

Foreign direct investment and sustainable development in the European Union

Inozemna izravna ulaganja i održivi razvoj u Europskoj uniji

Abstract

The aim of this paper is to analyze how foreign direct investment can impact sustainable development, particularly from an environmental standpoint. Pursuing that aim, the structure and flows of foreign direct investment are analyzed, along with the environmental protection regulation and its evolution over the last few decades in European Union (EU) countries. The conclusion of the research is that most EU countries have strong environmental requirements that can influence investors seeking pollution havens in these countries. However, while common EU policies are in place, member countries also apply their own national regulations and incentives. Different approaches to investments and sustainable development policies may have implications for the level of harmonization and collaboration among EU countries in the future.

Keywords: FDI, European Union, sustainable development, environmental protection

JEL classification: F2, F63

Sažetak

Cilj ovog rada jest analizirati na koji način inozemna izravna ulaganja mogu utjecati na održivi razvoj, posebice sa stajališta zaštite okoliša. Slijedom navedenoga, analizirani su struktura i tijekovi inozemnih izravnih ulaganja, zajedno s propisima o zaštiti okoliša i njihovim razvojem tijekom posljednjih nekoliko desetljeća u zemljama Europske unije (EU). Zaključak istraživanja upućuje na činjenicu da većina zemalja EU-a ima stroge ekološke zahtjeve koji mogu utjecati na ulaganja koja traže neku vrstu utočišta onečišćenja u tim zemljama. Međutim, iako postoje zajedničke politike EU-a, zemlje članice istodobno primjenjuju svoje nacionalne propise i poticaje. Različiti pristupi ulaganjima i politici održivog razvoja mogu imati implikacije na razinu usklađenosti i suradnje među zemljama u budućnosti.

Ključne riječi: inozemna izravna ulaganja, održivi razvoj, zaštita okoliša

JEL klasifikacija: F2, F63

1. Introduction

Strengthening the process of globalization has revealed some new challenges, particularly the issue of sustainability.

During the 1980s and 1990s, there was a strong wave of internationalization and liberalization in the world economy, accompanied by large flows of foreign capital, particularly foreign direct investment (FDI). International mobility of production factors, especially capital, resulted in the global in-

terdependence of countries. As a result of strengthening internationalization and liberalization processes, opportunities for achieving economic growth arose, but at a certain price. Through this process, environment and sustainability have become endangered. From this standpoint, it can be said that globalization and movement of production factors have multiple effects, seen not only in opportunities for growth and development, but also in their consequences for sustainable development, particularly from the environmental aspect.

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Sustainable development can be described as a process of development that meets the needs of present generations, without compromising the ability to meet the needs of future generations (UNCTAD, 2004). The concept of sustainable development began to be used widely at the end of the last century, when consensus was reached that economic growth, while still crucial, must be achieved in a different way, and include the needs of both people and the environment (Ivaronavičienė and Lankauskienė, 2011).

Growth stimulated by liberalization can exacerbate existing market and policy failures with respect to the environment. Current trends in pollution and resource use are not sustainable, nor moving towards a more sustainable path. FDI is undeniably a factor in these trends.

On the other hand, foreign direct investments have become one of the most common methods of technology and wealth spillover, particularly between developed and developing countries. Through foreign investments, multinational companies can affect the welfare of a host country significantly. The extent of this influence depends largely on the purpose and value of the investment, but also on the regulatory framework of the host country and international investment agreements concluded. While multinational companies are interested in a limited number of private economic goals, government interest lies in the realization of much broader public economic and non-economic objectives. Multinational companies try to increase profits and sales, while countries seek to increase the well-being of their citizens (Dunning, 1993). In this sense, there is no consensus on the impact of foreign direct investment. Moreover, it can have very different effects in different countries (Chudnovsky and Lopez, 2008).

Official statements on the environmental impacts of FDI and trade liberalization are typically characterized by three main arguments (OECD, 1998):

1. Countries have environmental comparative advantages: each country will set its regulations based on domestic preferences and resources. Countries with low incomes, the ability to tolerate pollution, or extensive resources, should set standards low and attract pollution-intensive and resource-seeking FDI.

2. FDI increases the demand for environmental quality: if host-country demand for environmental quality increases as incomes rise, then eventually environmental damage will begin to fall (the environmental Kuznets curve argument). As FDI increases incomes, it will contribute to this increased environmental demand.
3. FDI is cleaner than domestic investment: FDI involves new technologies that are cleaner than those of domestic producers, therefore encouraging FDI can improve the environmental performance of a country.

In general, opening a country up to international trade and capital will increase prosperity, if the country has introduced environmental and social policies. Introducing international standards of environmental protection could be a solution to avoid the race to the bottom (Cogoy and Steininger, 2006).

On the other hand, economists traditionally consider that environmental regulations add costs to companies and slow down productivity. Environmental regulations may thus affect the competitiveness of the domestic industry, if the stringency of policies differs across countries, putting some firms at a disadvantage to their foreign competitors (Dechezleprêtre and Sato, 2014).

The aim of this paper is to research how foreign direct investments can impact on achieving sustainable development, particularly from an environmental standpoint. With that goal in mind, besides analyzing foreign direct investment flow and structure, environmental protection regulation and its evolution over the past few decades in the European Union countries are also analyzed and compared. The paper consists of five parts. The first is the introduction followed by the literature review. The third part presents the methodology, and the fourth part an analysis of FDI and EU environmental regulation. The final part is the conclusion.

2. Literature review

It is largely accepted that countries that produce more also pollute more. Environmental pollution and general environmental degradation, especially in developing countries, is a consequence of unsustainable production and consumption patterns, at home and abroad, and limits their opportunities to

achieve sustainable development (Petrovic-Randjelovic, 2007). This is a particularly pressing issue at a time of strengthening the process of production movement from developed to developing countries, motivated by environmental cost savings.

Increased flows of trade and investment can exacerbate the existing inefficient allocation of scarce natural resources. This implies that economic benefits will be coupled with environmental and social costs, particularly affecting the most disadvantaged, and the long-term welfare implications of increased FDI are often ambiguous; especially in environmentally sensitive sectors (Mabey and McNally, 1999). Debate over measures and environmental policies has emerged as a result of differences in regulations between developed countries and developing countries, and has resulted in discussions on the impact of environmental policies on investment decisions, or the location of production.

Open capital accounts allow countries to diversify portfolios and manage investment risk better, regardless of the level of economic development (Grgić and associates, 2012). Investments are definitely considered the key to achieving sustainable development and growth (Petrovic-Randjelovic, 2007). However, the exact conditions and components that determine the positive effects of foreign investment on sustainable development are still unknown (Kardos, 2014).

As already mentioned, foreign direct investments are expected to generate positive spillovers and overall positive effects on the recipient economy, but there are also potential costs involved in this form of capital inflow. Subsequently, in the last few years, the focus of research has changed and the effects of FDI on the potential to create 'green' growth and development, along with the broader impact on the environment and society, are being analyzed more intensely.

As for effects on the environment, foreign investment can have either beneficial or adverse effects, as presented in the 'pollution haven' or 'pollution halo' hypothesis. Some believe that countries with lower environmental standards will attract more foreign investments seeking to save costs, thus creating so-called 'pollution havens' (see Gray, 2002; Petrović-Randjelovic, 2007). Environmental protection regulation is seen here as a way of internaliz-

ing the external costs of environmental protection that company would have to pay by locating it in a particular country. In order to attract foreign direct investments, countries may deliberately depreciate the value of the preserved environment and reduce pollution taxes or similar regulatory measures, which would otherwise serve to preserve it. This kind of behavior is called the 'race to the bottom'. On the other hand, it is argued that foreign direct investment can generate positive spillovers of new, modern, environmentally-friendly technology. Foreign investments may thus help spread best practices of environmental management and contribute to a well-preserved environment, and this will be reflected in changes in the consumption pattern (the 'pollution halo' effect).

One of the earliest models which accounted for the impact of environmental policies on location decisions was that by Markusen and associates (1993). Their analysis was carried out considering environmental policy as an exogenous factor, and focusing on local pollution. Most of the key factors involved in company location decisions are taken into account, such as plant and company fixed costs and transport costs connected with exports. Commonly, the first generation of models, which appeared in the 1990s (e.g. Markusen and associates, 1993; Motta and Thisse, 1994) focused on explaining the effect of environmental measures on location decisions, with location as the only endogenous variable.

During the last fifteen years, the main focus in the literature has shifted towards endogenizing environmental policy in a strategic context, while often taking the international strategy of companies as exogenous (Bayindir-Upmann, 2003; Cole and associates, 2006). Only in a few papers are both government and company decisions treated as endogenous (Markusen and associates, 1995; Rauscher, 1995; Ulph and Valentini, 2001).

However, models that see both environmental policy and location as endogenous factors have become increasingly stylized, to the extent of losing many of the essential ingredients of the location decision. It is generally assumed that there are no transport costs, that companies serve only a third market, that profits are not a component of welfare, and that all countries are of similar size, etc. Such models lose

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much of their interest in terms of empirical work or policy decisions.

As a novelty, Sanna-Randacci and Sestini (2011) analyzed the effect of asymmetric environmental policies on international location strategies in pollution-intensive sectors, when countries differ in terms of market size. The authors suggested that international environmental rules should take account of differences in market sizes and thus the ability to attract production.

Still, less attention has been paid to macro-level issues of how increased economic activity, driven by liberalized investment and trade impacts on the environment and a country's prospects for sustainable development (Mabey and McNally, 1999). In the European Union, analysts are discussing the relevance of the risk of 'carbon leakage' due to unilateral emission mitigation policies.

Overcoming the 'first mover disadvantage' requires some international harmonization of standards, or the consolation that others will face some level of regulation. There is increasing pressure on the international community to establish principles to balance the interests of companies, countries and people (Milgrom, 2014). Achieving sustainable development in addition to international community principles requires firm commitment on the part of governments and private sectors, and the simultaneous existence of appropriate legal frameworks and resources to finance sustainable development. This process is already happening in regional trading blocs such as the EU and NAFTA, but needs to be accelerated (Mabey and McNally, 1999).

However, it is undeniable that there are still huge differences in environmental protection regulations between countries and regions. The most significant effect of different standards may not be a race to the bottom, but the 'chilling effect' on regulation and enforcement, which means hindering regulations from reaching their socially optimal levels. Tackling this requires greater environmental regulation, both independently and collectively.

While the 'pollution haven' picture continues to be unclear, the possibility that trade and investment flows will be affected if countries pursue environmental regulation with significantly different degrees of ambition cannot be ruled out. Several

avenues of emerging research will strengthen the empirical evidence base and provide a better understanding of how the potentially adverse impacts of environmental regulation on trade and investment can be mitigated. Two examples are emerging research on the comparability of environmental effort (for example, Aldy and Pizer, 2013), and assessments of the effectiveness of alternative measures to address competitiveness impacts. For example, a body of work evaluates the allowance allocation methods under emissions trading schemes (Fischer and Fox, 2007; Meunier and Ponsard, 2012), border carbon adjustments (Branger and Quirion, 2014; Böhringer and associates, 2014), and consumption-based accounting (for example, Jakob and associates, 2014). These studies are not empirical, due to a lack of actual policy experiments.

3. Methodology

For the purpose of analyzing FDI flows and structure, and environmental protection regulation in EU countries, data from secondary sources were used, namely, UNCTAD, Eurostat and OECD databases. Research was conducted using standard analysis, induction, deduction and comparison methods. The literature review results were synthesized and used as guidelines for data analysis and conclusions.

Data were analyzed for the period 2003-2013, i.e. up to the last available year. One of the most important parameters that roughly indicate the location of the given statistics on a numerical axis is the arithmetic mean, average, or mean value of a given series of numerical data. As a complement to average values, the degree of homogeneity of indicators used is often given, in which standard deviation is the most important. In addition to standard deviation as a measure of the dispersion, coefficients of curvature (asymmetry) and kurtosis can be used. This research was conducted as a preliminary analysis for further empirical research of the relationship between FDI and environmental protection regulation.

4. Results of the analysis of foreign direct investments and environmental protection in the European Union

Rapid development without adequate controls can bring about irreversible social and cultural

disruption, removing traditional economic support mechanisms without replacing them with adequate substitutes. The irreversibility of much environmental damage means that liberalization can result in long-term negative impacts if host country regulation cannot respond to increased economic activity (Mabey and McNally, 1999).

4.1. Overview of FDI flows and structure in EU countries

In the global environment, many countries face the problem of insufficient capital sources to finance their needs. Many see foreign direct investment (FDI) as a potential source of much-needed capital. However, due to strong competition between countries, there is a growing need to offer certain incentives with a stable investment climate, in order to attract FDI. However, each country needs to analyze carefully which types of incentives are acceptable and most appropriate, that is, what kind of incentive package will yield more benefits than costs and therefore avoid the 'race to the bottom' effect.

Increasing FDI in the EU results in a variety of economic impacts. These impacts are not only scrutinized according to quantity, but also quality. Investments bring many benefits, such as job creation, optimizing resource allocation, transferring technology and skills, increasing competition and boosting trade. This explains why EU countries make significant efforts to attract foreign invest-

ment (European Commission, 2015a).

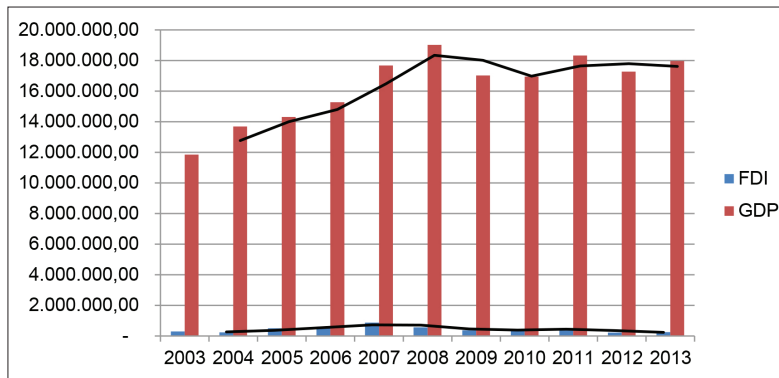
Since the global economic crisis, FDI trends have slowly recovered, but not to pre-crisis levels. In the European Union in 2013, outward flows were 34% higher than EU flows in 2012. Similarly, EU-28 inward flows were 12% above EU-27 flows in the previous year (Eurostat, 2015). However, EU FDI flows in 2013 were more than 20% below the EU peak levels of 2011 in terms of both inward and outward investment relations with the rest of the world. The income rates of return from both outward and inward investment in 2012 were slightly down from the previous year, but remained above the rates for 2008 and 2009.

Since many researchers (e.g. Nuzhat, 2009; Jun-Yi and associates, 2008; Abbas and associates, 2011) have proved the existence of a relationship between FDI and gross domestic product (GDP), we looked at the trends of FDI inflows and GDP values for a ten-year period (Figure 1). Some similarities in the movement of indicators can be detected. Upward trends in GDP and FDI were recorded up to 2008, after which values plummeted, due to the economic crisis. The EU has been recovering slowly from the crisis, accompanied by growth in GDP; however, FDI has not recovered as fast. Investors are hesitant to invest during times of crisis, due to increased risks of returns and unstable markets.

While the contribution of FDI to GDP growth is

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Figure 1 FDI inflow and GDP trends in EU-28, 2003 - 2013 (million USD)

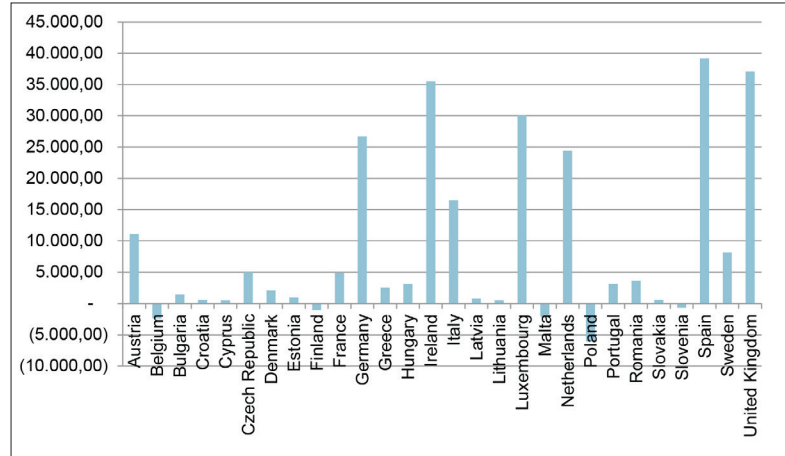


Source: UNCTAD database (2015).

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Figure 2 FDI inflow by country, 2013 (million USD)



Source: UNCTAD database (2015).

sometimes overstated, FDI would be particularly valuable for the peripheral euro area in the current situation. After all, most domestic companies are financially constrained and have problems in accessing financing via conventional channels. This means that the availability of capital for large-scale investments in the economy is scarce (Vetter, 2014).

Comparing FDI inflow among EU countries (Figure 2), it can be concluded that in 2013, Spain (39,166 million USD), the UK (37,100 million USD) and Ireland (35,519 million USD) received the largest amounts of FDI, while Belgium (-2,405 million USD), Malta (-2,099 million USD) and Finland (1,064 million USD) actually recorded disinvestments.

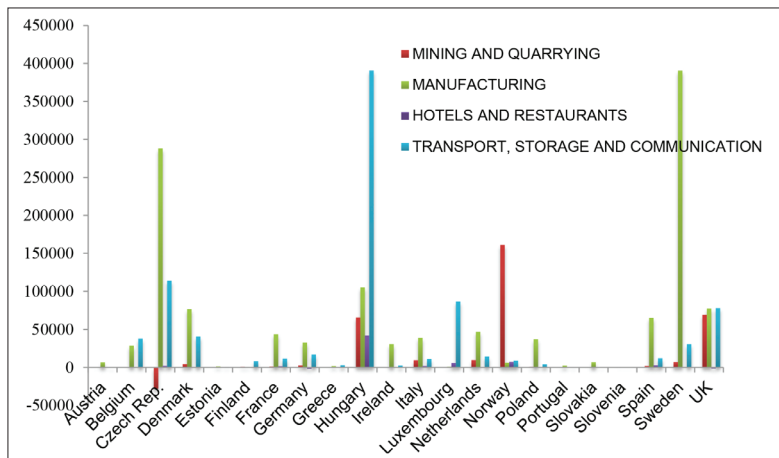
Besides quantity, the quality of investments is also crucial to the economy. As for the structure of FDI, services made by far the largest contribution to both outward (62%) and inward (87%) FDI stocks for the EU, and their respective shares of total stocks at the end of 2011 were greater than at the end of 2010, in particular inward stocks (Eurostat, 2015). Around three-fifths of inward stocks of services and almost four-fifths of outward stocks of services were held in financial and insurance activities, which themselves grew during 2011. Almost all services subsectors contributed to the positive development, the highest growth being recorded

for information and communication services (outward stocks) and financial and insurance activities (inward). On the other hand, EU inward stocks decreased for information and communication services, accommodation and food service activities and for real estate activities, while both inward and outward stocks decreased for other services.

The EU countries have no large foreign direct investment in extractive industries which often cause irreversible consequences in the environment. However, sustainable development and environmental protection have an important place in the development agenda. Therefore, it is interesting to see how much FDI flows into potentially polluting activities, and how well the EU countries regulate environmental protection.

The manufacturing industries perceived as potentially highly polluting are mining and quarrying, wood, publishing and printing, refined petroleum and other treatments, chemical products, rubber and plastic products and metal products. Some services regarded as more burdensome on the environment include hotels, restaurants, and transport. Figure 3 shows the total sums of inward FDI by economic activity in EU member countries (for which data was available). For the purposes of this analysis, only potentially polluting sectors were

Figure 3 FDI by potentially highly polluting economic activity, EU countries, 2003-2013 (million USD)



Source: OECD (2015).

selected and compared. Detailed data of inward and outward FDI by economic activity in the EU are shown in Annexes 1 and 2.

Looking at Figure 3, it can be concluded that manufacturing industries and transport services are sectors that have received most FDI in the countries analyzed. Unlike other EU members, Hungary, Norway and the UK have received large amounts of FDI in the mining and quarrying industry, which may be potentially harmful to their environment. FDI in manufacturing industries has been significant in the Czech Republic and Sweden, particularly in mechanical products, rubber and plastic manufacturing (in the former) and wood, publishing and printing, and chemicals manufacturing (in the latter) (Annex 1). Estonia, Portugal, Slovenia and Slovakia have received considerably less FDI in polluting-intensive industries and services than other EU countries. Those countries are also at the top of the list of environmental tax revenues in the EU (Figure 5). FDI flows in environmentally burdensome service sectors were largest in Hungary and the Czech Republic.

Changes in economic structures influence the proportion of FDI stock in pollution-intensive industries in the total FDI stock. The presence of FDI in pollution-intensive industries is, however, only one

of the factors influencing the environment in a host country. Technologies used by investors and environment management also play an important role (Witkowska, 2012).

Considering the importance of sustainable development and allocating investments for desired economic activities, FDI rules and environmental protection regulation are important determinants of a country's attractiveness to foreign investors. Furthermore, unlike geography, FDI and environment protection rules are factors over which governments can exert control.

Regarding restrictions for foreign investors, the EU countries have already eliminated most barriers and discriminatory measures, and facilitated investments from abroad to a greater degree than most other countries (Vetter, 2014).

The level of FDI restrictiveness can be measured with the FDI Regulatory Restrictiveness Index (FDI Index). It measures statutory restrictions on foreign direct investment in 58 countries, and covers 22 sectors. The FDI Index gauges the restrictiveness of a country's FDI rules by looking at the four main types of restrictions on FDI (OECD, 2015):

- foreign equity limitations,
- screening or approval mechanisms,

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- restrictions on the employment of foreigners as key personnel,
- operational restrictions, e.g. restrictions on branching, capital repatriation, or land ownership.¹

As it can be seen from Table 1, Austria has one of the most closed regulatory systems, with particularly regulated primary sector activities (0.15), hindering foreign investors from entering this sector easily. On the other hand, the most open regulatory systems are noted in Luxembourg, Spain and Portugal. Secondary sector openness is high in most of the countries analyzed.

4.2. Evolution and reforms of EU environmental protection regulations

The EU has common policies for investment and environment regulation. However, member countries can also have their own national policy measures. Most of Europe's outflowing and inflowing FDI is protected by bilateral trade agreements (BITs). To date, only a few EU countries have included provisions for sustainable development in their BITs.

Market-based instruments, such as environmental taxes, tradable permit systems or targeted subsidies, are a cost-effective way to protect and improve the environment. They provide incentives for firms and consumers to opt for greener production or products.

In January 2005, the European Union Greenhouse Gas Emissions Trading System (EU ETS) started operations as the largest multi-country, multi-sector Greenhouse Gas Emission Trading System worldwide. It covers over 11,500 energy-intensive installations across the EU, and around half of Europe's emissions of carbon-dioxide. These installations include combustion plants, oil refineries, coke ovens, iron and steel plants, and factories making cement, glass, lime, brick, ceramics, pulp and paper. Emissions trading does not imply new environmental targets, but allows for cheaper compliance with existing targets under the Kyoto Protocol. Allowing participating companies to buy or sell emission allowances means that the targets can be achieved at the minimum cost.

The use of emission-restricting regulations is not

Table 1 FDI Regulatory Restrictiveness Index, 2014

Sector	Primary	Secondary	Tertiary	Total
Austria	0.15	0.143	0.066	0.106
Belgium	0.035	0.023	0.052	0.04
Czech Rep.	0.025	0	0.012	0.01
Denmark	0.056	0	0.045	0.033
Estonia	0.023	0	0.028	0.018
Finland	0.015	0.02	0.019	0.019
France	0.155	0	0.053	0.045
Germany	0.069	0	0.022	0.023
Greece	0.079	0	0.035	0.032
Hungary	0	0	0.057	0.029
Ireland	0.135	0	0.037	0.043
Italy	0.13	0	0.057	0.052
Luxembourg	0	0	0.007	0.004
Netherlands	0.062	0	0.008	0.015
Poland	0.05	0	0.125	0.072
Portugal	0.006	0	0.012	0.007
Slovakia	0	0	0.098	0.049
Spain	0	0	0.015	0.007
Sweden	0.011	0	0.038	0.011
United Kingdom	0.016	0.023	0.05	0.061
Mode	0.00	0.00	0.01	0.01
Average	0.051	0.010	0.041	0.034

Source: OECD (2015).

¹ Restrictions are evaluated on a 0 (open) to 1 (closed) scale. The overall restrictiveness index is the average of sectoral scores.

widely prevalent across EU countries, which have opted for more market-based approaches to the climate change problem. Nevertheless, regulations have been used, in particular to address emissions from vehicles and transport. For instance, emissions standards have existed since the 1970s and currently target four groups of emissions: nitrogen oxides, hydrocarbons, carbon monoxide and particulate matter. While emissions standards are a common feature of environmental policies in many advanced economies, the EU has only recently begun to address the issue of CO₂ emissions from vehicles. Recent legislation has set the timeline for the implementation of new standards in this area (International Labour Organization, International Institute for Labour Studies, 2011).

Moreover, under the Europe 2020 strategy, the EU has adopted the '20-20-20' plan, which sets climate and energy targets of cutting greenhouse gases by 20 per cent by 2020 compared with 1990 levels, achieving 20 per cent of primary energy from renewable resources and improving energy efficiency by 20 per cent by 2020. As part of the strategy, many governments in the EU have imposed taxes on the use of electricity, mineral oils, roads and vehicles, which vary based on weight, purpose and emissions.

There is little evidence to suggest that strengthening environmental regulations reduces international competitiveness. The effect of current environmental regulations on where trade and investment take place has been shown to be negligible compared to other factors, such as market conditions and the quality of the local workforce. However, the impact could increase in the future, if efforts to control pollution diverge significantly across countries. Emerging research comparing environmental efforts in different countries will play a key role in assessing and preventing adverse impacts on trade and investment in the future (Dechezleprêtre and Sato, 2014).

As previously mentioned, environmental taxes are increasingly considered a useful and important part of the policy mix. When carefully designed, such instruments can provide economic incentives which can encourage dynamic innovation, change the business case for investment, and inform consumer choice, thus helping deliver economic, social (e.g. health, income distribution) and environmental

(e.g. efficient resource use, energy security) benefits (Withana and associates, 2014).

Environmental taxes and charges are the most widely used market-based instruments for green policies in the EU, with governments imposing taxes on transport, emissions and air pollution, energy and mineral oil (International Labour Organization, International Institute For Labour Studies, 2011). Subsidies and tax credits can be granted to enhance energy efficiency in a variety of areas, including buildings, transport and households.

Environmental tax reform is a combination of the increased application of environmental taxes, with the reduction of other, more distorting taxes, e.g. on labour, in order to improve the environment and to improve employment, within a context of budget neutrality.

The momentum behind environmental tax reforms has continued to grow over the past two decades. What began as an exercise among a few leading European countries has gradually expanded to encompass a number of countries and regions across the globe.

Figure 4 shows changes in the proportion of environmental and labour taxes in total tax revenues since 1995. EU countries make very different use of environmental taxes, for example, in 2006 the proportion was more than 10% in Denmark, the Netherlands and Malta, while it was less than 6% in Belgium, Spain, France, Sweden and Austria. During 2005-2006, trends also differed among the countries concerned: Latvia accounted for the greatest decrease in its proportion of environmental taxes (from 9.2% to 7.9%), while in Denmark, the proportion increased (from 11.5% to 12.2%).

Plans and initiatives are underway in several countries to introduce new environmental taxes, charges, or levies or to amend existing systems, either as part of a broader package of fiscal reform, or as individual proposals reflecting different interests and circumstances. Recent initiatives in some countries have responded to fiscal necessities, while others seek to support wider environmental, economic and social objectives. The reform agenda has also attracted attention at the EU level, and has appeared, for example, in several country-specific recommendations under the European Semester,

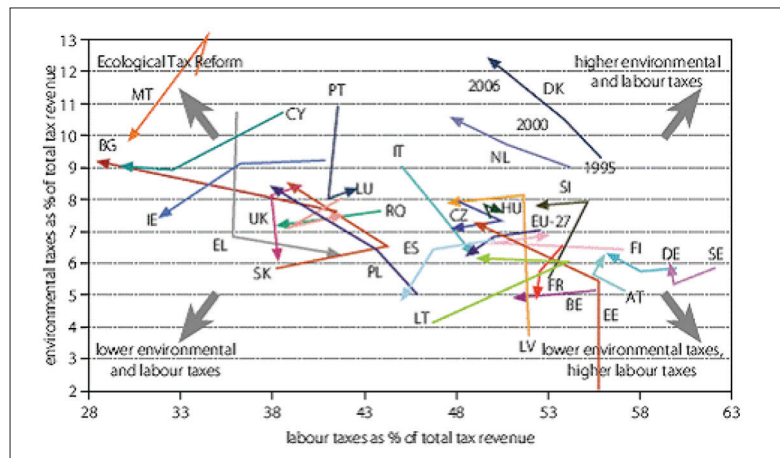
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Figure 4 Changes in the proportion of environmental and labour taxes in total tax revenues



Source: European Commission (2008).

and in policy discussions on climate change, resource efficiency and the circular economy (Withana and associates, 2014).

To date, the main focus of efforts has been in the areas of transport, energy and water, albeit with significant variation in the type of instrument, rate applied and impact across countries (Withana and associates, 2014). In the area of energy, the rate of taxation applied varies significantly across different energy products, sectors and countries. In a number of countries, vehicle registration taxes have been set to promote the purchase of low-carbon vehicles, e.g. in Ireland, the Netherlands, Portugal and Spain. Waste-related taxes and charges and product taxes are in place in nearly all countries. Water-related taxes and charges are applied to drinking water supply and consumption, waste-water discharges and effluents, and water abstraction.

It can be concluded that environmental taxes in the EU are composed mainly of energy taxes (accounting for some 75% of the EU-28 environmental tax revenues), of which transport fuel taxes represent more than three-quarters, followed by non-fuel transport taxes (21%) and pollution/resources taxes (4%) (Eurostat, 2014).

Despite the flat trend in environmental taxes since 2009 at the overall EU level, individual Member

States have displayed considerable differences in the dynamics of application. The largest increases were recorded in Greece and Finland, and the greatest decreases were in Lithuania, Portugal and Spain. Total revenues from environmental taxes in the EU-28 in 2013 were EUR 331 billion; this figure equates to 2.5% of gross domestic product (GDP) and 6.3% of the total revenues derived from all taxes and social contributions (Figure 5).

Energy taxes (which include taxes on transport fuels) were particularly prominent in Lithuania, Luxembourg and the Czech Republic, where they accounted for more than nine-tenths of total environmental tax revenues. In contrast, energy taxes slightly exceeded 50% of revenues from environmental taxes in Malta and Norway (Figure 6).

A good tax system ensures predictable revenues for the government, is stable, and minimizes distortions in investment decisions. There is a broad consensus that applying tax instruments with reasonable tax rates over a broad base is sound policy. Paradoxically, this approach rules out all tax incentives (Johnson and Toledano, 2013). Some subsidies for the industrial, transport, agriculture and energy sectors can be environmentally harmful, because they promote the use of polluting or energy-intensive products or processes. They can also introduce

Table 2 Total environmental tax revenues by type of tax in EU-28, 2013

Sector	(million EUR)	(% of total environmental taxes)	(% of GDP)	(% of total revenues from taxes and social contributions)
Total environmental taxes	331.378,00	100,00	2,50	6,30
Energy taxes	248.496,00	75,00	1,80	4,70
Transport taxes	66.617,00	20,10	0,50	1,30
Taxes on pollution and resources	16.266,00	4,90	0,10	0,30

Source: Eurostat (2015).

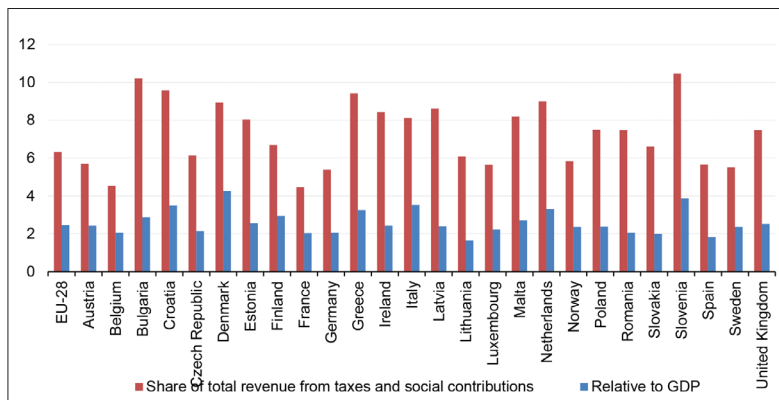
distortions in the Single Market (European Commission, 2015b). Yet, some experts have argued that governments should implement less neutral policies, because not all investments are the same, and some incentives may be needed.

In fact, the level of the tax rate alone does not determine tax impacts. The evolution of tax over time, exemptions granted and associated conditions, as well as the use of revenues raised, are equally important factors influencing effectiveness. In some cases, a number of exemptions are granted in the early years of imposing an environmental tax, which are then gradually phased out. In some cases, exemptions are conditional on the achievement of certain targets, voluntary agreements with the government etc. For example, in the Netherlands, in order not to harm international competitiveness, large industrial electricity consumers receive an energy tax refund, if they have entered into long-term energy efficiency agreements with the government,

and as long as they pay on average more than the European minimum rate. In some cases, the success of the environmental tax, charge or levy can lead to negative impacts, for example on public finances and/or on environmental objectives. For example, the bonus-malus system introduced in France in late 2007 aimed to encourage the purchase of vehicles which emit low CO₂ emissions. The system was supposed to be neutral in respect of public finances; however, due to its success, it led to a financial deficit of EUR 1.46 billion between 2008 and 2011 (Withana and associates, 2014).

More countries have shifted toward the use of state aid for horizontal purposes, and this has been reflected in the greater use of incentives to address market failures and pursue specific goals. With respect to the relationship between aid-type and objectives, most aid dedicated to environmental purposes is available through tax exemptions (European Commission, 2011).

Figure 5 Total environmental tax revenues, 2013 (%)



Source: Eurostat (2015).

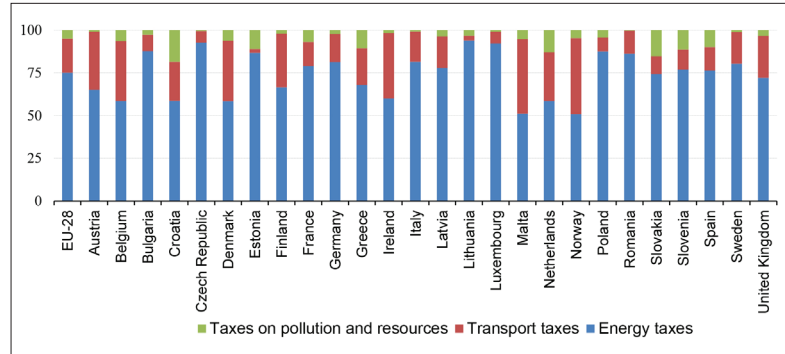
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Figure 6 Environmental taxes by tax category as % of tax revenues, 2013



Source: Eurostat (2015).

The total amount of incentives for EU industry in 2009-2011 was 60,048 million euros (Table 3). As already mentioned, tax reductions were the most common instrument for improving environmental protection. The average amount of tax reductions in the EU countries was 885 million euros.

Overall, the impacts and effectiveness of environmental taxes, charges and levies vary across countries, and are determined by a number of factors, including design (i.e. point of application, breadth of coverage), level of taxes and charges, implementation (i.e. evolution over time, exemptions granted and associated conditions), and the use of revenues raised. Furthermore, the impact of these instruments needs to be seen in the wider context of related taxes and other policy instruments in place, as well as external factors that drive change (Withana and associates, 2014).

5. Conclusion

Achieving the goals of sustainable development while attracting investment and promoting economic growth depends on the successful development of national policies, and their synergy and coherence. Well-allocated, high-quality foreign investment can help make current economic practices more sustainable, while inappropriate investment can destabilize communities and the environment. The European Union has formulated a long-term strategy for economically, socially and environmentally sustainable development. Subsequently, the

EU has strong environmental requirements that can be regarded as a barrier to potential practices of seeking pollution havens in these countries. Environmental taxes in the EU are composed mainly of energy taxes, of which transport fuel taxes represent more than three-quarters, followed by non-fuel transport taxes (21%) and pollution taxes (4%), while at the same time, manufacturing industries and transport services are sectors that have received the most FDI in the countries analyzed. It can be assumed that environmental regulation is not a repelling factor for the entry of FDI. Additionally, most EU members implement their own national autonomous policies towards foreign investors, using different incentives packages. Thus, these countries try to influence investment decisions and encourage investors to invest in industries favouring a knowledge-based and environmentally-friendly economy. All the above leads to the conclusion that there is significant diversity in practices among European countries, given different national and local interests and circumstances. This diversity can also lead to competitiveness problems, or less effective results in certain areas. Different approaches to investment and sustainable development policies may have implications for the level of harmonization and collaboration between countries. One possible approach that can be considered in the future is that of cooperation and coordination through 'coalitions of like-minded countries', which would bring together groups of countries with similar

Table 3 Aid to industry and services by instrument and country, 2009-2011 (million EUR)

	Grants	Tax reduction	Equity participation	Soft loans	Guarantees	Total
EU27	32.393,00	23.903,00	602,00	1.895,00	1.255,00	60.048,00
Austria	1.407,00	222,00	2,00	54,00	12,00	1.697,00
Belgium	981,00	625,00	9,00	61,00	1,00	1.677,00
Bulgaria	18,00	7,00	-	-	-	25,00
Cyprus	84,00	2,00	-	-	-	86,00
Czech Rep.	753,00	113,00	-	6,00	100,00	972,00
Denmark	1.139,00	60,00	6,00	9,00	1,00	1.215,00
Estonia	13,00	3,00	-	-	-	16,00
Finland	550,00	294,00	19,00	34,00	3,00	900,00
France	4.971,00	6.458,00	14,00	328,00	14,00	11.785,00
Germany	8.245,00	5.289,00	29,00	201,00	76,00	13.840,00
Greece	825,00	117,00	-	-	1.013,00	1.955,00
Hungary	803,00	488,00	1,00	24,00	5,00	1.321,00
Ireland	325,00	439,00	2,00	30,00	-	796,00
Italy	3.147,00	383,00	20,00	226,00	11,00	3.787,00
Latvia	36,00	15,00	1,00	1,00	-	53,00
Lithuania	95,00	13,00	1,00	-	-	109,00
Luxembourg	90,00	-	-	1,00	-	91,00
Malta	38,00	98,00	-	-	-	136,00
Netherlands	1.461,00	315,00	6,00	18,00	10,00	1.810,00
Poland	1.777,00	747,00	17,00	38,00	1,00	2.580,00
Portugal	190,00	2.603,00	14,00	19,00	-	2.826,00
Romania	219,00	2,00	4,00	3,00	-	228,00
Slovakia	115,00	106,00	-	-	-	221,00
Slovenia	308,00	6,00	1,00	2,00	-	317,00
Spain	2.498,00	984,00	-	740,00	7,00	4.229,00
Sweden	442,00	2.356,00	2,00	5,00	-	2.805,00
UK	1.863,00	2.157,00	452,00	96,00	1,00	4.569,00
Average	1.200,00	885,00	22,00	70,00	46,00	2.224,00
Min	13,00	-	-	-	-	16,00
Max	8.245,00	6.458,00	452,00	740,00	1.013,00	13.840,00
Std.Deviation	1.815,42	1.620,54	86,26	156,19	194,57	3.346,39

Source: European Commission (2011).

interests in a particular area. This approach would be voluntary, and could help ensure more effective and efficient regulation. Cooperation could in some cases lead to more harmonized or synchronized approaches between countries, while supporting better sharing of information on experiences and plans in others, to ensure the improved design of policy instruments. For activities where pollution leakage and competitiveness issues represent a serious risk, it is important to create policy options to prevent adverse impacts on trade and investment, while avoiding the creation of new distortions. The adjustment of policies in each economic sector will be required to balance policy goals with the multiple impacts of environmental regulations on pollution, investment, trade, productivity, employment and innovation. The limitations of this paper relate to

the absence of empirical testing of the relationship between FDI and environmental regulation. Therefore, it would be useful if future research conducted econometric analyses to see if the aforementioned relationship can be confirmed, along with its strength among the various EU countries.

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Annex 1 Inward FDI by economic activity in the EU countries, 2003-2013 (million EUR)

	Austria	Belgium	Czech	Denmark	Estonia	Finland	France	Germany	Greece	Hungary	Ireland
1495: Mining and quarrying	90.00	127.00	- 28 088.17	4 292.00	46.38	974.94	1 294.00	2 651.00	11.36	65 675.26	-
1100: Extraction of crude petroleum and natural gas; service activities incidental to oil and gas extraction, excluding surveying	34.00	-	4 415.70	4 302.00	-	- 274.58	916.00	1 562.00	- 205.98	70 847.43	-
3995: Manufacturing	6 765.00	28 538.00	288 090.83	7 664.00	1 464.92	783.54	43 743.00	32 650.00	1 808.25	105 565.19	30 640.00
1605: Food products	192.00	9 270.00	17 842.36	35 421.00	146.44	267.88	1 319.00	3 033.00	132.14	- 67 030.07	1 502.00
2295: Total (1805+2205)	257.00	9 771.00	15 389.99	- 117.00	513.45	- 153.86	1 753.00	1 370.00	- 0.61	69 355.64	2 502.00
1805: Textiles and wearing apparel	9.00	677.00	3 022.59	145.00	115.05	24.00	5 500.00	8 320.00	6.23	809.58	-
2205: Wood, publishing and printing	248.00	1 725.00	12 167.34	- 1 562.00	398.40	- 152.75	1 234.00	516.00	- 6.94	68 926.06	411.00
2595: Total (2300+2400+2500)	2 400.00	8 180.00	51 398.28	6 788.00	1 90.23	867.44	202 740.00	3 555.00	1 370.27	708 501.50	7 723.00
2300: Refined petroleum & other treatments	- 72.00	- 2 747.00	678.90	- 676.00	1.82	-	793.00	2 616.00	203.33	62 986.26	-
2400: Chemical products	2 204.00	- 7631.00	14 946.25	2 568.00	153.83	855.59	16 991.00	1 252.00	1 126.34	367 771.50	6 032.00
2423: Pharmaceuticals, medicinal chemical and botanical products	4 000.00	493.00	- 45 509.7	1 484.00	19.74	- 102.00	8 949.00	282.00	1 801.6	415 994.51	1 783.00
2500: Rubber and plastic products	266.00	- 361.00	35 717.76	5 118.00	28.52	- 9.39	2 484.00	- 314.00	40.60	2 777 457.4	-
2995: Total (2805+2900)	1 911.00	2 631.00	93 534.74	20 061.00	1 341.5	3 858.06	6 231.00	11 712	11 712	- 297 559.59	2 236.00
2805: Metal products	523.00	- 2 425.00	52 947.14	1 800.00	75.80	3 579.43	3 474.00	2 219.00	- 70.48	2 913 554.16	-
2900: Mechanical products	1 387.00	5 056.00	40 587.60	18 819.00	58.35	278.64	2 738.00	6 892.00	187.59	-	74.00
3295: Total (3000+3200)	162.00	45.00	- 33 480.43	3 014.00	121.33	1 775.7	1 656.00	1 458.00	- 220.55	267 144.75	5 493.00

	Italy	Luxembourg	Netherlands	Norway	Poland	Portugal	Slovakia	Slovenia	Spain	Sweden	UK
1495: Mining and quarrying	9 356.46	3.80	9 484.00	16 1325.00	924.20	511.41	1231.2	18.08	1 933.00	7 126.00	69 250.00
1100: Extraction of crude petroleum and natural gas; service activities incidental to oil and gas extraction, excluding surveying	3 390.86	-	10 515.00	155 489.00	617.60	-	38.40	17.46	264.00	-	66 536.00
3995: Manufacturing	38 960.97	1 060.30	46 859.00	6 067.00	3 722.700	2 297.80	6 970.59	135.10	63 260.00	390 623.00	775 28.00
1605: Food products	13 602.07	- 380.20	21 222.00	- 2 539.00	4 284.30	-	283.08	48.98	1 068.00	5 4073.00	24 196.00
2295: Total (1805+2205)	2 744.2	- 1 080.70	- 2 195.00	- 23 555.00	358.70	-	396.27	- 13.98	989.00	73 081.00	4 689.00
1805: Textiles and wearing apparel	2 703.75	- 856.10	- 736.00	-	1 102.0	-	58.98	- 10.05	- 861.00	-	- 115.00
2205: Wood, publishing and printing	- 2 477.52	- 224.50	- 1 465.00	- 303 321.00	248.60	-	337.50	- 3.92	2 433.00	7 797.00	4 811.00
2595: Total (2300+2400+2500)	6 750.65	2 835.50	30 675.00	- 31 099.00	8 410.90	-	1 234.35	80.60	1 017 100	79 746.00	23 974.00
2300: Refined petroleum & other treatments	10 665.21	-	2 445.00	-	- 355.30	-	328.94	- 1.41	5 133.00	-	- 503.00
2400: Chemical products	- 5 916.95	- 55.40	30 898.00	- 36 386.00	5 047.10	-	279.70	58.47	- 5 001.00	7 235.100	21 087.00
2423: Pharmaceuticals, medicinal chemical and botanical products	- 3 730.88	-	3 538.00	- 6632.00	593.50	-	- 21.87	- 56.08	1 360.00	11 833.00	1 583.00
2500: Rubber and plastic products	1 986.38	2 890.90	- 2 671.00	- 84.00	3 719.10	-	6 671	23.54	2 218.00	-	930.00
2995: Total (2805+2900)	2 097.50	- 920.90	3 586.00	83 542.00	9 797.50	-	2 280.10	87.61	7 890.00	27 008.00	11 469.00
2805: Metal products	1 671.14	- 1 069.50	1 282.00	15 335.00	7 659.10	-	1 961.39	- 25.26	4 581.00	- 86 26.00	1 633.00
2900: Mechanical products	4 271.8	1 487.0	2 299.00	64 706.00	2 158.40	-	3 177.1	111.86	4 480.00	22 677.00	8 564.00
3295: Total (3000+3200)	7 745.53	18.20	- 3 670.00	- 40 032.00	1 480.40	-	353.15	- 4.90	664.00	2 390.00	1 581.00

Source: Eurostat (2015).

Values represent total sum of Inward FDI for the period 2003-2013, or last available year.

Annex 2 Extra EU FDI stocks by economic activity, end 2011 (billion EUR)

	Outward	Inward
Total	4,940,90	3,768,10
Agriculture, hunting and fishing	4,10	2,10
Mining and quarrying	450,20	27,70
Manufacturing	1,245,80	374,00
Food products, beverages and tobacco products	181,60	82,00
Textiles and wood activities	58,10	11,50
Petroleum, chemical, pharmaceutical products	442,80	139,50
Metal and machinery products	368,60	72,60
Vehicles and other transport equipment	75,40	39,10
Electricity, gas, steam and air conditioning	63,70	17,70
Water supply; sewerage, waste management	6,00	3,30
Construction	23,20	10,80
Services	3,087,60	3,283,00
Trade; repairs of motor vehicles and motorcycles	215,10	159,70
Transportation and storage	59,90	25,90
Accommodation and food service activities	21,50	11,80
Information and communication	338,00	88,70
Financial and insurance activities	1,849,60	2,563,60
Real estate activities	44,10	51,00
Professional, scientific and technical activities	451,60	302,90
Other services (NACE Rev. 2 Sections N to U)	107,80	79,40
Other, including activities not allocated	60,40	49,50

Source: Eurostat (2015).

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