Empirical approaches to exploring interactions between ecological policy and export
competitiveness of a country

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The question of interaction between ecological regulation and export competitiveness is on the agenda. It's explained by the understanding of governments that economic development and reinforcement of competitive advantages is possible if ecological loses are taken into account. The relative governmental policy problem is in minimizing the costs of compliance with environmental policies and improving the international trade flows and competitiveness.

The high interest of governments, especially of developed countries in investigating ecology-competitiveness links is represented in attempts of scientists to understand these links through developing theories and empirical studies in this area. The base theory and a starting point in this investigation is hypothesis of M.Porter and C. van der Linde. The main idea of the theory is that stringent but properly designed ecological policy may enhance innovation processes in a country that will lead both to ecological and economic performance. There are so called "weak", "strong" and "narrow" places in this theory broadly explored in the scientific world.

The effectiveness of this theory is being discussed until now. The fact that the theory has triggered high boost in researching of interactions between ecological policies and competitiveness in different levels and as a consequence it has contributed to a more comprehensive and full understanding of drive forces of competitiveness. So the question is how stringent must be ecological policy to improve economic effectiveness and competitiveness and what outcomes from this policy should be expected?

There have been elaborated different regression models trying to answer these questions. Some studies attempted to investigate the evidence of the "pollution haven theory" according to which polluting industries from developed countries will be relocated in jurisdictions with weak environmental regulations – "pollution havens". This fact has been tried to be proved empirically by European Network of Economic Policy Research Insitutes. Here are some results of researches (table 1).

So, the main conclusions we can make from the empirical studies considered above are like these:

1) when examining the links between environmental regulation and export

competitiveness the results are different in in some cases depending on the theoretical concepts;

2) there is statistical evidence of relationships between ecological policy and export competitiveness;

3) consequences of applying ecological regulations are more effective for developed countries than for developing ones;

4) ecological regulations will lead to more yields in a medium- and long-term periods rather than in a short term period.

Table 1

Results of empirical investigations of ecology-competitiveness links

Aims of investigation	Methods	Results
Area of study: EU15 exports (Roberta de Santis)		
to estimate whether and how the interaction between WTO, EU and MEAs memberships exerted a significant impact on EU15 exports in a gravity setting	Modified Hausman and Taylor estimator (HT)	1) EU14 bilateral export flows were positively influenced by the presence of both trade and environmental agreements in the period 1988-2008; 2) the environmental regulations have not constituted a secondary trade barrier in the past 20 years; 3) the membership of an MEA in the period 1988-2008 had a positive impact on EU14 exports ranging between 22 and 35%; 4) joint membership of WTO/EU and MEAs had a further positive 'interaction effect' on exports; 5) results reject the pollution haven hypothesis in favour of a view à la Porter, at least for EU members; 6) positive and significant relationship, in line with the existing literature, between EU and WTO membership and bilateral exports: EU countries exported about 31% more towards WTO countries and 16% more towards EU members
Area of study: U.S. manufacturing (Michael Greenstone, John A. List and Chad Syverson)		
1) to frame conceptual view of how environmental regulations might affect a manufacturer's productivity level and how to measure such effects; 2) to use the principal instruments	Modified Cobb-Douglas production function	1) large-scale estimates of the economic costs of environmental regulations turned to be not insubstantial; 2) among surviving polluting plants, the nonattainment designation is associated with a roughly 2.6 percent decline in total factor

of the Clean Air Act Amendments (CAAAs), the pollutant-specific, county-level attainment/nonattainment designations; 3) to use the literature of the past two decades that has sought to explain differences in producers' total factor productivity levels		productivity; 3) the regulations governing ozone have particularly large negative effects on productivity, though negative effects are also evident among emitters of particulates and sulfur dioxide; 4) carbon monoxide nonattainment, on the other hand, appears to increase measured TFP, especially among refineries; 5) overall, the productivity losses among surviving plants in nonattainment counties correspond to annual lost output on the order of $11.0 billion in 2010 dollars

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Area of study: Syrian Olive Oil Industry (Mohamad Ahmad, Thomas Kuhn, Omar Feraboli)		
1) to shed light on the impact of compliance with environmental policies on the production and exports for the Syrian olive oil industry; 2) to assist developing and transition economies in examining how compliance with environmental policies can help to improve economic efficiency and export competitiveness; 3) to explore the need for supporting the use of environmental policies as the best way to promote international trade flows and avoid environmental dumping in the region, especially before the environmental damage occurs	Double log-linear regression equation through the use of an Error Correction Model	compliance with environmental policies in developing and transition economies has negative impacts on their production and exports, i.e., on their international trade flows and export competitiveness
Area of study: 14 different industries in 6 OECD countries (Md. Ashfaqul I. Babool, Michael R. Reed)		
1) to identify factors that influence export competitiveness; 2) To develop a valid framework based on the H-O model to estimate changes in international trade flows as influenced by factor endowments along with environmental regulations; 3) To compare regulation's impact at different product-based industries	Modified Heckscher-Ohlin model	1) in general, factor intensities positively and the environmental variable negatively influence export flows; 2) environmental regulations imposed in the textile, textiles products, leather and footwear industry, iron and steel industry, machinery and equipment industry and manufacturing (n.e.c) industry negatively impact net exports; 3) the coefficients of environmental regulation for only textiles, textile products, leather and footwear and manufacturing (n.e.c.) sectors are statistically significant; 4) a positive influence of environmental regulations on food, beverages and tobacco exports, which is supported by the Porter hypothesis; 5) Stringent environmental standards for iron and steel industry is found to negatively influence net exports but the coefficient is not significantly different from zero

Table 1

Area of study: EU 15 exports (Massimiliano Mazzanti, Valeria Costantini)		
1) to explore how the competiveness of the EU economy, captured by the export dynamics over a fairly the medium run (1996-2007), has been affected by environmental regulation both on the public and private sector side; 2) to test the strong and weak versions of the Porter hypothesis by specifying the export dynamics of four aggregated manufacturing sectors classified by their technological content, estimated with a dynamic panel data estimator applied to a gravity model of international trade	Gravity model of international trade	1) environmental policy actions seem not to undermine EU competiveness; 2) the effect of energy and environmental taxes (to a lesser extent) is not in conflict with export performances; 3) environmental policy actions eventually bring about negative performances in the very short run, but correlates positively to competiveness in the medium run; 4) environmental and energy taxes, regulatory effects captured by PACE, public R&D and patenting activities all generate enhancement of green competitive advantages, after controlling for structural trade related, geographical and structural time related effects; 5) high tech and medium tech sectors respond positively to energy and environmental taxation, and also medium tech and low technology sectors are not negatively impacted; they respectively even respond positively to energy and environmental taxes

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