Among traditional determinants of FDIs – is environmental laxity a new driver?

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Foreign direct investments (FDIs) are an important tool for corporations to access new markets, channels, and cheaper production. The body of literature is quite extensive about the determinants of FDIs. Among the traditional determinants, the literature lists market size, growth rate, exchange rates, liberalization, infrastructure and taxes as the most frequent cited determinants of FDIs. However, to what extent environmental regulations can be seen as a determinant of FDIs has not been elaborated intensively. In order to verify this, the article uses three different scales as proxies how environmental regulations are handled, since there is no observable indicator. Therefore, the paper's aim is to discover to what extent different handling of environmental regulations is influencing FDI inflows of countries. For the period of 2000 – 2005, these three different proxy variables will be tested using a mixed linear model to verify how the lax handling of environmental regulations affects the FDI inflows. A strong significant relationship has been found using the proxy variable including SO^2 as emission variable when testing the laxity over the years 2000 – 2005. Therefore one can conclude that environmental regulations, when using laxity as a proxy, are indeed a determinant of FDIs.

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1. INTRODUCTION

"Foreign direct investment represents a special form of capital flows involving not only the relocation of capitals but also intangible assets such as production know-how and management skills, and multinational enterprises are major players of FDI." (Xing, 2006, p.203).

In other words, foreign direct investments (FDIs) are a primary source of access to new markets, channels, cheaper production, technology and thereby increased competitiveness of corporations (Harrison, 1994). Out of this, 4 major motives of corporations to undertake FDIs emerge: market - seeking, resource - seeking, strategic asset - seeking, and efficiency seeking. (Vetter, 2014). However, the benefits of FDIs are not limited to corporations and organizations, they are likewise beneficial for governments and societies by providing financial stability and economic development (OECD, 2008). To illustrate the importance of FDIs for the economy some recent developments of FDIs will be presented. First, the most FDI inflows are among developed countries than among developing countries (UNCTAD, 2015). To be more precise, among the top ten of FDI recipients, 4 countries are developing countries (China, Hong Kong, Singapore, and Brazil) and 6 countries are developed countries (USA, UK, Canada, Australia, The Netherlands, and Luxembourg) (UNCTAD, 2015). Even if the top ten recipients of FDI inflows are mainly developed countries, China with 128 billion USD was the largest recipient in 2014 (UNCTAD, 2015). Furthermore in 2013 China's FDI inflow alone was greater than the total FDI inflow among all EU countries (Vetter, 2014). An important factor within the development of FDI flows is globalization. Globalization is responsible for the development of close connected markets and the global mindset of managers to invest in foreign countries. On the other hand the globalization, if not alone, likewise leads to increased damages of the environment caused by corporations (Marcotullio , 2003).

During last decades, pollution emissions of countries with large industries like Europe, the United States and China or the deforestation of the tropical rain forest in Brazil and Indonesia have damaged the earth dramatically and led to eco-friendly awareness among societies worldwide. According to the WWF (2015), 12 - 15 million hectares of forest are lost each year, which is equivalent to 36 football fields per minute. The consequence of the damage of the environment were emerging environmental regulations for corporations in order to allow sustainable activities. Certificates like ISO (International Organization for Standardization), FSC (Forest Stewardship Council) and Blue Angle (Blue Angle certificate) have emerged and globally accepted and integrated in business practices.

Since the importance of environmentalism and environmental regulations as well as the importance of FDIs have increased over the last years, it would be interesting to analyze to what degree managers should incorporate environmental regulations into their FDI decisions.

The extensive literature about the determinants of FDI identified the following determinants: market size, labor costs, growth rate, infrastructure, corporate taxes, exchange rates, and trade barriers (Schneider & Frey, 1985; Culem, 1988; Singh & Jun, 1995; Biswas, 2002; Bevan & Estrin, 2004; Janicki & Wunnava, 2004; Blonigen, 2005 Ang, 2008; Bellak & Leibrecht, 2009). However, to what extent environmental regulations are viewed as a determinant has not been elaborated intensively. Therefore this article tries to support to the literature of determinants of FDIs by testing the relationship between FDIs and environmental regulations. In order to analyze the effect of environmental regulations it is important to precisely define, what we mean by environmental regulations, since there is no observable indicator. For this reason, it is only possible to refer to lax handling of environmental regulations. Therefore, this article has the following research question, which will be answered**: To what extent can lax handling of environmental regulations be seen as a determinant of FDIs?**

The sample of the analysis consists of 22 countries and three different scales as proxy variables. These three scales are: "original scale, "optimized scale", and "modified scale", which consist of three different constellations of variables for the expression of the lax handling of environmental regulations. The FDI inflows of these 22 countries will be tested on the proxy variables over the period of 2000 to 2005. The first scale represents the "original scale", used within the analysis of Kolstad and Xing (2002) who analyzed the effect of lax handling of environmental regulations on FDI outflows of different US industries. The second scale is an "optimized scale" according to the reliability tests of Cronbach's alpha. The last scale is a "modified scale", which includes only those variables, which result in the most sufficient Cronbach's alpha. Additionally a new emission variable (CO2) for the expression of the lax handling of environmental regulations is included within the "modified scale". The data required for this analysis was mainly obtained from the World Bank database. The remaining data was collected through the Nasa Earth data platform and through the KPMG Asia report of 2007.

The results of the mixed linear model indicate a strong relationship between FDIs and lax handling of environmental regulations when using the "original scale" as a proxy variable. This indicates that corporations deliberately look for countries with lax handling of environmental regulations for their foreign direct investments.

The paper's relevance is established by the practical implications for financial management when considering foreign direct investments. The results indicate that lax handling of environmental regulations is indeed a determinant of FDIs and financial managers, especially from heavy polluting industries, should focus on countries with lax handling of environmental regulations for their investments. Furthermore, the results can be useful for policy makers of governments when trying to attract FDI inflows. Especially for developing countries it could be beneficial to keep the lax handling of environmental regulations as low as possible in order to receive FDIs, which can result in economic development and increased wealth among the population.

In order to answer the research question, the article will be divided in the following sections. The first part will discuss the underlying theory and the determinants of foreign direct investments, followed by the related problems with the measurement of environmental regulations. Next, the model of this paper will be introduced. Finally, the article will be closed with the results and discussion.

2. LITERATURE REVIEW

2.1 Underlying Theory

There is an extensive body of literature regarding theories of FDIs. There are many different drivers for managers to invest in particular countries. Foreign direct investments are per se a major part of economics. However, there is also a large practical relevance for financial managers when considering FDI decision. In order to be able to clarify the different reasons why financial managers respectively boards of companies decide to invest in particular countries, the following theories will be adduced.

2.1.1 Firm Specific Advantage

Stephen Hymer developed the theory of the firm specific advantage in 1976. This theory assumes that corporations invest in certain countries because of specific benefits (Das, 2015). Examples of such benefits are access to raw materials, superior management and low transaction costs (Das, 2015). In other words, following this theory corporations invest in foreign countries to gather a competitive advantage. For this article the competitive advantage of corporations could be lax handling of environmental regulations in the sense that lax handling of environmental regulations will pay off in the future because all produced goods or services are following a standardized procedure, which allows involved companies to sell their products to ecoconscious customers in demanding markets like Europe and the US.

2.1.2 Internalization Theory

The Internalization theory implies that external markets fail to provide an efficient environment in which a corporation can use it's technology or production resources (Shenkar, Luo & Chi, 2015) However, firms are not only exploiting their own knowledge to achieve their objectives, they are also internalizing operations and management practices (Shenkar, Luo & Chi, 2015). Internalizing in this case means that corporations make use of unified governance structures and common ownership. One of the reasons for the internalization is the inefficiency of the external market. The following list summarizes the internalization advantages (Shenkar, Luo & Chi, 2015):

- To avoid search and negotiating costs
- To avoid costs of moral hazard
- To avoid costs of violated contracts and ensuring litigation
- To capture economies of independent activities
- To avoid government intervention (quotas, tariffs, price controls etc.)
- To control supplier conditions of sale of input (including technology)
- To control market outlets
- To better apply cross - subsidization, predatory pricing, and transfer pricing.

The advantage of internalization emerges due to international economies of scale and scope and by the transfer of knowledge across the business network (Shenkar, Luo & Chi, 2015). Especially in the case of environmental regulations it could be argued that the competitive advantage will emerge due to the transfer of knowledge regarding environmental standards (and therewith environmental regulations)

2.1.3 The Eclectic Paradigm

The Eclectic Paradigm offers a general framework for international production, which is also called OLI framework (Das, 2015). This framework includes three different variables: ownership - specific (O), location - specific (L), and internalization (I) (Dunning, 2001). The key allegation of this framework is that all three factors are important in explaining FDIs. The following list defines the three factors in more detail in order to show how these factors affect FDIs:

- Ownership – specific factor: includes tangible and intangible assets. Examples of tangible assets are natural endowments, manpower, and capital. Intangible assets can be technology information, marketing, entrepreneurial skills, and organizational system.
- Location – specific factor: expressed as market structure, governmental legislation and the political, legal, and cultural environments etc.
- Internalization: refers to the firm's flexibility to produce and market its own internal subsidiaries.

The Eclectic Paradigm includes and distinguishes between structural and transactional market failures. Structural market failure is an external factor that refers and promotes monopoly advantages due to erected barriers of companies and governments or both. On the other hand the transactional failures refer to the failure to transact goods and services at a lower costs than via internalization. To summarize, the Eclectic Paradigm is a more detailed theory of FDIs than the Internalization Theory.

Following this theory, environmental regulations could be considered as a market failure, which is exploited by investing in low regulated countries. However, this is not necessarily a one way relationship, it could likewise be the case that corporations are trying to introduce the environmental friendly production in their subsidiaries abroad, to benefit in the long term by being more flexible for demands of ecoconscious customers.

2.2 Determinants of FDIs

Before focusing on the effect lax handling of environmental regulations, the empirical evidence of the traditional determinants will be provided. It is important to mention that not all determinants of FDIs are included within this list. There are two reasons for this decision. The first reason is that this article focuses mainly on the influence of lax handling of environmental regulations on foreign direct investments. The second reason refers to the most frequent cited determinants, in order to be able to distinguish between traditional determinants and the possible new one – the lax handling of environmental regulations. Specifically for the literature review, 15 articles from the 80's 90's and the last decade have been reviewed and the most cited determinants will be considered as traditional determinants.

2.2.1 Market Size

Among the determinants found in the literature, market size is the most frequently discussed determinant of FDIs. In general there is a positive significant relationship between market size and FDIs (Bevan & Estrin, 2004). In this respect the analysis of James B. Ang (2008) revealed that a possible reason for this positive relationship is economies of scale. The same opinion

was shared by C.G. Culem (1988) who mentioned that bigger markets allow corporations to capture the benefits of large-scale productions, which is in favor of foreign investors. Another reason for the importance of the market size is that corporations are inclined to invest in those markets where potential shares can be obtained (Janicki & Wunnava, 2004). Therefore market size is considered to be a determinant of FDIs.

2.2.2 Labor Costs

Another frequently cited determinant of FDIs are labor costs. According to Bevan & Estrin (2004) there is a negative significant relationship between labor costs and FDIs. However, this negative relationship is not consistent within the literature. In the analysis of C.G. Culem (1988), the relationship is only negative for developed countries if all other factors (e.g. market size) remain the same as in developing countries. Consequently, the relationship between labor costs and FDIs is negative and significant for FDI inflows into developing economies but is insignificant for FDI inflows between developed countries (Singh & Jun, 1995). Even if there is no consistent view on the effect of labor costs on foreign direct investments, labor costs seem to be an important determinant in most of the cases of FDIs.

2.2.3 Growth Rate

Next to market size and labor costs the market growth rate expressed by the percentage increase in GDP is another frequently discussed determinant of FDIs. According to James B. Ang (2008) investors are attracted to economies with relatively high growth rates. However, James B. Ang focused within his analysis on FDIs in developing economies. Therefore, growth rates seem to be a more important determinant for FDIs in developing economies. However, in previous studies the positive effect of growth rates is likewise related to already developed economies (Culem, 1988). The expected benefit of growth rate is that rapid economic growth leads to large domestic markets, which simultaneously creates new opportunities for foreign firms to invest in these markets (Ali & Guo, 2005). However, the beneficial effect of economic growth is not only restricted to FDIs. The same relationship exists for domestic investments as well (Hansen & Rand, 2006). Additionally, it is important to mention that there is a bi-directional coherence between GDP (growth) and FDI (Chowdhury & Mavrotas, 2006). This means that FDI is not only favored by economic growth, economic growth is also stimulated by FDIs. Even if there is also no completely consistent view on the effect of growth rates on FDIs, one can conclude that there is an effect of growth rates on foreign direct investments.

2.2.4 Exchange Rate

Another frequent enumerated determinant of FDIs is the appreciation respectively the depreciation of a country's currency. According to James Ang (2008) and Froot and Stein (1991) the appreciation of a country's currency leads to a proportional higher FDI outflow of that country. In other words if a country has a relatively strong currency in respect to the currency of the host country receiving the investments, investments in those countries with a weak currency are encouraged. To be precise, the impact of exchange rates on FDI occurs through two different channels (Xing, 2006). The first channel is the wealth effect channel and the second channel is the relative production cost channel. The first channel, the wealth effect channel, has the assumption that foreign investors are increasing their wealth after the devaluation of the host country's currency. The reason for this is that a devaluation will lead to reduced prices for all kind of production inputs, such as labor, land and machines and other assets of the host country. The relative production channel has the same underlying explanation as the findings of James Ang (2008) and Froot and Stein (1991), meaning that a devaluation of the FDI host country's currency leads to relative lower production costs in this particular country.

2.2.5 Infrastructure

Infrastructure is defined in multiple ways within the literature of FDIs. According to Christian Bellak, Markus Leibrecht and Jose P. Damijan (2009), communication and information infrastructures are more important than transport infrastructure, since transport infrastructure tend to be more developed than communication and information infrastructures. However, most commonly infrastructure is referred to the railroad network and road network of a country (Sun, Tong & Yu, 2002). According to James B. Ang (2008) the development of an adequate infrastructure base encourages FDI inflows of a country. The reason for this finding is based on the fact that a proper infrastructure stimulates the accessibility of overall resources and raises the productivity of capital (Ang, 2008).

2.2.6 Corporate Taxes

Among the literature the impact of corporate taxes on FDIs is predominantly consistent. According to James Ang (2008) low corporate taxes is an important tool for governments to attract foreign direct investments. This view is shared by Bruce A. Blonigen (2005) with the addition that the type of taxation matters. An important issue, which has to be considered carefully when including corporate taxation as a determinant of FDIs, is the concept of double taxation. Some corporations may face taxes within the host and parent country, which will alter the value of the investment within the host country (Blonigen, 2005). Within the subject of corporate taxes and FDIs, Christian Bellak and Markus Leibrecht contributed a valuable analysis to the literature of the determinants of FDIs. According to Christian Bellak, Markus Leibrecht (2009) there is a negative linear relationship between FDIs and corporate taxes. However, it is important to mention that Christian Bellak, Markus Leibrecht and Joze P. Damijan (2009) have also analyzed the interaction effect between corporate taxes and infrastructure and the correlated impact on FDIs. According to their work, when considering the interaction effect between infrastructure and corporate taxes, it is important to recall that both, corporate taxes and infrastructure are determinants of FDIs. However, it is not possible to view one determinant superior over the other. Therefore this interaction effect between the both may be viewed differently- depending what is more important to the corporation – infrastructure or corporate tax havens. Nevertheless, the underlying mechanism within the interaction effect is that corporations may hazard the consequences of high corporate taxes if the infrastructure is sufficient for the business and vice versa.

2.2.7 Trade Barriers and Liberalization

Another important frequent cited determinant of foreign direct investments is the degree of openness to trade respectively liberalization. Liberalization is closely related to trade barriers and tariffs imposed by governments (Ang, 2008). According to

James Ang (2008) openness to trade is significantly related to FDIs, meaning that investors are seeking for access to international trade. This opinion is shared by Hubert Janicki and Phanindra Wunnava (2004) mentioning that especially export oriented corporations are interested to invest into countries which are more liberal to trade, due to the fact that trade and investment complement to each other.

As one can see among the traditional determinants market size, labor costs, growth rate, exchange rate, infrastructure, and liberalization, the positive or negative effect of lax handling of environmental regulations on FDI is missing. In order to proceed with the test of the effect of lax handling of environmental regulations on FDIs, a proper definition of lax handling of environmental regulations will be provided as well as problems related to the measurement of lax handling of environmental regulations.

2.3 Measurement of lax Handling of Environmental Regulations

Since this article focuses on the impact of environmental regulations on FDIs, it is important to define what we mean by environmental regulations. Following the definition of ChemAlliance.org, powered by Society of Chemical Manufacturers and Affiliates, which is the leading international trade association serving the specialty, batch chemical manufacturing industry, environmental regulations are rules that cover generally two things. First it covers the pollution control, which regulates how much pollution in form of chemicals and other output is generated by a facility. The second aspect of environmental regulations is the conservative management. The conservative management is responsible for the maintenance of the ecosystem. However, for the analysis of this paper this definition creates a problem of measurement. The measurement of lax handling of environmental regulations is not an easy task since there is no observable indicator of the peculiarity of these regulations. Therefore, it is necessary to create a proxy for environmental regulations. Furthermore, it is not possible to quantify environmental regulation. However, following an emission-based measurement, it is possible to express environmental regulations by using emission variables. Nevertheless, with this method it is still not possible to explain environmental regulations, but it is possible to refer to the application of environmental regulations. In other words, using emission variables, one is able to distinguish between strict and lax handling of environmental regulations. In this case, stringency and laxity have the same meaning but are aiming in opposite direction. The assumption is that high emissions indicate a lax dealing of environmental regulations and low emissions indicate strict dealing of environmental regulations.

Before an appropriate measure will be selected it is important to consider the different obstacles of measuring environmental laxity. According to Burnel and Levinson (2013) the obstacles are Multidimensionality, Simultaneity, Industrial Composition, and Capital Vintage.

2.3.1 Multidimensionality

The obstacle of multidimensionality is expressed in a way that governments regulate different areas of the environment e.g. air, water, and hazardous waste. At the same time these regulations cover different pollutants in those areas e.g. sulphur dioxide, and toxic chemicals. Different political orientations make it almost impossible to compare environmental programs established by governments for different countries (Kozluk & Zipperer, 2014; Brunel & Levinson, 2013).

2.3.2 Simultaneity

The problem of simultaneity arises because researchers want to measure the lax handling of environmental laxity in order to analyze the consequences of those regulations. However, on the other hand these consequences explain lax handling of regulations as well, which results in the problem of simultaneity (Kozluk & Zipperer, 2014; Brunel & Levinson, 2013).

The literature revealed that there are two possible ways to cope with the simultaneity namely: natural experiments and instrumental variables (Brunel & Levinson, 2013). Natural experiments are situations in which external factors determine the stringency of regulations. A practical example in this case would be the US Clean Air Act, which imposes uniformed national environmental standards across the US. When using natural experiments one could compare previous years of the introduction of such external events with following years. However, this method also includes the problem of scarcity, because such external events are scarce. Therefore this type of analysis cannot be used frequently.

In order to come over the problem of scarcity of natural experiments, literature revealed that the introduction of instrumental variables can be used (Brunel & Levinson, 2013 & Kolstad & Xing, 2002). The idea behind instrumental variables is that a variable will be introduced to the model, which explains laxity of regulations but is uncorrelated to e.g. the economic activity of a particular country. However, this method has also its disadvantage because such instrumental variables are likewise scarce.

2.3.3 Industrial Composition

The obstacle of industrial composition is related to the principle of Adam Smith and David Ricardo – comparative advantage (Brunel & Levinson, 2013). Industrial composition is influenced by comparative advantage in the way that countries will try to specialize in industries, which they can manage most effectively and efficiently. Examples of these comparative advantages are: natural resources, labor skills, proximity to transportation but also regulatory laxity. An often-used method to measure the lax handling of environmental regulations is the pollution abatement costs. However, this method contains the problem that heavy polluting industries will have proportional higher abatement costs compared to less polluting industries, even if these industries would have the exact same regulations.

2.3.4 Capital Vintage

The last obstacle of measuring the lax handling of environmental regulations is the problem of capital vintage. Capital vintage in this case means that in general regulations for new sources of pollution tend to be distinct from existing sources (Buchanan & Tullock, 1975). A particular example would be the emission standards for new cars. While new cars have stricter emission standards, classic cars do not have to obey certain emission standards.

The problem of capital vintage is not only related to consumer products, it is also true for industrial regulations. When measuring the lax handling of environmental regulations in this case, the problem of capital vintage can significantly bias the

measurement. For example if the method of measurement were abatement costs, this would mean a country with certain regulations and existing sources of pollution results in no new development and low abatement cost. However, if the sources are new the result would be high abatement costs only for the reason that the source of waste is new.

3. METHOD AND DATA

The body of literature of the determinants of foreign direct investments is quite extensive. However, to what extent lax handling of environmental regulations in certain countries can attract or refuse foreign direct investments has not been fully described.

Therefore this article established the following research questions: *To what extent can lax handling of environmental regulations be seen as a determinant of FDIs?* In order to test the effect of lax handling of environmental regulations on FDIs, the assumed relationship between FDIs and the lax handling of environmental regulations will be explained, followed by solutions to overcome the obstacles of the measurement of lax handling of environmental regulations. Finally, a mixed linear model with the inclusion of instrumental variables will be conducted.

3.1 Definition of the Relationship

Before presenting the developed hypothesis for the relationship between FDIs and environmental regulations, the already existing hypothesis from the literature will be explained in more detail. It is important to mention that this article has the following assumption: The used SO2 and CO2 emissions within the hypotheses represent the lax handling of environmental regulations. If a hypothesis states that higher emissions of a country will lead to a higher inflow of FDIs in that particular country, this means that higher emissions indicate lax handling of environmental regulations. This relationship works likewise the other direction, meaning that lower emissions indicate less lax regulations. Out of this, the independent variables of this model are the CO2 and SO2 emissions and the dependent variable are the FDI inflows of a particular country.

3.1.1 Pollution Haven Hypothesis

The pollution haven hypothesis states that multinational corporations (MNCs) deliberately look and try to exploit countries with lax environmental regulations for their investments. (Asghari, 2013). It is important to mention that these investments are focused on heavy polluting industries, which has the implication that countries with lenient regulations will tend to focus on polluting intensive industries in order to attract FDIs. Furthermore, developing countries may have the incentive to keep a lax dealing of environmental regulations, in order to continuously attract foreign investments to increase e.g. employment and financial stability. Since this article focuses on the emission-based measurement of lax handling of environmental regulations, the positive linear relationship of the pollution haven hypothesis will be expressed as the following:

H1: the higher the emissions of a country the higher the FDI inflow within a country

3.1.2 Pollution Halo Hypothesis

The pollution halo hypothesis has a different underlying assumption than the pollution haven hypothesis. Under this hypothesis it is believed that MNCs undertake FDIs in developing countries with the intention to transfer knowledge, management practices and technology which results in clean environment in the host country (Zarsky , 1999; Asghari, 2013). In addition, one of the underlying assumptions of this article is that environmental standards support FDI decisions in the long term. The reason for this assumption is that environmental standards may prevent FDIs in the first place (short term) because of higher associated costs (abatement costs). However, in order to have a long-term competitive advantage, it may be necessary to proof environmentally friendly productions and products, especially when focusing on sales in Europe and the U.S. In addition, financial institutions require the receiving parties to obey certain environmental regulations for granting credits. Consequently, the underlying assumption of this article views environmental regulations not as threat but rather as criteria for corporations to conduct business most effectively.

As one may notice this hypothesis is correlated to the Internalizing theory described in section 2.1.2 and the hypothesis, which will be tested, is assumed to have a negative linear relationship, which is expressed as the following:

H2: the higher the emissions of a country the lower the FDI inflow within a country

Before the model will be introduced and tested, it will be explained how the analysis of this paper will overcome the obstacles of the measurement of lax handling of environmental regulations.

3.2 Coping with the Obstacles in Measurement of lax Handling of Environmental Regulations

Among the 4 particular obstacles (multidimensionality, simultaneity, industrial composition, and capital vintage) of the measurement of the effect of lax handling of environmental regulations on FDIs, the problem of endogeneity respectively simultaneity and multidimensionality are among all the most important ones to be solved (Kozluk & Zippere, 2014; Kolstad & Xing, 2002; Brunel & Levinson, 2013). In order to circumvent the problem of simultaneity, the model used within this article will follow the principle of the analysis conducted by Kolstad and Xing from 2002. The authors have introduced instrumental variables to the model, which are correlated to the laxity of environmental regulations, however are uncorrelated to the measurement of FDIs (Brunel & Levinson, 2013). In particular these instrument variables are infant mortality rate and population density. By introducing instrument variables, the quality of the analysis will be improved. Regarding the problem of multidimensionality, which refers to the problem that in general regulations are restricted to particular areas (air, water, etc.) and therefore are not easy to be compared, this paper will introduce an additional emission variable (CO2) to the model. Even if this new CO2 variable represents also only a particular area of environmental regulations, introducing this variable to the model can reduce the problem of the multidimensionality.

3.3 The Modeling FDI by Laxity

The relevant data for this analysis and more specifically the FDI inflows (dependent variable), the CO2 emissions (independent variable) and the other control variables except the corporate tax rates have been obtained from the World Bank database. The second independent variable, SO2 emissions, have been obtained from the Nasa Earth data platform. The missing data of corporate tax rates has been collected through a KPMG Asia report of 2007.

The sample size for this analysis is based on the work of Yuquing Xing and Charles D. Kolstad in 2002. After they could provide significant insights into the laxity of environmental regulations on FDIs of several US industries, it seems to be acceptable to have a sample size of 22 countries including countries from Asia, Europe and North America. However, in contrast to the work of Xing and Kolstad this paper will not focus only on two different years, the paper will analyze the period from 2000 to 2005.

Before the actual effect of environmental regulations on foreign direct investments will be ascertained, it will be interesting to verify, how reliable the variables of the model are in explaining the laxity of environmental regulations. In contrast to the analysis of Kolstad and Xing (2002), this article will also introduce the CO2 emission variable to the model in order to verify whether the laxity of environmental regulations can be also explained using this kind of emission. The reason for this choice is based on the limitation indicated within the article of Kolstad Xing (2002), that SO2 emissions alone reflect lax handling of environmental regulations only in a narrow category. Therefore, the model used within this article will also introduce CO2 emissions. However, it is also important to mention that the model used within this paper is slightly different to the model of Kolstad and Xing. While Kolstad and Xing focused on analyzing the FDI outflows of US industries into the selected 22 countries, this article tries to elaborate how the lax handling of environmental regulations determines the FDI inflows of a particular country. The only difference between the scale of Kolstad and Xing and the scale of this paper is that the FDI inflow by country is the dependent variable compared to the FDI outflow of US industries, which has been used by Kolstad and Xing.

In total 9 variables (GDP per capita, SO2 emissions by country, Total Population by country, Population Density by country, Industry Share by county, Infant mortality rate by country, Corporate Tax rate by country, Hydropower capacity by country and Gross National Income by country) are included within the scale of the analysis. In contrast to the work of Kolstad and Xing, this paper will also test the scale used by Kolstad and Xing, in order to validate, whether the scale selected by Kolstad and Xing expresses the lax handling of environmental regulations effectively. In order to test the scales, the reliability test of Cronbach's alpha will be used. Moreover, within this paper three different scales will be provided, with the first scale including the same variables as in the analysis of Kolstad and Xing (equation 1). The second scale will be an "optimized scale" based on the corrected item – total correlation, which will include only those variables that result in the most efficient Cronbach's alpha (equation 2). The third scale will also include the additional CO2 variable (equation 3). The reason for these three different scales is, that this paper tries also to provide the most efficient measurement of environmental laxity by conducting reliability tests, which was missing in the analysis of Kolstad and Xing.

$$(1)\ I_i = \beta_O + \beta_T T_i + \beta_P P_i + \beta_E \ln S_i - \alpha\beta_E \ln G_i - \alpha_E\beta_E \ln HPC_i + \alpha\beta PD_i + \alpha\beta TP_i + \alpha\beta IM_i - \alpha_R\beta_E R_i + \varepsilon_i$$

$$(2)\ I_i = \beta_O + \beta_T T_i + \beta_E \ln S_i - \alpha_E\beta_E \ln HPC_i + \alpha\beta IM + \varepsilon_i$$

$$(3)\ I_i = \beta_O + \beta_T T_i + \beta_P P_i + \beta_E \ln C_i - \alpha_R\beta_E R_i + \varepsilon_i$$

Within these equations, I_i refers to the FDI inflow of a particular country. $\beta_T T_i$ refers to corporate tax rates within a country, $\beta_P P_i$ indicates the GDP per capita of a country, $\beta_E \ln S_i$ and $\beta_E \ln C_i$ are the SO2 respectively CO2 emissions by country. $\alpha\beta_E \ln G_i$ is the Gross National Income by country and $\alpha_E\beta_E \ln HPC_i$ is the hydropower capacity by country, $\alpha\beta PD_i$ and $\alpha\beta IM_i$ are the instrumental variables population density and infant mortality rate by country. The $\alpha\beta TP_i$ refers to the total population and finally $\alpha_R\beta_E R_i$ indicates the industry share within a country. For an complete overview of the variables used within the analysis of this paper see Table 1 in the appendix.

3.3.1 The Reliability of the Variables

For the reliability test of the first scale, the scale of Kolstad and Xing referred to as 'original scale', it is surprising to note that Cronbach's alpha of only 0.04 was obtained when analyzing the selected 9 variables of Kolstad and Xing. Since an acceptable value of Cronbach's alpha is between 0.6 and 0.7, the obtained value of the 'original scale' is not very strong in expressing lax handling of environmental regulation. According to Cronbach's alpha there would be a better alternative for the expression of the laxity of environmental regulations.

The second scale referred to as 'optimized scale' consisting of 5 variables (SO2 emissions, Total Population, Infant Mortality, Corporate Tax, Hydropower capacity), resulted in a Cronbach's alpha of 0.63. Since this value is between 0.6 and 0.7, this optimized scale is a better alternative in explaining the laxity of environmental regulations than the scale used by Kolstad and Xing.

For the third scale referred to as 'modified scale' consisting of 4 variables (GDP per country, CO2 emissions, Industry Share by country, Corporate Tax rates per country), Cronbach's alpha of 0.63 was obtained. Surprisingly this acceptable value of Cronbach's alpha was only obtained when removing the instrumental variables infant mortality and population density. However, it is also important to mention that Cronbach's alpha has increased by 0.40, when the SO2 emission variable was removed from the scale, which was used by Kolstad and Xing. Consequently, it seems to be the case that the SO2 emission variable may be not the best for measuring the lax handling of environmental regulations. Nevertheless, this paper will use all three different scales for the estimation of the effect of the laxity on FDIs.

3.3.2 Analysis of the Effect of lax Handling of Environmental Regulations on FDIs

After it has been clarified that different scales consisting of different variable constellation may result in different outcomes for the impact of lax handling of environmental regulations on FDI inflows, it is interesting to verify what actual effect the lax handling of environmental regulations has on FDI inflows. In order to test this, an OLS estimator will not be consistent and efficient for the analysis (Kolstad & Xing, 2002). The reason for this is that the due to the problem of simultaneity the

emission (CO2 and SO2) are simultaneously correlated to the error term and to the FDI inflow. In order to circumvent this problem Kolstad and Xing (2002) have introduced instrumental variables to the model.

However, this article will not only introduce the same variables to the model, it will likewise use a different method of measurement. In order to analyze the impact of laxity of environmental regulation on FDI inflows, this article will use a mixed linear model. There are two main assumptions, which need to be fulfilled for the mixed linear model. The first assumption is that there has to be a linear relationship. This assumption seems to be fulfilled, since there are no indicators for an exponential relationship. Furthermore, this method has the assumption of the nearly normal condition. In order to verify whether this condition is fulfilled, a Shapiro – Wilk test will be considered. The test was done for the laxity variables over all years. The results of the Shapiro – Wilk test indicates that the 'original scale' is insignificant ($SW_{(21)}$ = 0.99; p = 1.00). The same result was obtained for the 'modified scale' ($SW_{(21}$ = 0.98; p = 0.83). For the 'optimized scale' a significant relationship was obtained, which indicates that the data is not normally distributed ($SW_{(21)}$ = 0.77; p = 0.00). However, the literature indicates that the normality of residuals does not affect the parameter estimates in multilevel models (Gelman & Hill, 2007). Therefore, it seems to be acceptable to proceed with the mixed linear model. There are two emerging benefits with this method. First, by using a mixed linear model, it is possible to observe the impact of environmental regulation's laxity on FDI inflows over multiple years. In comparison to the simple OLS method, in which one can see the effect of laxity on the FDI inflow for a single year, the mixed linear model provides the opportunity to undertake an analysis for multiple years. This is important because otherwise when using an OLS estimator one may find significant results for few single years, which is not consistent to make valid statements about the interaction between FDI inflows and environmental regulations' laxity. Furthermore, the mixed linear model provides the possibility to identify the explanatory power of every single variable included in the scale of the laxity of environmental regulations. This is likewise a valid outcome of this method, because this allows one to see which variables within the model have significant relationships with FDI inflows of countries.

4. RESULTS

The results of this paper will be divided into two sections. The first section will cover the impact of lax handling of environmental regulations on FDI inflows by considering the three different selected scales. The second section will provide the results of the explanatory power of every single variable selected within the three scales. The results of the mixed linear model will be evaluated following the analysis of Hadi Alhorr, Curt Moore, Tyge Payne, (2008). For a complete overview of the results of the analyses see Table 2 in the appendix.

4.1 Lax Handling of Environmental Regulations as a Determinant of FDIs

In analyzing the relationship between lax handling of environmental regulations on FDI inflows, the 'original scale' used by Kolstad and Xing has been proven as positive significant (F(1;52.28) = 4.67; p < .04). This is a surprising result, because the initial implemented reliability test of Cronbach's alpha has indicated a weak expression of lax handling of environmental regulations when using the 'original scale'. Nevertheless, a positive significant relationship (B= 0.09; SE_B = 0.19; p < .05) has been obtained, which would imply the higher the lax handling of environmental regulations within a country, the higher the FDI inflow within this country. In other words, if there is a lax handling of environmental regulations within a country, the respective FDI inflow will be higher, compared to less lax handling of environmental regulations. Recalling the pollution haven hypothesis, corporations investing in sites with weak environmental regulations would explain the results obtained from the analysis of the linear mixed model.

The obtained results for the 'optimized' and 'modified' scales of the analysis are likewise surprising as the results of the 'original scale'. For the 'optimized scale' a statistical insignificant relationship has been found (F(1;89.87) = 0.39; p = .53) (B = - 0.8; SE_B = 0.15). Similar results have been obtained for the 'modified scale' which were likewise insignificance (F(1;49.23) = 0.58; p = .81) (B = - 0.12; SE_B = 0.15).

For both scales, the 'optimized' and 'modified', there was no significant result out of the analysis of the linear mixed model. This is a surprising result, because according to the Cronbach's alpha values, the 'optimized scale' with a value of 0.63 and the 'modified scale' with a value of 0.63 are indicating that these scales are appropriate in expressing a country's lax handling of environmental regulations. Nevertheless, no significant relationship has been found for these two scales. However, the 'optimized' and 'modified' scales still provide useful insights when looking at each variable individually.

4.2 Influencing Variables

The second part of the analysis verifies the explanatory power of every individual variable regarding FDI inflows. When looking at each variable individually, the impact of these variables differs across the three different scales ('original', 'optimized', 'modified'). Therefore it might be the case that variables within one scale have been proven as significant, while the same variables within a different scale have been found as insignificant. Furthermore, even if some variables have not been found to be significant, this does not mean that there is no relationship between this particular variable and the FDI inflow of a country. Some variables have resulted in marginal trends, which will be likewise reported. For a complete overview of the relationships between the individual selected variables among the three different scales see Table 2 within the appendix.

An important finding within the 'original scale' was the statistical significance of the Gross National Income (GNI) (F (1;29.32) = 8.34; p = .007). This means that GNI has been proven as very positive significantly correlated to the FDI inflow within the 'original scale' and consequently a higher GNI within a country is associated with a proportional higher FDI inflow (B = 1.09; SE_B = 0.38). Furthermore, statistical significant results have been obtained for the variables GDP per capita and population density. For GDP per capita a negative significant relationship has been obtained (F (1;70.33) = 4.08; p = .05) (B = - 0.37; SE_B = 0.18). For the relationship between lax handling of environmental regulations and FDIs, this means that a higher FDI inflow is associated with a lower GDP per capita. Regarding the population density a negative significant relationship has been observed (F (1;16.06) = 5.82; p = .03) (B = -0.412; SEB = 0.17), indicating that a higher population density is related to a lower FDI inflow.

Additionally, a marginal trend can be seen on the example of hydropower capacity. Within the 'original scale', hydropower capacity's relationship towards the FDI inflow of a country has been proven as a negative marginal trend (F (1;14.87) = 3.28; p< .09)(B = - 0.27; SE_B = 0.15). This means that a higher FDI inflow is associated with a low hydropower capacity.

Within the 'optimized scale' no statistical significant results have been obtained. However, a negative marginal trend for infant mortality rate on FDI inflows has been observed (F (1;15.08) = 3.15; p = .09) (B = - 0.59; SE_B = 0.33). This trend indicates that a proportional higher FDI inflow is expected with a decreasing mortality rate. All other variables within the 'optimized scale' have not provided any marginal trends or statistical significance.

Finally, within the 'modified scale' no statistical significance or marginal trends have been observed except for industry share. According to the results, industry share seems to have a negative marginal trend (F(1/24.55) = 3.29; p = .08)(B = - 0.30; SE_B = 0.17). This would mean that a smaller industry share is related to higher FDI inflows.

Even if these marginal trends indicate that certain variables are not significantly correlated to FDI inflows, these variables still indicate a direction and it would not be surprising if these variables will be proven as significant using different scales for the analysis.

5. CONCLUSION & DISCUSSION

This paper analyzed the potential effect of lax handling of environmental regulations on FDIs. By doing this, the following research question has been established: *To what extent can lax handling of environmental regulations be seen as a determinant of FDIs?* In order to test the relationship between FDIs and lax handling of environmental regulations, it was required to come up with a proxy variable expressing the lax handling of environmental regulations. Consequently, this paper established three different proxy variables for the expression of the laxity of environmental regulations. The results show that the "original scale" established by Kolstad and Xing (2002) is negative significantly correlated to the FDI inflow of the selected country sample of 22 countries. Therefore, the research question can be answered in the following way.

Since there is a significant relationship between FDIs and lax handling of environmental regulations, one can conclude that lax handling of environmental regulations is indeed a determinant of FDIs.

The reason for this is that the negative and significant relationship between FDIs and lax handling of environmental regulations can be explained with the pollution haven hypothesis, which states that corporations deliberately look for host countries with lax handling of environmental regulations. On the other hand the pollution halo hypothesis can be rejected, because the underlying mechanism assumes that less lax handling of environmental regulations would lead to a proportional higher FDI inflow. Since the results indicate a negative relationship, it seems predominantly important for corporations to select sites for their investments with lax handling of environmental regulations. Consequently, environmental regulations are still treated as a kind of threat for corporations and the results of this paper coincide with the findings of Kolstad and Xing of 2002. Therefore, the implication for financial managers is to include the determinant of lax handling of environmental regulations when considering new production sites for an investment. Operating within a heavy polluting industry, it would be even more important to focus on countries with lax handling of environmental regulations. Nevertheless, the practical implications are not limited to organizations. Especially for policy makers it can be important to include lax handling of environmental regulations within their policy creation. Since the results indicate that lax handling of environmental regulations favors FDI inflows, especially policy makers from developing countries could use this information for their policy creation. In particular, if a policy maker wants to stimulate FDI inflows in order to promote economic development, it could be an advice to keep the handling of environmental regulations as lax as possible.

When considering the results of the individual variables selected within the three different scales, it is important to discuss the underlying reasoning for the existence of these relationships. Since a positive significant result has been obtained for the variable GNI, indicating that higher GNI is associated with a higher FDI inflow, it is important to recall the FDI determinant of labor costs. Within the literature there is no consistent view about the effect of labor costs on FDIs. A possible reason for this positive relationship between GNI and FDIs could be that in the case of developed countries other determinants than labor costs are more important, which would result in a positive relationship between GNI and FDIs.

For the finding of the negative significant relationship between FDIs and GDP per capita, one should recall the determinants of growth rate and market size of FDIs. In general for both determinants a positive significant relationship has been observed. Since within the results of this paper GDP per capita is negatively correlated to FDI inflows, a possible explanatory reason could be that lower GDP per capita could be associated with potential higher growth rates, which in turn would favor FDI inflows.

The marginal trend of the infant mortality rate on FDI inflows can be explained when recalling the determinant of labor costs for FDIs. Since high mortality rates are associated with low habitat conditions and low habitat conditions are related to lower income, the negative marginal trend of the infant mortality rate can be explained by the determinant of labor costs. Since low labor costs indicate a proportional lower habitat condition, a proportional higher FDI inflow is associated with a lower infant mortality rate.

The results of the negative marginal trend of industry share on FDIs can be explained likewise the effect of GDP per capita on FDIs. Since the negative marginal trend of industry share indicates that a lower industry share is experienced with a higher FDI inflow, a possible explanation for the negative marginal trend of industry share is that due to the low industry share potential high growth rates can be expected in a particular country, which would favor a higher FDI inflow.

In order to explain the obtained negative significant relationship of the population density, it is important to call to mind the determinant of infrastructure and corporate taxes, respectively the interaction effect of both on FDIs. The assumption is that a low population density results in less people living within a particular region, which simultaneously require fewer infrastructures than for countries with higher population densities. Given this fact, this would mean a country with a low population density results in low infrastructure, which could be experienced with a low FDI inflow. However, the relationship,

which has been obtained within the results of this paper, is negative. The only explanation for this case is the interaction effect between infrastructure and corporate taxes. Corporations accept higher taxes if infrastructures are low, because then the corporation would expect that the government of that particular country is able to build up the infrastructure themself. If one includes the effect of corporate taxes in this case, it would mean that a country with low population density has low a infrastructure but high corporate taxes, which then would results in a proportional higher FDI inflow.

Finally the negative marginal trend for the hydropower capacity can be explained when recalling the pollution haven hypothesis. Since the hydropower capacity indicates the percentage of electricity produced by a hydroelectric power plant, this means that FDI inflows are proportionally higher in countries in which electricity is mainly produced by fossil fuels. When reconsidering the pollution haven hypothesis, in which corporations look deliberately for countries with lax handling of environmental regulations, a country with a higher electricity production out of fossil fuels and therefore less electricity from hydroelectric power plants would be associated with higher FDI inflows.

Since this article has tried to analyze the impact of lax handling of environmental regulations on FDIs, there is simultaneously a limitation, which appears. With the decision to use an emission-based measurement for the effect of lax handling of environmental regulations on FDIs, it is not possible to make statements about the effect of environmental regulations. Emissions only refer to the application of environmental regulations, however, do not refer to the regulations themselves.

Regarding future research within this topic, it is recommended to include other emission or waste variables, in order to improve the proxy variable of environmental regulations. This is important because even if this paper could provide significant results when using SO2 emissions to express the lax handling of environmental regulations within a country, SO2 emissions in general only represent a small area of environmental regulations due to the obstacle of multidimensionality. In other words future research projects should come up with new scales as a proxy variable for lax handling of environmental regulations, in order to be able to test whether there are stronger proxy variables for the expression of the lax handling of environmental regulations.

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Appendix A: Table 1: Overview of Variables

Variable	Description	Label
Corporate Tax rate (control variable)	The corporate tax rates are expressed by the average corporate tax rates within a particular country.	$\beta_T T_i$
Industry Share (control variable)	The industry share is expressed by the % of GDP and comprises value added in mining, manufacturing (also reported as a separate subgroup), construction, electricity, water, and gas.	$\alpha_R \beta_E R_i$
Population (control variable)	Is expressed by the total number of population of a particular country.	$\alpha\beta TP$
Hydropower capacity (control variable)	Hydropower refers to electricity produced by hydroelectric power plants.	$\alpha_E \beta_E \ln HPC_i$
Population Density (instrumental variable)	Population density is midyear population divided by land area in square kilometers. Population is based on the de facto definition of population, which counts all residents regardless of legal status or citizenship--except for refugees not permanently settled in the country of asylum, who are generally considered part of the population of their country of origin. Land area is a country's total area, excluding area under inland water bodies, national claims to continental shelf, and exclusive economic zones. In most cases the definition of inland water bodies includes major rivers and lakes.	$\alpha\beta PD_i$
Infant Mortality Rate (instrumental variable)	Infant mortality rate is the number of infants dying before reaching one year of age, per 1,000 live births in a given year.	$\alpha\beta IM$
Gross National Income (control variable)	GNI per capita based on purchasing power parity (PPP). PPP GNI is gross national income (GNI) converted to international dollars using purchasing power parity rates. An international dollar has the same purchasing power over GNI as a U.S. dollar has in the United States. GNI is the sum of value added by all resident producers plus any product taxes (less subsidies) not included in the valuation of output plus net receipts of primary income (compensation of employees and property income) from abroad. Data are in current international dollars based on the 2011 ICP round.	$\alpha\beta_E \ln G_i$

FDI inflow (dependent variable)	Foreign direct investment are the net inflows of investment to acquire a lasting management interest (10 percent or more of voting stock) in an enterprise operating in an economy other than that of the investor. This variable shows net inflows (new investment inflows less disinvestment) in the reporting economy from foreign investors. Data are in current U.S. dollars.	I_i
GDP per capita (control variable)	GDP per capita is gross domestic product divided by midyear population	$\beta_P P_i$
SO2 Emissions (independent variable)	Total emissions of SO2 from 2000 - 2011 by geographic entity; Gigagrams SO2	$\beta_E \ln S_i$
CO2 Emissions (independent variable)	Carbon dioxide emissions are those stemming from the burning of fossil fuels and the manufacture of cement. They include carbon dioxide produced during consumption of solid, liquid, and gas fuels and gas flaring.	$\beta_E \ln C_i$

Appendix B: Table 2: Results of the Mixed Linear Model

	Original Scale			Optimized Scale			Modified Scale		
	F	**df1/df2**	**β(SE $_{\beta}$)**	**F**	**df1/df2**	**β(SE $_{\beta}$)**	**F**	**df1/df2**	**β(SE $_{\beta}$)**
Intercept	4.67	1/17.07	-0.08(0.13)	0.32	1/20.36	-0.08(0.15)	0.63	1/15.80	-0.12(0.15)
CO^2 Emissions							1.63	1/31.60	0.23(0.18)
SO^2 Emissions	0.13	1/98.62	-0.07(0.57)	0.05	1/101.69	0.04(0.58)			
GDP per capita	4.08	1/70.33	-0.37(0.18)*				0.83	1/41.83	-0.13(0.15)
Total Population	0.65	1/17.32	1.29(1.59)	0.44	1/19.79	1.18(1.78)			
Population Density	5.82	1/17.32	-0.41(0.17)*						
Industry Share	0.02	1/20.64	-0.02(0.18)				3.29	1/24.55	-0.30(0.17)$^{+}$
Infant Mortality Rate	0.54	1/15.19	0.34(0.46)	3.15	1/15.08	-0.59(0.33)$^{+}$			
Corporate Tax Rate	0.21	1/56.39	-0.06(0.13)	0.16	1/53.28	-0.05(0.13)	0.49	1/45.59	-0.09(0.12)
Hydropower Capacity	3.28	1/14.87	-0.27(0.15)$^{+}$	0.89	1/18.25	-0.14(0.15)			
Gross National Income	8.34	1/29.32	1.09(0.38)**						
-2Log L		210.188*			213.202			212.847	

Note: Significanct *p<.05 **p<0.01

Marginal $^{+}$p<0.10

a. The variable FDI inflow is the dependent variable in the analysis of this paper and was obtained from the Worldbank Database.
b. The variables CO2 emissions, SO2 emissions, GDP per capita, Total Population, Population Density, Industry Share, Infant Mortality rate, Corporate Tax Rate, Hydropower capacity, and Gross National Income represent the independent variables for the analysis of this paper. The data for this analysis has been obtained mainly from the World Bank database except the SO2 emissions and Corporate Tax rates, which haven been obtained from the Nasa Earth data platform and through the KPMG Asia report of 2007.
c. For the analysis a sample size of 22 countries including 5 developing countries and 17 industrial countries.

Appendix C: Table 3: Annual descriptives of variables

	Year					
	2000	2001	2002	2003	2004	2005
	M(SD)	M(SD)	M(SD)	M(SD)	M(SD)	M(SD)
FDI inflow	2.83(4.57)	1.80(1.80)	1.73(1.78)	1.50(1.39)	1.21(1.89)	4.04(5.82)
CO2 Emissions	7.66(3.87)	7.74(3.80)	7.70(3.66)	7.68(3.67)	7.70(3.59)	7.69(3.53)
SO2 Emissions	1655.01(4548.41)	1772.50(4669.05)	1815.91(4942.50)	732.59(1228.49)	2079.91(6300.05)	2198.14(6933.38)
GDP per capita	18321.70(11438.97)	16902.87(1155.59)	18113.78(12242.73)	21674.64(14670.27)	24657.73(16588.39)	27551.45(16460.75)
Total Population	138702231(331422593)	140163942(335084572)	141597165(338644844)	142998063(342110325)	144364929(345499887)	145704330(348852454)
Population Density	455.32(1248.66)	464.15(1283.28)	466.03(1285.30)	458.42(1243.32)	462.34(1255.38)	470.09(1285.64)
Industry Share	31.66(7.16)	31.20(6.93)	30.93(7.01)	30.72(7.36)	30.83(7.65)	30.66(7.64)
Infant Mortality Rate	10.76(14.71)	10.40(14.18)	9.59(13.17)	9.59(13.17)	9.22(12.68)	8.87(12.68)
Corporate Tax Rate	0.34(0.07)	0.33(0.06)	0.32(0.06)	0.32(0.06)	0.32(0.06)	0.30(0.06)
Hydropower Capacity	18.00(21.37)	17.85(20.75)	16.13(20.18)	16.36(18.96)	15.83(18.79)	15.13(19.40)
Gross National Income	22178.18(10823.03)	22843.64(10875.68)	24655.00(11548.06)	24655.00(11548.05)	25929.09(1292.67)	27220.91(12689.38)