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The Impact of the Environmental Policy Stringency on Korean Exports of Environmental Goods

환경정책의 엄격성이 우리나라 환경상품수출에 미치는 영향

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Abstract: This paper examined the two aspects of environmental policy stringency on the exports of Korean environmental goods: 1. The effects of a trading partner's environmental policy stringency; and 2. The effects of Korea's environmental policy stringency. Based on panel data for OECD and BRIICS countries from 2002 to 2012, we employed a modified gravity model where an environmental policy stringency (EPS) index (OECD) served as an indicator for the level of environmental policy stringency. Our main findings are summarized as follows: 1. The environmental policy stringency of a trade partner has a positive effect on exports of environmental goods from Korea ; 2. Korea's environmental policy stringency has a decisive influence on the increase in the export of Korean environmental goods, which is consistent with the Porter Hypothesis. In addition, Korea's environmental policy is more influential than the effect of a trade partner's environmental policies. Stringent environmental policies should therefore be promoted to strengthen the competitiveness of Korea's environmental goods and a certain level of stringency should be maintained for environmental industries.
Key Words: Environmental Policy Stringency, Korea Export Competitiveness, Porter Hypothesis, Exports of Environmental Goods, Revealed Comparative Advantage

요약: 환경문제에 대응하기 위해 선진국들은 더 엄격한 환경정책을 도입하고 있다(Marchal, 2011). 우리나라의 환경정책 엄격성 지표도 지속적으로 강화되어, 2003년 이후 OECD 평균보다 높은 수준을 유지하고 있다. 환경정책의 강화가 국가 경쟁력에 미치는 영향에 대해서는 상반된 의견이 공존하나 적절하게 설계된 환경정책이 오염저감 비용을 상쇄하고, 국가경쟁력을 증진한다는 포터가정(Porter Hypothesis)에 대한 연구는 부족한 실정이다. 본 연구는 환경정책의 엄격성이 우리나라 환경상품 수출에 미치는 영향을 패널분석하여, 환경정책의 강화가 환경산업 경쟁력을 향상시킨다는 포터가정이 우리나라 환경상품 수출에 적용되는지 검증했다. 연구 결과, 교역국의 환경정책이 엄격할수록 우리나라 환경상품수출에는 긍정적 영향을 미쳤다. 또한 우리나라의 환경정책강화가 우리나라 환경상품 수출을 증가시켰고, 국내정책이 교역국의 정책보다 더 큰 영향을 미쳤다. 즉, 이 연구는 환경정책이 엄격할수록 환경 분야 시장 형성을 촉진하고 환경산업의 발달을 유도한다는 포터가정을 확인했고 환경보전과 경제발전을 동시에 추구하는 정책적 접근이 가능함을 시사한다.
핵심주제어: 환경정책 엄격성, 한국의 수출경쟁력, 포터가정, 환경상품수출, 현시비교우위지수

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I. Introduction

Environmental policy stringency is defined as "the degree to which environmental policies put an explicit or implicit price on environmentally harmful behavior (Botta and Koźluk, 2014)." Due to the increasing environmental challenges and growing scientific evidence that earth is nearing its environmental tipping point, more and more countries have enforced stringent environmental policy (〈Figure 1〉). According to the Environmental Policy Stringency (EPS) Index developed by the OECD, countries have constantly increased the stringency of environmental policies. In case of the Republic of Korea ("Korea"), environmental policy stringency rapidly increased from 2002 and generally kept more stringent level than the OECD average.

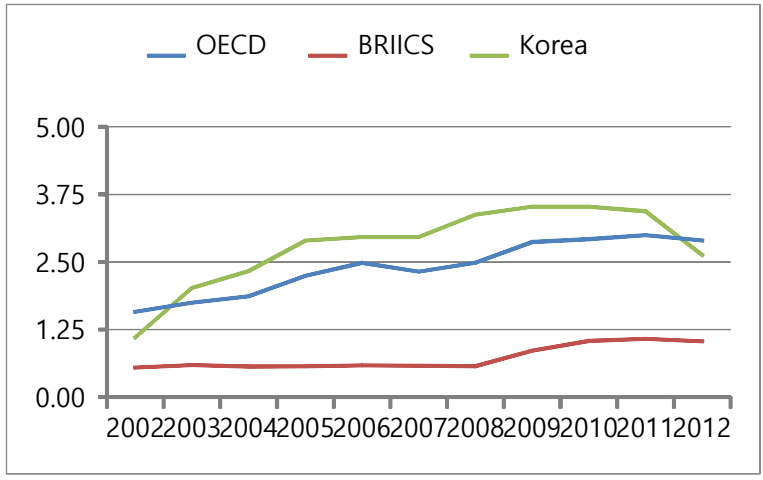
In this trend of increasing environmental policy stringency, debate on whether stringent environmental policy enhances a country's competitiveness also grow. Many previous empirical literature supported Pollution Haven Hypothesis that stringent environmental policy would weaken the domestic economic performance (Frankel and Rose, 2005; Bommer, 1999; Copeland and Taylor, 2004; Levinson and Taylor, 2008). The Porter Hypothesis, however, suggests that the stringent environmental policy motivates firms to reduce negative environmental effects and induces the innovation which leads the industry to shift to a cleaner production, thereby enhancing country's competitiveness.

With this background, understanding the effect of environmental policy stringency on trade of environmental goods is meaningful to grasp the potential of a growing environmental industry and to draw

implication for trade competitiveness. In this vain, we empirically analyzed how environmental policy stringency affect the trade competitiveness of environment industry of Korea. Korea can be a good case to test Porter hypothesis as Korea's environmental policy has rapidly increased more than any other countries in the OECD. That is, we empirically examine whether the Porter Hypothesis can be applied to the Korean exports of environmental goods.

The aim of this paper is twofold. First, we estimate how bilateral export patterns of Korea's environmental goods are affected by the environmental policies stringency of trade partners. Second, the effect of Korea's environmental policy stringency on Korean environmental goods is studied. Through this research, we test the validity of the Porter Hypothesis and find the implication of the role of Korea's environmental policy stringency for enhancing export competitiveness of domestic environmental goods.

〈Figure 1〉 Trends of environmental policy stringency (OECD, BRIICS and Korea)



Source: Botta, E. and T. Koźluk (2014)

II. Literature Review

It has been a long debate on the efficacy of stringent environmental policy because the relationship between economic growth and environmental benefits is recognized as a trade-off, rather than a coexistence (Frankel and Rose, 2005; Bommer, 1999; Copeland and Taylor, 2004; Levinson and Taylor, 2008). The Porter Hypothesis, however, suggests that the stringent environmental policy encourages the innovation and enhances the competitiveness of an industry (Porter and Linde, 1995).

Porter hypothesis can be analyzed in two ways; weak version and strong version. The weak version of Porter hypothesis examines the relationship between environmental policy and technological innovation and generally finds a positive relationship. The strong version, however, points to a direct relationship between the environmental policy stringency and industrial competitiveness and does not sum up in a uniform fashion. Bhanagar and Cohen (1997) concluded that the environmental policy stringency promote innovation but not profitability. Lanoie et al. (2008) found the significance on factor productivity in sectors where international competition is high.

When it comes to analyzing environmental industry, however, the robust significance exists between environmental policy and competitiveness as the stricter environmental policy motivates environmental industries and provides an early mover advantages. (Porter and Linde, 1995; Wagner and Timmins, 2009). Empirically, Costantini and Crespi (2008) found a positive relationship between pollution abatement cost intensity and export flows in renewable

energy sector through a gravity model. The result indicates the environmental policy stringency strengthens the export competitiveness of renewable energy technologies. Furthermore, Costantini and Mazzanti (2012) identified that the environmental and energy taxes levied in EU-15 countries propelled exports of environmental goods over the 1996-2007. Jehan Sauvage (2014) employed the RCA Index, and asserted that stringent environmental policy increases a country's trade competitiveness, allows for countries' specialization and develop market for sectors such as solid-waste management or wastewater treatment.

Regarding the studies covering Korean case, several studies supported the Porter hypothesis in the environmental industry. Ki Eun Shim and Kyong Hwa Jung (2009) uses gravity model and found that the stringent environmental policy affects more negatively the Korea exports of energy saving technologies than Japan where stricter environmental policy was implemented. Hyeok Ki Min et al. (2010), using the panel data from 1995 to 2007, illustrate that Korean export to countries with stringent environmental policy decreased and environmental policies exert more influence on environment-related sectors than total industries (Hyeok Ki Min et al., 2010). Il Chung Kim et al. (2013), using panel data from the period of 2000 to 2010 with gravity model, contends that Porter Hypothesis loses its explanatory power when a larger number of trade partner are taken into consideration and that the strict environmental policy of the importing country is a trade barrier to the Korean pollution industries, but not a definite one for the non-pollution industries (Il Chung Kim et al., 2013).

The previous studies have only focused on how Korea's export

competitiveness is affected by stringency of trade partner's environmental policy. There is a need to investigate the impact of Korea's environmental policy stringency on Korean exports of environmental goods, when the policy and export both growing rapidly. In this process, we expect to test the strong version of Porter Hypothesis in Korea's environmental industry.

Ⅲ. Trade Competitiveness of Environmental Goods in Republic of Korea

1. The Scope of Environmental Goods and Combined List of Environmental Goods (CLEG)

International consensus on the list of environmental goods and services let alone the definition does not exist. A number of practical barriers in achieving international agreement were addressed in the process of settling a comprehensive list of environmental goods (Steenblik, 2005): first, existing classification of HS code is not diverse enough to classify all environmental goods; second, the characteristics of products can be of multiple purposes apart from environmental uses; third, the range of environmental goods cannot be clearly designated due to factors such as different levels of environmental performance in use; and lastly, the technological innovations frequently bring about the changes in terms of the scope of environmental goods which does not fall into the existing category.

Despite such difficulties, several attempts have been made to draw up the list of environmental goods as it becomes a frequent topic in trade negotiations. Among many, the lists from WTO, OECD and

APEC are the most widely used in trade negotiations. WTO Committee on Trade and Environment meeting in Special Session (CTE-SS) comprises the list of 154 environmental goods which is shared among the member of Friends Group.[1] In addition, OECD set up a list of climate-change-relevant goods in Plurilateral Environmental Goods and Services (PEGS) agreement,[2] which covers 150 products (Sauvage, 2014). APEC agreed on a set of environmental goods, among which a list of 54 products was announced at the 2012 at Vladivostok summit to have reduced applied tariff rates to 5% or less.[3]

Finally, Sauvage (2014) combined three prominent existing lists of WTO, OECD and APEC. They devised a customized set of 248 environmental goods called Combined List of Environmental Goods (CLEG) using the HS 2007 classification at the six-digit level. CLEG includes a broad scope of environmental goods, which accounts for the 4.9% of total number of HS 2007 codes.[4] In our research, we used all codes proposed in the CLEG list. We also use an alternative, narrower list of environmental goods,[5] the Core CLEG (11 products) which takes up 0.79% of the total 2007 HS codes, and the Core

1) The Friends group is composed of Canada, the European Union, Japan, Korea, New Zealand, Norway, Switzerland, Chinese Taipei, and the United States.
2) This PEGS list was initially prepared by the OECD for the 2010 Toronto summit of the G20 such as Argentina, Australia, Brazil, Canada, China, France, Germany, India, Indonesia, Italy, Japan, Mexico, Russia, Saudi Arabia, South Africa, South Korea, Turkey, United Kingdom United States and European Union.
3) Australia; Canada; China; Costa Rica; the European Union; Hong Kong, China; Japan; Korea; New Zealand; Norway; Singapore; Switzerland; Chinese Taipei; and the United States.
4) HS 2007 code has total 5,052 classifications.
5) Environmental Business International Inc. (EBI) selected Core CLEG and Core CLEG+ by assessing the likely environmental content of the corresponding HS line against proprietary data from EBI on the size of the global market for various environmental pieces of equipment.

CLEG+ (40 products) which accounts for 0.22% of the total 2007 HS codes.

〈Table 1〉 List of environmental goods

List	Purpose of environmental list	Number of HS codes
WTO	WTO Committee on Trade and Environment meeting in Special Session (CTE-SS) comprises the 154 products as environmental goods (WTO, 2009)	154
OECD	OECD defines the Climate-change-relevant goods for a plurilateral environmental goods and services (PEGS)[6] (Sauvage, 2014)	150
APEC	APEC made agreement on 54 products at 2012 Vladivostok summit to reduce applied tariff rates to 5% on environmental goods (APEC, 2012)	54
CLEG	OECD combines three existing lists from OECD (2010), WTO (2009) and APEC (2012) (Sauvage, 2014)	248

The CLEG contains various environmental themes and media. Renewable energy plant accounts for the largest share from the list (22%), followed by cleaner or more resource efficient technologies and products (19%), environmental monitoring, analysis and assessment equipment (15%), waste water management and potable water treatment (13%), heat and energy management (10%) and so on (〈Table 2〉).

6) This PEGS list was initially prepared by the OECD for the 2010 Toronto summit of the G20 such as Argentina, Australia, Brazil, Canada, China, France, Germany, India, Indonesia, Italy, Japan, Mexico, Russia, Saudi Arabia, South Africa, South Korea, Turkey, United Kingdom United States and European Union.

〈Table 2〉 The environmental themes and media of CLEG
(Among 254 codes in total)

Code	Environmental theme or medium	Share of HS lines
APC	Air pollution control	5%
CRE	Cleaner or more resource efficient technologies and products	19%
EPP	Environmentally preferable products based on end use or disposal characteristics	2%
HEM	Heat and energy management	10%
MON	Environmental monitoring, analysis and assessment equipment	15%
NRP	Natural resources protection	〈 2%
NVA	Noise and vibration abatement	〈 2%
REP	Renewable energy plant	22%
SWM	Management of solid and hazardous waste and recycling systems	10%
SWR	Clean up or remediation of soil and water	〈 2%
WAT	Waste water management and potable water treatment	13%

Source: Sauvage, J. (2014)

2. Trade Competitiveness of Korea Environmental Goods

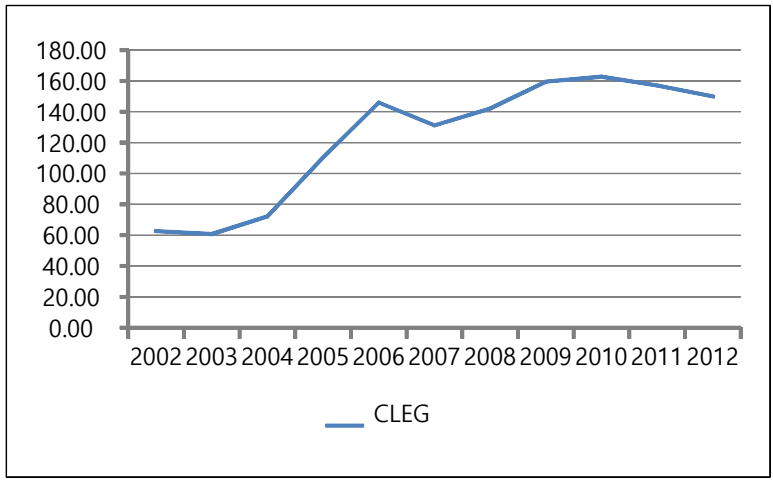
Trade competitiveness of Korean environmental goods has been constantly growing for a decade as evidenced by the increasing export volume of environmental goods. Revealed Comparative Advantage (RCA) is frequently used in research on international trade to provide a concise picture of countrys' trade competitiveness. It allows comparison between a country's share of world exports for a particular set of goods and that country's share of world exports for all goods.

The graph below illustrates that Korea RCA of CLEG Products has consistently been increasing since 2003 until it exceeds the unity value of 100% in 2005. The country can be said to have a revealed comparative advantage in CLEG products.

When a narrower scope of environmental goods is considered by using the list of Core CLEG and Core CLEG+ as in 〈Figure 3〉, it did

not reach the point of unity value 100%,[7] which implies that the country has revealed comparative disadvantage of Core CLEG and Core CLEG plus products. Even though Korea did not reach the point of revealed comparative advantage, the value of RCA is rapidly growing. The RCA results show that Korean environmental goods have potential in global market and that a well-designed environmental policy could support this growing trend of revealed comparative advantages even in Core CLEG and Core CLEG + products.

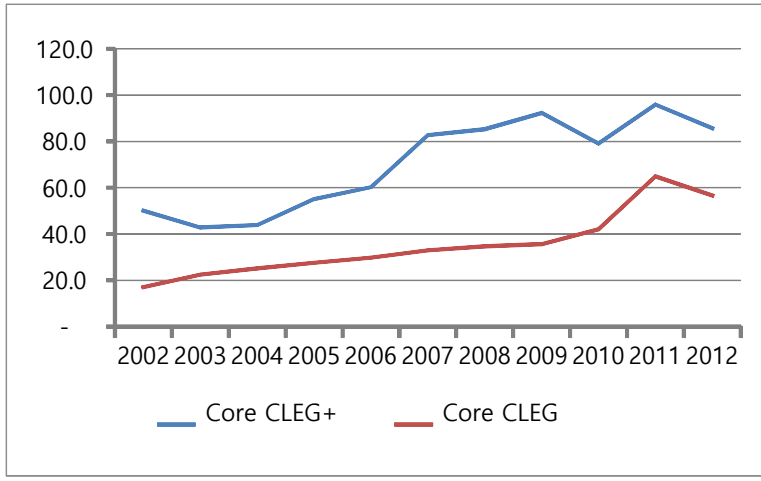
〈Figure 2〉 Korea RCA index of CLEG products



Source: UN Combtrade

7) A value of less than a unity implies that the country has a revealed comparative disadvantage in the product. Similarly, if the index exceeds unity, the country is said to have a revealed comparative advantage in the product.

〈Figure 3〉 Korea RCA index of core CLEG and core CLEG+ products



Source: UNCombtrade

Ⅳ. Methodology and Data

1. Gravity Model

Gravity model has been widely used in many empirical researches on international trade analysis. Tinbergen (1962) and Leamer and Levinson (1995) used Gravity equation to test the determinants of the international trade. Similar to the functional form of Newton's Law of Universal Gravitation, the gravity equation of trade predicts that the volume of bilateral trade is positively related to the product of the countries' GDP and negatively related to trade barriers between trade partners. The typical gravity equation is as follows;

$$\text{Trade Flows}_{ij} = \alpha \frac{Y_i Y_j}{D_{ij}} \times Z_{ij}$$

where indicates the amount of the trade flow from country i to country j, the economic sizes of country i and j, the distance between country I and j, and any other factors affecting trade flows between country i and country j.

This paper modifies gravity equation by using bilateral export flows of Korea environmental goods and utilized EPS index which is newly developed by OECD. Through the research, we verify whether the current environmental policy in Korea is properly designed to support environmental industry in searching for the determinants of Korea bilateral export performance of environmental industry, with a particular focus on Korean exports of environmental goods.

2. Model Specification

The equation below is set up to test the effect of environmental policy stringency on Korean exports of environment goods. Equations include variables from gravity model such as GDP for economic size and distance between Korea and trade partners, and control variables, existence of regional trade agreement (RTA). EPS index from the OECD database is used for measurement of environmental policy stringency.

We selectively examine the cases of OECD and BRIICS for the empirical analysis to overcome data deficiency of EPS index. As OECD and BRIICS countries accounts for more than 90% of total export of Korea's environmental goods, it is within bounds to say that this paper investigates the effects of environmental policy stringency on almost all the countries where the Korean environmental good is mainly exported.

$$\ln(EXP_{it})=\alpha+\beta_1 \ln(GDP_{it})+\beta_2 \ln(DIST_i)+\beta_4 \ln(EPSK_t)+\beta_3 \ln(EPS_{it})+\beta_5 RTA_{it}+\varepsilon_{it}$$

〈Table 3〉 Definition of variables, statistics source and acronyms

Variable	Definition	Source
	Dependent variable	
EXP_{it}	Bilateral export flows of environmental goods from Republic of Korea (Constant 2010 USD)	UNCTAD
	Gravity equation	
GDP_{it}	Natural logarithm of trade partner's real GDP per capita (Constant 2010 USD)	World development indicators
$DIST_i$	Natural logarithm of geographic distances	centre d'Etudes prospectives et d'informations Internationales
	Independent variable	
EPS_{it}	Natural logarithm of composite indicator of environmental policy stringency of trade partners	OECD
$EPSK_t$	Natural logarithm of composite indicator of environmental policy stringency of Korea	OECD
	Control variable	
RTA_{it}	Regional trade agreement between Korea and trade partners	Ministry of trade, industry and energy

The Korea's EPS variable ($EPSK_t$) is to examine the effect of Korea's environmental policy stringency in consideration with the change in trade partner's environmental policy stringency (EPS_{it}). The hypothesis is that the stricter environmental policy of Korea increases the Korean exports of environmental goods. If the estimate turns out to be positive, it implies that Korean exports of environmental goods would be facilitated by the increased stringency in Korea's environmental policies, which in turn supports the Porter Hypothesis.

3. Dependent Variable

The dependent variable represents the bilateral export flows from

Republic of Korea to OECD and BRIICS country at time t (calculated at constant 2010 USD). Korea export flow data is extracted from UNCOMTRADE database based on the Harmonized Commodity Description and Coding System (HS 2007), but the export figures from 2002 to 2006 uses the form of HS 2002 code because of the change in product classification.

The environmental goods are well classified under the *Combined list of Environmental Goods (CLEG)* by OECD using HS 2007 code. In this paper, $CLEG_{it}$ represents the exports of environmental goods listed in CLEG. Core $CLEG+_{it}$ and Core $CLEG_{it}$ is the export of the environmental goods from Core CLEG+ and Core CLEG, which is a narrower scope of the CLEG products.

4. Independent Variable

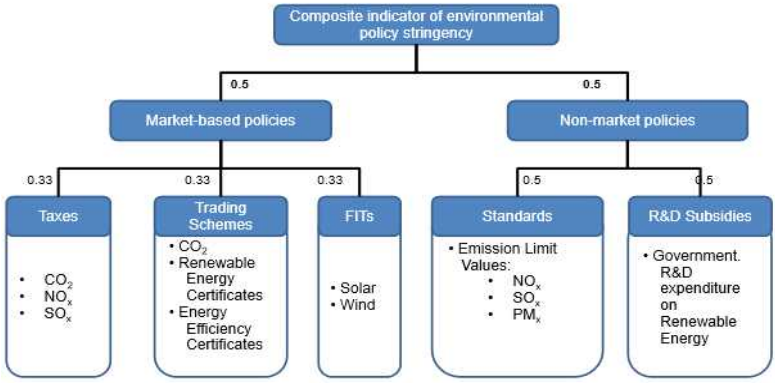
1) Environmental Policy Stringency (EPS) Index from OECD

To estimate the impact of environmental policies, an adequate proxy for measuring the environmental stringency should first be devised. The hitherto attempts to measure environmental policy stringency across countries have yet allowed an empirical application since most of them lack time-series dimension (Dasgupta et al., 1999; Eliste and Fredriksson, 2002). The Environmental policy stringency (EPS) index developed by the OECD is the first tangible efforts to measure environmental policy stringency internationally and over a relatively long period of time (Koźluk and Timiliotis, 2016).

The EPS index measures the degree of environmental policy stringency of OECD and BRIICS countries. The indicator is scored on a scale of 0 to 6, with 6 indicating the most stringent policies. In

addition, the index covers the broadest range of for empirical cross-country analysis and law-based regulations with a specific focus on environmentally important sectors such as energy and transport while ensuring a similar degree of relevance across countries.

〈Figure 4〉 Structure of EPS index



Source: Botta, E. and T. Koźluk (2014)

5. Control Variable

1) Regional Trade Agreement

Countries can adopt trade-related measures aimed at protecting the environment by following a number of requirements under WTO rules. These rules are providing an increasingly prevalent option for countries that opt to pursue liberalization of certain environmental goods through Regional Trade Agreements (UNEP et al., 2012). We include RTA as a control variable which has taken effect prior to 2012 as a dummy variable depending on the existence of RTA between Korea and trade partner at time t (RTA=1, 0).

〈Table 4〉 Regional trade agreement from 2002 to 2012

RTA	Member countries in OECD and BRIICS
EFTA (2006)	Norway, Switzerland
ASEAN FTA (2007)	Indonesia
CEPA (2010)	India
EU FTA (2011)	European Union; Austria, Belgium, Czech Republic, Denmark, Finland, France, Germany, Greece, Hungary, Ireland, Italy, Netherlands, Poland, Portugal, Slovakia, Slovenia, Spain, Sweden, United Kingdom
USA FTA (2012)	USA

V. Results

To control the unobserved effect of individual country, we consider the fixed effect model and the random effect model. As a result of Hausman test, we interpreted the result with the fixed effect model except for the distance variables which is time-invariant.

〈Table 5〉 shows that Korea's environmental policy stringency positively affect the Korean export of environmental goods. When the Korea's environmental policy stringency increases by 1%, the export increases by 1.029% for CLEG products, 0.924% for Core CLEG+ product and 0.899% for Core CLEG product. The effect of trade partner's environmental policy stringency is positive but not as significant as the influence of the Korean environmental policy. The increase in the environmental policy stringency of trade partner by 1% increases the export of Core CLEG+ product by 0.532% and Core CLEG product by 0.649%.

As generally outlined by the gravity model, the GDP of trade partners has positive relationship with Korea's export flows of environmental goods for all categories of environmental goods. As the GDP increases by 1%, Korean export of CLEG products also increases

by 4.474%. Core CLEG+ and Core CLEG products increase by 2.961% and 4.249% respectively. The distance variables using the random effect model confirm a negative relationship in all three cases of environmental goods and denote that the trade becomes smaller with the trade partners farther away. While all variables or original gravity model forms a statistically significant relationship with Korean export of environmental goods, the existence of RTA between Korea and trade partners does not show any significant relationship.

〈Table 5〉 The effect of Korea's environmental policy stringency

Variable	Fixed effect			Random effect		
	$\ln(CLEG_{it})$	$\ln(Core\ CLET+_{it})$	$\ln(Core\ CLEG_{it})$	$\ln(CLEG_{it})$	$\ln(Core\ CLEG+_{it})$	$\ln(Core\ CLEG_{it})$
$\ln(GDP_{it})$	4.474** (3.07)	2.961* (2.12)	4.249* (2.05)	0.135 (1.01)	0.135 (0.92)	0.134 (0.90)
$\ln(DIS_{ik})$	–	–	–	−1.418** (−2.84)	−1.401*** (−3.44)	−1.465*** (−3.65)
$\ln(EPSK_t)$	1.029*** (4.52)	0.924** (2.96)	0.899*** (3.65)	1.840*** (7.07)	1.610*** (4.22)	1.822*** (5.30)
$\ln(EPS_{it})$	0.298 (1.41)	0.532* (2.63)	0.649* (2.25)	0.376 (1.23)	0.274 (1.32)	0.423 (1.28)
RTA	−0.00619 (−0.04)	0.235 (1.55)	0.206 (1.02)	0.139 (0.90)	0.360* (2.48)	0.375 (1.75)
C	−102.2* (−2.62)	−64.73 (−1.73)	−100.6 (−1.81)	25.82*** (3.90)	22.95*** (3.61)	21.92*** (3.47)
Observation	341	341	341	341	341	341
R^2	0.0934	0.0912	0.0916	0.2905	0.2403	0.2504

*** p〈0.001", ** p〈0.01, * p〈0.05

The result shows that stringent environmental policy of Korea would strengthen the country's export competitiveness of environmental goods and supports the Porter's Hypothesis. In addition, Korea's environmental policy plays a more viable role in increasing Korea's export of environmental goods rather than the trade partner's environmental policy stringency.

Ⅵ. Conclusion

We study the effects of environmental policy stringency on Korea's exports of environmental goods, particularly the effect of trade partner's environmental policy stringency and the effect of Korea's environmental policy stringency.

Korea's environmental policy stringency has a positive relationship with Korea's exports of environmental goods, and is also more influential than the effect of trade partner's environmental policy stringency. Moreover, the effect of Korea's environmental policy stringency is greater as the scope of environmental goods broadens. The results suggest that stringent environmental policies would strengthen the export competitiveness of Korea's environmental goods and the strong version of the Porter Hypothesis is applicable in Korea's environmental sector.

In addition, higher environmental policy stringency of a trade partner positively affects Korea's exports of environmental goods. The stricter environmental policy of trade partner has spurred the creation of a market for environmental goods, the Korean export of environmental goods may also have been influenced by increasing demands for environmental goods in their trade partner's market. That is, trade partner's environmental policy stringency has provided a chance for Korean environmental goods rather than act as a barrier.

In summary, the empirical results show that the Porter Hypothesis does appears in the Korean trade of environmental goods from 2002 to 2012. Although previous empirical studies do not demonstrate univocal results of the Porter Hypothesis in the Korean context, the

finding of this study shows the positive impact of Korea's stringent environmental policy on export competitiveness of environmental goods.

This paper, however, has limitations in three areas. First, the scope of the analysis does not include developing countries due to the deficiency of data. The target country is limited to OECD and BRIICS countries, which generally adopt stricter environmental policies. Second, the paper considers a limited range of environmental policy instruments mainly focused on the energy sector, such as taxes, trading schemes, Feed-in-Tariffs, Standards and R&D subsidies as we use the EPS index. Lastly, the EPS index utilized in this paper does not count the difference of each instrument to environmental policy stringency; equal weight is given to all instruments despite their different effects on environmental policy stringency.

Despite these limitations, the finding of this paper would contribute to exploring the Porter Hypothesis and empirically shows that stringent environmental policy could play a role in increasing the export competitiveness of Korea's environmental goods. We expect to ease some pressure between environmental protection and economic growth through this paper. In addition, the trade benefits from the implementation of stringent environmental policies could counter the traditional concern of the Pollution Haven Hypothesis and could promote environmental sectors as a new industrial growth engine for green growth.

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