2A_SP

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0.1 Computation of Hirschman-Herfindahl (HHI) and Concentration Ratio (CR indexes)

Bachelor in Economics. UAB

Professor Dr. Asencio

Students: Roylan Martinez Vargas and Rohan Foster

We decided to work on the Supermarket's Market

0.2 Spain Supermarket's Market

Spain as a developed country has a considerable variety of supermarkets, up to 2017 there were more than 21 000 supermarkets operating throught all Spain. JAVIER SALVATIERRA, 2016

Currently, the leader in this Market by market share is Mercadona. This firm is a complete leader in the distribution sector, it has reached a market share of 24.9% in 2018 and it does not seem to be decreasing in the years to come.

An inform of the *Balance de la distribución y el Gran Consumo* elaborated by *Kantar Woldpanel* has shown how Mercadona has improved its index by 0.08 points in comparisson with 2017. Behind Mercadona, we find Carrefour, Dia, Eroski, Lidl and Auchan trying to improve its market shares. Lidia montes, 2018

0.2.1 Hirschman-Herfindahl Index (HHI)

The data we will use to compute the HHI and the CR5 index comes from Kantarworldpanel, 2019

```
[1]: import pandas as pd
a = pd.DataFrame( {
    'mercadona': [0.257],
    'carrefour': [0.087],
    'grupodia': [0.064],
    'grupoeroski': [0.056],
    'lidl': [0.049],
    'grupoauchan': [0.035,],
    'regionals': [0.122],
    })
a['notseenmarket'] = 1 - a.sum(axis=1)
print(a)
```

```
print('\nAll market shares')
print('Sum:', a.loc[0].sum())
```

```
   mercadona  carrefour  grupodia  grupoeroski   lidl  grupoauchan  regionals  \
0      0.257      0.087     0.064        0.056  0.049        0.035      0.122

   notseenmarket
0           0.33
```

```
All market shares
Sum: 0.9999999999999999
```

Before doing any computation it is important to see this data does not provide the full information about all the markets shares (there is one third of not seen market share), therefore we are not able to compute exactly the Hirschman-Herfindahl Index. However we are able to compute its extreme values to get a trustable interval for the HHI.

[2]:
```
seen_mkt = a.loc[0].sum() - a.loc[0, 'notseenmarket']
not_seen_mkt = a ** 2
print(not_seen_mkt)
print('\nLargest posible HHI:')
print('Sum:', not_seen_mkt.loc[0].sum())
```

```
   mercadona  carrefour  grupodia  grupoeroski      lidl  grupoauchan  \
0   0.066049   0.007569  0.004096     0.003136  0.002401     0.001225

   regionals  notseenmarket
0   0.014884         0.1089
```

```
Largest posible HHI:
Sum: 0.20825999999999995
```

[3]:
```
b = a.drop('notseenmarket', axis=1) ** 2
print('\nLowest posible HHI')
print('Sum:', b.loc[0].sum())
```

```
Lowest posible HHI
Sum: 0.09935999999999999
```

As I mentioned before we are not able to compute the exact HHI because there is a 33% of notseen market share over the total market share. The largest posible value (assuming one firm has the control of this 33% of the total market share) is 0.20825999999999995 and the lowest posible HHI (assuming infinite firms have the control of this 33% of the total market share) is 0.09935999999999999 and therefore the real HHI should lie between those two numbers.

0.2.2 Concentration Ratio (HHI)

The data we will use for this Index is the same as as before.

```
[4]: r = a[['mercadona', 'carrefour', 'grupodia', 'grupoeroski', 'lidl']]
     print(r)
     print('\nTotal market share:', r.loc[0].sum())
     print('Concentration Ratio (5):', r.loc[0].sum())
```

```
   mercadona  carrefour  grupodia  grupoeroski   lidl
0      0.257      0.087     0.064        0.056  0.049

Total market share: 0.513
Concentration Ratio: 0.513
```

As we see the CR5 taes a value of 0.513.

Conclusion

The data used to compute these two indexes has as a geographical location Spain and it tracked the largests supermarkets to identify the largest firms behind. This data as I mentioned before also provides an estimation of the total amount of supermarkets. *The parameters they used to decide what can be considered a supermarket and what does not is not available.*

HHI

The HHI value relies between (0.1, 0.21). It is relatively low, it informs the market can be considered more a competitive market rather than a monopolistic one. We also believe the HHI should be taken as an informative index and not as an indicative of causality for competitive problems, besides the interpretation of this index does not have the same meaning for all the kind of services and goods because the relativeness of the categorization parameters behind is not the same for all the services or goods, therefore, in the Supermarket market it is somewhat tricky to define what is a Supermarket and what is not with a precise segregation paremeter. However, overall we think the HHI is way more trustable than the CR5.

CR5

The CR5 has even more interpretation problems with its meaning. Again it can take an informative roll, but it cannot be used to issue causality information regarding the competition problems because an index of the concentration of the N firms in a market depends upon many other factors that are not necessarily indicators of competition problems.