1 + c_2}{3} \tag{3}$$

$$Prof_1 = \frac{(a - 2 * c_1 + c_2)^2}{9 * b}(SameforProf_2) \tag{4}$$

I hope you found my LaTeX project useful, and please let me know if you wish to see any changes above.