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MASTER'S THESIS

THE IMPACT OF ENVIRONMENTAL REGULATIONS ON FDI IN MANUFACTURING SECTOR IN TRANSITION COUNTRIES

Ljubljana, December 2015   IVAN LIVAJA

AUTHORSHIP STATEMENT

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INTRODUCTION

Many debates took place when it comes to environmental questions and their influence on different fields, as well as economy, which is our greatest interest. As different parts of world had different rate of development, different countries were in different stages of development, so environmental regulations (hereinafter ER) in those countries became one of the factors important for progress of economy in country. One of the most important aspects of these debates is influence of environmental regulations when it comes to international competitiveness of countries and choice of location for construction of their plants in polluting industries. Strong regulations could lead companies to move their plants into the countries with weaker environmental regulations. This is specially emphasized in pollution intensive industries and it might cause significant capital investment in country with weaker regulations, and usually, funds transfer or investment goes from developed country to developing country. Many countries consciously attracted large international companies to invest in their country by supporting them with their weaker environmental regulations which indicates that environmental regulations have significant influence to the foreign direct investments (hereinafter FDI).

It is very important how these standards are set, how high or low and what they are allowing the investor. It is very important which level of pollution according to these standards is acceptable in the country. These standards are very important for investors because on them depend on how much will be effective and whether it will succeed to lower costs compared to the costs that have in the country of origin, which ultimately means that investors will achieve higher profit. If the standards are set lower than in other countries it may be one of the factors by which the country attracted foreign direct investment. This is very often case in transition countries that still don't have a well-designed standards which can lead to excessive pollution of the environment and the creation of "pollution haven" in the country.

Thus, the pollution haven hypothesis says that less developed countries are trying to attract foreign investors by lowering environmental standards. Through lowering environmental standards less developed countries create competitive advantages that help attract dirty industries. Manufacturing and exporting pollution intensive goods try to get higher participation in the global market while richer countries buy from them the products that they would not themselves produce (Frankel & Rose, 2005).

Porter hypothesis also discusses the relationship between FDI and environmental regulations, as opposed to „pollution haven hypothesis" says that stricter environmental regulations stimulate innovation and efficiency, thereby improving competition in the markets, which leads to the final goal, attracting investments.

There are numerous empirical studies that are concerned about the determination of causality between environmental regulation and foreign direct investment. Smarzynska and Wei (2003) and Jaffe, Copeland and Taylor (1995), that are concerned with the subject of environmental regulations have found that in certain industries and in certain cases, environmental regulations have a significant impact on foreign direct investment (FDI), while on the other hand in some industries and cases don't have significant impact and represent a minor item in the process of selection of location for investors.

According to the foregoing, it can be noted that the focus of research on the relationship between environmental regulation and FDI was mainly on developed countries while the transition countries were largely excluded from the sample because of lack of data. Therefore, this study was based on a sample of transition countries. Also, this study includes foreign direct investment in manufacturing sector because of environmental regulations aimed at this sector and this sector has the greatest impact on the environment.

Another important problem related to research of environmental regulation, as determinant of FDI, is choice of adequate proxy variable for environmental regulation. Environmental stringency is very hard to quantify. In different countries are used different proxies as well as in various researches. Also if the strict environmental regulations that were adopted by the state are not implemented properly then you do not have the desired effect and they are similar as weak regulations. According to some authors, the problem we have with the measurement of environmental stringency is very important because, cost relating to environmental stringency exists in every industry and if it does not accurately measure may give a misleading picture of the actual negative pollution haven effect.

Environmental stringency is mainly measured by expenditures on environmental protection, or emission-based measures. We will follow these lead using expenditures on environmental protection (as percentage of GDP by country) as the indicator for environmental regulation.

The purpose of this investigation is to analyze how environmental regulations in transition countries influence attraction of foreign direct investments in these countries. The main research question in this work is: Does lax environmental regulation attract FDI in manufacturing sector in transition countries?

The hypothesis is set as follows: Countries with lax environmental regulations receive more FDI in manufacturing sector in transition countries.

The objectives of the thesis are:

1. To explain the relationship between environmental regulation and FDI.
2. To analyze influence of environmental regulation on inflow of FDI in manufacturing sector in transition countries.
3. To provide policy implication for attracting FDI in transition countries in the context of an impact of environmental regulations on FDI.

In this study, sample includes eleven transition countries of Central-Eastern Europe: Bulgaria, Croatia, Czech Republic, Estonia, Hungary, Latvia, Lithuania, Poland, Romania, Slovakia, Slovenia and covering the period from 2001 to 2012. For determining relationship between environmental regulations and foreign direct investments, it was used econometric model based on panel data for transition countries.

1 THEORETICAL FRAMEWORK

Today, our planet's environment is under a great threat by the pollution caused by humans. The environmental changes do not only affect the earth's clime, or depletion of resources, they also affect the world's economy. Foreign direct investment (FDI) is considered to be one of the factors causing environmental changes.

In theory, environmental regulations can greatly affect foreign direct investments, positive and negative, and thus to a changing environment. Before, almost every economist supported the traditional idea saying that strong environmental regulations, made for reducing external pollution, are responsible for cutting the firm's profits and narrowing their options.

This chapter gives us an insight into the theories that deal with the relationship of FDI and environmental regulations. Two theories that are interesting to us and which we deal with are Porter Hypothesis (hereinafter PH) and Pollution Haven Hypothesis (hereinafter PHH). Both theories are related environmental regulations and opposite in explanation the consequences that environmental regulations have on welfare and economy. Also many economists through his studies attempted to provide answers to questions related to the relationship between environmental regulation and foreign direct investment.

1.1 Porter Hypothesis

Michael Porter (1991) in his article „The Competitive Advantage of Nations", brought an idea which says that strong and effective environmental regulations could enlarge competitiveness and may actually benefit to firms as well as social welfare. Today, the idea is known as Porter Hypothesis (PH). The Porter Hypothesis came out of empirical study by Porter, in which he found regularities in relationship between economic performance and

stringency of environmental regulations. For decades after, his idea was researched theoretically and empirically by great number of economists.

The theory advocated by Porter tells us about the causes of international trade and the development of competition where the real advantage of this theory lies in regard to these causes from the company's standpoint and from the standpoint of the national economy. According to Porter and Van Der Linde (1995) competitive advantage of the company or of one nation lies in a desire and capacity for innovations and improvements that will lead to moving the boundaries and limitations toward overcoming them. The primary and the most important task of any government is to provide its citizens better living conditions and Porter believes that it will realize with better resource productivity in that country.

According to Porter (1991) strict environmental regulations do not inevitably hinder competitive advantage against rivals, they often enhance it. He says that environmental regulations are affecting companies to be smarter and better utilize its resources which is causing a decrease of costs which ultimately leads to the competition on the market. He explains in which ways can ER's enlarge the competitiveness of the nation, and says that it can be done by lowering the waste disposal costs and reducing the use of threatening chemicals. Before this idea appeared, the most of economist until that time believed and claimed that strict ER's lead to reduction of firm's profits and narrowing their options. If it were not so Porter and van der Linde (1995) in their article "Green and Competitive", showed an example of compliance of environmental regulations in the Netherlands by flower producers. It is well known that the flower industry is strongly represented in the Netherlands and that the Netherlands is "stealing" land from the sea and it has a little problematic and unpredictable weather. In spite of all that the Netherlands is a leading supplier of flowers in the world. The problem arose when it came into force a law that applies to chemicals that companies use in the cultivation of flowers. So after the entry into force of the law, companies were not allowed to use these chemicals because their use pollutes the land and the groundwater. However Netherlands invented a new system of cultivation of flowers where flowers are grown in stone wool instead of soil, which has resulted in reduced use of pesticides and fertilizers, to achieve an even growth of flowers as well as improving the quality of flowers. This example shows how environmental regulations are not necessarily bad for the company and do their higher costs and lower profits, on the contrary, this example illustrates how environmental regulative can and should encourage companies to innovate and think differently and in finding new ways to reach the finish line and becoming more competitive in the market.

Shortly after PH was introduced in 1991, it was further clarified and developed in an article „Toward a concept of the environment competitiveness relationship", written by Porter and van der Linde (1995). Porter and van der Linden (1995) say that properly and well-designed standards can promote innovation and thus partially or perhaps even a whole

outweigh the costs which may be incurred for innovation. Such innovation offsets, represents the way in which companies implement and apply the new environmental regulations, can reduce the costs to be incurred in respect of imposed regulations, and also can lead to the attainment of advantages over companies that are located in other countries and are not subject to these regulations. Also through innovation offsets comes to improving productivity, and thus to a reduction in pollution of the environment. Stricter environmental standards through stimulating innovation may also lead to an increase in the competitiveness of companies. According to this, main argument of Porter and van der Linde's theory is that environmental regulation increases the welfare and indirectly leads to cleaner environment. They claim, as well, that strict ER's also improve international competitiveness by stimulating innovations and leading to new technologies in environmental protection, which all can bring net gains to firms, what we can see in the example above about Netherlands and production of flowers.

But not every environmental regulation is welcome. There are bad defined environmental regulations that lead to a reduction in the competitiveness of the country as opposed to the good defined regulative that contribute to increasing competitiveness. This we can see in the example of the pulp and paper sector in Scandinavia and in the United States. The 1970s United States introduced regulative in their system without prior phase of gradual introduction of legislation. That meant that the companies were forced to in a very short time accept the latest technology with which so far have not worked and that they were also very expensive. On the other hand, Sweden has approached this problem much more flexible. First of all it allowed their companies to devote first to their manufacturing process and to be as innovative in conformation and the introduction of new regulations. Thanks to this flexible approach companies have invented a new pulp and paper technology with which they are at the same time maintained a new regulative and reduce their costs of production. United States made a mistake because it imposed severe regulations with clear goals in a very short time and did not provide the support and space to the companies to innovate and with that solve the problem. Sweden has done quite the opposite, initially introduced lower standards for companies to adapt to the new situation with the clear intention that it will introduce stricter standards after some time.

Porter says that the companies need to observe ER as an opportunity and possibility to become innovative, competitive and by that much more successful, not necessary as a cost and something bad for business.

Figure 1. Schematic presentation of the Porter
Hypothesis
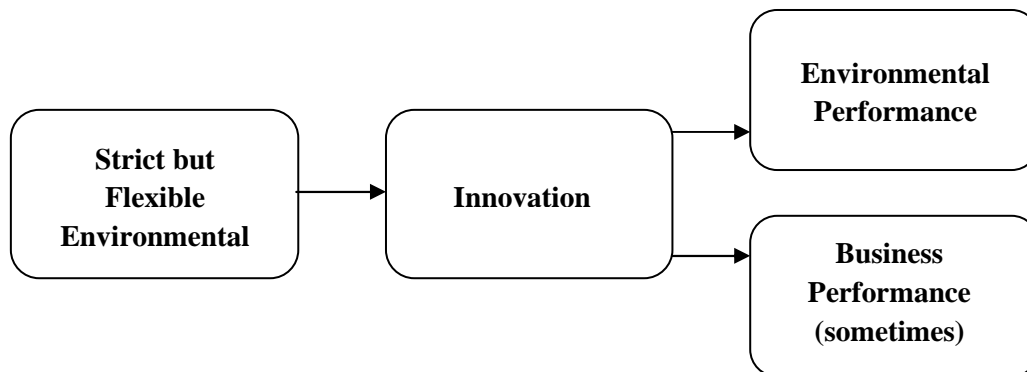
Source: S. Ambec, M.A. Cohen, S. Elgie & P. Lanoie, *The Porter Hypothesis at 20: Can Environmental Regulation Enchance Innovation and Competitiveness*, 2011, p.3.

Porter and van der Linde (1995) explain at least six purposes for having well designed environmental regulations:

- First, regulations signal companies about likely resource inefficiencies and potential technological improvements. Companies are still inexperienced in measuring their discharges, understanding the full costs of incomplete utilization of resources and toxicity, and conceiving new approaches to minimize discharges or eliminate hazardous substances. Regulation rivets attention on this area of potential innovation.
- Second, regulation focused on information gathering can achieve major benefits by raising corporate awareness. Such information gathering often leads to environmental improvement without mandating pollution reductions, sometimes even at lower costs.
- Third, regulation reduces the uncertainty that investments to address the environment will be valuable. Greater certainty encourages investment in any area.
- Fourth, regulation creates pressure that motivates innovation and progress.
- Fifth, regulation levels the transitional playing field. During the transition period to innovation-based solutions, regulation ensures that one company cannot opportunistically gain by avoiding environmental investments. Regulations provide a buffer until new technologies become proven and learning effects reduce their costs.
- Sixth, regulation is needed in the case of incomplete offsets. We readily admit that innovation cannot always completely offset the cost of compliance, especially in the short term before learning can reduce the cost of innovation-based solutions. In such cases, regulation will be necessary to improve environmental quality.

Porter and van der Linde (1995) believe that stringent regulation can actually produce greater innovation and innovation offsets than lax regulation. While the cost of compliance may rise with stringency, then, the potential for innovation offsets may rise even faster. Thus, the net cost of compliance can fall with stringency and may even turn into a net benefit.

Porter says that the country in the past evolved and progressed using competitive advantages such as cheap labor and natural resources that are possessed. Today the situation is a little different; today's competitive advantages are the infrastructure, expertise, developed technology and innovation. Porter also says it does not matter what you produce, but how you produce. He explained his Concept of Competitive Advantage by system called the Diamond of National Advantage. It is a system with four determinants where each determinant influence on the other three and determinants are: factor conditions, demand condition, related and supporting industries and firm strategy, structure and rivalry. Porter's Diamond of National Advantage is shown in Figure 2.

Figure 2. Porter's Diamond of National Advantage
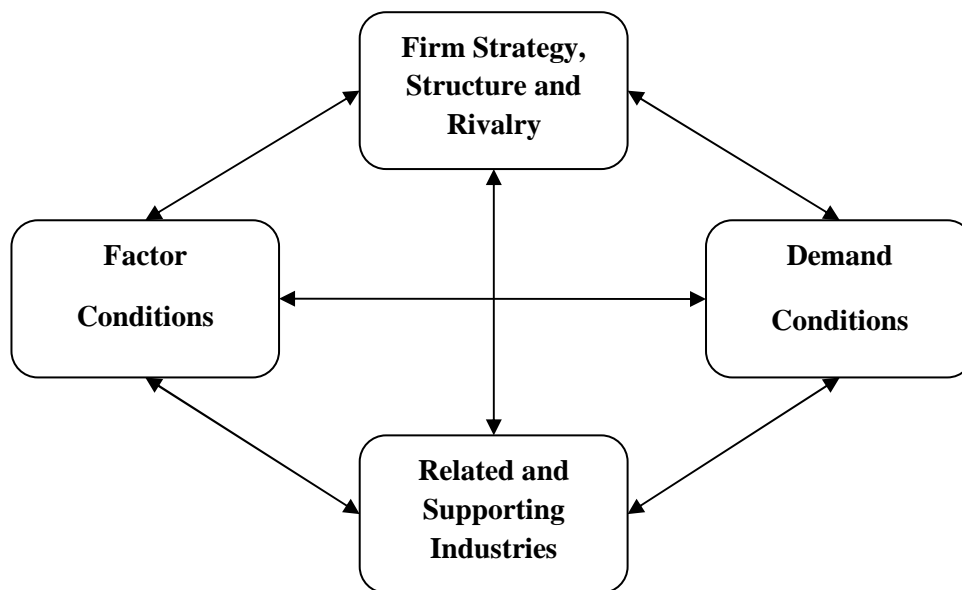
Source: M.Porter, *The Competitive Advantage of Nations*, 1990, p. 78.

The first determinant of this system is the factor conditions. Porter and van der Linde (1995) refer to the factors of production such as skilled manpower, infrastructure and the like, and include all factors that can be used in the production of a particular industry. These factors can be classified into several categories such as human resources, material resource, capital resources, knowledge resource and infrastructure. These factors usually allow the initial advantage for the country but Porter says that's not enough for success but need constant creation, training and development. Each country has a set of factors that are

characteristic to it, and that will help to develop industries which have the optimum factors in every country.

Second determinant is demand and it applies to the domestic demand for goods and services. Porter believes that the state can gain a competitive advantage in a particular industry or a particular market segment if the demand for domestic products is larger in comparison to competitive products. Also companies that are able to survive and do well in the domestic market have a greater chance to survive and operate in foreign markets.

The third determinant is related to the existence or non-existence of foreign competitors' related industries as well as supporting industries. Related industries represent a successful industry that can operate, and transfer their activities, knowledge, experience and way of doing business to other makers and business sectors, and by that their competitive advantage. The company, which operates within the related industry, achieves competitive advantage because it has at hand suppliers, the flow of products and information and etc.

The fourth determinant is firm strategy, structure and rivalry. Refers to the conditions in the country which determine how the company is organized and how it's managed that ultimately determines the competitiveness of the domestic market compared to foreign. Cultural aspect is very important because in different nations are viewed differently in interaction between companies, work ethic, and the structure of the company's managerial system which could represent an advantage or loss (disadvantage) for the company. Porter says that there is no unique form of management, ownership or business strategy that will ensure the success of the company, but it all depends on the situation on the market.

According to Porter, success can expect only those countries which possess high quality communication established between all determinants in the Diamond of National Advantage. Porter also said that if he wants to achieve a maximum score based on Porter's Diamond then it is imperative to include the consideration of two more determinants that greatly influence the creation of international competitive advantage. By that the determinants we mean the influence of state policy and the random and unplanned events, and we can see them in the Figure 3. Enlarged view Porter's Diamond of National Advantage with exogenous variables.

When we talk about the role of the state and state policy and its impact on the creation of competitive advantage, then we say that the role of the state is stimulating, coordinating, orienting and supporting nature. As an independent factor that generates competitive advantage state policy will never have success. Only when based on other factors to achieve competitive advantage, the government can achieve success by supporting and assisting in the development of these factors and their activities, and thus the competitive advantage of nations.

Another important determinant is random events. These are events in which the company doesn't have influence. These events include unexpected finding, significant price changes, technological advances, large fluctuations in financial markets, unexpected political events, natural disasters, and wars and so on. All of these events could significantly and suddenly ruin the position of a country while these same event can be quite the opposite, positive effect on the situation in another country and strengthen their position as to enable them to create competitive advantages.

Figure 3. Porter's Diamond of National Advantage with exogenous variables
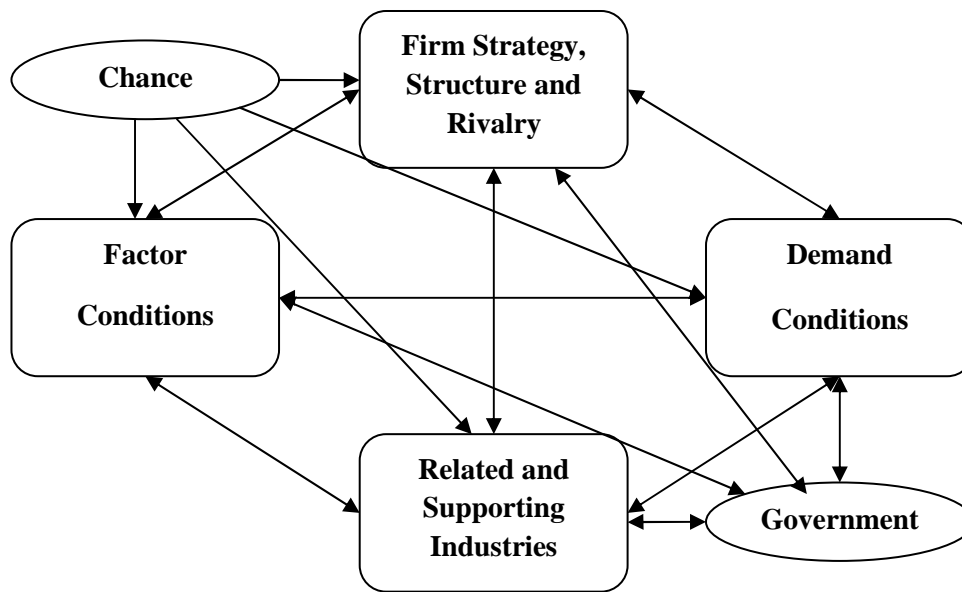
Source: M.H.R. Mehrizi & M. Pakneiat, *Comparative analysis of Sectoral Innovation System and Diamond Model (The Case of Telecom Sector of Iran)*, 2008, p.82.

1.2 Criticisms of Porter's Hypothesis

For the last 20 years, there is an ongoing debate on Porter Hypothesis which offers a different view on the impact of environmental regulations. In wide specter of literature referring this theme, there are lots of conflicts in explaining and understanding the PH. There have been a lot of critics relating Porter Hypothesis, and "accusations" that this hypothesis is written on weak theoretical basis and lack of empirical evidence. In addition to the accusations and criticisms relating to the Porter Hypothesis existing literature offers us the arguments in favor of the same hypothesis. Some of them are already mentioned in the previous text through examples of the Netherlands flower industry as well as the example of the pulp and paper sector in Swedish and United States. Porter and van der Linde (1995) in their book "Toward a New Conception of the Environmental-Competitiveness Relationship" are dealt with criticism relating to Ported Hypothesis.

The first criticism relates to a very small probability that the "innovative offset" to be present and possible in practice as in theory is possible. "Innovative offset" is the way that adheres to the new regulations. Porter and van der Linde (1995) believe that this criticism is wrong. They explain their position by example that says that the emergence of economic waste is very often the result of inefficient, ineffective and incomplete utilization of resources in the production process. These inefficiencies and incomplete utilization of resource requirements companies further activities such as storing or throwing unused resources which produces additional costs of the company. These activities are the hidden costs of the company whom are a lot and that should be avoided. Porter and van der Linde (1995) say that cost reduction opportunities in a way to reduce waste in production and thus pollution should be the rule rather than the exception, and the company will achieve this by using its resources in an efficient and effective manner.

Another criticism relates to the high costs of compliance and behavior in accordance with environmental regulations and critics is state that there is a fixed tradeoff between competitiveness and environmental regulations. Porter and van der Linde (1995) believe that thinking like this is wrong and the actual costs of compliance and compliance regulations are usually lower than anticipated costs. Poor expenditure forecast is due to that information regarding the costs are usually emitted from industries that oppose regulations and rules. The case, which shows us that the statement by Lee Iacocca of 1970, who said that the introduction of new regulations will make an increase in the cost of production in the automotive industry and thus the price of the car and that there will be long delays at the beginning of the 1975th. Act came into force 1970 and predictions of Lee Iacocca were completely wrong. A similar mistake to predict the costs occurred during the 1990th when analysts have predicted that there will be an increase in costs for U.S. industry, and that they will be more than 100 billion of dollars. Predictions have turned out to be wrong. In a study performed in the pulp and paper sector actual expenses amounted to $ 4.00 to $ 5.50 as opposed to the foreseen $ 16.40 per ton. As another reason for the emergence of bad estimates are not taking into consideration the possibility of innovation.

The third criticism says that if imposed regulations encourage innovation that will lead to reduced competitiveness because it would reduce investment in other potentially better and more profitable projects. Porter and van der Linde (1995) believe that it is no wonder that many companies do not see the benefits that can be achieved through innovation, because taking into account incomplete information, poor understanding of the relationship between production and pollution, as well as a lack of interest in environmental innovations is nothing more we can expect.

After all, Porter and van der Linde (1995) believe that none environmental regulation is no guarantee that there will be innovation and increase competitiveness. They find that the

only way is properly combined designed environmental regulations and laws of companies that are willing and eager to comply with these regulations as well as in accordance with their capabilities, lead to innovations that will in most cases lead to reduced costs and increase competitiveness.

1.3 Empirical evidences of Porter Hypothesis

According to some literature, there are arguments that support Porter Hypothesis, at least in some parts. For example, according to Xepapadeas and de Zeeuw (1999, p. 177) they say that if the capital or assets of a company can be made up of newer machine that is more productive and the old machine that is less productive, the effect of environmental taxes is better in two ways, as compared to the case where modernization of the capital stock is not possible: the marginal decrease in emissions is higher and the marginal decrease in profits is lower. In this part they found the Porter Hypothesis to be valid.

According to Mohr (2002), his results were consistent with Porter's theory. According to Mohr's learning-by-doing model, Porter Hypothesis is consistent with economic theory in the part where he claims that environmental regulations can increase the productivity and decrease the pollution. Mohr's model explains the circumstances in which innovations can partly or even at all offset the environmental regulations costs. According to Mohr (2002, p. 139), and according to his model, a well-designed environment policy may lead to increase productivity and general welfare. The profit of this model also is cleaner environment. Mohr's results show that if a certain government asks of companies to use newer technology, which can lead to increase of welfare and private benefit for companies.

Ambec and Barla (2006) claimed that PH could be valid in some circumstances. According to them, when it comes to regulations, they can have a positive influence on research and development and in new technologies. On the other side, Ambec and Barla question the necessity of regulations in order to increase innovations in new technologies, and they question the part of PH which says that firms do not take opportunities in new technologies innovations, than actually ignore them.

As for the empirical evidences, there are numerous case studies relating the Porter Hypothesis. Results from different studies are contradictory, and they do not give a general conclusion on validity of Porter Hypothesis. The differences in results arise from different strategies of research and availability of facts and data. There are lots of studies done on industry or macro level, but not much on individual firm level. Most of researches inquired into impact that environmental regulations have on productivity. Majority of these researches came to conclusion that environmental regulations have a negative impact on productivity. This is all because investing in new technologies is required by environmental regulations can increase the costs of production.

Wagner (2003) did the literature review of theoretical models and empirical tests of PH, in which he evaluated the efficiency of instruments and efficiency of environmental regulations. As for the empirical tests Wagner came to conclusion that environmental regulations have presumably small negative influence on industry level. Further, he concluded, based on previous empirical studies, that ER's are not causing primary negative economic effects, regarding their small impact on increase of the rate of inflation. When it comes to GDP growth and productivity, Wagner concludes that environmental regulations are in general convivial with economic growth. At the end of his review of Porter Hypothesis, Wagner, concluded that empirical research to date makes it thus likely that although Porter Hypothesis may hold in individual industrial sectors or for more narrow interpretations in specific countries under certain regulatory conditions. It is unlikely to hold (empirically as well as theoretically) in its most general form across all levels of analyses and forms of interpretation of the hypothesis.

There are lots of researches based on the influence of environmental regulations on innovation. But most of this research found that the PH is not supported by strong evidences. For example, Centre for European Economic Research (ZEW) published observable papers and articles regarding this theme.

More recently, Rennings and Rexhäuser, at World Congress of Environmental and Resource Economists (WCERE), in 2010, presented the results of their researches of impact that ER's have on innovations. According to Rennings and Rexhäuser (2010) there is a cumulative impact of the age of respective environmental regulations on eco-innovations. This empirical study has proved that ER's have influence on innovations, influence that increases as the time passes. As a result they concluded that eco-innovations in contrary to other innovations have a greater positive effect on profitability. There are other studies that investigate the impact that environmental regulations have on efficiency, and great number of them have a conclusion that there is no positive correlation between environmental regulations and efficiency.

At the end, it seems that to date, there has been more evidence against Porter Hypothesis than in its favor. Of course, every empirical research has its weaknesses, and it can't be taken for granted. To support Porter Hypothesis in the future, scientists will have to know where to look for Porter effects more accurately, because most of them only focus on proving that there is no support for Porter Hypothesis, and they ignore the fact that environmental regulations can be valuable for firms in a way of reducing dirty goods and outputs and increasing their profits as a result of investing in eco-innovations.

1.4 Pollution Haven Hypothesis

In addition to the Porter Hypothesis, another theory is concerned with the impact of environmental regulations on international trade, and that's Pollution Haven Hypothesis (hereinafter PHH). According to Pollution Haven Hypothesis, companies from developed countries are planting their dirty industries in developing countries and the main reason why this happens are higher costs of production in their own country due to high environmental regulations. Pollution Haven Hypothesis says that stricter environmental standards will cause an increase in costs of production because the company will have to introduce new technologies and ways of production and business, which will lead to increased prices of their products. Increase in product prices will make companies less competitive in the market, and that is the reason for moving the plants in developing countries with weaker environmental regulations.

While companies from developed countries are interested in lowering their costs, and improving or keeping the quality of their environment, developing countries benefit from such relocations in capital resources needed for their own development and in gaining comparative advantage in pollution-intensive industries. Today, undeveloped countries keep their environmental regulations weak in order to ensure the inflow of foreign direct investment in their country. In that process they care less about the quality of environment in opposite to developed countries with strict environmental regulations. As a consequence, there are pollution havens forming in developing countries for dirty industries, and for that reason developing countries are regressing in social welfare.
The relocation of more polluting industries to poorer countries due to gaps in environmental standards is known as the pollution haven effect. Copeland and Taylor (2004) believe that existence and the magnitude of such an effect depend on two things:
- whether environmental regulations impose substantial additional costs on polluting industries, and
- whether, absent other compensatory policies, regulation differentials are large enough to impact on industry location, output composition and trade.

There is a difference between Pollution Haven Hypothesis (PHH) and Pollution Haven Effect (hereinafter PHE). In PHH, as already said, companies from developed countries, with stronger ER's, plant their dirty industries in countries with weaker ER's, usually developing countries. Pollution Haven Effect says that environmental regulations have an impact on such relocations of plants, and on trends in exports of pollution intensive goods. In words of Copeland and Taylor (2004) the pollution haven effect is so strong that it offsets more than other motives for trade in dirty goods.

Coopland and Taylor (2004), in their analysis of theoretical background concerning and supporting the Pollution Haven Hypothesis, concluded that there is a weak support for the

Pollution Haven Hypothesis, while there is a strong support in theory for the Pollution Haven Effect. The main cause of skepticism towards PHH is existence of other factors which affect trade flows, apart from environmental regulations. If those factors affect trade flows in a strong, significant way, than there is no support for Pollution Haven Hypothesis (PHH) in contrary to Pollution Haven Effect (PHE).

To answer the questions of existing and confirming the PHH and the PHE, Coopland and Taylor (2004) ask two questions regarding environmental regulations policy. The first question concerns necessity of restriction of environmental policy by international trade law, in order to prevent countries to use environmental policy in place of trade policy. There is a great concern that countries that lower their environmental regulations in favor of freer trade will set their environmental standards too low. The second question concerns the need of trade policy in acquirement of environmental goals in home country as in other countries.

In their study Coopland and Taylor (2004) begin with the idea that high incomes affect environmental welfare, in a way if income increases, the country will be prepared to allocate greater amount of funds in environmental quality. Further, they investigated the influence that international trade has on environment. There are empirical evidences to support the theory which says that weak environmental regulations and liberalization of trade have a positive impact on economic growth by spurring innovations. As a result, they claim, even though liberalization of trade can increase productive efficiency by increasing total output, it also can lead to greater pollution.

According to Copeland and Taylor (2004) the trade effects on environment depend from country to country, and they depend on comparative advantage that countries have. In some countries the trade liberalization will lead to attraction of pollution-intensive industries. The Pollution Haven Hypothesis claims that countries with weaker environmental regulations will specialize in pollution-intensive industries, and, as opposite, countries with strong environmental regulations will special in clean industries. The main weakness of the pollution haven models is that they assume that policy differences are the only motive for trade.

1.5 Empirical evidences of the Pollution Haven Hypothesis

Levinson (2008) differentiates between two waves in Pollution Haven literature. The first wave was using cross-sectional data, treating the environmental regulations exogenous, and found weak or no support for PHH. The second wave uses panel data studies in their researches, and found statistically significant evidences that support PHH.

In 1970s came the first wave of literature regarding Pollution Haven and driven by political debates based on turbulent events happening in that time. Majority of literature until that time were focusing on problems regarding optimal trade and environmental regulations. In that matter they were testing hypotheses to prove the relationship between trade and environmental aftermath.

One of the most important literature achievements in this area was brought by Grossman and Krueger (1993) on NAFTA. The two of them introduced the environmental Kuznets curve (EKC) which says that higher incomes cause greater pollution in developing countries and decrease of pollution in developed countries. This view is significant as it differences this stand from other stands in literature which says the contrary, that higher income and higher trading could even be good for social welfare. According to this point of view, there is no determined and simple relationship between income and pollution. Grossman and Krueger in their research substantiated the assertion that greater income increases the quality of environment. They have also substantiated that this effect occurs owing to greater per-capita income ensued because the strength of environmental regulation. In the most of related literature, researches are not performed accurately, analyzing only affect that income has on environment quality, apart from other influential factors. Because of that, it is poorly known about income's influence on social welfare. Some of the researches have provided evidences to support this hypothesis, but under the certain circumstances and certain pollutants.

In 1990s, scientists agreed on validity of hypothesis which says that strength of environmental regulations doesn't have much or doesn't at all have influence on trade and innovations. To date researchers have an opposite stand and have found strong evidences in support of Pollution Haven Effect, but haven't found much evidences that will support the Pollution Haven Hypothesis. According to these researches, the conclusion is drawn that other factors have a greater impact on trade and profits than environmental regulations. According to Jaffe (1997) there is a relatively little evidence to support the hypothesis that environmental regulation have had a large adverse effect on competitiveness.

In contrary of first empirical studies of this area, researchers today use the panel of data instead of cross section of data. They are now tending to find statistically significant evidence of pollution havens. Example for this can be found in Copeland and Taylor (2004). This all can be summarized in Copeland and Taylor (2004) where they say that after controlling for other factors affecting trade and investment flows, more stringent environmental policy acts as a deterrent to dirty-good production.

Edington (2005) explain the reasons why previous literature and empirical studies haven't found evidences to support the PHH. They claim that previous studies were mostly focusing on industries with similar regulation policies that are developed countries, so the

pollution haven effect in that circumstances is not emphasized. Further, they say that this effect could be clearly seen if researches were made between industries with different policies in environment, and it could have more effects on efficiency.

In some literature, to examine PHH authors were using data of foreign direct investments. Eskelend and Harrison (2003) examined the effect that foreign direct investments have on environment quality on example of Morocco, Cote díIvoire, Venezuela and Mexico, but haven't found significant evidence that would support the PHH.

In contrary, Smarzynska and Wei (2003) found some evidences that support the pollution haven hypothesis in their research done in 24 developing countries. Further, there is correlation detected between environmental regulation and foreign direct investments by Dean (2002), but correlation that is opposite to that evoked in PHH. On their example, China, they found that weaker regulation will attract FDI from developing countries, but if the standards in environmental regulations are set higher, it will attract developed countries in this area. They explain this effect by differences in technology.

At the end, a recent study by Cole (2006) found that there is an inverse relationship between FDI and environmental regulations, but as a function of degree of corruption in the host country. They have shown that if the corruption in the country is high, FDI can lead to weaker environmental regulations and vice versa.

There are lots of problems regarding the research of this particular area. One of the problems is that environmental regulations and pollution are both measured in the same time, and it takes time for pollution haven effect to occur. Early studies of this problem haven't found any statistically significant evidence to support the PHH, but the problem could be in their use of cross section of data. In newer researches, when it comes to data, there has been made a great progress in using of panel of data now, to research the pollution haven phenomena. The newer studies have found evidences to support the PHH. But, at the end, there are no evidences that completely prove that countries will reallocate their production plants to countries with weaker environmental regulations.

The debate on environment and trade, as already said, has been going since 1970's and is still lasting. The focus of this debate is the effect that environmental regulations have on efficiency. In terms of liberalized trade, environmental regulations will lower the competitive advantage of dirty industries in developed countries and will also affect foreign direct investments as well as reallocation of these industries in countries with weaker environmental regulations.

To prove the focus of this debate and find evidences to support it, scientists have done lots of theoretical and empirical studies. Most of these studies did not find statistically

significant evidence that would support this effect. Outside of academy, the negative effect that environmental regulations have on competitiveness was intuitively taken as a proven fact. Due to that opinion in public, George Bush, president of U.S. at that time, rejected to be the part of Kyoto climate change agreement, because he claimed that total costs would offset the benefits of it.

Generally, research results on this area have found deficient evidences to support PHH, but they found some evidences in a support of Pollution Haven Effect. Empirical studies of the PHH are lacking in heterogeneity of explanatory variables, they do not consider great number of countries in their researches, there are only focusing on single country, most of the time that country considered is developed country instead developing country in which the effect could be seen clearly. At the end, Copeland and Taylor (2004) believe that in fact, no study in the literature provides a compelling many-country test of the PHH.

Even though these rather negative results, it would be unreasonable to reject the PHH. There is a need to look into the problem of lack of evidences regarding this theme. Scientists in the future will have to take care of more accurate measurement of disputed effect.

When it comes to Porter Hypothesis, different view of this debate was brought by Michael E. Porter in the early 90s. Porter (1991) claims that environmental regulations can trigger innovatory activities and lead to economic efficiency. Porter found some empirical evidences which support his hypothesis, mostly based on the case studies.

A great number of formal models were analyzing this hypothesis in order to find evidences to support it or to show the weakness of it. Evidences resulting from those researches are rather mixed. As in the Pollution Haven Hypothesis, some of theoretical and empirical studies support Porter Hypothesis, and others don't find any empirical evidence that will support it.

The difference between Pollution Haven Hypothesis and Porter Hypothesis is that first one assumes the negative effect of environmental regulations on competitiveness, and second one assumes the opposite. The reason there are any such evidences supporting both hypotheses lays in a dynamic approach of firms to environmental regulations costs. Some firms may offset their costs by investing in innovations which can bring them income, as for others, they can use some other strategy. Different industries will react different on environmental regulations, even similar or same industries could react in a different way. That is the area in which both Porter Hypothesis and Pollution Haven Hypothesis have the same weaknesses.

2 OVERVIEW OF EMPIRICAL STUDIES ON FDI AND ENVIRONMENT

There are numerous empirical studies that have concerned with the determination of causality between environmental regulation and foreign direct investment. Authors that are concerned with the subject of environmental regulations have found that in certain industries and in certain cases, environmental regulations have a significant impact on foreign direct investment (FDI), while on the other hand in some industries and cases have no significant impact and represent a minor item in the process of selection of location for investors.

According to Birdsall and Wheeler (1993) there are many plausible reasons why there is higher pollution intensity and loose environmental regulation in developing countries. First, environmental amenities are normal goods. At higher income there is higher demand for safe environment. Wealthier people tend to demand better environmental quality, support stricter laws and enforcement concerns, purchasing costly green goods. Poor people who depend more on the environment than the wealthy lack the means to express the demand. Second, the relative financial strength of developing countries means, costs of monitoring environmental standards are higher in developing countries. There is scarcity of trained manpower and equipment. Third, economic growth in developing countries is associated with a shift from subsistence agriculture into manufacturing. This and the resulting, urbanization, increase in investment in infrastructure would lead to a deteriorating environment.

Barde (1994) states that environmental regulations indicate the creation and implementation of certain rules and standards. Yet, says that these standards can be divided into different forms of standards such as standard products, standard manufacturing process of the product, the quality standard environments and standard emission.

There are many ways in which environmental regulations may affect the cost of production. According to Sterner (1996) there may be the direct or indirect manner, and under the direct influence on the costs we include increased costs for investment in new technology, to engage additional manpower, purchase certain know-how and like.

Jaffe (1995) states that the decision on the location of the industry and its transfer alongside environmental regulation plays an important role and form of environmental regulations. Yet says that the cost that originate behavior and compliance with environmental regulations are not big in developed countries, as well as in developing countries and do not constitute the main reason that encouraged firms from developed countries to their plant moved to another country.

Observing behavior and following investment decisions of large multinational companies, 534 of them from 24 countries from Central and Eastern Europe and former Soviet Union, according to the model by which the decision on foreign direct investment depends on the size of the market, corruption, labor costs, taxes, and environmental regulations, Smarzynska and Wei (2003) have concluded that the only industries that are major emitters are willing to move their plants to countries with lower environmental regulations but not to companies from other branches of industry.

Xing and Kolstad (1998) have studied FDI USA, according to the model used by Smarzynska and Wei, in six different sectors in 22 countries, of which seven were developing countries, in polluting and non-polluting sector in the period since 1985 to 1990. Foreign direct investment in a model depended on environmental regulations, market size, tax rates and industry profitability. The conclusion was that the sector where environmental regulation increases costs and the sector in which the chemical industry and heavy metals, foreign direct investments have extremely negative relationship with the amount of environmental regulation which is not the case with non-polluting industry.

Xing and Kolstad (1998) were also investigating data relating to the manufacturing industries in developing countries and developed countries to see whether lower environmental regulations have an impact on foreign direct investment, and came to the conclusion that lower environmental regulations greatly affect foreign direct investment in industries that are high pollutants but not in other industries. Yet another their research, which was related to the impact of environmental regulations on the location of polluting industry says that if all the other parameters that influence the location of industry leave constant environmental regulations will affect the location of industries.

Relations between choosing locations for companies and environmental regulations in the period from 1986 to 1993 are dealt by the List and Co (2000). Their model states that the decision on the selection of sites for new plants of foreign investors play a major role of environmental regulation and demonstrates that very high standards of environmental regulations affecting the choice of location to the polluting industries and for non-polluting.

List (2000) also came to the conclusion that the great and powerful multinationals influence the environmental policy of the country. Stronger environmental regulation increases costs and thus the country with the weaker the environmental regulations have priority over countries with stronger regulations and attract multinationals. List says that in some developing countries, domestic companies were affected by environmental regulations while countries from abroad weren't because foreign companies lead to an increase in employment, salary increase, contributing to the overall economy of the country.

Low (1992) is from a study that was conducted; found that the charges created by environmental regulations in developed countries are not huge, only about 1% of total production costs, a maximum of 5% in the most polluting sector that is not a sufficient reason and incentive to companies are moving to other countries. Also Low and Yeats (1992) reported that there has been an increase in the number of countries that have created competitive advantages in dirty industries, by the fact that developing countries have a greater tendency toward creating conditions to attract dirty industries than industries from non-polluting sectors.

Trade may lead to increased level of contamination for the reason which leads to increased economic activity, and it still leads to polluting industries are moving their factories to countries with weaker regulations cite the environmental Copeland and Taylor (1995). Copeland and Taylor (2004) state that the environmental policies of one country affect commerce and the movement of investment. Cropper and Oates (1992) also consider as well as Low, that the costs that are created by the business rules of environmental regulations are not high even in industries that are the biggest polluters.

Gentry and Fernandez (1997) have asked the heads of financial services from the Fortune 500 as well as analysts from different sectors to say what influence environmental regulations have on investment decisions and received a response that the current effect is not large and is limited but in the future will play a much more significant role. On the basis of research on the relationship between changes in environmental standards and foreign direct investment in the U.S. on 958 plants, Keller and Levinson (1999) came to the conclusion that the effect of changes in the standard is small in polluting industries. They also found that costs incurred to reduce pollution have a major impact on manufacturing FDI.

Levinson (1996) found that differences in environmental regulations among the states within the U.S. have very little impact on the choice of location for the plant. He also revealed by reviewing literature about the influence of environmental regulations on investment both domestic and foreign, that differences in pollution across the country have no impact on the choice of location for a new plant and concluded that after a long-term empirical research cannot be said that higher standard in one country refuse foreign direct investments as well as that attract them to lower standards.

Levinson and Taylor (2008) say that environmental regulations are not the main factor which influences the investment in that country. Fixed expenses that are required in funding as well as market size are more important than regulation.

Wheeler and Moody (1992) just like most author states that environmental regulation does not play a role in investment decisions. While Dasgrupta, Moody and Sinha (1996) in their study of Japanese companies say that a crucial role is played by the quality of the workforce in a decision on choosing a location for investment.

Oman (2000) says that companies in selecting locations for investment primarily look the basic economic and political factors, such as availability of labor and land, market size, infrastructure and energy, and then discusses the factors that still may affect the choice of location among which may be an environmental regulation. Study of Charles Oman (1998) makes some evidence to support race to the bottom hypothesis and countries that have tried to attract foreign investors lowering the environmental standards, but have failed. Another study of shows that foreign investors do not affect that country's lower the standards, but on the other hand, foreign investors influence the standards in one country to a higher level.

Liang (2006) has decided to conduct the research on the topic of whether foreign direct investment harms the host country. Researching in China in the period from 1996 to 2006 in more than 260 cities, he came to the conclusion that the increase in foreign direct investment contribute to lowering sulfur dioxide if other factors maintain the same, which means that the foreign direct investments will contribute to improving and preserving the environment.

Eskeland and Harrison (2003) have studied the investment industry in Mexico, Morocco, Venezuela, Cote d'Ivoire and etc. They found that cost-cutting had no significant influence on the distribution of foreign direct investment in the manufacturing industry. The biggest reason for investors is lower energy use which implies less pollution. Kirkpatrik and Shimamoto (2008) say that it is much more important to investors that there is a regulatory framework that is certain and transparent than what is the degree of measures of environmental regulations.

Zhang and Fu (2008) were engaged in researching Pollution Haven Hypothesis (PHH) using data on Chinese provinces and say that foreign direct investment goes to those provinces that have a lower level of environmental regulation. Zhang and Fu (2008) also say that the developing countries are much more important in creating favorable conditions and a better environment for multinational companies that want to invest in the country, but it lowers the environmental regulations. If countries are not to take any action in order to improve conditions rather than just continue to drive down the environmental regulations, in the future we can only expect an even worse economic situation. Zhang and Fu say that the negative effects of environmental regulations on foreign investment can be avoided through the promotion of certain factors that are important to foreign investors such as infrastructure.

An interesting situation has found Cole (2006), where foreign direct investment influence to the fact that environmental regulations are stronger if corruption at the local government level is low. Cole and Eliot (2003) say that companies from polluting industries will be willing to move to another country if the comparative advantage of products produced by the company and is not exclusive caused by environmental regulations.

The positive effect of FDI on the environment of a country bring us Kevin Gray and Duncan Brank (2002) in their theory, which proposes a "pollution halo effect" which says that multinational companies establish and promote TNCs, ensuring excellent learning opportunities for the host enterprises to adopt similar principles and method of work, and to consent domestic companies to adopt environmental management system ISO 14001 standard.

Porter (1991) believed that the pressure of environmental control like the pressure of market competition, encourage clean production or the innovation of clean products, and these innovations can offset some or all of the regulation costs, then logistics FDI can improve pollution control technology, to produce positive environmental effect, achieving a clear advantage in logistics market competition.

Raspiler, S. and N. Riedinger (2004) have noticed an interesting thing, namely products of the industries that are the biggest polluters are imported into France from countries that have the highest environmental standards and these products remain in harmony with the earth and the standards of the country where are manufactured. This situation leads to the conclusion that the costs of environmental regulations are not the main reason for moving the companies.

A large number of studies say that weaker environmental regulations give the countries in which are such regulations, which are mostly developing countries, a comparative advantage in the case of industries that are highly polluting. Dean (2002) addressed the literature on the Environmental Kuznets Curve, as well as the openness and growth, and concluded that in this case where countries with weaker regulations take precedence over those with more severe may be the opposite.

Some say that if companies do not innovate for fear that they will not profit, in that case will prevail non finished market. Porter and Van der Linde (1995) say that the pressure which is achieved by regulations that would require companies and market sedated and become inert, to encourage companies and educate them that resources can be better and more efficiently to use, and that it can lead to improved technology and environmental protection.

3 FDI PATTERNS IN TRANSITION COUNTRIES

3.1 Trends in FDI

The recovery of FDI that started in 2010 and continued through 2011, and stopped the decline in 2012, FDI has fallen to a level which had noted before the crisis. The assumption is that after this fall a recovery of FDI last even longer than it is predicted before, and the reason is political uncertainty as well as poor economic situation in the world. The inflow of FDI globally has fallen by 18 per cent, from $1.65 trillion, which were realized in 2011 to $1.35 trillion in 2012 (Figure 4), however a decline of FDI in 2012 is in total contradiction with other variables such as trade, employment, GDP, which recorded a positive trend in 2012. It is also expected continuation of the positive trend in the 2013. Poor economic situation in the world and political uncertainty in many economies are the reason for an increasing caution among investors. Many TNC have canceled their investments abroad as well as transfers of already existing assets and systems. If there is improvement in the market situation and conditions in the areas where they invest, and investors again begin to believe in the return on investment, it may re-invest large amounts in new projects. Perhaps then, FDI has reached the level of $1,4 trillion in 2014 or even more $1,8 trillion in 2015. Significant risks and uncertainties that this scenario will happen remain. Factors such as the weakening of the global financial system, weak growth in the EU as well as the uncertainty of the situation in the areas where they invest could lead to an even greater fall in FDI.

Figure 4. Global FDI flows, 2004-2012, (billions of dollars)
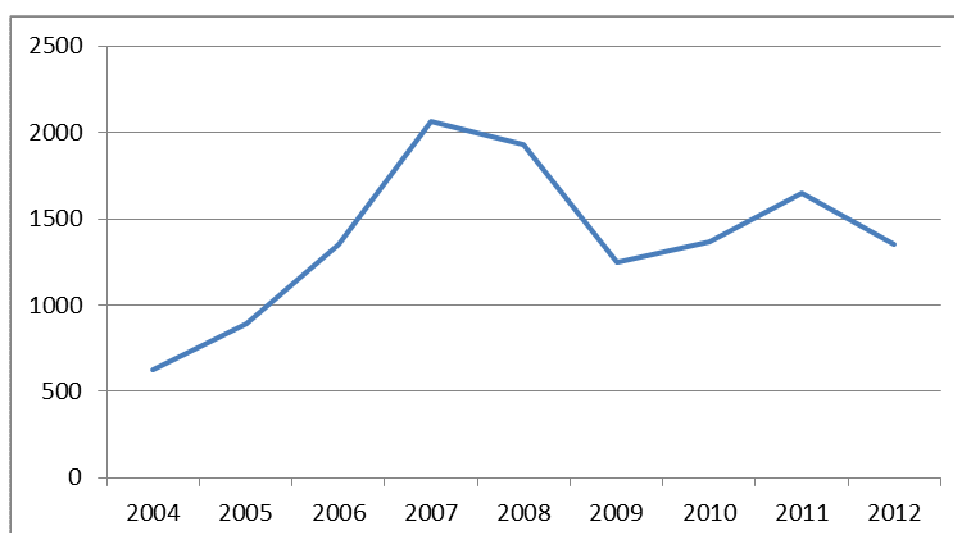
Source: *World Investment Report 2013: Global Value Chains: Investment and Trade for Development,* 2013, p.xii, Figure 1.

The decline of FDI inflows that occurred in 2012 were recorded in all three major economic groups of countries which are developed countries, developing countries and countries in transition. Also decline that occurred took place at a different pace.

Developing countries in 2012 recorded a fall in investment inflow of 4 per cent and recorded inflow of $703 billion (Table 1). It is the second best result ever in developing countries. Despite the decline in investments recorded for the first time developing countries have managed to achieve a greater inflow of investments from developed countries. They had $142 billion higher inflow than developed countries. Actual inflow represents 52 per cent of total FDI inflows globally. Despite the reduced inflow of investment, developing countries from Asia and Latin America have remained at a very high level. Inflow of investments in Asia fell by 7 per cent, and investments dropped to the amount of $407 billion, and decrease was recorded in most countries including China, India, Saudi Arabia, the Republic of Korea, Turkey and Hong Kong. However, despite the decline in investments in developing countries in Asia, they account for 58 per cent of the total FDI in developing countries. As far as FDI inflows into Latin America and the Caribbean, there is a decline of 2 per cent and fell to $244 billion. Growth was recorded in South America 12 per cent, which mitigated a complete drop in this region. Inflow of investments in this region occurred mainly because investors search for new markets and search for the resources. Inflows of FDI in Central America have also declined, largely due to declining inflows into Mexico. Africa, unlike Asia and Latin America in 2012 has recorded a growth of FDI inflows for 5 per cent and has reached the amount of $50 billion.

Outflows from developing economies has increased in 2012 and reached the level of $426 billion, which it continues upward trend. This investment growth from developing countries increased their share of total FDI in the whole of the world and now amounts to 31 per cent. Despite the global crisis, large international companies from developing countries nevertheless continued to spread and develop and invest in new markets. FDI originating from Africa have risen three times while investment from Asia, Latin America and the Caribbean retained the level that they had in 2011. Asia has remained the largest source of investment when it comes to FDI from developing countries. FDI flows from the BRICS countries which include Brazil, the Russian Federation, India, China and South Africa has increased from $7 billion in 2000 to $145 billion, which was the in 2012. International companies from these countries have become very active which shows by the fact that China has become the third largest investor in the world in 2012, ahead of her are just the United States and Japan.

The growth trend of FDI inflows to the developed countries, which happened in 2010 and 2011, was terminated in 2012. The inflow of FDI in developed countries recorded a fall of 32 per cent. He fell to the level of $561 billion which is the lowest level in the last ten

years that has been recorded in developed countries. Fall was recorded in 23 out of 38 developed countries. The overall decline in investment inflows in developed countries has occurred due to the unpredictable and changing political situation in the world as well as the reduced number of investments in the extractive industries. Europe and North America as well as Australia and New Zealand recorded a decline of inflows of foreign direct investment.

The largest decline in FDI inflows occurred in the European Union and the United States. The fall in investment inflows in the European Union accounted for 41 per cent, and in the United States 26 per cent, in Australia 13 per cent while the decline in investment in New Zealand was 33 per cent. In Europe, a significant decline in FDI was registered in Belgium and Germany. In Belgium, there was a decline greater than $100 billion, while in Germany the decline in 2012 was approximately $42 billion, from $49 billion in 2011 to $6.6 billion in 2012, mostly due to large divestments. The inflow of investments in Southern Europe, where we include Greece, Portugal, Italy and Spain fell by more than 50 per cent. The biggest culprit for this is the indebtedness of the economy. A decline of investment in the United States mostly occurred due to the decline in cross-border M&A projects. Despite this fall in, the United States has remained the largest recipient of FDI. The increase in investment inflow was recorded in Japan and in the United Kingdom, Canada and Ireland.

Outflows from developed economies that had a positive trend during 2010 and 2011, in 2012 was recorded a fall in investment by 23 per cent, which is the amount of $274 billion, and dropped to a level of $909 billion. By the fall of outflows has come in 22 of the 38 developed countries. As the largest source of foreign direct investment, Europe and North America have declined significantly, especially emphasizing the drop of FDI from Belgium, Netherlands and the United States. Investments from the European Union fell by 40 per cent while investments from the United States decreased by 17 per cent. The main reasons for this decline states were reducing the number of jobs as well as the attitude of big international companies from developed countries, which reads "wait and see". The crisis that is still present in the Euro zone is a major cause of reduced volume of investment that enters into it, especially coming from the United States which was Europe main market in which to invest. Although most developed countries have recorded decline in outward FDI, Japan did not. Japan recorded increase investments that are leaving the country by 14 per cent and thereby retained its position as the second largest investor in the world.

The inflow of FDI in transition countries in relation to the year 2011 declined by 9 per cent in 2012, which is caused by a drop in cross-border mergers and acquisition. FDI fell to a level of $87 billion, of which $51 billion goes to Russian Federation, while on the other hand, most of that is attributed in "round-tripping". While in the Russian Federation was recorded a decline in FDI, in Ukraine and Kazakhstan was recorded an increase of FDI.

Due to the decline in investment coming from the EU, which has traditionally been the largest investor in the region, investments in South-East Europe were reduced almost by half. In the Commonwealth of Independent States (CIS) they made recordings of a very small drop in FDI, only 7 per cent. The reason for very small drop of FDI is that investors still see the potential for investment in the ever-growing market and its natural resources.

When we speak of FDI coming from countries in transition, there is a decline in the investment in 2012 by 24 per cent. Foreign direct investment fell to $55 billion, and as the biggest reason for this decline is stated the decline of investments that go from Russia. Despite the fall, the Russian Federation has still retained a dominant role in the region, and from the Russian Federation takes 92 per cent of total investment from countries in transition. In the ranking of the largest FDI investor in the global level there was a growth of economies in transition.

Table 1. FDI flows by region, 2010-2012 (billions of dollars and per cent)

Region	FDI inflows			FDI outflows		
	2010	2011	2012	2010	2011	2012
World	**1409**	**1652**	**1351**	**1505**	**1678**	**1391**
Developed economies	696	820	561	1030	1183	909
Developing economies	637	735	703	413	422	426
Africa	44	48	50	9	5	14
Asia	401	436	407	284	311	308
East and South-East Asia	313	343	326	254	271	275
South Asia	29	44	34	16	13	9
West Asia	59	49	47	13	26	24
Latin America and the Caribbean	190	249	244	119	105	103
Oceania	3	2	2	1	1	1
Transition economies	75	96	87	62	73	55
Percentage share in world FDI flows						
Developed economies	49,4	49,7	41,5	68,4	70,5	65,4
Developing economies	45,2	44,5	52,0	27,5	25,2	30,6
Africa	3,1	2,9	3,7	0,6	0,3	1,0
Asia	26,4	26,4	30,1	18,9	18,5	22,2
East and South-East Asia	22,2	20,8	24,1	16,9	16,2	19,8
South Asia	2,0	2,7	2,5	1,1	0,8	0,7
West Asia	4,2	3,0	3,5	0,9	1,6	1,7
Latin America and the Caribbean	13,5	15,1	18,1	7,9	6,3	7,4
Oceania	0,2	0,1	0,2	0,0	0,1	0,0
Transition economies	5,3	5,8	6,5	4,1	4,3	4,0

Source: *World Investment Report 2013: Global Value Chains: Investment and Trade for Development*, 2013, p.xiii, Table 1.

3.2 Trends in FDI in transition economies

Foreign direct investment in transition countries that belong to the South-East Europe, Georgia and the Commonwealth of Independent States (CIS) showed a decrease in 2012 compared to a year ago (Figure 5). The decline of FDI recorded in South-East Europe was 41 per cent and occurred primarily due to the decline in investment coming from neighboring countries which are the main investor in the region. In the Commonwealth of Independent States (CIS), the situation is a little different and they made recordings of a very small drop in FDI, 7 per cent. The reason for very small drop of FDI in this country is that investors still see the potential for investment in the ever-growing market and its natural resources. Most FDI inflows, precisely 84 per cent of total FDI inflows in the region, were still present in several economies which are Russia, Ukraine and Kazakhstan

Figure 5. FDI Inflows, 2006-2012 (billions of dollars)
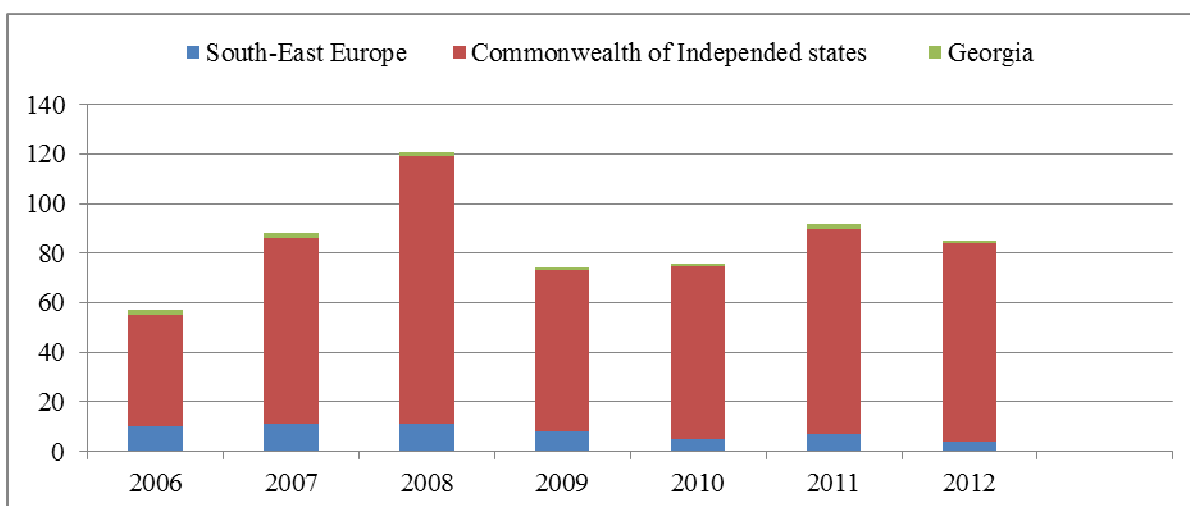
Source: *World Investment Report 2013: Global Value Chains: Investment and Trade for Development*, 2013, p.63, Figure B.

The inflow of foreign direct investment in Russia is maintained at a high level with the amount of $51 billion although it recorded a decline in investments by 7 per cent. (Table 2). Investors who have invested in Russia are attracted to the constant growth and development of the Russian market which can be seen through the re-investment in the automotive industry and the financial industry. An important influence on investment decisions, where and how to invest, had the Russian Federation's accession to the World Trade Organization. The main investors in Russia are still developed country members of the European Union. A significant amount of inflow of investments into Russia comes from offshore financial centers and the largest investment coming from Russian investors from Cyprus, where investors use the tax benefits offered by Cyprus to invest. As the situation in Cyprus deteriorated lately investors have started to flee to other countries that

offer similar conditions as Cyprus offered before. Only 6 per cent of the total FDI that are invested in Russian Federation in 2012, arrived from Cyprus, which is a very low percentage if compared with previous years where it was 25 per cent in 2010 and 28 per cent in the 2011. The influx of investment in Kazakhstan has increased by 1 per cent, amounting to $14 billion while Ukraine recorded a record and despite unfavorable political situation has attracted $8 billion of investments.

The fall in foreign direct investment in transition countries in 2012 occurred primarily due to the decline in cross-border M&A and whose net worth became negative for the first time in history. Among other reasons, as the most important states are reducing investment by BG Group Plc (United Kingdom) company which deals with gas. Also it was recorded a significant decrease of Greenfield projects. In addition to the decline of FDI inflows in transition countries, there was also a fall of investments from countries in transition. The largest share of investments from countries in transition comes from Russia, 92 per cent in 2012. Investments that derive from Kazakhstan, Azerbaijan and Ukraine have reached a level of over $1 billion (Table 2.).

Table 2. Distribution of FDI flows among economies by range, 2012

Range	Inflow	Outflow
Above $5.0 billion	Russian Federation, Kazakhstan, Ukraine	Russian Federation
$1,0 to $4,9 billion	Turkmenistan, Azerbaijan, Belarus, Croatia and Uzbekistan	Kazakhstan, Azerbaijan and Ukraine
$0,5 to $0,9 billion	Albania, Georgia, BiH and Montenegro	...
Below $0,5 billion	Armenia, Kyrgyzstan, Serbia, Tajikistan, Republic of Moldova and the FYR of Macedonia	Georgia, Belarus, Serbia, BiH, Montenegro, Albania, Republic of Moldova, Armenia, Kyrgyzstan, the FYR of Macedonia and Croatia

Source: *World Investment Report 2013: Global Value Chains: Investment and Trade for Development*, 2013, p.63, Table A.

In the future it is expected that the inflow of FDI will be positive. Expected moderate growth in FDI in 2013 due to an environment conducive to investment and the emergence of privatization in the host country where it is primarily related to Russia and Ukraine.

A large proportion of the total foreign direct investment relating to Russia, in addition to the usual forms of investments, accounted for by "round-tripping". "Round-tripping" is a special form of investment which involves very high correlation inflows and outflows investments between countries and financial centers, in this case between Russia and Cyprus and the British Virgin Islands. In addition to these two countries, in the same society is the Netherlands, which represent the three major investor in Russia, while at the same time they are the three main destinations of investments originating from Russia, and what is more interesting, the inflow and outflow of investment in both directions are almost the same. Counting together, 60 per cent of investment in both directions, so the input and output, accounted for by these three countries. However, the highest percentage goes to Cyprus. Russian companies established in Cyprus transfer money to their legal departments in Russia engaged in export of oil, iron and minerals with a view to avoiding or reducing taxes. One such company is the Russian company Evraz dealing with metal, which is owned by the Cypriot company in which the Russians have a majority share in the government.

Unlike the Commonwealth of Independent States (CIS), which experienced a very small decline in FDI, almost insignificant, in South-East Europe is again declining FDI in 2012 after they had in 2011 recorded positive trend and realize the value of investments of $4.2 billion. The main cause of the decline in investment in general is fall of investment from the EU, which represent a major source of investment in the region. Before the economic and financial crisis, South-East Europe has posted positive trend and a significant increase in foreign direct investment. The influx of investment increased from $2.1 billion, which had noted in 2002, to $13.3 billion in 2008 (Figure 6). A significant influx of investment into the region occurred due to the economic recovery of the region, due to the positive atmosphere and the investment climate as well as the EU accession negotiations. In addition to these reasons, a significant inflow of investments helped cheap labor, privatization of the public sector as well as easy access to a complete European market.

Figure 6. FDI inflows to South-East Europe, 2001-2012 (billions of dollars)
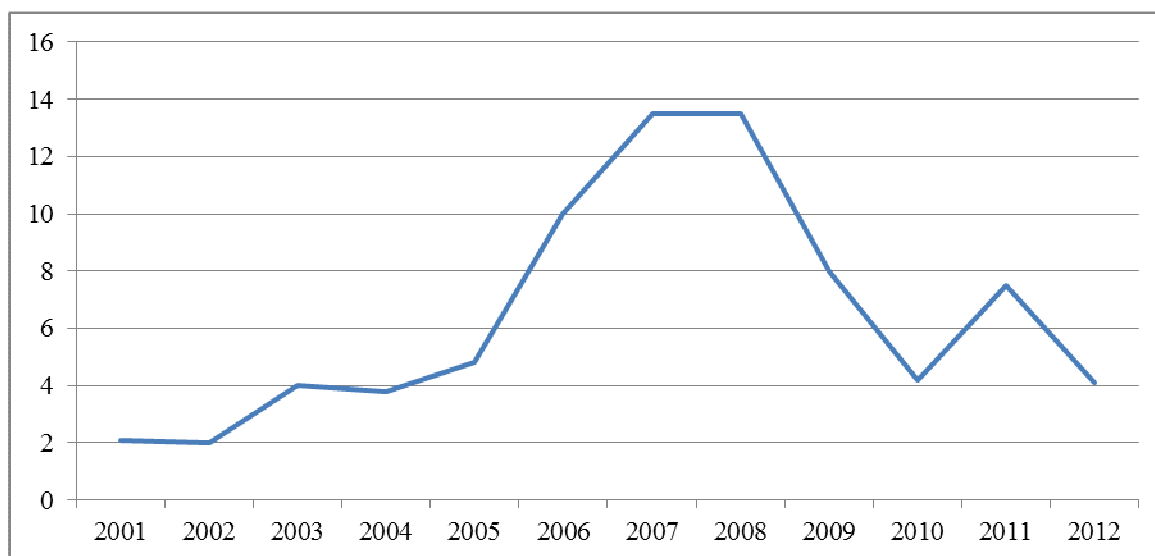
The largest recipients of FDI in the region were Croatia and Albania, but that changed in 2009 when it declined by 35 per cent, and immediately the next year and a decrease of 46 per cent. During this period many jobs and projects in Croatia were canceled or rescheduled for a later period, and there was a decline of FDI from $6 billion, which was the 2008 to $432 million in 2010. Inspired by the new situation of international companies from the Netherlands and Austria withdrew its resources from the Croatia. A significant decline in FDI is also recorded in Macedonia. Unlike the Croatia and Macedonia, Albania has managed to resist the negative trend is primarily due to the benefits that it offered the privatization of state property as well as the suitable atmosphere and climate for investment.

The negative trend of FDI in the countries of South-East Europe is largely associated with negative issues and problems within the EU, from which derives the largest share of investments in this region, and no other major global investor such as for example Japan, U.S. or China does not invest in this region. Another thing that has contributed to the negative trend of FDI in South-East Europe is a bad investment diversification or distribution where the most of the funds were invested in the financial industry and the retail trade.

3.3 FDI in manufacturing sector in transition countries

The deepening of the global crisis and the deteriorating economic situation, particularly in the Euro zone, resulted in the decrease of FDI in 2012, in all three sectors, including the

manufacturing sector, unlike last year when the FDI recorded positive growth trend. It has certainly influenced on the investors and their desire and need for investment abroad, which has now been significantly reduced. It also reduced demand in the world as well as the pressure that creates competition contributed to the fact that investors prior is to think about and work on how to provide a dividend to its shareholders as well as to provide some security for the company before they consider how to invest in new projects. This negative trend is related to Greenfield projects as well as M&A projects. Greenfield projects have fallen by 33 per cent compared to 2011, decreased from approximately $850 billion to $600 billion, while M&A projects dropped by 45 per cent, from approximately $550 billion to nearly $300 billion (Figure 7).

Figure 7. Historic trend of FDI projects, 2003-212, (billions of dollars)
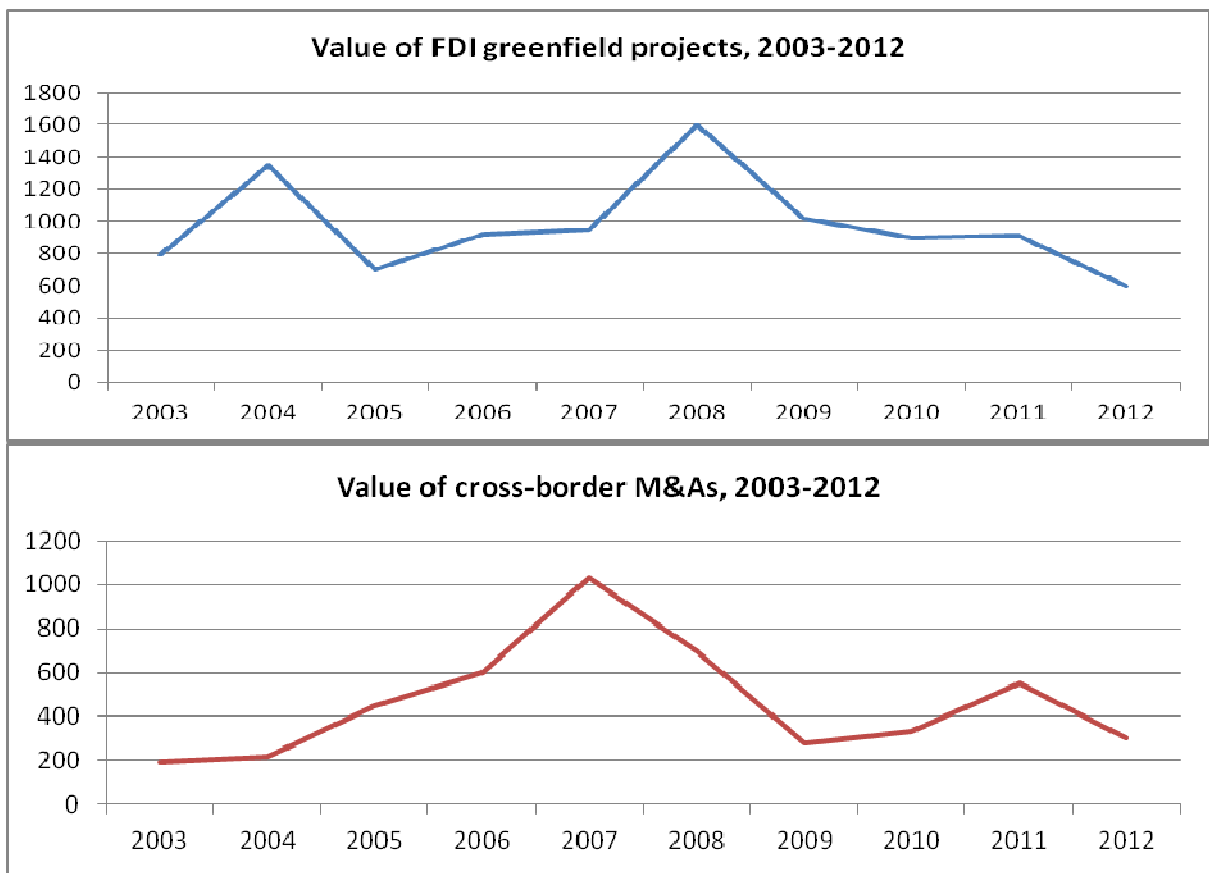
Source: *World Investment Report 2013: Global Value Chains: Investment and Trade for Development*, 2013, p.8, Figure I.8.

The poor economic situation in the world has affected all three sectors, but still a little different scope and intensity. The primary sector has suffered significant damage as in the Greenfield projects as well as in cross-border M&As, mostly due to the decline in investment in the quarrying, mining and petroleum industry. Which are the activities that are the most invested in. What we are most interested in is manufacturing sector, and it was

who recorded the largest decline in FDI when we talk in absolute terms. The biggest reason for this decline is the drop in the value of Greenfield projects that have been recorded in developed countries and in developing countries and countries in transition. This decline in value of Greenfield projects as a form of foreign direct investment has occurred due to decrease in the number of projects by 21 per cent globally, while there was a decline in the value of cross-border M&As caused by lower average investment value, in other words, the company did not want to invest in major projects. Services sector was the least affected by this negative trend and the crisis in the world, yet he was. It shows a decline in Greenfield projects only 8 per cent (Figure 8).
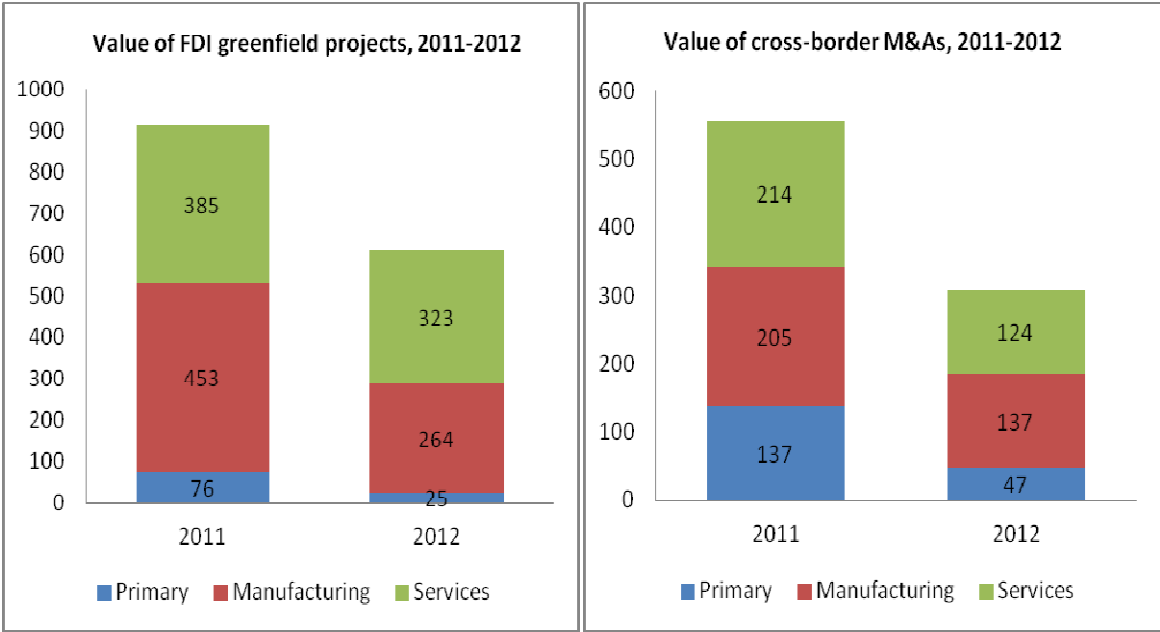
Figure 8. FDI projects by sector, 2011-2012 (billions of dollars)

Source: *World Investment Report 2013: Global Value Chains: Investment and Trade for Development*, 2013, p.8, Figure I.9.

Although the crisis has affected all manufacturing activities, not all industries within the same sector were equally affected. When talking about industries that fall under the manufacturing sector, the impact of the crisis is especially felt in industries that are closely associated with the primary sector industries engaged in the extraction of resources, and were exposed to the negative trend that has resulted in a reduction of FDI in the manufacturing sector. In fact industries that are affected by crisis in general and were making the biggest drop in FDI in 2012, are the industries from the primary sector dealing with quarrying, mining and petroleum industries and industries in the manufacturing sector dealing with processing of raw materials such as metals and metal products and coke, petroleum products and nuclear fuel. Half of the overall decline of Greenfield projects, approximately $ 130 billion, is going on these industries.

Other industries that also fall within the manufacturing sector have different reaction to the crisis that has struck them. Industries such as the motor vehicle industry and other transportation equipment, and electrical equipment industries were one of the most affected by the crisis, and because of the nature of the business were very sensitive to the decrease in demand at the global level than they were in other industries from manufacturing sector. Two important reasons for decreased demand are the crisis in Europe and slower growth in emerging economies. Reduced demand has led to that investors less investment in new projects, and are more trying to reduce capacity, throw out outdated of the their business, regain financial stability and of course save money. In addition to these industries that have really felt the crisis and which have had a significant change in the business, there are some industries that have managed to limit and greatly reduce the loss of FDI, such as the food industry, pharmaceuticals industry, tobacco industry and industry of beverages.

4 ENVIRONMENTAL REGULATIONS IN TRANSITION COUNTRIES

4.1 Environmental Regulation in Transition Countries

A very important period in the transition countries represents a period of transition and the transition from centrally-based to a market-oriented economy. This transition to a market economy orienting represents a significant part in the full strategy for economic development of a country in transition. With the development of economy comes the need for better protection to the environment and thus to the introducing stricter environmental regulations. While introducing stricter environmental regulations there is a concern that this could lead to an increase in product prices which could cause a decline in exports as well as the country's competitiveness. There is relatively little evidence that environmental regulations have had a large adverse effect on competitiveness, concluded by Jaffe et al. (1995) in his review of articles.

In transition countries, governments are struggling with many problems such as social problems of citizens, unstable market, uncertain economic growth, unemployment and the like, so it is not surprising situations where environmental protection is not a priority. However, countries in transition, whose goal is to become part of European Union in the near future, strive as much as possible to pay attention to environmental protection and to integrate strategy for environmental protection in the whole development strategy of the country, because they know that the EU is a lot of attention paid to environmental policies and for them that is a very important item in the full strategy.

In addition to the above mentioned problems faced by countries in transition, another problem is present and that is the economic crisis who is still present. All these problems

mentioned contribute to that the managers in transition countries are dealing with environmental issues and can't behave and use the knowledge and tools used by managers in developed countries. Also, no instruments that apply in developed countries to protect the environment, cannot be applied in countries in transition. Very big problem in countries in transition represents their outdated technology. So they need to develop newer technology which is more efficient and much more rooted in environmental protection. Another thing that is specific to a particular country in transition is the inflation rate which is much higher than in developed countries. The inflation rate has a very bad effect on the country's competitiveness as well as their attractiveness to invest in it, and does not provide any incentive for technological innovation. Environmental benefits are rarely subject of consideration and authorities in the countries in transition which are often not willing to allocate funds for environmental protection. Also markets in these countries are often underdeveloped and because of all these factors and mismanagement, secrecy environmental destruction becomes inevitable.

Generally it can be said that the problems related to environmental protection is not a priority in countries in transition. Those who are trying to do something on environmental issues don't have a huge impact or fall under the influence of others whom the profit is essential. An example of a similar situation occurred in Russia with the State Environmental Committee which fell under the jurisdiction of the Ministry of Natural Resource and they only mattered that using natural resources to generate a profit, and not to protect the environment as it should. To them it did not matter the environmental protection, so industry lobby has managed to effect that environmental taxes are put aside, and the abolition of lectures on environmental protection from schools. All this has contributed to a worse situation in terms of environmental protection in the country.

Transition countries while operating below capacity, and although they have a problem with a lack of resources, however, they can increase the quality of the environment and its protection by increasing production efficiency. In transition countries managers who deal with environmental issues do not take into consideration the issue of efficient and quality utilization of resources and thus don't see the advantages in preserving the environment. Also important thing in transition countries is the development of the market at the same time as the environmental institutions. It is very important that companies understand and accept sense of responsibility toward environment. The perfect moment for building a strong sense of responsibility for environmental protection is during the transition from state to private ownership (Golub, Dudek & Strukova, 2003).

When we talk about tools for environmental protection, then the transition countries have to be very careful and choose the right tool for them and apply it very carefully. We must ensure that the tools applied in other countries do not necessarily correspond in any other country and especially not if it is successful tool in developed countries. An example is

China, which has been very cautious when introducing his environmental regulations. China was first introduced legislation to certain regions and cities, and only after being convinced of the effectiveness of these regulations spread their effect on the wider area.

Many economists believe that the best option for countries in transition to introduce pollution charges as an instrument of control and prevention of pollution (Sand, 1987). They think this is the best form of regulation that can be applied because the earlier encounter with the instrument of regulation. However, according to Soderholm (1999), yet the pollution charges will not have any significant impact as long as it does not do so great and important changes in the legal and economic institutions. According to Soderholm (1999), for whatever form of environmental regulation a country in transition decides their introduction and application should be gradually, and that in the beginning goes with a milder environmental regulations and only later when all the participants get used to them, when the market is developed and there would be available larger budget, then it should be proper to introduce stricter regulations and fees for pollution. Also a very important thing in introducing evironmental regulations that is needs to be thought in long term. Short-term thinking and the introduction of legislation in the short term can only give instant results.

As it can be seen in the Figure 9, Estonia has the highest level of stringency of environmental regulations in Central and Eastern Europe. Estonia is followed by Czech Republic and Slovenia. The lowest level of stringency of environmental regulations has a Bosnia and Herzegovina and Albania.
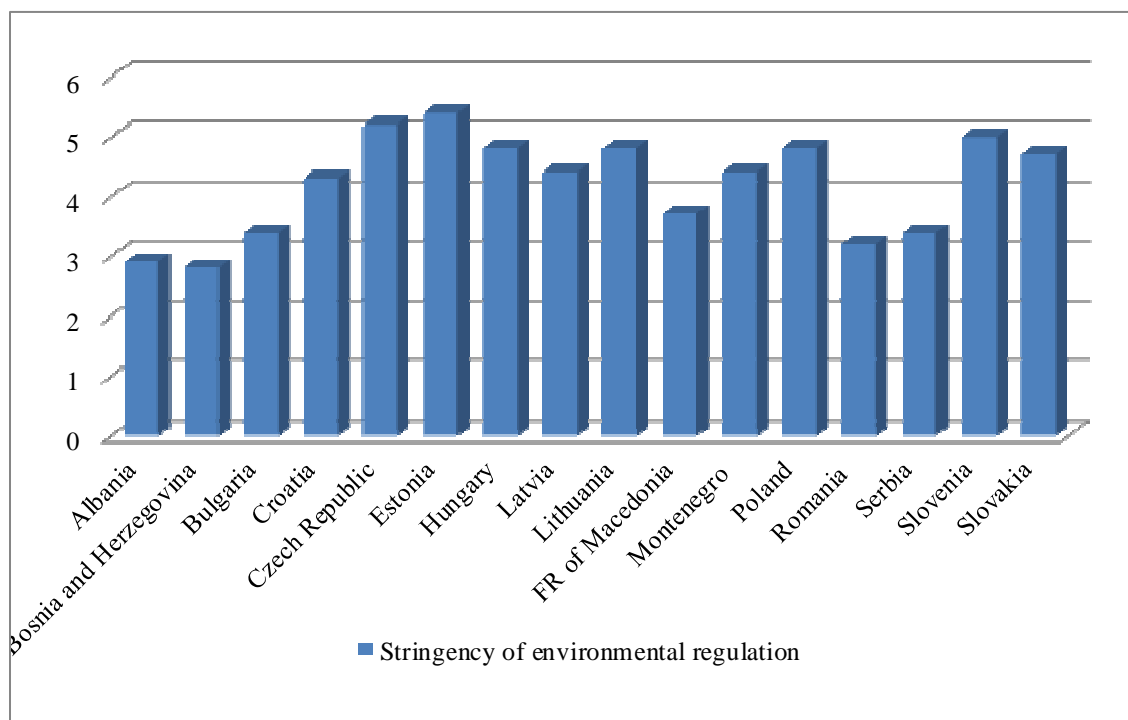
4.2 Environmental Taxes

Environmental degradation requires from states to react with the environmental objective of destroying or at least decrease further destruction due to creating better living conditions for its citizens, and also that response should cause minimal adverse impact on economic growth and development. In the past, the reaction was much smaller in contrast to the response that is required today by the state for the simple reason because the pollution was much less. Countries are now much more cautious and much more sensitive to environmental pollution than they were before, especially developed countries.

To combat pollution, countries on the disposal have various tools such as, environmental taxes, innovation policies, regulations, environmental subsidies. With the help of tools above many countries have been able to take a big step forward in protecting the environment in the last twenty years and have managed to put under control the use of materials in the production of which is considered a major environmental pollutants. In spite of the progress made in environmental protection there are still forms of pollution that are very difficult to control and which are very widespread and that have a global status, such as sulfur dioxide and carbon dioxide, which are already harmed the ozone

layer that we can feel the consequences and changes in global scale.

The scope of the tax on the environment depends on the extent of environmental damage that has occurred. This refers to the level of political authority which determines taxes. So problem of contamination of soil is generally limited to a small area and as such usually falls under the jurisdiction of the city and they should determine the tax. On the other side of the noxious gases that create atmospheric changes affect the global climate and therefore should apply global taxes.

The use of environmental taxes in recent years is set as a very important issue. According to Markandya and Lehoczki (1994), environmental taxes increase revenue in a way which does not create inefficiencies in the economy. With the help of environmental taxes countries have many advantages and benefits as well as the achievement of economic efficiency and increase government revenues. Also environmental taxes can be seen as a way in which we can influence the behavior of people in order to prevent pollution. Certainly payment rates for a clean environment through taxation allow companies and customers flexibility and choice on which way to reduce their impact on the environment. Environmental taxes are control methods and used in the market but do not constitute the primary means by which the government increases its revenues, but primarily serves to raise funds that later will be invested in environmental protection. Environmental taxes show an increasing and widespread problem that we have with water and air pollution as well as waste disposal. Environmental taxes represent a very important item in the whole mechanism that shows companies and other market participants as well as all the others how should it behave. Will mechanism have success, and succeed to change mindsets and behavior of an individual or collective, largely depends also on the recipient of messages. It is also crucial that all measures that are introduced into the environmental protection programs are consistent with the primary objective which is the change in thinking and behavior of the people through their education, and investing in infrastructure and finding alternative solutions. So designing environmental taxes and the manner of implementation is the most important factor in overall success. Without the influence of the state there is no success, because the influence of the market on the company itself as well as individuals to think about and deal with the environmental pollution is insignificant, because of the costs for an individual is very small or non-existent.

The measures adopted by the State concerning environmental protection and fall under environmental taxes primarily relate to the conservation of energy resources and prevent pollution. Therefore, the state taxed all those who cause negative changes in the environment and deplete natural resources. Taxes imposed on the exploitation of natural resources and in particular those of non-renewable energy sources aiming to users begin to use renewable energy instead of non-renewable. First of all, this applies to fossil fuels, and efforts to reduce their consumption and replace with some other renewable source.

Another important role of environmental taxes is to prevent dumping of waste in nature and encouraging better use of resources to reduce waste and encourage waste recycling. Taxes imposed by the state for the purpose of waste disposal are divided into two groups. The first group includes taxes paid by ones who are in charge of waste disposal, while the second group consists of the producer or importer of the product. Another very important thing about waste is waste export. Sending waste to other countries as a solution to the disposal is totally wrong and should not be done while exporting waste to recycling is desirable but should be very careful because it can easily lead to overload of waste in the recipient country.

Environmental taxes can be divided into four main groups:

- Energy taxes
- Transport taxes
- Pollution taxes
- Resource taxes

Energy taxes means taxes which are taxed raw materials from which we get energy, both for the purpose of transport and stationary purposes. The main sources of energy that we use to transport are the diesel fuel and gasoline, while for stationary needs primary sources are gas, coal, electricity and fuel oil.

Transportation taxes relating to the possession and use of funds for transportation or motor vehicles. This group also includes other forms of transportation means (such as airplanes) and other types of transportation services (such as taxes that are charged for flights). And yet here are include taxes that are collected on the basis of tolls as well as once on the import or sale of transportation equipment.

Pollution taxes are taxes that are collected on the basis of air and water pollution. Also pollution taxes are collected on the basis waste disposal and noise.

Resource taxes relate to exploitation of natural resources. That raises the question whether it is harmful and whether polluting excavation of resources, and many agree that excavation of resources leads to pollution as well as soil erosion. Taxes are calculated on the exploitation of natural resources from countries such as minerals and crude oil which is usually collected as a resource rent. Resource rent is equal to the value of production minus the costs of excavation.

Pollution knows no territorial boundaries, and is very easily spread through the air and the waterways and reaches a territory which does not use resources that pollute the

environment but become polluted. The most famous example is global warming and the greenhouse effect. The intent and wishes for a better and more successful fight against pollution, EU member states have adopted more than 20 directives relating to the elimination of waste, pollution control, environmental protection as well as water and air. The policies advocated by the EU does not relate only to environmental protection and improvement of the quality of the environment, rather than trying to reconcile the problems that are created between economic progress and environmental protection. Many believe that the protection of environment provides only the desirable and in the economic and ecological issues while others believe that the policies that protects the environment greatly affects the domestic economy and undermines competitiveness of domestic industries and reduce economic growth and development. It should be noted that before countries have introduced special institutions dealing with environmental taxes, in many countries on their markets through direct and indirect taxation have been raised funds which are later invested in environmental protection.

The best example of environmental pollutants tax is a tax on fuel. Today in Europe, in all countries are differently taxed fuel types. So taxed at the lowest rate of fuel is used by motor vehicles intended for business purposes, while the highest rate taxed fuel is used for private purposes. Many countries impose substantial taxes on motor fuels, diesel and petrol because it pollutes the air and contributes to global warming. Reducing pollution and emissions can be accomplished in several ways. For example drive a smaller car with less power consumption, drive a car-driven resource that pollute less (hybrid or electric car), drive less, or use public transportation, walk, use bicycles.

Also the taxation of other energy sources varies from country to country as well as carbon taxes. Finland is the first country that introduced carbon taxes on fossil fuels. Another object of taxation is sulfur that is released during the combustion of coal and oil.

When we talk about the taxation of motor vehicles, we can say that it is in line with the goals of environmental protection, but taxation is not done through the form of new taxes than through an additional amount to the already existing sales taxes. It is essential to say that the tax on motor vehicles is greater than the sales tax on any other product unless it falls into the luxury well as motor vehicles. Different system of taxation of motor vehicles applies Netherlands, where the amount of tax depends on the ecological characteristics of the vehicle. In the UK the vehicles are taxed by special taxes on motor vehicles, while in Finland the amount of tax depends on whether the vehicle has a catalytic converters. It is also important to note that the tax on motor vehicle fuel increased from 1990 in order to improve environmental protection.

Some OECD countries have introduced special taxation of certain products in order to better protect the environment. Thus, in Sweden, Norway, Denmark and Finland in

particular taxed beverages that are found in certain containers and boxes especially if they are thrown in the garbage. In Sweden and Norway are particularly taxed batteries for cars, while in Italy the special tax is in effect for plastic bags, especially those non-biodegradables.

Companies have a strong incentive to innovate. As taxes increase the costs of manufacturing products that pollute the environment, companies are trying to innovate and develop new technologies and ways of production in order to reduce costs and pollution. New investments in newer and cleaner technologies as well as in environmental equipment enables significant tax relief in the form of certain incentives, such as capital equipment, new domestic and foreign investments, taxes credit, accelerated depreciation, and the like.

Alternative to taxation of harmful things in the environment is the elimination of taxes on those things that do well for the environment. The system of taxation can subsidize goods or services that are environmentally beneficial, for example, introducing tax exemptions on energy-efficient products. The introduction of "green" taxes demands a cautious and systematic analysis of many factors. Poorly defined taxes can have a counter effect and create additional economic costs and reduce the desired effect on the environment.
According to Markandya and Lehoczki (1994), taxes collected by different tax bases should go into a single fund that will continue to finance government spending. So it should not separate the tax collected on the basis of environmental taxes than other forms of taxation. Overall, revenues from environmental taxes should be viewed as all other income and spend them in other areas of public expenditure such as reducing public debt and the like. The reason in favor of this kind of thinking is that if the funds that are collected on the basis of environmental taxes were only used for investments relating to the protection of the environment that make these investments directly depended on the income earned on the basis of environmental taxes or tax rate would be formed depending on the investment for environmental protection and not on the basis of harm caused to nature.

We can conclude that taxes related to environment protection play an important role in solving environmental problems. Taxes can be very effective when properly defined, properly and correctly addressed and with adequate rate. Yields collected on a renewal of environmental taxes can greatly help in solving other tasks of fiscal policy, such as reducing public debt and reduced taxes collected on other grounds. Providing the right information at the right time is crucial to taxation considered successful. And finally is required a combination of environmental taxes and other instruments of the state to achieve effective and more efficient environmental policy because environmental taxes alone cannot do much.

Table 3. Environmental tax revenue - % of GDP for some CEE Transition Countries

Country	2008	2009	2010	2011	2012
Bulgaria	3,45	3,04	2,95	2,88	2,82
Croatia	3,44	3,35	3,68	3,32	3,18
Czech Republic	2,35	2,40	2,38	2,47	2,35
Estonia	2,34	2,95	2,96	2,77	2,78
Hungary	2,73	2,69	2,67	2,54	2,55
Latvia	1,96	2,33	2,40	2,46	2,42
Lithuania	1,65	2,04	1,85	1,70	1,66
Poland	2,60	2,56	2,58	2,55	2,52
Romania	1,78	1,87	2,01	1,89	1,94
Slovakia	2,05	1,95	1,87	1,85	1,75
Slovenia	3,01	3,56	3,64	3,45	3,82

Note.* Data in Table 3 represent values of environmental tax revenue as percentage of GDP. Data were used from Eurostat Statistics Database.

5 EMPIRICAL ANALYSIS: THE IMPACT OF ENVIRONMENTAL REGULATION ON FDI IN TRANSITION COUNTRIES

5.1 Model Specification

The objective of this study is to analyze the impact of environmental regulation on the inflow of foreign direct investment in the sample of transition countries. In the empirical studies about transition countries we usually encounter a problem related to time series data. In this study, we used a panel data covering the period from 2001 to 2012 for eleven transition countries of Central-Eastern Europe: Bulgaria, Croatia, Czech Republic, Estonia, Hungary, Latvia, Lithuania, Poland, Romania, Slovakia, and Slovenia.
We specify the following model to be estimated:

$$\ln FDI_{it} = \beta_0 + \beta_1 \ln GDPpc_{it} + \beta_2 OP_{it} + \beta_3 IN_{it} + \beta_4 ER_{it} + \varepsilon_{it} \tag{1}$$

where is:

ln is natural logarithm
FDI_{it} - denotes FDI stock per capita of the country i in period t
$GDPpc_{it}$ - denotes GDP per capita of the country i in period t

OP_{it} – denotes the share of trade in GDP of the country i in period t

IN_{it} – denotes the inflation rate of the country i in period t

ER_{it} – denotes environmental stringency of the country i in period t

ε_{it} - random error (structure it depends on whether the model is estimated using OLS, FE and RE models)

Because of missing observations our dataset is an unbalanced panel. The principal variable of interest in this analysis is environmental regulation (ER) which describes the strictness of environmental regulations in FDI host country. For the environmental stringency variable we use Environmental Performance Index (EPI) built by the Yale Center for Environmental Law and Policy (YCELP) and the Center for International Earth Science Information Network (CIESIN, Columbia University), followed recommendation by Bazillier et al. (2013). The goal of this index is explicitly to track policy effectiveness through measurable outcomes and according to Bazillier et al. (2013) the EPI is the most complete index measuring real environmental performances for a large sample of countries including transition countries. Using EPI scores, the countries can be rank in terms of how they behave and how well they solve problems related to the environment within the two areas of concern, namely: protection of human health from environmental harm and protection of ecosystems. Within these two areas EPI ranks countries in nine categories that consist of 20 indicators. Indicators measure how much a country is close to achieving international goals for environmental protection. EPI offers us access to the data that are useful and easy to understand and relate to environmental protection. Using EPI, countries can compare their achievements with other countries. With the inclusion of time series data, countries can also see how their own performance has changed over time. The source for this data is obtained from a database published by the Yale University, Environmental Performance Index 2014.

The independent variable in this research is FDI stock per capita (FDI). This variable includes the inward FDI stock in manufacturing sector according to NACE (Nomenclature of Economic Activities) classification. The source for this data is obtained from a database published by the Vienna Institute for International Economic Studies (WIIW). In addition to these sources there are also available and alternative sources (EBRD, IMF, etc..). But it seemed reasonable to use the data from the published WIIW given to this institution, among other things, focused on data collection and research related to the transition countries of Central, Eastern and Southeastern Europe.

Further, we incorporate a set of control variables. In our model we include information on GDP per capita (GDPpc), the share of trade in GDP - openness (OP) and inflation (IN). For control variables we chose the determinants that may also affect FDI in accordance with the above discussed theoretical concepts and determinants used in empirical research. Data for the control variables were collected from the World Bank database.

In our research, we use GDP per capita, which is a proxy variable for the purchasing power of local customers (local demand), level of technology development and size of the market. This variable is also a factor that checks whether companies are motivated by searching for the market. For this variable we expect a positive sign. Countries that have higher purchasing power of consumers attract more foreign direct investment.

Results of numerous studies indicate that the indicator of openness has a positive impact on the foreign direct investment (Balasubramanyam et al., 1996), which suggests that foreign investors when making decisions on FDI location, among other things, take into account the benefits and potential sites in the context of a liberal trade regime and membership countries in trade agreements. The variable Openness (OP) is measured as the share of trade in GDP. Trade represents the total sum of exports and imports of goods and services. The relationship between FDI and the degree of openness of the economy highlights the importance of liberalization of the trade regime in the recipient country of FDI and partly indicates a preference to export by multinational companies. Generally speaking, trade liberalization should have a close connection with FDI, as it may affect the country's appeal to foreign investors. The source that we used to collect these data is the base of the World Bank.

Further, in our model we include inflation (IN) as a standard proxy for macroeconomic stability. Inflation is expected to have a negative impact on the inflow of foreign direct investment. Specifically, for the decision to invest in any country, with investors high rates of inflation in the recipient countries of FDI adversely affect the decision on the location of foreign direct investment. The source that we used to collect these data is the base of the World Bank. Table 4. presents descriptive statistics for the above discussed variables and Table 5. presents correlation matrix.

Table 4. Descriptive statistics

Variable	Obs.	Mean.	Std. Dev.	Min.	Max.
FDI PC	95	1,077958	0,6790472	0,1733446	2,771374
GDP PC	132	11023,64	5477,499	1729	26989,7
Openness	127	118,1307	30,77669	57,8	181
Inflation	132	4,658333	4,208498	-1,1	34,5
EPI Overall	121	66,3257	8,56808	45,55	81,97

Table 5. Correlation matrix

	GDP PC	Openness	Inflation	EPI Overall
GDP PC	1. 0000			
Openness	0. 3909	1. 0000		
Inflation	-0. 3536	-0. 1148	1. 0000	
EPI Overall	0. 6458	0. 5752	-0. 3815	1. 0000

5.2 Methodology

Given the panel data we have, the initial step will be evaluation of the equation (1) with fixed effects model (FEM). A model like this essentially represents an Ordinary Least Squares (OLS) regression, which for each country includes a dummy variable for calculating country-specific effects (LSDV model). If the error processes have the same variance (homoscedasticity) and if all error processes are independent from each other, we believe that the method of OLS is optimal. However it's not so simple because the panel data are affected by a complicated error processes (Beck & Katz, 1995): panel heteroscedasticity (i.e. variances of the error processes differ from country to country); contemporaneous correlation (i.e. large errors for country and at time t will often be associated with large errors for country j at time t); and serial correlation (i.e. errors for each country show temporal dependence (autocorrelation).

And if we do the calculation model using data that are homoscedastic and are not related to each other, or, are not autocorrelated, can happen to us to create a regression with heteroscedastic unobserved and interconnected and dependent on each other errors processes. The reason for this is that heteroskedasticity and autocorrelation that we look at and deal with are also function of model misspecification. In this context, we applied tests for checking the presence of heteroskedasticity and autocorrelation (Wooldridge test for autocorrelation in panel data and Wald test for group-wise heteroscedasticity[1]).

Besides the previously mentioned heteroscedasticity, by serial correlation are affected and the estimates that use FEM models in their assessments. For example, a Wooldridge test for checking autocorrelation rejects the null hypothesis of no first order serial correlation. The effects that occur with autocorrelation are similar to those that occur with heteroscedasticity, but the problems that arise later on are much more serious. In the

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[1] The tests reject the null hypothesis of no first order serial correlation and heteroscedasticity.

presence of autocorrelation the OLS coefficient estimates remain the same, but no longer belong to the best linear unbiased estimators (BLUE) or asymptotically efficient. It should also be said that autocorrelation causes standard errors to remain biased.

Struggling with problems and the complications that carry serial correlation, heteroscedasticity and contemporaneous correlation, both Parks-Kmenta method and Beck and Katz's (1995) offer us a variety of methods and the approaches for their solutions. FGLS estimation technique brought to us by Parks and Kmenta are suitable for data analysis with groupwise heteroscedasticity, individual effects, serial correlation, endogeneity and cross sectional dependence (Kmenta 1986; Hicks 1994). However, Beck and Katz (1995) tells us that too much confidence in the standard error composed by methods that bring us Parks and Kmenta very unstable if the pattern that we observe is not large and if the time span that we look at is not very large. As an alternative method in studies such as our sample, Beck and Katz (1995) suggest the use of panel corrected standard error (PCSE) technique. We therefore combine panel corrected standard errors with a Prais-Winsten transformation (AR1) to eliminate serial correlation of errors including country dummy variables to allow for fixed effects. Following previous empirical studies (e.g. Mehic et al., 2013) we believe that this approach is appropriate for our analysis. PCSE seems appropriate to be used in case of not very large time dimension and unbalanced panel, as is the case of our panel data. In addition, this method is suitable for our datasets because PCSE has better small sample properties due to the block diagonal variance-covariancematrix. The reason for using the fixed effect panel data version of the Prais-Winsten estimator is that the FGLS standard error estimates may be over-optimistic (Beck and Katz, 1995). It is worth noting, however, that the use of alternative GMM estimators is unfeasible in this case.[2]

5.3 Results

Table 6. presents the results of econometric analysis that we have done for the purposes of this research. Specifically, the table reports OLS fixed-effect panel data estimates with PCSE panel-corrected standard errors.

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[2] Instrumental and GMM estimators, like the well-used Arellano and Bond (1991), performance have appealing properties for N large, being consistent and also asymptotically efficient. However, the finite-sample of GMM estimators turns out to be very poor when the cross-sectional dimension is small (as is the case in our panel), as demonstrated in a number of Monte Carlo experiments (Kiviet, 1995; Judson and Owen, 1999; Bruno, 2005).

Table 6. Results of econometric analysis

Variable	Coefficient (Standard error)	
GDPpc	1,129***	(0,977)
Openness	0,001	(0,002)
Inflation	-0,025***	(0,006)
EPI	-0,044**	(0,019)
R-squared	0,88	
Wald chi2 Prob >F	6494,26***	
No. Of observations	92	

Notes: Standard errors are given in brackets (PCSE); All regressions include a constant and country dummies (not reported in the table)., ***denotes statistical significance at the level of 1%; **denotes statistical significance at the level of 5%; *denotes statistical significance at the level of 10%;

The results of econometric analysis reveal significant effect of all variables included in the model in line with the a priori expectations with the notable exception of Openness variable. The interpretation below refers to ceteris paribus, on average effect of these variables. Negative and significant coefficient of the variable environmental regulations EPI (significant at 5% level) shows that it has a positive effect on foreign direct investment in transition countries. Opennes has the expected sign and, however, is not found to influence FDI inflow in these countries. Possible explanation for obtained results for variable OP may be in choosing an appropriate indicator of trade openness. Traditional measure of trade openness, as share of trade in GDP, has a number of weaknesses key among them is the possible effect of size of economy, resource endowments, and/or the levels of trade restrictions. Inflation also has expected sign and it is significant at the 1% level. GDPpc has expected positive sign and it is significant at the 1% level. Based on obtained results, we can conclude that GDPpc and inflation as well as environmental regulations have an impact on FDI in manufacturing countries.

CONCLUSION

In this thesis we employ econometric analysis to investigate the impact of environmental regulation on FDI in manufacturing sector in transition economies. Taking into account that the current state of the world is characterized by a very developed and widespread industry and very serious and not negligible climate change, it is not surprising that environmental regulation plays a very important role in attracting FDI. When we talk about the theoretical as well as empirical findings about the impact of environmental regulations on FDI inflow, it sets the question of a positive impact of these regulations on foreign

direct investment. The reason for these doubts is mostly associated with the increase in production cost due to the application of environmental regulations, such as environmental taxes and other forms of environmental measures. Relying on data from the empirical part of this thesis we can conclude that there is a negative relationship between environmental regulation and FDI inflow in terms of countries in transition.

The thesis consists of two parts, the theoretical and empirical part. In the theoretical section it explains the policy dealing foreign direct investments and how to attract them or how certain situations and regulation act on foreign direct investments. Particularly interesting theory on which we specifically addressed the attention is the Porter's Competitive advantage theory. The reason why we have addressed the special attention exactly to the Porter theory is because Porter advocates stricter regulations in the country which according to Porter leads to companies wishing to invest in the country because they believe that it is better organized and more organized, and that it will be easier to do business in such a country. Theoretical studies mostly talk about how environmental regulations may affect the inflow of foreign direct investment, although there is not a small number of those who speak of the positive impact of environmental regulations on foreign direct investment. Studies that talk about the positive impact of environmental regulations are essentially advocates Porter Theory. In general there is no clear position from which we can certainly speak and claim with absolute certainty that environmental regulations have a positive or negative impact.

To get a complete and a better picture of environmental regulations and environmental policies in the theoretical part, we handled environmental regulations in the countries in transition as well as in the manufacturing sector. In the last two decades the EU has assumed primacy in international environmental policies. This success is related to the progress of their green parties whose influence became more powerful than the U.S. who had been a leader in environmental policies. When we talk about the situation in these countries, we can say that they have a lot of problems such as outdated technology, underdeveloped market, various social problems and so it is not surprising that their problems related to the environment and its protection are not the top priority. Yet those transition countries that are on the road to EU know how the EU pays attention to environmental regulations and so they become more aware of the problems they have and are willing to make an effort to solve it and become members of the EU. They need to put the problem of environmental regulations in the decision-making process, choose the right tools for solving the problem and apply it in the right way.

Using an unbalanced panel dataset for 11 transition countries from 2001 to 2012, this research explores the impact of environmental regulations on FDI inflow. As proxy for environmental regulation variable, we used the Environmental Performance Index (EPI), whose data have been taken from a database published by Yale University. It turns out that

these data are used for variable of environmental regulation and they are very good since they encompass a very wide range of indicators relating specifically to environmental regulations, and there are data for all countries in the sample and for the observed period.

The main result of our analysis is that environmental regulation has an impact on foreign direct investment. Since there is a negative and significant relationship between FDI and environmental regulations, one can conclude that lax handling of environmental regulations is indeed a determinant of FDIs in transition countries. In addition, the results imply that the least regulated transition economies tend to attract pollution intensive industries and tend to benefit from differences in compliance with environmental regulation among countries. The results reveal a strong negative and significant impact (significant at 5%) of the environmental regulation on FDI among CEEC. In other words, multinational enterprises tend to allocate each main production step to different transition countries in order to minimize the cost of production process.

Our findings could be interpreted as supporting evidence for the Pollution Haven Hypothesis which says that countries with poorer regulation trying to attract FDI from dirty industries. Pollution Haven Hypothesis says that stricter environmental standards will cause an increase in costs of production, which will lead to increased prices of their products, what will ultimately make companies less competitive in the market, and that is the reason for moving the plants in developing countries with weaker environmental regulations.

Some countries keep their environmental regulations weak, and with that weak regulation they are trying to ensure the inflow of foreign direct investment in their country. In that process thay care less about the quality of environment in opposite to developed countries with strict environmental regulations. As a consequence, there are pollution havens forming in developing countries for dirty industries, and for that reason developing countries are regressing in social welfare.

The policy implications are not necessarily straightforward. According our results, environmental stringency can be used as an instrument to attract FDI in manufacturing sector. However, the host country should be aware that they will mainly attract intermediate goods production through vertical integration. In other words, they will only be part of a small part of the global value chain and production process, the most polluting one. In terms of economic growth and development, this is not necessarily the best way to ensure sustainable development and governments need to ensure that sustainability considerations are more systematically applied to economic policies and regulations related to environment in transition countries.

This research leaves space and provides opportunities for further research and asking new

questions when it comes to environmental regulations and environmental protection. Some other authors have the opportunity to research impact of environmental regulations on foreign direct investment outflow from countries in transition and the impact of environmental regulations on the export of goods and services and the like. Also the impact that this thesis could have is to encourage and stimulate the creators of environmental policy on the introduction of even stricter standards and stricter policies especially in countries in transition, where the biggest changes happen. Countries that perhaps the most need and expect changes are countries in our area, especially referring to the Balkan countries, and by introducing of even stricter and stricter policies have the opportunity to create a healthier and better place to live, and also a better environment for business and economic growth. Further investigation can be concentrate on examining the conditions from both source, home and host countries that may facilitate the assimilation of a better environmental management promoted by FDI using gravity model.

The limitation of our research is the lack of data, or precise data availability for FDI stock in manufacturing sector on lower aggregation levels, in the so-called dirty industries. It is certain that the use of data at this level of aggregation gave a much better and more accurate results about the impact of environmental regulations on foreign direct investment.

We contribute to the literature in two ways. First, we provide some empirical evidence in support of the PHH by analyzing the relationship between environmental regulation and foreign direct investment in transition countries. Further, we used the Environmental Performance Index (EPI) as proxy variable for environmental regulation. This index is the most complete index measuring real environmental performances. Based on this finding, we shed some light on questions regarding the relationship between environmental regulation and FDI and give some empirical evidence in favor of Pollution Haven Hypothesis.

It should be noted that the results should be taken with cautious. The proxies for environmental regulations are unfortunately still imperfect and scarce. The use of a more reliable proxy variable for environmental regulation could give more reliable results in future studies. Also, extension of the sample of countries could be significant incentives for future research.

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APPENDIXES

LIST OF APPENDIXES

Appendix A: Descriptive statistics

```
summarize FDI_PC    GDP_PCUS_    Openess Inflation EPIOverallScore

Variable       Obs   Mean     Std. Dev.      Min    Max

FDI_PC          95   1.077958   .6790472   .1733446  2.771374
GDP_PCUS_      132   11023.64   5477.499        1729  26989.7
Openess        127   118.1307   30.77669        57.8  181
Inflation      132   4.658333   4.208498        -1.1  34.5
EPIOverall~e   121   66.3257    8.56808        45.55  81.97
```

Appendix B: Correlation matrix

```
pwcorr GDP_PCUS_ln Openess Inflation EPIOverallScore

             | GDP_PC~n  Openess Inflat~n EPIOve~e
-------------+-----------------------------------
 GDP_PCUS_ln |   1.0000
     Openess |   0.3909   1.0000
   Inflation |  -0.3536  -0.1148   1.0000
EPIOverall~e |   0.6458   0.5752  -0.3815   1.0000
```

Appendix C: Prais-Winsten regression, correlated panels corrected standard errors (PCSEs)

```
xtpcse FDI_PCln GDP_PCUS_ln Openess Inflation EPIOverallScore i.Country,
correlation(ar1)

Prais-Winsten regression, correlated panels corrected standard errors (PCSEs)

Group variable:   Country                    Number of obs      =        92
Time variable:    Year                       Number of groups   =        11
Panels:           correlated (unbalanced)    Obs per group: min =         7
Autocorrelation:  common AR(1)                              avg =  8.363636
Sigma computed by casewise selection                        max =        10
Estimated covariances      =        66       R-squared          =    0.8849
Estimated autocorrelations =         1       Wald chi2(14)      =   6494.26
Estimated coefficients     =        15       Prob > chi2        =    0.0000
```

```
--------------------------------------------------------------------------------
                |            Panel-corrected
        FDI_PCln |     Coef.   Std. Err.      z    P>|z|     [95% Conf. Interval]
----------------+---------------------------------------------------------------
     GDP_PCUS_ln |   1.129566   .0977539    11.56   0.000     .9379723    1.321161
         Openess |   .0009554    .002095     0.46   0.648    -.0031507    .0050615
       Inflation |  -.0256391   .0065201    -3.93   0.000    -.0384183     -.01286
 EPIOverallScore |  -.0446481   .0195351    -2.29   0.022    -.0829363   -.0063599
                 |
         Country |
              2  |   -.559762   .1556643    -3.60   0.000    -.8648584   -.2546655
              3  |   .8759756   .2914959     3.01   0.003     .3046541    1.447297
              4  |   .0609766   .1639092     0.37   0.710    -.2602795    .3822327
              5  |   .5124823   .1560192     3.28   0.001     .2066902    .8182744
              6  |  -1.255717   .1187402   -10.58   0.000    -1.488443    -1.02299
              7  |  -.5921448   .1695606    -3.49   0.000    -.9244776    -.259812
              8  |  -.0569765   .1556712    -0.37   0.714    -.3620864    .2481334
              9  |  -.6402515   .3383264    -1.89   0.058    -1.303359    .0228561
             10  |    .392491   .2045772     1.92   0.055     -.008473     .793455
             11  |  -.3749084   .2157579    -1.74   0.082    -.7977862    .0479694
                 |
           _cons |  -7.425944   .9529804    -7.79   0.000    -9.293752   -5.558137
----------------+---------------------------------------------------------------
             rho |   .3343143
--------------------------------------------------------------------------------
```