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Methodology for Frontier Model of the Environmental Inefficiency effects on Livestock Bioeconomy

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We use this protocol and it's working

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Abstract

This protocol considers the methodology used for Stochastic Frontier Analysis on the Livestocks Bioeconomic model. The applied methodology measured the eco-efficiency of Mexican dairy farms using the empirical application of a stochastic frontier bioeconomy model. The productive sector of the bioeconomy studied was the Eco-intensification of the livestock production system (dairies).

Guidelines

For this protocol is very important to consider the theoretical bioeconomic model when the methane variable is included. software used in this process is very important for organizing the data and collecting information.

Materials

Frontier version 4.1 software
Questionary
Transport
PC and Laptop
Team of researcher

Before start

If necessary define the bioeconomy model. For this is very important the design of the questionary according to the file data required in the software Frontier 4.1.

Stochatics Frontier Analysis

1 Collecting Data. The study was carried out in 102 cattle farms for milk production in six municipalities of the state of Tlaxcala Mexico, in 2020. The production units were randomly selected, and dividing them among the four regions of importance in dairy production in the state of Tlaxcala. The questionnaires contained technical information, owner information, and economic data. In addition, 102 dairy cattle farms were monitored. For the collection of data, the following procedure was followed:

an a) identification of the areas of the state with the highest volume of milk production.

2 b) identification of the production units present in the study areas, which is located in the Mexican Altiplano and at the geographic coordinate's 98°43" west longitude and 19°44' north latitude, and 97°38' east longitude and 19° north latitude. 06 south latitude. The prevailing climate in the state is sub-humid temperate with summer rains. The average altitude of the study region is 2,200 meters above sea level.

3 c) design and application of a questionnaire to collect information, which considers the variables that will be included in the model of efficiency and inefficiency.

4 d) analysis of the data obtained. Before running the software is necessary to consider 3 files. The first is the data, the second is the instruction and the third is the results or outputs. The **FRONTIER** Version 4.1 computer program (Battese & Coelli, 1988, 1,992 and 1995) was used to obtain a maximum likelihood estimate (MLE) of the selected data in the study period; this is raised in the literature review section. The first model is the Stochastic Frontier Model for a Livestock Bioeconomy System.

5 The second is the Model of Technical Production Inefficiency for a Livestock Bioeconomy System: Environmental Condition and variability in Climate Change.

6 Hypothesis to be tested: If the inefficiency model is stochastic, then the technical efficiency of the dairy farm system can be explained by the Stochastic Frontier model for a Livestock Bioeconomy system influenced by climate change variability (Greenhouse Gas Emissions).

7 Stochastic Frontier Analysis running Frontier 4.1, implies organizing the information in figures and tables according to the purpose of the research.

Protocol references

Zuniga Gonzalez CA and Jaramillo-Villanueva JL. Frontier model of the environmental inefficiency effects on livestock bioeconomy [version 2; peer review: 1 not approved]. *F1000Research* 2023, **11**:1382 (https://doi.org/10.12688/f1000research.128071.2)