Supermarkets market in Spain

Superefficiency & Unit Cost Benchmark

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1 Motivation

2 Introduction

The main goal of this exercise will be to rank supermarket firms based on the *Supperefficiency and unit cost benchmark* concepts from a revenue efficiency perspective. To achieve this we will use real[1] data from 17 supermarkets operating in the Spanish supermarket market.

3 Materials and methods

3.1 Supermarkets market in Spain

The supermarkets market in Spain will be assumed to be a non-empty and finite set $S(C)$. By definition, $S(C)$ will be a n-tuple where n is the number of supermarkets in the supermarkets market or simply the length of $S(C)$ and C are the coordinates set of the supermarket market.

3.2 Coordinates set

The coordinates set of $S(C)$ will be a non-empty, unordered and finite set C. By definition, C will be of length n and formed by ordered pairs c. By definition, $c_i = \{c_{1i}, c_{2i}\}, \forall \in n$.

4 Appendix

To handle all the data manipulation we used the programming language Python, version 3.7.4. The libraries used were Pandas, Numpy, Matplotlib and Scipy.

```
import pandas as pd
import numpy as np
import matplotlib.pyplot as plt
```

[1] We researched information about 17 firms operating in the Spanish supermarket market and then adapted the data for this exercise. More information is given in the Appenddix.

```
4 from scipy.spatial import ConvexHull, convex_hull_plot_2d
```

Listing 1: Python libraries used