

HHINDEX

A new Stata command for Market Concentration Indexes

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- t Focus on cardinal market concentration indexes:
Herfindahl-Hirschman and Entropy
- t Develop a Stata command for markets whose
composition can vary over time
- t Application to Italian Newspapers Markets at provincial
level

Utility of measures of MKT concentration

- t Needed in any regression or more sophisticated econometric analysis of an economy, a single market, comparisons between markets.
- t As a proxy of market power, are used from Antitrust Authorities for evaluating when the relevant market concentration thresholds are reached in a market, with negative consequences for free competition.

Cardinal versus ordinal measures of market concentration

Encaoua, D. and A. Jacquemin (1980), *International Economic Review*.

- t Axiomatic approach: define properties of concentration measure of a market where n firms produce a homogeneous product, with vector of output shares $m = (m_1, m_2, \dots, m_n)$, $m_i \geq 0$ and $\sum_{i=1}^n m_i = 1$
- t Symmetry condition: a cardinal measure is independent of the order of the components of the size distribution

E-J Properties of Concentration measures

n fixed:

- t Transfer of a part of m to a bigger firm must not decrease C
- t Given n , C is min when m_i is the same for all firms
- t If 2 industries have the same n , and the aggregate share of the biggest k in 1 is \geq than in 2, then $C_1 \geq C_2$
(Lorenz-criterion)

Properties used also in the context of measures of inequality of income distributions. However they do not reflect same feature and goals, in particular Gini coefficient does not satisfy the second category of properties, that must hold when n varies:

- t In case of merger between 2 or more firms, C must not decrease.
- t In case of industries composed of firms of equal m , C must not increase with an increase of the number of firms.

Cardinal measures that satisfy all the E-J properties

t The Herfindahl-Hirschman index:

$$HH = \sum_{i=1}^n m_i^2$$

more weight is given to biggest firms, $0 \leq HH \leq 1$;
 $HH = 1$ if monopoly; $HH = 1/n$ if m_i const.; for n fixed is
 HH bigger the bigger is asymmetry across firms

t The (inverse of) Entropy measure:

$$E = - \sum_{i=1}^n m_i \log m_i$$

tends to reduce the importance of biggest firms; $E = 0$ if
monopoly; becomes more and more negative when n
increases.

Ordinal measures

t Concentration ratio index:

$$C_k = \sum_{i=1}^k m_i$$

for the k biggest firms of the market, k is arbitrary. Give only partial information on the distribution of the market.

t Linda index:

$$L = \frac{1}{j} \sum_{i=1}^j \left(\frac{A_i}{i} / \frac{A_j}{j} \right)$$

where A_i is total mkt share of the biggest i firms, among the biggest $j = 2, \dots, n$; A_j is total mkt share of the biggest j firms. L is therefore the sum of two averages, is calculated for j increasing.

t Leader-follower:

$$q_i/q_1, q_i/q_2, \dots$$

used in marketing.

HHINDEX command

The syntax is very simple.

The data-set must be wide shaped: each row is a market in a given year.

hhindex varlist

where **varlist** contains firm-specific output levels, the program calculates the output shares automatically.

hhindex produces for each row two variables: *HH* and *E* containing the Herfindahl-Hirschman and Entropy measures of concentration for each market/year.

Extensions

- t Accommodate for different data shapes
- t Generalize the .do file procedure for ordinal measures of concentration