



# Competitiveness Benchmarking

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# Significance of the Study

- Competitiveness as a key criterion for assessing the success of firms
- deal with the new volatile external environment due to the nuclear sanctions
- look into their internal resources for comparatively better market position
- taking into account a selected number of financial, economic and productivity ratios obtainable from the firms' financial statements
- input, processes and output as a means to compare performance level
- bigger or smaller firms are affected more severely by the nuclear sanctions

# Presumption at the Iran's Chamber

- Invest on smaller firms
- Agile towards changes
- Applicable for short-term strategy

- Low value- high volume products (OTC) and High value- low volume products (special drugs for less prevalent diseases)
- Economics of Scarcity and Economics of Abundance

## Why this matters

# Does the Size Matter?

Same old Question

- deciding on the rank of firms according to a number of criteria or Multi Criteria Decision Making (MCDM).
- TOPSIS (Technique for Order Preference by Similarities to Ideal Solution),
- suitable for cases with a large number of attributes, alternatives and handy for objectives with quantitative data
- alleviates the requirement of paired comparison

# THE MODEL

- based on the internal perspective of competitiveness
- considering the input, processes and output of firms.
- This is obtained by the calculation of financial, economic, and productivity indicators extracted from the companies' financial statements as a legitimate reflection of firms' performance

# A firm's competitiveness depends on

- their customers' and shareholders' values,
- the financial power that determines their actions and reactions in the competitive environment,
- and the potential of its workforce and implemented technologies to bring about the necessary strategic changes.
- create and maintain a proper balance between all the aforementioned factors



# In Iran..

- political and business circumstances
- No influence on the external factors impacting their environment
- Uncertainty in terms of external factors
- be extremely cautious of their internal processes to remain competitive.
- 'pharmaceuticals'
- difficulty of obtaining raw material and lack of access to the patents required for lean production
- export their products,
- acquire new technologies, etc.
- need to compensate for this loss through improving their internal processes

# COMPETITIVENESS

- competitiveness as a 'multi-dimensional' and 'relative' concept
- 'Performance measurement' is the process of measuring and assessing the performance of organizations over certain time periods
- technological, engineering, and economist approaches towards productivity

- As defined by Martz, competitiveness is the economic power of a unit against its competitors in a market where goods, services, talents, and ideas are easily supplied across geographical boundaries.
- firms' ability to design, manufacture, market, and sell products in quantities higher than those of its competitors can

# Productivity as the main contributor

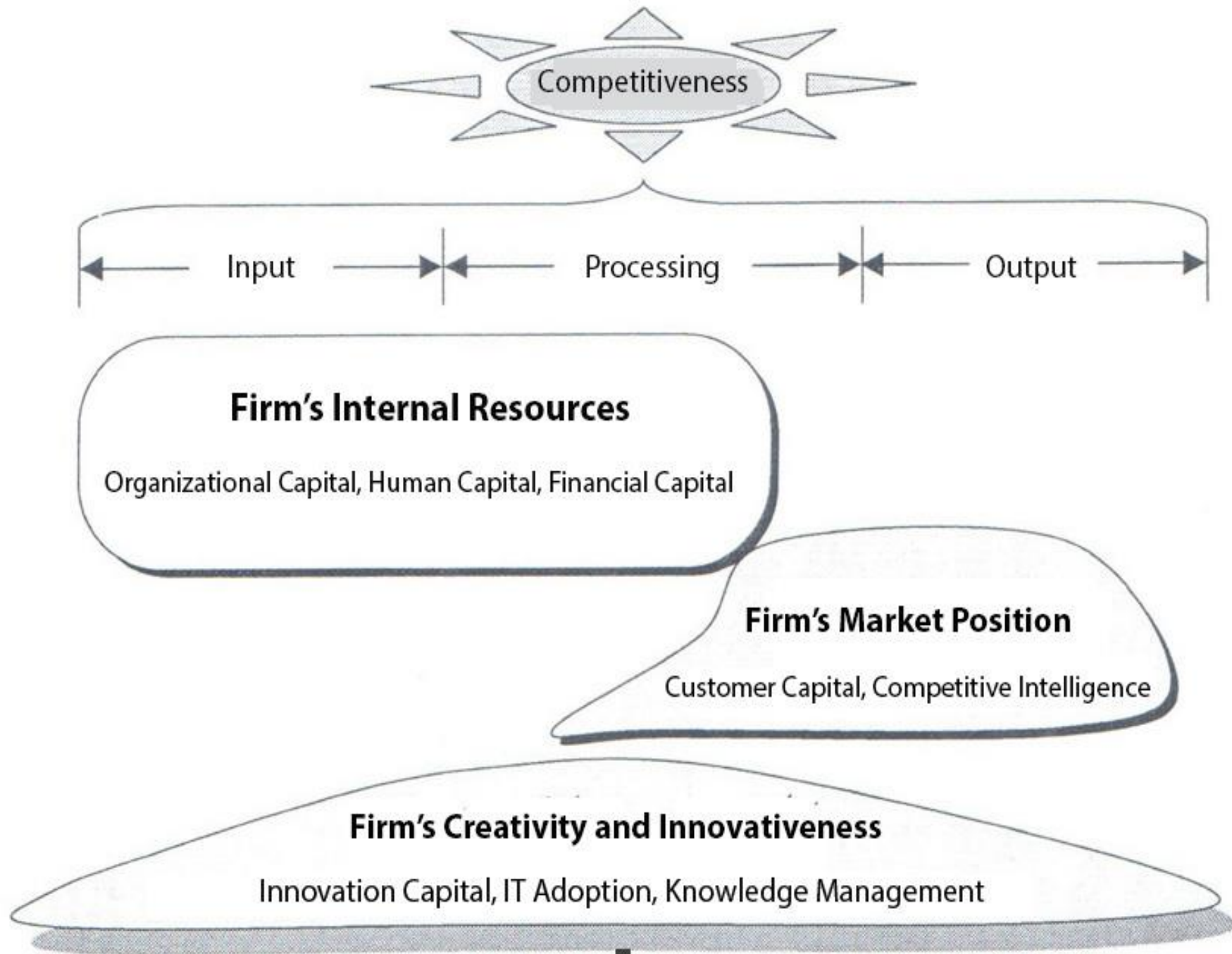
- In a conceptual model, Tangen defines productivity as the result of 'input efficiency' and 'output effectiveness', which subsequently leads to higher profitability, and hence, higher performance.

# Performance, Productivity, and Profitability

- Having a high performance is one way to gain competitive advantage.
- Performance can be measured by firms' productivity and profitability.
- There is a link between productivity and profitability ratios.
- Productivity is output volume per input volume.
- Profitability, on the other hand, is output volume times output unit price over input volume times input unit costs
- competitiveness is conceptualized as having three dimensions, namely 'potential', 'processes' and 'performance'.
- also characterized by its 'long-term orientation', 'controllability', 'relativity', and 'dynamism'

# competitiveness as an ability-based concept

- ‘internal factors’ are the main contributors to a firm’s competitiveness.
- This approach is mainly aimed at emphasizing the competitive advantages coming from a firm’s resources. In other words, it focuses on a firm’s internal resources as the potential sources of competitive advantage



- Organizational capital (human resources, financial structure, organizational culture, processes, and management capabilities)
- Technology and manufacturing capabilities

## Firm's internal resources

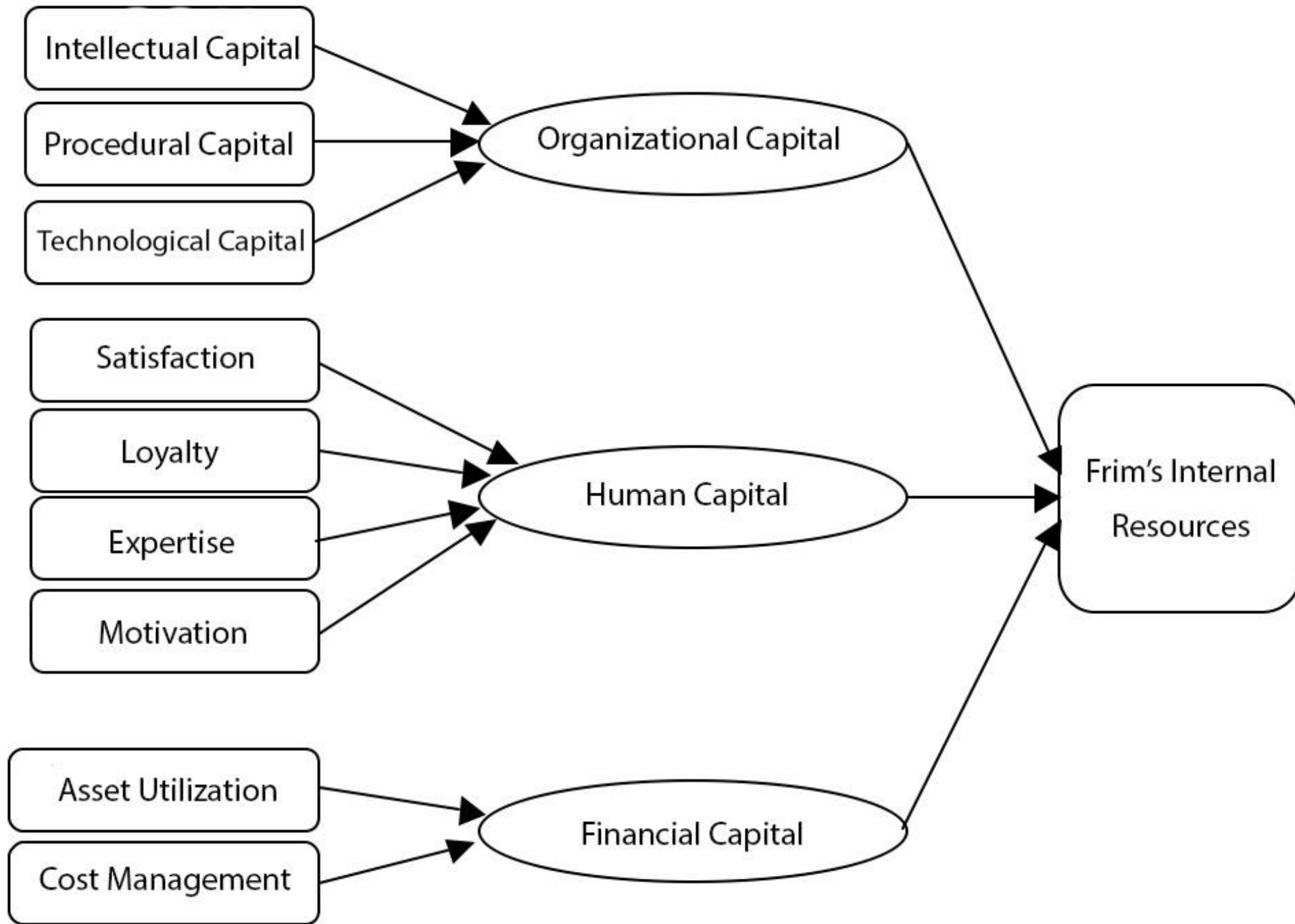


# Firm's market position

- Competitive strategy
- Flexibility and adaptability
- Quality
- Productivity
- Market share and marketability
- Product variety and differentiation
- Customer satisfaction
- Business Environment

# Firm's Creativity and Innovativeness

- Competency
- Design and application
- Innovation
- IT
- Knowledge management
- R&D
- New product development



	Level I	Level II
Competitiveness	Input	Capital
		Material
		Energy
	Process	Human Resource
		Overhead Cost
		Sales and Admin Costs
	Output	Financial
		Economic
		Productivity

# The Input attributes breakdown and their respective measures

Level I	Level II	Level III
Input	Capital	Patent and Trademark
		Fixed Assets
		Long-term Investment
		Machinery
		Orders and Prepayment
		Cash
	Material and Energy	Cost of Material
		Energy Cost

# The Process attributes breakdown and their respective measures

Process	Human Resources	Direct Wage
		Sales and Admin staff Salary
	Overhead Costs	Process Efficiency- Revenue Method
		Maintenance
		Production Equipment Depreciation
		Production and Lab Tools
		Packaging
		Transportation
		Contractual Costs
		Workshop Consumables
		Sales and Admin Cost
	Sales Costs	
	Financial Costs	

Output	Financial	Tax
		Accounts Receivable
		Percentage of Profit in Added Value
		Accounts Payable
		Net Income
		Quick Ratio
		Debt Ratio
	Economic	Operational Profit
		Profit Per Capita
		Return On Investment(ROI)
		Added Value to Output Value
		Added Value per capita
		Sales per capita
	Productivity	Labor Productivity
		Energy Productivity
		Material Productivity
		Capital Productivity
		Total Factor Productivity (TFP)
		Percentage of Labor Compensation in Added Value
		Percentage of Cost of Capital in Added Value
		Percentage of Credit Cost facilities in Added Value
		Percentage of Profit in Added Value

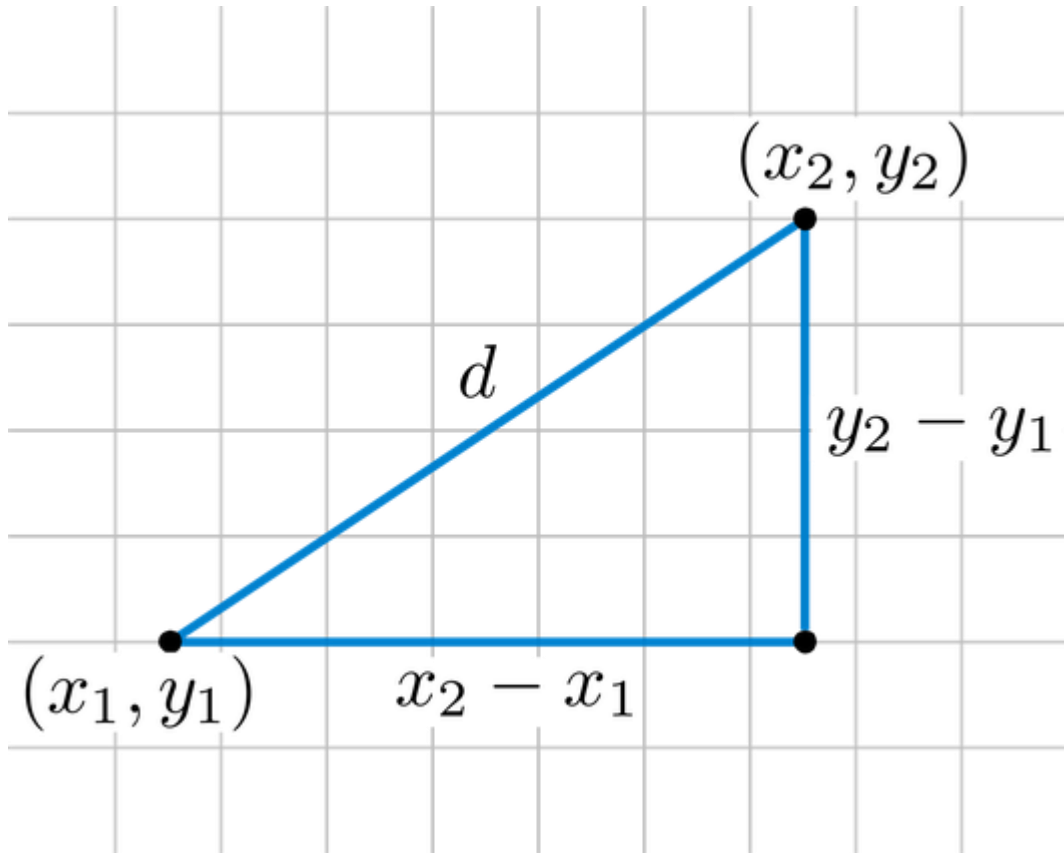
Input	Capital	Total Assets
		Land
		Property
		Long-term Investment
	Material & Energy	Cost of Material
		Energy Costs
Process	Human Resources	Sales and Admin staff salary
	Overhead Costs	Maintenance
		Process Efficiency
		Contractual Costs
Output	Financial	Percentage of Profit in Added Value
		Net Income (after tax deduction)
	Economic	ROI
		Added Value
		Added Value (income method)
		Output Value
	Productivity	Fixed Asset Productivity
		Capital Productivity
		Total Factor Productivity (TFP)
		Labour Productivity



# ASSUMPTIONS

- There has been no distinction between public and private entities
- The firms' production type is not considered in the calculations.
- Many qualitative elements cannot be translated into the numerical ratios and factors.
- The reciprocal impact of the elements on each other is not taken into account.
- Different accounting systems can result into different values of measures among firms.

# Euclidean Distance and Normalization



$$d(x, y) = \sqrt{\sum_{i=1}^n (x_i - y_i)^2}$$

# STEPS, To the Excel Sheet

- i. Calculating the weights of measures by paired comparison of cluster measures, attributes, and areas (AHP)
- Normalized Measures
- Weighted Normalized
- Positive Ideal Solution (the highest value for 'positive measures' and the lowest value for 'negative measures')
- Negative Ideal Solution (the lowest value for positive measures and highest value for negative measures)
- distance to the Positive Ideal Solutions and distance to the Negative Ideal Solutions

$$\frac{x}{\sqrt{\sum x^2}}$$

# The competitiveness score

$$S^* = \frac{dS^-}{dS^- + dS^+}$$

- Then the regression test is conducted to study the relationship between the change in the overall competitiveness score (firm-specific standard deviation) of firms and their size (average size among years)
- test a meaningful relationship between the size of firms and
  - a) their overall competitiveness score, and
  - b) their relative competitiveness score fluctuation.
- This will answer to the question if the bigger or smaller firms have had more significant change, or in other words, are affected more severely by the external circumstances

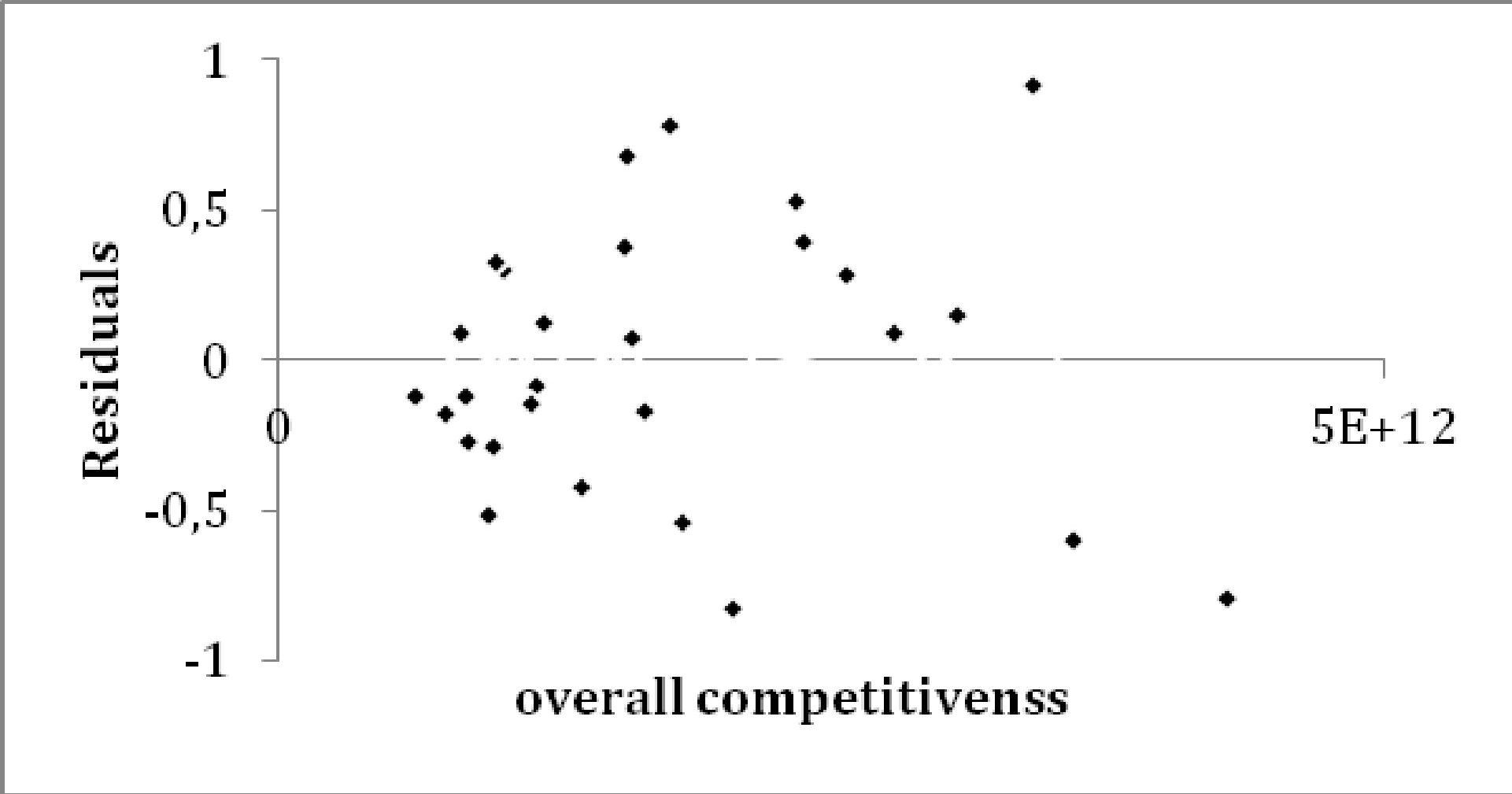
# Discussion on the weights

- productivity as a whole and process efficiency have got the highest weights among the measures.
- their overall weight is more than the weight of other measures altogether.
- While it is justifiable that land and property must have a low influence on the overall competitiveness of firms, the low weight for output (0.09) indicates that in order for a firm in the sector to flourish, it is not necessarily sufficient to focus on the higher production and develop in size

# FURTHER DISCUSSION

- relationship between the size and change in competitiveness, although R-Squared is low, but the fit is statistically significant.
- Regardless of the R-Squared, the significant coefficients still represent the change in the response.
- This means the trend obtained indicate the predictor variable (size) still provides information about the response.
- R-Squared represents the scatter around the regression line
- Low R-Squared can only be problematic when there is a need for precise predictions. A model with an acceptable p value has a good fit anyway. Obviously, in order to improve R-Squared, it is simply needed to add more variables to the model.

# Residual Plot



# Findings

- the total competitiveness of firms and their fluctuations over time depends on the size of firms.
- The firms with bigger size benefit from relatively higher competitiveness
- and also the bigger firms have experienced wider change (more fluctuation) in terms of their competitiveness.
- as a whole there has been an increase in the value of competitiveness scores of all the firms together over years.



# YES, SIZE MATTERS!

Thanks for your attention 😊