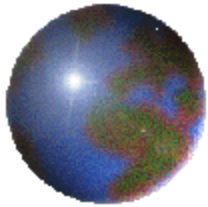




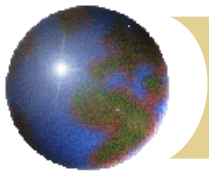
*10-13 July 2004*  
*Prague*

# **EIRASS Conference**



*Innovation and Technological Transfer  
in the international competition of italian  
SMEs*

**V. Sanguigni, F.Faggioni**



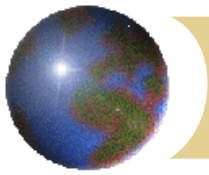
# *Object*

Study on innovation and national (international) competitiveness of SMEs;

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Research on italian SMEs, located near Rome.





## *Theoretic Analysis on:*

### ❖ Economic Studies dealing with internationalisation and technological change:

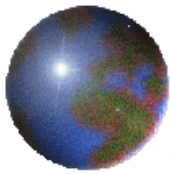
#### ❖ On a:

- Macroeconomic point of view;
- Microeconomic point of view.

### ❖ Economic Studies dealing with innovation:

- Traditional theoretical models on innovation;
- New theories on innovation seen as a systemic process.

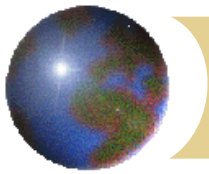




# A Synthesis – innovation-

Theories on innovation	Key words	measure
Neoclassic and Shumpeterian theories	1.product/process innovation 2.innovazione radicale ed incrementale 3.idea/innovation/diffusion	Input: R&D (€) Output:licenses
		<b>HR at R&amp;D</b>
Evolutionary theories on innovation	1.apprentice, <i>skill, routine</i> ; 2.process; 3.complementarity, technological interlink; 4.opportunity; 5.interactions; 6. technological paradigme;	<ol style="list-style-type: none"> <li>1. hi-tech plants and machineries;</li> <li>2. licenses, marks;</li> <li>3. R&amp;D <i>intra/extra moenia</i>;</li> <li>4. HR training/specialists;</li> <li>5. design, industrial project;</li> <li>6. networking;TT</li> </ol>

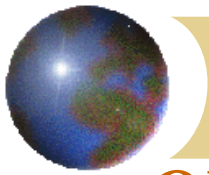




# A Synthesis – internationalisation and technology -

Theme	Authors
<p>a) <b>Technology as a mean to determine:</b></p> <ul style="list-style-type: none"> <li>- <b>1.Countries comparative advantages;</b></li> <li>- <b>2.world wealth distribution.</b></li> </ul>	<p><b>1.Keesing(1967);</b>  <b>Gruber-Metha-Vernon (1967);</b>  <b>2.Hicks (1953).</b></p>
<p>b) <b>analysis of innovation processes:</b></p> <ul style="list-style-type: none"> <li>- <b>- determining factors of technology</b> <b>widespreading;</b></li> <li>- <b>- role of the diffusive processes in the</b> <b>configuration of the exchanges and of the</b> <b>international investments.</b></li> </ul>	<p><b>Linder (1961);Posner (1961);</b>  <b>Vernon (1966);Krugman, (1979);</b>  <b>Grossman-Helpman (1991); Hirsch</b>  <b>(1975);Wells (1969); Baldwin (1971);</b>  <b>Dosi et al (1990)</b></p>
<p>c) <b>Relations between international trade and</b> <b>goverments trade policies to create influence on</b> <b>innovation and competitiveness of companies.</b></p>	<p><b>Romer (1986)</b>  <b>Krugman (1990)</b>  <b>Rivera, Batiz, Romer (1991)</b></p>





## *Objective theoretical recognition:*

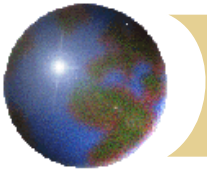
- ✚ Pointers of Internationalisation for SMEs;
- ✚ Pointers of innovation for SMEs.

## *The role of technological transfer*

Link between:

- ▣ The internationalisation degree of a firm;
- ▣ The innovative skill of a firm.



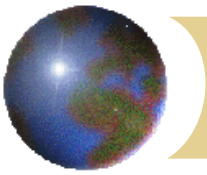


## *The empirical research*

### Methodology to select small innovative businesses

- **1° phase (on desk):** theoretical selection;
- **2° phase (on field):** confirmation of the selected group of SMEs.



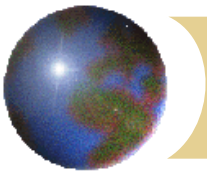


(\*)

## *2° phase of firms selection:*

- ⊕ Average dimension;
- ⊕ Belonging industry;
- ⊕ Technological equipment;
- ⊕ Innovation activities in the last three years;
- ⊕ Course of the expense for innovation in the last three years;
- ⊕ Eventual activity of national/international technological transfer.





## *The empirical research*

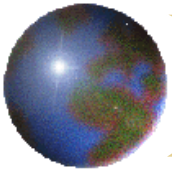
### **Methodology for the appraisal of innovation activities**

**hypothesis:**

**Innovation activity is important during:**

- ❑ The phase of creation;
- ❑ The phase of management.





*Continues..*

## *The empirical research*

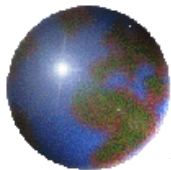
### **Methodology for the appraisal of innovation activities**

Pointers:

1. **R&D *intra moenia*;**
2. Cross Technological transfer
3. Networking

—————→ **innovation creating firms**





# Estrapolazione di un indicatore di innovatività nella gestione e nell'utilizzo dell'innovazione:

- Creazione di un indice di innovatività generico per la ponderazione degli indicatori di innovazione:

$$\frac{\sum_{i=1}^{12} nu}{12}$$

**Criterio =**  
**+ ricorrente**  
**- innovativo**

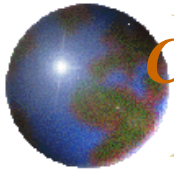
NUMERO INDICATORI CONSIDERATI	GERARCHIA DEGLI INDICATORI*	CATEGORIE INNOVATIVE	PESI ASSOCIATI ALLE CATEGORIE
1	1	marketing dei prodotti innovativi	0,26923
2	2	studio dei prodotti della concorrenza	0,25
3	3	acquisto servizi R&S extra moenia	0,23077
4	3	acquisto licenze e brevetti	0,23077
5	3	partecipaz a network	0,23077
6	4	formazione personale interno	0,21154
7	4	design	0,21154
8	5	trasferimento in	0,19231
	<i>categorie sopra l'incide =meno innovative</i>	<i>Posizionamento dell'indice grezzo</i>	
9	6	trasferimento out	0,15385
10	7	assunzione personale tecnico	0,13462
11	8	acquisto macchinari e attrezzature	0,11538
12	9	Partecipaz a fiere e mostre	0



I pesi sono stati calcolati per ogni indicatore secondo la formula:

$$P_{indic} = \frac{\max(f_i) - (f_i)}{\sum_{i=1}^{12} f_i}$$

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*Continues..*

*The empirical research*  
**Methodology for the appraisal of innovative activities**

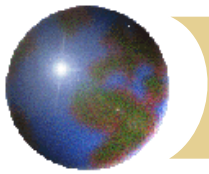
*The innovative index for a firm managing innovation*

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$$I_j = \left( \sum_{j=1}^{12} Pind * Dummy \right)$$

—————> **Managing innovation firms**



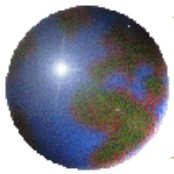


## *The results of the empirical research:*

### **Methodology for the appraisal of innovative activities**

- ✚ From a statistic point of view:
  - ✚ The aim is to verify the existence of an association between innovation and competitiveness (Q G.U. Yule index)
- ✚ The link between internationalisation and competitiveness is taken by:
  - ✚ international technological transfer;
  - ✚ Market shares.





# The results:

## Relation between competitiveness and innovation for creating and managing innovation firms:

Firms

Market share	Creating innov	Non creating innov.
Increment/stability	68,42	26,31
Decrement	0	5,26

Firms

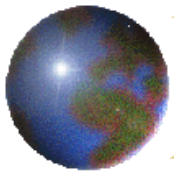
Market share	High management innovation	Low management innovation
Increment/stability	26,31	68,42
Decrement	0	5,26

$$Q_{11} = \frac{68.42 * 5.26 - 0 * 26.31}{68.42 * 5.26 + 0 * 26.31} = 1$$

$$Q = \frac{26.31 * 5.26 - 0 * 68.42}{26.31 * 5.26 + 0 * 68.42} = 1$$

Q.YULE





## The results:

### Relation between Technological Transfer and creating/managing innovation for firms.

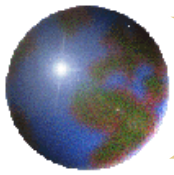
	Creating innov	Non creating innov
TT	47,36	21,05
Non TT	21,05	10,52

	High managing innov	Low managing innov
TT	26,31	42,10
Non TT	0	31,57

$$Q = \frac{47.36 * 10.52 - 21.05 * 21.05}{47.36 * 10.52 + 21.05 * 21.05} = 0.058$$

$$Q = \frac{26.31 * 31.57 - 0 * 42.10}{26.31 * 31.57 + 0 * 42.10} = 1$$





## *The results:*

### *Relation between International Technological Transfer and national competitiveness.*

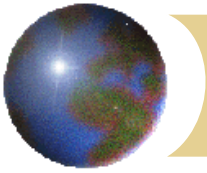
$$Q = \frac{10.56*5.26 - 0*84.21}{10.56*5.26 + 0*84.21} = 1$$

Int. TT and national market share

$$Q = \frac{10.56*26.31 - 0*63.17}{10.56*26.31 + 0*63.17} = 1$$

Int.TT and national turnover





## *Final considerations*

- ✚ The relation between innovation and market share or national turnover is positive;
- ✚ TT is just one way to make innovation for SMEs (in phase of managing innovation);
- ✚ The internationalisation of research activities for SMEs doesn't automatically deal with internationalisation of the operations and of markets.

