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On the determinants of industrial competitiveness: The European Union emission trading scheme and the Italian paper industry

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HIGHLIGHTS

- The European Emission Trading Scheme (EU-ETS) and the effects on the Italian paper industry competitiveness.
- Key factors that provide a measure of the "competitiveness risk" for the Italian paper industry.
- Those risks are limited at the moment, but some factors need to be carefully managed, such as electricity uses and prices.
- Industrial policies and new firms strategies are required to manage the "competitiveness risk" in the coming years.

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ABSTRACT

The European Union Emission Trading Scheme (EU-ETS) represents the masterpiece that the EU adopted to achieve the Kyoto Protocol and "Europe 2020" strategy goals of reducing greenhouse gas (GHG). Although the EU-ETS is designed "in order to promote reductions of greenhouse gas emissions in a cost-effective and economically efficient manner" and "without prejudice for the Treaty", the system has become a concern issue for firms and industries over competitiveness in European and international markets in addition to carbon leakage.

This paper analyses whether and to what extent the EU-ETS may harm competitiveness, by following a qualitative approach, and presenting the case of the Italian paper industry, included in the system as an energy-intensive sector. More specifically, first the paper identifies those key factors that provide a qualitative measure of the "competitiveness risk" related to the EU-ETS; then, those factors are used to examine the Italian paper industry and to assess the actual and potential risks affecting the sector. This analysis is of interest given the lack of similar studies on the Italian paper industry and represents a starting point to serve further studies and future policymaking in Italy and Europe.

1. Introduction

The European Union Emission Trading Scheme (EU-ETS) was introduced by Directive 2003/87 and came into force on 1st January 2005. It represents the masterpiece that the EU implemented to achieve its Kyoto Protocol's goal of reducing greenhouse gas (GHG) emissions by 8% in the period 2008–2012 compared with the 1990 level.[1] The system has been recently revised by Directive 2009/29 to fulfil the new goals stated for 2020 (−20% GHG emissions, 20% of renewable energy production relative to total consumption), and to set the ground for a more ambitious and effective European environmental strategy in the long run.

The EU-ETS, as a market-based instrument, works following the "cap and trade" principle. It is subdivided in three phases, with the last one launched in 2013. In the first two phases the system was organised following a decentralised approach, where Member States set the annual cap and allocated the equivalent emission

Abbreviations: EU-ETS, European Emission Trading Scheme; GHG, Greenhouse gas; EC, European Commission; NAP, National Allocation Plan; MAC, marginal abatement cost; OECD, Organisation for Economic Co-operation and Development; FAO, Food and Agriculture Organisation; CEPI, Confederation of European Paper Industries; CHP, Combined Heat and Power; CO_2, Carbon Dioxide; BAT, best available technology; UNECE, United Nation Economic Commission for Europe; EU, European Union; VAT, Value Added Tax

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[1] The global goal is the reduction of GHG emissions by at least 5%.

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allowances among sectors, firms and plants[2] on the basis of a National Allocation Plan (NAP), one for each phase, reviewed by the European Commission (EC),[3] mainly free of charge. Starting from the third phase, the EC have decided to replace this method with a centralised approach where the EC itself sets a European-wide cap. This cap will be reduced by 1.74% every year from 2013, divided into single allowances distributed among sectors, firms and plants, progressively moving from free of charge to 100% auctioning.

Once a firm has obtained its permits, if it emits more than the allocated allowances, it can choose how to manage the pollution in excess, by taking direct actions on production process/products and/or by buying permits from the market; the choice depends on the comparison between permit price and individual Marginal Abatement Cost (MAC).[4] Therefore firms take environmental actions at the least-cost abatement (cost effectiveness), a goal that cannot be pursued by other instruments such as direct regulation, especially in the case of strong asymmetric information (Baumol and Oates, 1988; Stavins and Revesz, 2004).[5]

Besides the theoretical functioning of the system, although Directives 2003/87 and 2009/29 read that the EU-ETS is designed "in order to promote reductions of greenhouse gas emissions in a cost-effective and economically efficient manner" and "without prejudice for the Treaty", the system has become a concern issue for firms and industries over competitiveness in European and international markets in addition to carbon leakage.[6] In fact, as briefly described above, the EU-ETS forces firms with weak environmental performance to invest in "greener" technologies or to buy emission permits,[7] posing additional costs (environmental costs) not compensated by an increase of the output levels, especially where international competitors benefit from more favourable climate policies.

This topic has been strongly debated over the past 25 years. The economic literature offers several theoretical and empirical works, which date mainly after the publication of Porter (1991) and Porter and Van Der Linde (1995a, 1995b), the first two authors to look at the environmental regulation, when well-defined and strict enough, as a way to incentivise firms to adopt green solutions and gain competitive returns ("the Porter hypothesis" that can be distinguished in the weak and in the strong versions).[8] Nevertheless, the bulk of the empirical studies do not converge to a shared position since results are sometimes weak (OECD, 2013), often too context-specific and depending on the modelling and scenarios analysis adopted (Oberndorfer and Rennings, 2006).[9]

In the context of this debate, this paper analyses whether and to what extent the EU-ETS may generate competitive disadvantages, by following a qualitative approach, reporting the case of the Italian paper industry,[10] included in the system as an energy-intensive sector. The focus on the paper industry is of interest because of its specific "energy modelling system and climate change perspective" (Szabò et al., 2009, p. 257) that has attracted the attention of policy makers in Italy and Europe over the past two decades, from both environmental and economic perspectives. In fact, the EU has clearly expressed its willingness to promote sustainability in the sector and, at the same time, to ensure its survival because of the relevant contribution provided to growth, as indicated in more than one EC communication on forest-based industry.[11]

More specifically, first the paper identifies those key factors that provide a qualitative measure of the "competitiveness risk" related to the EU-ETS and the analytic framework; then, those factors are used to examine the Italian paper industry and to assess the actual and potential risks affecting the sector. This analysis is of interest given the lack of similar studies on the Italian paper industry and represents a starting point to serve further studies and future policymaking in Italy and Europe. In particular, it can provide some insights on the ongoing EU-ETS reshaping process needed after the vast allowances surplus generated by the economic crisis, on the definition of the European environmental strategy for 2020 and beyond, and on the ongoing international climate negotiations.

The remainder of this paper is organised as follows. The following section presents a review of costs and benefits related to environmental regulations and emission permits, while the third section illustrates the factors used to assess the "competitiveness risk" that burdens firms when the Emission Trading System (ETS) is in force. Referring to the EU-ETS, the fourth section explains whether those factors could negatively affect the Italian paper industry's competitiveness. The fifth section provides a discussion. Some policy indications close the paper.

2. Materials and methods

2.1. Costs and benefits of environmental regulation

In economic literature, the determinants affecting competitiveness coming from environmental policy are usually distinguished into two broad categories depending on the time horizon adopted,

[2] The EU-ETS covers only some sectors, mainly the energy-intensive ones and, at the moment, more than 11,000 power stations and industrial plants are part of the system (oil refineries, steel works and production of iron, aluminium, metals, cement, lime, glass, ceramics, pulp and paper, cardboard, acids and bulk organic chemicals) (EC, 2013).

[3] The sum of national caps corresponded to the European cap.

[4] The MAC measures the additional costs a firm should burden when increasing one emission reduction. As the literature has shown, the MAC is a convex curve, which indicates that "the marginal costs for further improvements increase at higher environmental performance levels" (OECD, 2010, p. 20). This implies that the more a firm has introduced actions to reduce pollution, the higher the MAC for additional actions will be.

[5] Some authors calculated that the savings of policy costs linked to market-based instruments are between 15% and 90% (see i.e. Newell and Stavins, 2003; Schmalensee and Stavins, 2012; Ellerman et al., 2000; Keohane et al., 1998).

[6] In economics, the word "competitiveness" is controversial. In this paper, it is considered the definition provided by Balassa (1962, p. 26), who describes competitiveness as the ability of a firm "to sell in foreign and domestic markets". By extension, in this paper when referring to "industrial competitiveness", the author indicates the ability of a sector to sell in foreign markets.

[7] The EU-ETS is a mandatory environmental tool: firms must own enough permits to cover all their emissions, otherwise sanctions are imposed.

[8] Wagner (2003) synthesises the debate as follows: "[Porter and colleagues] … proposed and subsequently elaborated that stringent environmental regulation (under the condition that it is efficient) can lead to win–win situations in which social welfare as well as the private benefits of firms operating under such regulation can be increased… One important reason for net benefits of stringent regulation at the firm level which is often cited by Porter and supporting colleagues is that such regulation can induce innovatory activities which increase their competitiveness. Opponents of the Porter hypothesis criticise its hidden assumption that firms systematically overlook opportunities for (voluntarily) improving their environmental performance that would also increase their competitiveness. Metaphorically, they argue that it is impossible to find a 10-Dollar bill on the ground because, if it was there, somebody else would have picked it up already".

[9] See i.e. the findings of Klepper and Peterson (2004), Reinaud (2005, 2008), Demailly and Quirion (2008), Neuhoff et al. (2006), Porter and Van Der Linde (1995a), OECD (1993, 2006, 2010, 2013), Abrell et al. (2011). For a synthesis of the debate, see Oberndorfer and Rennings (2006) and Grey and Shimshack (2011).

[10] Italian pulp producers are not included in this analysis given the marginal role played in the sector (only 8 on 131 paper firms in 2011, 5 operating under the EU-ETS).

[11] "As large emitters of CO_2 the forest-based industries will be required to make a major contribution to climate change mitigation. These industries must achieve high environmental performance and energy efficiency without losing competitiveness. It is not in the interest of the European Union that in the future production moves to countries with less strict emissions limits ("carbon leakage") as this would have negative environmental and economic consequences" (EC, 2008, p. 5).