Scuola Superiore
Sant'Anna
di Studi Universitari e di Perfezionamento

The Effects of Sustainablity-oriented Strategies on Business Competitiveness: results of some empirical studies

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Links between Sustainability and Competitiveness

- The links between sustainability -oriented practices and competitiveness have been deeply investigated by researchers and practitioners with different approaches and perspectives, but the results are **not univocal**.

- The European Commission, in its Annual Competitiveness Report 2008, has provided an overview of these studies, clustering the effects of CSR on competitiveness in **6 indicators** of firm's competitiveness: cost structure, human resource performance, customer perspective, innovation, risk and reputation, management, and financial performance.

Research objectives

- Several studies carried out by our research team aimed at exploring these relationship, by testing whether the effects of CSR practices on firms' competitiveness are statistically supported:

  - **COSMIC**: Csr-Oriented Supply chain management improving competitiveness, funded by DG Enterprise

  - **EVER**: Evaluation of Emas for its Revision, funded by DG Environment

  - **EMPIRE**: Enviornmental regulation and Market forces Promoting and Incentivating Resource Efifciency, funded within the EC Sixth Framework Programme

COSMIC study

- In the first study we had the chance to investigate if there is a statistically significant correlation between the different measures of competitiveness and the adoption of specific CSR initiatives, as perceived by **250 sampled organizations** in the **textile sector** and located in **France, Italy and Spain**.

Correlation results

	Workplace-related CSR			Community related CSR		Market related CSR			
	Codes of Conduct	Benefits employ.	Staff_evaul	Intern._initiat	Local_comm	CSR Report	SC_agreem	GSCM_env	GSCM_en veth cert
Turnover	**-0.3187*****	**0.1929*****	0.0293	**-0.3217*****	**0.1228****	**0.1711*****	0.0547	0.0294	**-0.2093*****
Mkt perf — Demand traditional customers	0.0713	**0.1239****	0.0611	0.0505	0.0991	0.0807	0.0325	0.0789	**0.1080***
Mkt perf — Demand new customer	**0.1767*****	0.0219	0.0495	**0.2232*****	0.0795	0.0983	0.0958	0.0315	**0.2590*****
Mkt perf — Business attraction	**0.5660*****	**-0.3150*****	-0.0143	**0.5826*****	**-0.1881****	0.0654	**0.1684****	-0.0127	**0.5255*****
Innovation perf — Technical innovation	**0.1724*****	-0.0723	0.0154	**0.2265*****	0.0250	**0.1716*****	**0.2332*****	0.0924	**0.2591*****
Innovation perf — Organizational innovation	**0.3872*****	-0.0875	0.0443	**0.3949*****	0.0863	**0.1629*****	0.0672	**0.1441****	**0.3923*****
Personnel motivation	**-0.2796*****	**0.1721*****	-0.0103	**-0.2775*****	0.0743	0.0939	0.0603	0.0974	**-0.1429****
Personnel productivity	**-0.3345*****	**0.2320*****	0.0862	**-0.3737*****	**0.1330****	0.0096	0.0462	0.0546	**-0.2943*****
Intangible performance — Reputation	0.0047	0.0772	0.1005	-0.0489	-0.0239	0.0022	-0.0632	0.0808	0.0361
Relation with stakeholder	**0.3831*****	**-0.1261****	-0.0273	**0.3253*****	**0.1596****	0.0831	**0.1100***	**0.1758*****	**0.3110*****
Relation with credit	0.0207	**-0.1789*****	-0.0043	0.0323	-0.0499	**0.1303****	**0.1139***	**0.1505****	**0.1634****

*** $p < 0.01$ ** $p < 0.05$ * $p < 0.1$

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Furthermore

- We defined equations with the measures of competitiveness as dependent variables.

- The best results concerned the innovation performance (INNOV) as dependent variable.

- As independent variables we selected the adoption of an environmental management system complying with ISO 14001 (ISO 14001), the adoption of an ethical code of conduct (ETHIC_COD), and of environmental practices (ENV_RELATED).

Best results of the ordered probit

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Ordered probit regression                          Number of obs   =        260
                                                   LR chi2(4)      =      88.81
                                                   Prob > chi2     =     0.0000
Log likelihood = -589.49548                        Pseudo R2       =     0.0701

      INNOV |      Coef.    Std. Err.        z     P>|z|     [95% Conf. Interval]
------------+-------------------------------------------------------------------
ENV_related |    .5260085    .089605      5.87     0.000      .350386      .701631
  iso_14001 |    .4209209    .2300347     1.83     0.067    -.0299388     .8717806
       empl |    .0015828    .0009417     1.68     0.093     -.000263     .0034286
  ethic_cod |    .4110117    .1769362     2.32     0.020     .0642232     .7578003
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- The adoption of **environmental practices** increases the probability that an organization increases the level of technical and/or organizational innovation (the relation is significant at 99% and the coefficient is 0.5).

- The adoption of **ISO 14001** standard is as well positively related to innovation but the relation is slightly lower and weakly supported at statistical level.

- Finally, the adoption of an **ethical code** of conduct is also positively related to innovation (the relation is significant at 95% and the coefficient is 0.4).

EMPIRE study

The effect of environmental regulation on firms' competitive performance: the case of building & construction sector in European regions

RQ I: *Is a stringent environmental regulation able to positively affect the competitive performance of firms?*

RQ II: *What are the main differences between the forms of environmental regulation in the relation between environmental regulation, environmental performance and competitiveness?*

Three major theoretical approaches

- **1)** The "**traditionalist**" view of neoclassical environmental economics argues that the purpose of environmental regulation is to correct negative externalities, and that consequently environmental regulation – in internalising the costs of the negative externality – corrects a market failure, while burdening companies with additional costs.

- 2) the **Porter's approach** states that improved environmental performance is a potential source of competitive advantage, as it can lead to more efficient processes, improvements in productivity, lower costs of compliance and new market opportunities

- 3) **RBV approach** is an evolution of the Porter's approach, as it enlarges the typologies of resources that the companies and industries can rely on (focus on intangible assets such as *know how, corporate culture,* and *reputation).*

The role of different forms of environmental regulation

Porter and Van der Linde (1995) emphasized that "properly designed environmental regulation can trigger innovation that may partially or more than fully offset the costs of complying with them"

3 categories of environmental policy instruments, depending on their *ratio* (e.g.: "Polluter Pays Principle" vs. market-oriented approach) and the degree to which they are compulsory: *direct regulation* (*command and control*), *economic instruments* and *soft instruments*

Hypothesis: How does the form of environmental regulation affect the competitive performance of firms in the building and construction sector?

Survey data

Interviews were carried out from January to April of the year 2009, with the environmental manager of firms belonging to the investigated sector, using a standard questionnaire (78 interviews).

The definition of questionnaire was inspired to OECD survey "Environmental Policy and Firm-Level Management". Three main sections: Organization characteristics, Public environmental policy, Competitive performances

The sampling process was carried out in three steps.
1) we selected the NACE codes that potentially refer to the investigated sector segments.
2) we requested to different stakeholders (i.e. Chamber of Commerce, Trade Association) the list of all active organizations classified with the selected codes, located in the investigated regions.
3) we made a random sampling and identified 78 organizations to be interviewed.

The empirical model

$$\{Competitive\_performance_{i,t} = a + bStringencyC \& C_{t-1} + \gamma StringencyMBI_{t-1} + bStringencySFT_{t-1} + \varepsilon$$

where Stringency is a measure of the stringency of the environmental regulation and the specific policy instruments (command & control, market based instruments, soft instruments) and e is an error term.

Links between environmental regulation and competitiveness: the results

Ordered probit models: 6 equations to test if the environmental policy stringency can influence the competitiveness of a firm

Independent Variable	Innovation performance		Business performance				Intangibles performance					
	Technical Innovation		Business performance		Green business performance		Personnel motivation		Competence of technicians		Reputation	
Independent Variable	*Coefficient*	*z*	*Coefficient*	*z*	*Coefficient*	*z*	*Coefficient*	*z*	*Coefficient*	*z*	*Coefficient*	*z*
Technology based standards	0.664	**2.58**</br>**	0.524	**2.05**</br>**	0.128	0.50	.533	**2.25**</br>**	0.719	**2.96**</br>***	0.575	**2.43**</br>**
Green public procurement	0.530	**2.75**</br>***	0.112	0,58	0.066	0.36	.262	2.25	0.558	**2.96**</br>***	0.323	**1.81***
Input taxes	-0.199	-0.95	**-0.877**	**-3.70**</br>***	**-0.544**	**-2.55**</br>**	-.111	-0.57	0.208	1.05	0.091	0,47
LR chi2	21.89***		16.41***		6.77*		11.43***		31.43***		16.57***	
Pseudo R-square	0.1418		0.1117		0.0480		0.0612		0.1605		0.0842	

Conclusions

- Results support the Porter's hypothesis for the B&C sector

- The stringency can also stimulate the qualitative improvement of human resources in term of technical competence

- Soft instruments seem to have big potentiality but still need to be supported and promoted

- The role of Soft instruments (e.g.: evironmental certification) is relevant just on the intangible asset

- Properly designed C & C regulation can be a stimulus for the innovation by means of an increase in the investments

- The typical economic instruments such as the tax on input (energy, water) seem to be unable to address an organization towards an increase of innovation or efficiency playing on the equilibrium between marginal cost of pollution reduction and tax

Thank you!

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