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The European Union Emission Trading Scheme (EU ETS): empirical evidences from Italian companies

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EXTENDED ABSTRACT

The purpose of this paper is to investigate the effectiveness of the European Union Emission Trading Scheme (EU ETS) in promoting the environmental sustainable development of companies.

The institutional framework of the EU ETS reflects the intention of EU policy makers to achieve the sustainable development of companies, i.e. the improvement of their environmental performance and the safeguard of their economic performance (Segura, Ferruz, Gargallo, & Salvador, 2018; UNFCCC, 1992, 1998). The EU ETS involves energy and industrial companies and it is implemented in three phases, i.e. 2005-2007, 2008-2012 and 2013-2020 (European Commission, 2015). The EU ETS is a cap and trade system. On the one hand, it aims to improve companies' environmental performance by discouraging companies from polluting. Companies are required to buy allowances to pollute or alternatively to bear the costs for reducing emissions. After each year, companies have to surrender enough allowances to cover all their greenhouse (GHG) emissions, otherwise penalties are imposed (Marin, Marino, & Pellegrin, 2017). A cap is set on the total amount of available emissions allowances, which corresponds to the maximum level of GHG that companies can emit. The cap is reduced over the phases so that total emissions decrease. On the other hand, the EU ETS provides mechanisms for safeguarding the economic performance of companies. Within the cap, companies receive freely an amount of allowances and can trade allowances with other companies. Therefore, companies can use the allowances allocated freely or can buy allowances to comply with the obligation of surrendering allowances (European Commission, 2015).

Limited and inconclusive studies have analysed the effectiveness of EU ETS in the sustainable development of companies. Some scholars analyse the impact of EU ETS on companies' emissions reductions (Anderson & Di Maria, 2011; Ellerman & Buchner, 2007; Petrick & Ulrich, 2014). Others analyse the effects of the EU ETS on companies' economic performance (Marin et al., 2017; Martin, Muûls, & Wagner, 2016). Recently, Segura et al 2018 analysed the relationship between environmental and economic performance in Spanish companies involved in the EU ETS. That analysis reveals limited information about the impact of the EU ETS institutional framework on the companies' sustainable development.

Against this background, our research paper fills this gap and analyses the effectiveness of EU ETS in promoting companies' sustainable development. To

reach our aim, we follow two steps. First, we apply descriptive statistics to provide a deep understanding of the EU ETS institutional framework and its effects on companies' environmental and economic performance. Secondly, we apply archival data analyses to find if and how EU ETS affects companies' economic performance, over the three phases. We investigate how the institutional changes of EU ETS affect companies' sustainable development.

Through our empirical analysis, we find that the EU ETS is effective in promoting the sustainable development of companies, i.e. it improves companies' environmental performance and safeguards their economic performance. First, we find the increasing effectiveness of the EU ETS in improving the environmental performance of companies over the three phases. Secondly, we find that EU ETS institutional framework does not affect negatively companies' economic performance.

Our research contributes to advance research about the effectiveness of environmental regulation in promoting the sustainable development of companies. Furthermore, our research has practical implications for Italian and European policy makers involved in the implementation of the EU ETS. By offering evidences about the effectiveness of the EU ETS institutional changes, this research encourages policy makers to follow this direction to further increase the EU ETS effectiveness in promoting the sustainable development of companies.

Keywords: EU ETS, Sustainable Development, Environmental Performance, Policy Makers, Economic Performance.

THE EUROPEAN UNION EMISSION TRADING SCHEME (EU ETS): EMPIRICAL EVIDENCES FROM ITALIAN COMPANIES

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MOTIVATIONS

Human activities → **Rising of the GHGs concentration**

CLIMATE CHANGE

↓

ENVIRONMENTAL CHALLANGE

International Institutional Answer

UNFCCC → **Sustainable development principle**

Implementation tool

Kyoto Protocol

flexible mechanisms

emission reduction targets to countries

MOTIVATIONS

Kyoto mechanisms ⟷ **Sustainable development**

EMISSION TRADING SCHEME (ETS)

- Climate policy instrument at the national level to reduce **COMPANIES' GHG emissions and comply with Kyoto Targets.**
- It accounts for 12% of global GHG emissions (Muuls, Colmer, Martin, & Wagner, 2016).

EUROPEAN UNION EMISSION TRADING SCHEME (EU ETS)

- **The first ETS** for GHG emissions (Directive 2003/87/EC).
- **The largest ETS** implemented in the world (Giovanni Marin, Marino, & Pellegrin, 2017).

MOTIVATIONS

Environmental regulation → It improves firms' environmental performance

but

→ It can negatively affect firms' economic performance

Sustainable development of firms

=

Improving both firms' environmental and economic performance

Is environmental regulation effective in promoting the firms' sustainable development

?

Fragmented and inconclusive literature (Horváthová, 2010; Segura et al., 2018)

This paper aims to fill this literature gap by exploring the **EU ETS environmental regulation** and analysing its **effectiveness in promoting the sustainable development of firms.**

MOTIVATIONS

EU ETS → cap and trade system

maximum cap of GHG emissions = maximum amount of emission allowances (EUAs)

1 EUA = the right to emit an amount of GHGs equivalent to 1 tonne of CO2

- 3 phases : (2005-2007), (2008-2012), (2013-2020)
- Participating entities : European companies' installations of the energy and industrial sectors.
- Participants can emit GHG emissions only if they own EUAs.
- After each year participants have to surrender enough EUAs to cover all its GHG emissions, otherwise penalties are imposed.

MOTIVATIONS

EUAs allocation method

Free Allocation → Reducing the cost for complying with EU ETS and thus reducing the risk of carbon leakage.

Auctioning → Participants acquire allowances at a market price (European Commission, 2015).

ADDITIONALLY → Participants can acquire EUAs from other installations, through private transactions (G Marin et al., 2017; Segura et al., 2018).

The costs of EUAs' acquisition should deter installations from excessive GHG emissions, and promote installations' decisions of investing in technology for reducing GHG emissions.

MOTIVATIONS

The total sum of EUAs owned by installations:

EUAs allocated free of charge
+
EUAs allocated by auctioning
+
EUAs acquired through private transactions
–
EUAs sold through private transactions

By the 30 April of each year, EU ETS participants have to surrender an amount of EUAs equal to the emission produced in the previous year (G Marin et al., 2017).

3 scenarios of compliance

(1) Surplus → EUAs owned > emissions produced

(2) Deficit → EUAs owned < emissions produced

(3) Break-even → EUAs owned = emissions produced

MOTIVATIONS

The purpose of EU ETS regulation

Ensuring the environmental sustainable development of firms :

(1) it discourages firms from polluting, by imposing them costs for emitting GHGs.

Companies are supposed to acquire EUAs or to invest in green technologies to reduce the GHG emissions, so that the amount of EUAs freely allocated covers their emissions.

(2) It safeguards firms' economic performance.

It establishes mechanisms to help companies in fulfilling their commitments in a cost-efficient way, i.e. EUAs' free allocation and the possibility to trade the surplus of EUAs between firms (European Commission, 2015).

RESEARCH DESIGN

The methodology has a two-fold scope

1 **SEMANTIC SCOPE** (Cornelissen, 2017)

Descriptive statistics

Deep understating of the EU ETS institutional framework and its effects on the firms' environmental and economic performance over the three EU ETS phases.

2 **PRAGMATIC SCOPE** (Cornelissen, 2017)

Archival data analysis

If and how EU ETS affects the economic performance of firms, over the three phases.

RESEARCH DESIGN

SEMANTIC SCOPE

We use descriptive statistics to investigate the effects of EU ETS institutional changes on both firms' environmental and economic performance.

The institutional framework of the EU ETS has evolved over the three phases :

1. The scope of EU ETS increases over the three phases in terms of geography, sectors and type of GHG considered

2. The method of allocation

OBJECTIVE

improving the effectiveness of the EU ETS in reducing the GHG emissions and in safeguarding firms' economic performance

RESEARCH DESIGN

PRAGMATIC SCOPE

We use archival data analysis to find if and how EU ETS affects the economic performance of firms, over the three phases.

- Under EU ETS, environmental performance potentially impacts firms' cost production function (Segura et al., 2018).

HOWEVER

- The environmental performance depends also on the level of production.
- The more a company produces, the more pollutes.

THEREFORE

Two step of analysis

The relationship between the level of production and the environmental performance of firms.	The relationship between the environmental performance and the economic performance.

FINDINGS

Increasing effectiveness of the EU ETS in improving the environmental performance of firms over the years.

- The firms' verified emissions decrease progressively over the three phases.
- In the third phase, it emerges a strong reduction of the firms' verified emissions compared to the previous years.

EU ETS institutional framework does not affect negatively firms' economic performance

Firms' profitability tends to increase during the EU ETS third phase

EU ETS is effective in promoting the sustainable development of firms

FINDINGS

THEORETICAL CONTRIBUTIONS

Supporting the theoretical framework, according to which environmental regulations with flexible design is a condition for promoting the sustainable development of firms.

PRACTICAL IMPLICATIONS

Our findings offer evidences about the effectiveness of the institutional change of the EU ETS third phase, encouraging Italian and European policy makers to follow this direction to further increase the EU ETS effectiveness in promoting the sustainable development of firms.

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