THE IMPACT OF BILATERAL INVESTMENT TREATIES ON FOREIGN DIRECT INVESTMENT IN SWITZERLAND

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Abstract

This study examines the impact of bilateral investment treaties (BITs) on Swiss foreign direct investment (FDI). It also investigates the role of BITs as protective tools of Swiss investment. This paper is based on secondary data analysis; data is obtained from various official entities. This study uses statistical and machine learning techniques in order to detect meaningful relationships between BITs and FDI flows. Our findings suggest that the implementation of BITs have an insignificant impact on the increase of Swiss FDI flows. However, from our examination, two interesting findings have emerged suggesting that the completion of BITs may have an impact on the increase of political stability and rule of law of partner countries.

Resumen

Este estudio examina el impacto de los tratados bilaterales de inversión (TBI) de la inversión extranjera directa suizo (IED). También indaga el papel de los TBI como herramientas de protección de inversiones. Esta investigación se basa en análisis de datos secundarios, los datos son obtenidos de diversas entidades oficiales. Este estudio utiliza técnicas de aprendizaje estadístico con el fin de detectar relaciones significativas entre los TBI y los flujos de IED. Nuestros resultados sugieren que la implementación de tratados bilaterales de inversión tiene un impacto insignificante en el aumento de IED suizos. Sin embargo, desde nuestro examen, dos hallazgos interesantes han surgido, proponiendo que los TBI pueden tener un impacto en el aumento de la estabilidad política y el estado de derecho de los países asociados.

JEL Classification: F21, F23, F29
Keywords: International Investment Treaties, Bilateral Investment Agreements, Double Taxation Treaties, Foreign Direct Investment, Institutional Environmental Features

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1. Introduction

In the era of globalization, bilateral investment treaties have become a remarkable global phenomenon. These legal instruments have dominated the international investment scenario, about 92 percent of the total international investment agreements signed over the last past decade were BITs (UNCTAD, 2013a). Bilateral investment treaties are the building blocks of international law concerned with foreign investment (UNCTAD, 2007). Although such treaties represent a fundamental assistance in the process of the global economic integration (Schill, 2011), the role of BITs are scrutinized for their impact over foreign direct investment flows (Salacuse and Sullivan, 2005).

The unprecedented surge of the number of bilateral investment treaties signed in recent years has impelled an intense debate in which the core of the discussion is whether such agreements facilitate investment. While some scholarly research advocate the significance of BITs on the impact of FDI flows, other studies counteract this proposition suggesting that BITs are limited to their primary role, which is investment protection and the impact of BITs over FDI flows is *insignificant.* Some other studies have also indicated that BITs primary aim is to act as substitutes to the fragile institutional environment of host countries. This scholarly divergence encourages further investigation on this topic.

Switzerland is one of the foremost countries signing BITs together with Germany and China (Sachs and Sauvant, 2009). It is also one of the largest European investors, after Germany and France (UNCTAD, 2011). Furthermore, this small European country has established itself as one of the most attractive locations for FDI, scoring number eight in the world among the world's most attractive locations for FDI (Global Opportunity Index - Attracting Foreign Investment, 2013). Given Switzerland's position of an active player in the international investment scenario, examining the impact that BITs have over Swiss FDI is an interesting study to conduct. This study contributes to the on-going debate and to the literature in this area of research.

The remainder of this paper is organized as follows: section 2 introduces the conceptual background of bilateral investment agreements. Section 3 presents an overview of related literature in this topic of research, section 4 describes Swiss foreign direct investments and BITs completed as June 2013. Section 5 presents the way the data has been prepared and specifies the methodology utilized in this study. Section 6 presents the result of our study, while section 7 discusses the results of this investigation and section 8 closes with the main conclusions of this study.

2. Conceptual Background

The rapid expansion of the financial volume has accentuated the significance of private capital flows safeguard (Rios-Morales it et al., 2013). BITs most important aim is the protection of invested capital in foreign countries. However, with the rapid surge of the number of these legal instruments in recent years, certain change has taken place in the traditional norms and regulations of BITs. These agreements have wider impacts on the economy of host countries (UNCTAD, 2007). As the global economy continues to integrate, the traditional

concept of BITs has evolved; nowadays, bilateral investment treaties are defined as follows:

"Bilateral investment treaties (BITs) are agreements between two countries for the reciprocal encouragement, promotion and protection of investments in each other's territories by companies based in either country. Treaties typically cover the following areas: scope and definition of investment, admission and establishment, national treatment, most-favoured-nation treatment, fair and equitable treatment, compensation in the event of expropriation or damage to the investment, guarantees of free transfers of funds, and dispute settlement mechanisms, both state-state and investor-state"(UNCTAD, 17 August 2004, 16:13).

By defining bilateral investment treaties, the understanding of the scope and applicability of such legal instruments over international investment would be more comprehensible. However, another key term associated to BITs that needs to be defined is the term *"investment"*. This term is at the core of these treaties and receives an important place in the appreciation of these agreements, in some treaties *"investment"* refers to *"every kind of asset"* and in other BITs it refers only to foreign investment. According to UNCTAD (2007), most BITs concluded utilizing the traditional "asset-based" definition, while some agreements have included a list of clarifications; aiming to expound the term "investment".

For the past decade, a growing body of literature on the subject of international investment treaties and their impact on FDI has emerged. BITs have rapidly increased as many countries have welcomed the protection of foreign investment through the completion of these treaties. The following section gathers and examines a number of studies conducted on this subject matter, reflecting to balance the findings of these studies.

3. Related Literature

The significant increase of the number of international investment agreements (IIAs) signed over the last decades has been impelled a large and growing body of academic literature, echoing the significance of the topic of international investment. A robust stream of research is found particularly in the field of international investment law, covering the international legal aspects related to the protection of foreign investment (Schill, 2011); whilst scholarly research is more scarce in the fields of international business and economics (Hallward-Driemeier, 2003; Neumayer and Spess, 2005). The existing international investment law literature is marked by the depiction of the transformation of the international investment scene over the last decades (Hallward-Driemeier, 2003). This change is highly correlated to the transformation in the nature of trans-border economic activity of firms worldwide (Van Harten, 2008). Nowadays, international law has become significant in the course of the development of international business; bestowing protection to foreign capital (Schill, 2011).

The protection of foreign capital dates back to the colonial times. Then, international investment agreements not only provided protection for foreign investment, but also required host countries to respect property of foreign investors (Brownlie, 1998; Vandevelde, 2005). However, in recent years,

there has been large increase of international investment treaties disputes; a number of foreign investors had commenced arbitrations against states, claiming to have been unfairly treated (Barrett-Brown, 1995; Van Harten, 2008). Today, international investment treaties disputes are not longer settled diplomatic means, but settlements are handled in investment treaty tribunals (Schill, 2009). The main purpose of this lawful instrument is to guarantee investors that their invested capital is legally protected from expropriation under international law (Baldi, 2013). Nowadays, bilateral investment agreements and double tax treaties (DTTs) are the two principal international investment agreements (IIAs) (Sachs and Sauvant, 2009). BITs provide legal protection for the capital of foreign investors, endowing foreign investors with a secure legal environment (UNCTAD, 2007); while, double taxation agreements lessen or eliminate double taxation (Neumayer, 2006).

In the fields of international business and economics, the unprecedented surge of FDI has incited a fascinating debate among scholars concerning the impact of BITs over the increase of FDI flows. Although there is a universal acceptance that bilateral investment treaties play an important role in seeking to protect FDI, the debate relates to whether BITs influence the increase of FDI flows. One perspective of the debate advocates that BITs have an impact over the increase of FDI flows (Sachs and Sauvant, 2009), whilst the other perspective is more apprehensive to the positive effects and contributions of BITs over the increase of foreign investment flows. Scholarly research carried-out supports both perspectives. For instance, the study carried out by Neumayer and Spess (2005) suggests that BITs increase the inflows of FDI into developing countries. Similar results were revealed by Salacuse and Sullivan (2005); their findings show that FDI increases when developing countries concluded BITs with OECD countries. Whereas other studies have supported the other perspective in that the impact of BITs on FDI inflows is irrelevant, suggesting that FDI flows are subject to several political, regulatory and economic factors (Sachs and Sauvant, 2009). For instance, the study conducted by Hallward-Driemeier (2003) found that BITs have low impact on FDI. Akhtar and Weiss (2013) suggest that BITs seem to act more as substitutes to the fragile institutional environment of host countries. Some other studies have found low correlation between the conclusions of BITs and increase of FDI inflows (UNCTAD, 1998).

In addition to this scholarly divergence, Wells and Ahmed (2007) state that the rapid rate at which BITs had been concluded throughout the World do not match the effectiveness and mechanism for the protection of investors' rights. Nevertheless, some other research suggests that beside BITs, a number of economic and political factors seem to be the most significant determinates that influence investors' decisions (Schneider and Frey, 1985; Brada et al, 2005). Although it is widely acknowledged that investors place their capital in countries with stable political environment; however, nowadays, despite political instability, investors will invest in countries, where the ratio of benefit is higher than the risk (Rios-Morales et. al, 2009). Nonetheless, BITs reduce the risk of nationalization without proper compensation (Büthe and Milner, 2008).

While the debate goes on, BITs continue to dominate the international investment policy making. By the end of 2011, out of the 3,100 international investment agreements, 2,860 were BITs (UNCTAD, 2013b). During the ongoing economic and financial crisis, it has been observed that most FDI have been covered by international investment treaties. It has been acknowledged that BITs rank among the most important pillars in international law on foreign investment (UNCTAD, 2007). However, it also can be observed that many countries have received FDI without the conclusion of BITs, while other countries have signed BITs and yet have received only moderate inflows of FDI (Hallward-Driemeier, 2003). Although, traditionally the vast majority of BITs has been concluded between developed and developing countries, an increasing number of BITs are signed between developing countries (UNCTAD, 2008). Foremost countries in the world completing BITs are Germany, China and Switzerland (Sachs and Sauvant, 2009). Over the last decades, Switzerland has played an active role in the international investment scenario. Switzerland is also one of the largest European investors and is host of some of the largest foreign investors in the world (UNCTAD, 2011). According to the Global Opportunity Index - Attracting Foreign Investment (2013), Switzerland is among the top ten most attractive locations for FDI. In this index, Switzerland ranks eight among the 98 countries considered in this study. Foreign direct investment is an important component of the Swiss economy (Gugler and Tinguely, 2010).

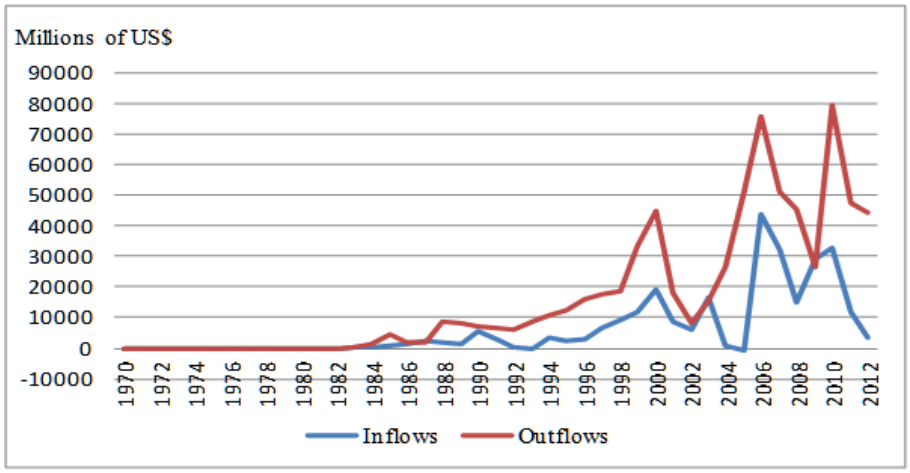
4. FDI, BITs and Switzerland

In the last decades, FDI has been central to economic development policies of many countries due to the outstanding contribution that FDI could have in the economies of host countries. It has been acknowledged that FDI has a large multiplier effect in the economy of host countries (IMF, 2003) and that foreign investment is an important driver of economic growth and poverty reduction (UNECE, 2005). The extraordinary surge of FDI worldwide has commenced in the 1990s with the liberalization of the foreign direct investment regulatory framework that has encouraged the increase of foreign investment worldwide (UNCTAD, 2013b). This rapid expansion of FDI inflows has been accompanied by strong competition to attract foreign investment among countries, using different means to make a country an attractive location for FDI (Blomström, 2001). It has been acknowledged that among the most important strategies utilized in attracting international investment in recent years have been international investment agreements (UNCTAD, 2007).

Switzerland has positioned itself as an attractive market location for FDI (Gugler and Tinguely, 2010). Much of this successful achievement in attracting FDI has been attributed to this country's innovation-focused policy strategies and policy dynamics (World Bank, 2012). Switzerland has an outstanding capacity for innovation and a very sophisticated business culture, which is reinforced by strong intellectual property protection and government support (World Economic Forum, 2011). In addition, Switzerland's stable economic, social and political environment have been important determinates to draw foreign investment (Rios-Morales *et. al,* 2013). In Figure 1, we observe that Switzerland had started to receive FDI in the early 1980s; the evolution of the inflows of FDI had been volatile and subject to the world economic and

financial trends. Figure 1 also depicts Switzerland as an important foreign investor; outflow of FDI have been significantly larger than the inflows of FDI received. Unlike its other European counterparts such as France, Germany, the United Kingdom and Holland, that have a long established record of receiving investment and investing in the world, Switzerland had only positioned itself as an attractive location for FDI and as a global investor in the early 1980s (UNCTAD, 2013a).

Figure 1. Switzerland's Inflows and Outflows of FDI, 1970-2012



Source: UNCTAD (2013b), FDI/TNC database (www.unctad.org/fdistatistics)

As of June 2013, Switzerland had 117 bilateral investment treaties completed, placing this country in one of the foremost nations with the number of signed BITs. The institution responsible for negotiating and signing these treaties is the State Secretariat for Economic Affairs (SECO formerly known as "Bundesamts für Aussenwirtschaft", BAWI). This institution aims to ensure that Swiss FDI is protected under investment policy and international investment law and it also aims to ensure that no restrictions or discriminations are placed on inflows of FDI (SECO, 2013). It is noteworthy to indicate that during the 1960s and 1970s, inflows and outflows of FDI were practically nonexistent, 23 BITs were signed; 14 treaties had been completed during the 1960s, while in the 1970s nine other treaties were signed (see Table 1). We also observed in Table 1 that around 70 percent of the 117 treaties were signed during the 1990s and 2000s. Table 1 also shows that BITs were by and large signed with developing and emerging countries.

Table 1: Bilateral Investment Agreements Concluded: Switzerland

Date of Signature	Date of Signature	Date of entry into force	Partners	Date of Signature	Date of entry into force	Partners	Date of Signature	Date of entry into force
Albania	22.sept.92	30.avr.93	Guatemala	09.sept.02	04.mai.05	Pakistan	11.juil.95	06.mai.96
Algeria	30.nov.04	15.août.05	Guinea	26.avr.62	29.juil.63	Panama	19.oct.83	22.août.85
Argentina	12.avr.91	06.nov.92	Honduras	14.oct.93	31.août.94	Paraguay	31.janv.92	28.sept.92
Armenia	19.nov.91	04.nov.02	Hong Kong, China	22.sept.94	22.oct.94	Peru	22.nov.91	23.nov.93
Azerbaijan	23.feb.07	---	Hungary	05.oct.88	16.mai.89	Philippines	31.mars.97	23.avr.99
Bangladesh	14.oct.00	03.sept.01	India	04.avr.97	16.févr.00	Poland	08.nov.89	18.avr.90
Barbados	30.mars.95	22.déc.95	Indonesia	06.06.1974	09.avr.76	Qatar	12.nov.01	15.juil.04
Belarus	28.mai.93	13.juil.94	Iran, Islamic Republic	08.mars.98	01.nov.01	Romania	25.oct.93	30.juil.94
Benin	20.avr.66	06.oct.73	Jamaica	11.déc.90	21.nov.91	Russian Federation	01.déc.90	26.août.91
Bolivia	06.nov.87	13.mai.91	Jordan	25.févr.01	11.déc.01	Rwanda	15.oct.63	15.oct.63
Bosnia & Herzegovina	05.sept.03	21.mai.05	Kazakhstan	12.mai.94	13.mai.98	Saudi Arabia	01.août.06	09.sept.08
Botswana	26.juin.98	13.avr.00	Kenya	14.nov.06	10.août.09	Senegal	16.août.62	13.août.64
Brazil	11.nov.94	---	Korea, DPR	14.déc.98	15.nov.00	Serbia	07.déc.05	20.juil.11
Bulgaria	28.oct.91	26.oct.93	Korea, Rep.	15.déc.05	01.sept.06	Singapore	06.mars.78	08.mai.78
Burkina Faso	06.mai.69	15.sept.69	Kuwait	31.oct.98	17.déc.00	Slovakia	05.oct.90	07.août.91
Cambodia	12.oct.96	28.mars.00	Kyrgyzstan	29.janv.99	17.avr.03	Slovenia	09.nov.95	20.mars.97
Cameroon	28.janv.63	06.avr.64	Lao, PDR	04.déc.96	04.déc.96	South Africa	27.juin.95	29.nov.97
Cape Verde	28.oct.91	06.mai.92	Latvia	22.déc.92	16.avr.93	Sri Lanka	23.sept.81	12.févr.82
Central African Rep.	28.févr.73	04.juil.73	Lebanon	03.mars.00	---	Sudan	24.oct.02	---
Chad	21.févr.67	31.oct.67	Lesotho	16.juin.04	07.mai.10	Syrian Arab Rep.	09.mai.07	01.juil.08
Chile	24.sept.99	02.mai.02	Liberia	23.juil.63	22.sept.64	Tajikistan	11.juin.09	---
China	27.janv.09	13.mai.10	Jamahiriya	08.déc.03	28.avr.04	Tanzania, United Rep	08.avr.04	06.avr.06
Colombia	17.mai.06	06.oct.09	Lithuania	23.déc.92	13.mai.93	Thailand	17.nov.97	21.juil.99
Congo	18.oct.62	11.juil.64	Macedonia, TFYR	26.sept.95	06.mai.97	Togo	17.janv.64	09.août.66
Congo, Dem. Rep.	10.mars.72	10.mai.73	Madagascar	19.nov.08	---	Trinidad and Tobago	26.oct.10	---
Costa Rica	01.août.00	19.nov.02	Malaysia	01.mars.78	09.juin.78	Tunisia	02.déc.61	19.janv.64
Croatia	30.oct.96	17.juin.97	Mali	08.mars.78	08.déc.78	Turkey	03.mars.88	21.févr.90
Cuba	28.juin.96	07.nov.97	Mauritania	09.sept.76	30.mai.78	Turkmenistan	15.mai.08	02.avr.09
Czech Republic	05.oct.90	07.août.91	Mauritius	26.nov.98	21.avr.00	Uganda	23.août.71	08.mai.72
Côte d' Ivoire	26.juin.62	18.nov.62	Mexico	10.juil.95	14.mars.96	Ukraine	20.avr.95	21.janv.97
Djibouti	04.févr.01	10.juin.01	Moldova, Rep. of	30.nov.95	29.nov.96	United Arab Emirates	08.nov.98	16.août.99
Dominican Republic	27.août.04	30.juin.06	Mongolia	30.nov.95	09.sept.99	Uruguay	07.oct.88	22.avr.91
Ecuador	02.mai.68	09.nov.69	Montenegro	07.déc.05	11.juil.07	Uzbekistan	16.avr.93	05.nov.93
Egypt	07.juin.10	---	Morocco	17.déc.85	12.avr.91	Venezuela	18.nov.93	30.nov.94
El Salvador	08.déc.94	16.sept.96	Mozambique	29.nov.02	17.févr.04	VietNam	03.juil.92	03.déc.92
Estonia	21.déc.92	19.août.93	Namibia	01.août.94	26.avr.00	Zambia	03.août.94	07.mars.95
Ethiopia	26.juin.98	07.déc.98	Nicaragua	30.nov.98	02.mai.00	Zimbabwe	15.août.96	09.févr.01
Gabon	28.janv.72	18.oct.72	Niger	28.mars.62	17.nov.62			
Gambia	22.nov.93	30.mars.94	Nigeria	30.nov.01	01.avr.03			
Ghana	08.oct.91	16.juin.93	Oman	17.août.04	---			

Source: UNCTAD (2013a), Switzerland: country-specific Lists of Bilateral Treaties concluded as at 1 June 2013.

5. Methodology and Data

The purpose of this study is to examine the impact of BITs completed by Switzerland, on inflows and outflows of FDI. This research also aims to investigate whether BITs have been signed as a strategic method to protect Swiss FDI outflows and to counteract hazardous institutional environmental features of the partner countries. For this investigation, we use statistical and machine learning techniques. The latter are especially useful for the identification of relations that may exist between a target variable (in our case, BITs) and a potentially large set of variables (changes in trade and FDI between Switzerland and the analysed country). The methodology is able to identify significant key variables regardless of the type of the relation that may exist (Smuc *et al.,* 2001). Currently there are many different machine learning algorithms and tools applicable for various data analysis tasks. In this

work, we have used rule learning approaches that have a unique property that the resulting relations are presented in the form of rules that can easily be interpreted and analysed by humans.

In this study the methodology has been used for two related tasks: a) identification of existence of relevant relations, and b) construction of models. For the second task, we have used the subgroup discovery approach (Gamberger *et al.,* 2004) that already has been successfully applied in a few scientific domains (Rios-Morales *et al.,* 2009). The methodology practically exhaustively generates a large number of elementary logical tests based on the available data. The form of these tests is: "$Var1 > x$" or "$Var2 < y$" (e.g. "increase_of_export_in_a_two_year_period> 2" and "current_relative_incoming_FDI < 100") and afterwards these tests were combined into complex logical expressions. Usefulness of expressions is measured by the classification accuracy on the given set of examples. A characteristic of the subgroup discovery approach is that a generalization parameter is used in the formula for the quality of classification, which practically enables those different models with various levels of generality to be constructed from the same data. These models may be evaluated by human experts. By selecting the most interesting models, the experts in fact include their expert understanding of the domain into the final result. The subgroup discovery tool is available as a public service that may be accessed at http://dms.irb.hr.

The preliminary experiments with the subgroup discovery methodology on the available data demonstrated weak classification quality of most of the generated models. Although, powerful in constructing the models, the methodology does not enable evaluation, if the obtained models are actually statistically significant. Classical statistical tests are not applicable on data used for model construction because the models are obtained. But testing a large number of possible combinations among which only those with optimal performance have been selected. And there is not enough data to test the models on independent data (data not used for model construction). A possible solution is the so called permutation test, which evaluates if the performance of the resulting model is significantly different from results that are obtained by the same methodology from the randomized data.

In this work, we have used the PeTe tool (http://may.irb.hr/PeTe/index.-php) that implements permutation testing approach for the task of statistical significance testing of existing relations between the target variable (BIT) and independent variables (trade, FDI, good governance indicators). The tool does not test significance of a single model but the significance of a general relation that exists between the complete set of independent variables and the target variable. The approach is based on constructing a predictive model consisting of an assemble of thousands of independent rules (Pfahringer et al., 2004). Each rule is constructed in a way similar to the subgroup discovery approach but the diversity of the assemble is ensured by repeating the procedure on various subsets of examples and variables. Predictive robustness of the predictive model is based on the majority voting of all included rules. In the PeTe tool the predictive model construction is repeated 20 times: 10 times for original data and 10 times for randomized data. The T-test is used to test if predictive quality is substantially different for original and randomized data.

Data used in this study has been compiled from the following official sources:

a. Swiss National Bank (2013): provided us with data of inflows and outflows of FDI for the period of 1985-2012 and data on exports and imports for the period of 1986-2012.

b. UNCTAD (2013): from this source we used the FDI/TNC database on foreign direct investment data, which is provided for the period of 1970-2012 and the country-specific Lists of Bilateral Investment Treaties completed as of June 2013.

c. The World Bank Group (2013): data obtained from this institution are a compilation of variables measuring the quality of good governance. Data is provided as a collection of quantitative statistical information based on several hundred variables, capturing governance perceptions as reported by surveys completed currently in 215 countries (Kaufmann *et al.,* 2010). This data collection is known as the Good Governance (GG) indicators of the World Bank. The GG indicators have been widely used in economic studies (Kaufmann *et al.,* 2005). For this research we have used following indicators: political stability, regulatory quality, government effectiveness, and rule of law.

In the first part of our work, we have concentrated on the impact that BITs have on FDI. For this task, we have also added data about Swiss imports and exports to test if the trade has been impacted by the completion of BITs. The data has been prepared so we were able to select 8 developing countries with BITs put into force in the period 1990-2006. These countries are Turkey (1990), Argentina (1992), Mexico (1996), South Africa (1997), Thailand (1997), Philippines (1999), Chile (2002), and South Korea (2006). For these countries a data set with in total 24 examples have been generated: 8 examples are positive examples, representing periods of three years after the BIT, while 16 examples are negative examples, representing the same countries and same information but for periods that are at least 5 years before or after BIT. Each example is described by three values representing Swiss import, export, and FDI. In order that the data is comparable for different countries, we did not use absolute values but their relative differences in the three year period. The data is prepared in this form so that it may be used by various data analysis tools and it is publicly available from http://lis.irb.hr/BIT_data/ .

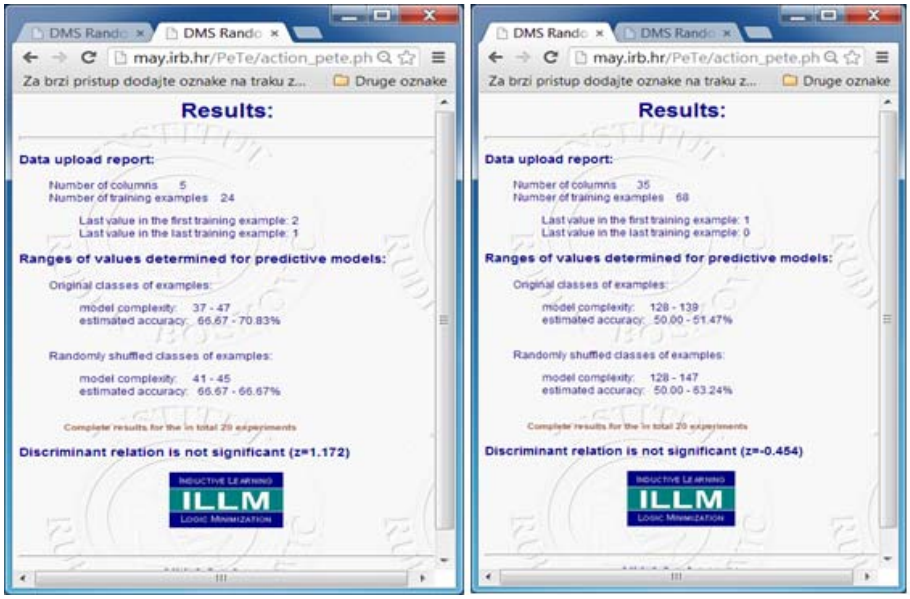
The second dataset has been prepared with available good governance data. It consists of 68 examples: 34 are for countries for which BIT has been put into force in the period 2000-2010 (e.g. South Korea in the year 2006 and India in year 2000), while negative cases are 34 countries for which the agreements have been put into force significantly earlier (e.g. Argentina in year the 1992 and Belarus in year 1993). The good governance data for negative cases are taken for the same year as for the corresponding positive case. For example, Argentina is the corresponding negative case for South Korea and for both of them; the data is taken for the period around the year 2006. Although we use only 4 good governance indicators, each example is described by a total of 33 variables, representing changes in good governance indicators both before and after the BIT has been put into force. Examples of generated variables are values of the indicators two years before BIT completion and differences in their values in the period of two years after BIT completion. The prepared

dataset can be downloaded from http://lis.irb.hr/BIT_data/ together with the description of all generated variables.

6. Results

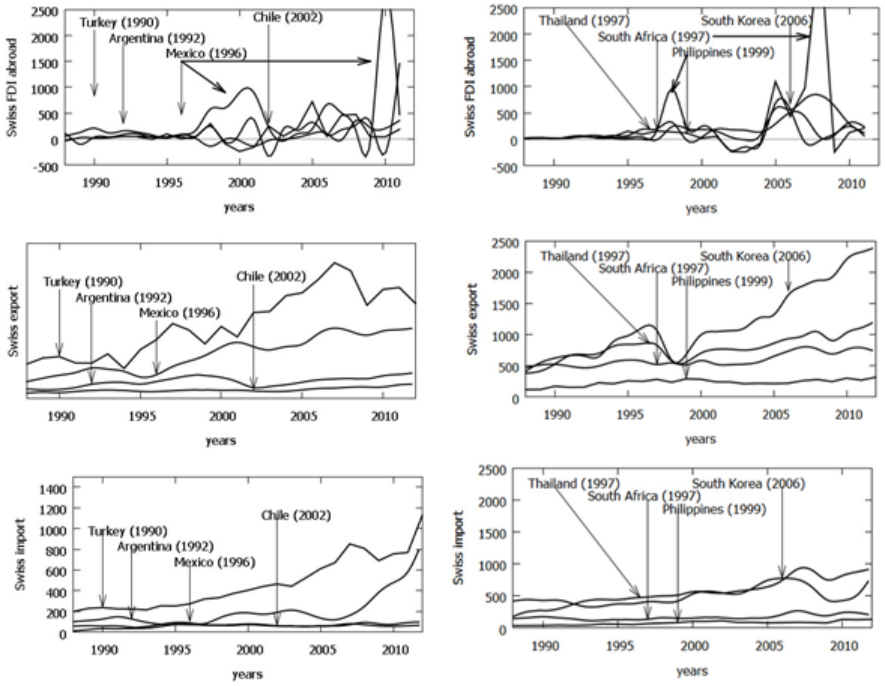
The first important result of the analysis is that for both prepared datasets, we have demonstrated that there is no statistically relevant relation between class membership and independent variables. The result is obtained by the permutation testing using the PeTe tool (see Figure 2).

Figure 2. Results of the Permutation Test tool (http://may.irb.hr/PeTe) for the first and the second datasets.



In the first dataset, the independent variables are differences in the Swiss FDI, trade inflows, and trade outflows. It means that our result demonstrates that no relevant changes in Swiss FDI and trade can be noticed in the period of three years after BITs have been put into force. To scrutinize further the above results, we have visualized the FDI and trade data for all 8 countries used for the analysis. The graphs are presented in Figure 3.

Figure 3: Illustration of the Impact of BITs on FDI flows, Exports and Imports: two group of countries



It can be noticed that only for Mexico there is some relevant impact of BIT over FDI flows, exports and imports. Interesting is that impact on Swiss FDI directed to Mexico is in the form of two peaks, where the first one is in the period of 3-6 years after BIT and the second one is about 5 years later. The impact on Swiss export occurred practically immediately after BIT, while Swiss import from Mexico started to grow with a delay of three years. For the other 7 countries, it is hard to attribute the changes in trade and FDI to BITs. It is interesting to notice that only in respect of FDI, there are two sharp peaks: the first is for the Philippines and it occurred one year after the agreement has been signed and one year *before* it has been put into force. The second even larger peak is for South Africa and it occurred 11 years after the agreement has been put into force (see Figure 3).

In the second dataset, the independent variables are values of good governance indicators and their differences before and after BITs have been put into force. The negative result by the PeTe tool (see right side of Figure 2) demonstrates that BITs are also not significantly correlated with these indicators. The result may be interpreted that in general, neither good governance indicators have been a condition for putting the agreements into force, nor that these agreements have been relevant for supporting positive changes in respect to these indicators in the partner countries.

Despite the fact that in the second dataset there is no relevant relation between good governance indicators and BITs, the subgroup discovery approach in combination with some other machine learning algorithms have been able to recognize two interesting subpopulations in the set of 34 positive cases. The first consists of following 14 countries: Chile, Qatar, Tanzania, Algeria, Armenia, Cambodia, Dominican Rep., South Korea, Kuwait, Lebanon, Lesotho, Libya, Nicaragua, and Turkmenistan. A common distinguishing property of these countries is that in the period of two years before the BITs have been put into force, political stability has significantly improved (political stability indicator has increased by more than 5.5 p-ranks). The second subpopulation consists of following 11 countries: India, Saudi Arabia, Tanzania, Armenia, Bosnia and Herzegovina, China, Colombia, Iran, Lebanon, Namibia, and Syria. A common characteristic of these countries is that in the year when BITs have been put into force the countries have relative low value for political stability indicator (p-rank below 34.1) but at the same time, they have satisfactory rule of law indicator value (p-rank above 35.6).

In order to illustrate the characteristics of the subpopulations, we have selected Chile from the first one and China from the second one. Good governance indicator values for these countries are represented in Figures 4 and 5. It can be noticed that Chile is characterized by very high and constant values for regulatory quality, government effectiveness, and rule of law indicators. Only political stability is relatively low and constantly fluctuating. The BIT has been signed with Chile in the year 1999, when political stability started to increase and it has been put into force in the year 2002, when indicator's p-value has been at its peak value above 83. After the year 2002, political stability in Chile started to decrease. The agreement with China has been signed in the year 2009 and it has been put into force in the year 2010. In the period 1996-2010, China is characterized by relative low and decreasing political stability. The indicator's p-rank value was only 27.5 and 23.6 in the years 2009 and 2010, respectively. In contrast to that, rule of law indicator shows a positive trend and it reached p-rank value equal to 44.6 in the year 2010, when the BIT has been put into force.

Figure 4. Example of Model A: Countries with Increasing Political Stability

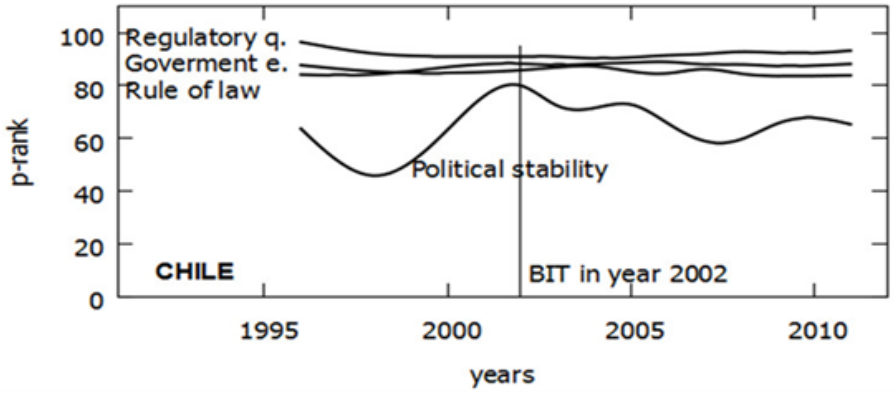
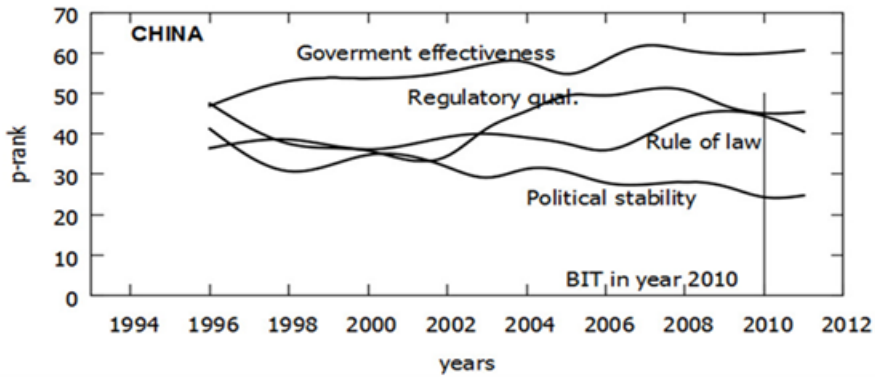
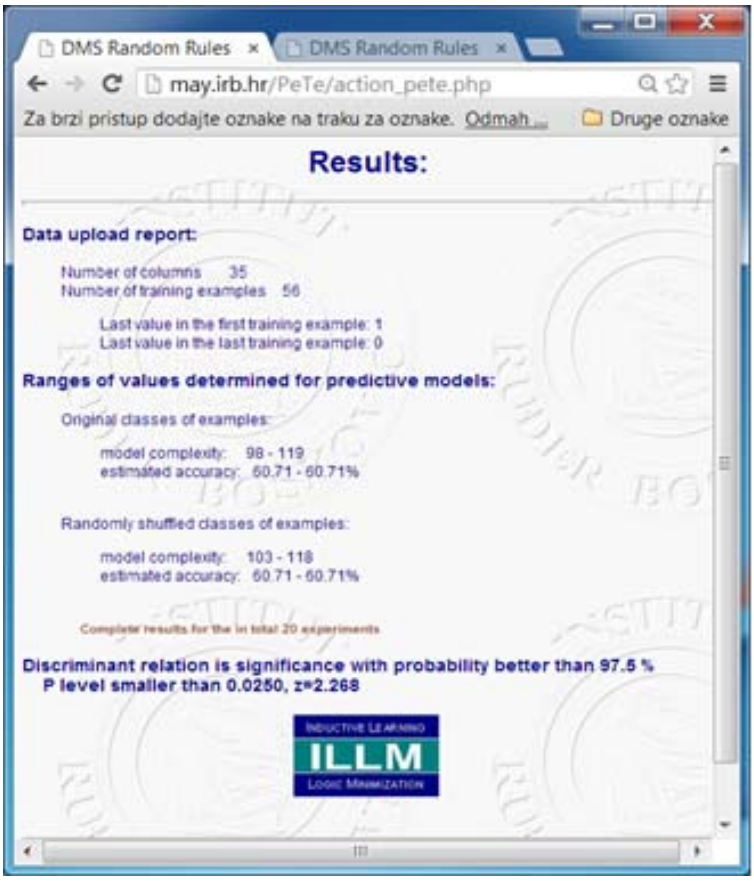


Figure 5. Example of Model B: Countries with Relative High Rule of Law in Spite of low political stability



For the interpretation of the results it is very interesting to notice that detected subpopulations of positive cases are statistically significantly different from negative cases. This fact has been tested by the PeTe tool so that we were able to form an auxiliary dataset, which consists of 22 positive examples included in both subpopulations and all 34 negative cases. It can be noted that Armenia, Lebanon, and Tanzania are in both datasets. The examples in this auxiliary dataset are described by all 33 variables, as in the original dataset. The result of the PeTe tool is presented in Figure 6. It can be noticed that the computed p-value for the auxiliary dataset is 0.01. It means that with a probability higher than 99% we can state that classification of examples is related with the values of the independent variables.

Figure 6. Result of the PeTe tool for the Auxiliary Dataset with 22 Examples Representing two Subpopulations of Countries with BITs.



7. Discussion

In this paper, we focused on studying a remarkable phenomenon that has taken place over the last decades, the extraordinary surge of BITs completion. Given Switzerland's position as an active player on the global investment scene and the effort that Switzerland makes in negotiating bilateral investment treaties, we attempted to detect links between BITs and Swiss FDI flows. By using statistical and machine learning techniques, our results indicate that the relationship between BITs and Swiss FDI flows is insignificant. Similar results to our findings were discovered by other studies (UNCTAD, 1998; Büthe and Milner, 2008; Wells and Ahmed, 2007), implying that BITs do not play a primary role in increasing FDI flows. Beside BITs, there are a number of other determinant factors that influence investors' decisions (Schneider and Frey, 1985; Brada *et al.,* 2005). The increase in the number of BITs over the last decade is largely a consequence of the transformation of investor-state relations, in which international investment law has become a significant component of such development (Schill, 2011).

However, from our results we obtained two interesting findings. The first finding is that in almost 65 percent of all cases (in 22 out of 34 of analysed countries) with which Switzerland has signed the BITs, significant improvements in respect of either political stability or rule of law can be noticed in the period *before* the BITs have been put into force. This result demonstrates that in the majority of cases, the Swiss administration has performed with a clear goal to shelter invested capital and to counteract hazardous institutional environmental features in partner countries. It can be assumed that in other 35 percent other criteria has been used that may not be described by the good governance indicators used in this study. Similar results were found by Franck (2007) suggesting that the conclusion of BITs indirectly facilitate FDI by promoting the rule of law and economic development.

The second finding is concerned with a methodological issue. Our results demonstrate a common fact that datasets, collected in social and economic sciences, often have a significant number of examples that either do not follow the main pattern of behavior or that we simply do not have the data to describe the patterns that the examples follow. In the concrete case of the second dataset, 50 percent of examples have been enough (12 examples added to 22 examples that follow the main concept) to completely transform a simple and well-defined model into a statistically uncorrelated dataset. From this analysis the following lessons have been learnt: a) useful patterns can be detected also from datasets that are identified as uncorrelated and b) machine learning approaches, especially those for subgroup discovery, are a powerful tool for detecting such patterns.

8. Conclusions

Although we have set our analysis to examine the impact of BITs over foreign direct investment, we have rather detected an interesting insight that relates to the presence of BITs in developing countries. This finding suggests that BITs may have a positive effect on the improvement of institutional environmental features of host countries. This finding can also be interpreted as follows: while BITs provide investors with legal protection for their capital overseas and act as shielding instruments to counteract hazardous institutional environmental elements in host countries, for many developing countries FDI is an important mean of economic growth and poverty reduction. Therefore, developing stable institutional environmental framework will be the result of the efforts of developing countries' government in foresting and enhancing regulatory environment features conducive to capital formation (Akhtar and Weiss, 2013).

This study has created a baseline helpful for further investigation concern with the impact of BITs over institutional environmental attributes. Our next step is to test the applicability of our methodology in other countries that have completed BITs. However, future research studies should look in detail into the dynamics between international investment treaties and institutional environmental features.

Bibliografía

Akhtar, S. and Weiss, M. (2013). U.S. International Investment Agreements: Issues for Congress. Congressional Research Service, CRS Report for Congress - R43052, Washington April 2013.

Allee, T. and C. Peinhardt (2010). Delegating Differences: Bilateral Investment Treaties and Bargaining Over Dispute Resolution Provisions. *International Studies Quarterly*, 54 (1), pp. 1-26.

American Chamber of Commerce and The Boston Consulting Group (ACC & BCG, 2007). Multinational Companies on the Move: How Switzerland will win the Battle. *Joint Report of the American Chamber of Commerce and The Boston Consulting Group*, Zurich 2007.

Amiti, M., and K. Wakelin (2003), Investment Liberalization and International Trade. *Journal of International Economics*, 61(1), pp. 101-126.

Baldi, M. (2013). Are Trade-Law Inspired Investment Role Desirable?. Columbia FDI Perspectives, the Vale Columbia Center on Sustainable International Investment, No. 105 September 30, 2013.

Brada, J. C., A. M. Kutan and T. M. Yigit (2005). The effects of Transition and Political Instability on Foreign Direct Investment in ECE Emerging Market. United Nations Economic Commission for Europe. Series of papers on foreign direct investment. http://www.unece.org/fileadmin/DAM/ead/sem/sem2005/papers/FDIUNECE1.pdf

Brownlie I. (1998). Principles of Public International Law. Fifth Edition. Oxford University Press: United Kingdom 1998.

Blomström, M. (2001). The Economic of International Investment Incentives. OECD, Series, September 2001.

Blonigen, B. A., and R. B. Davies (2004). The Effects of Bilateral Tax Treaties on US FDI activity. *International Tax and Public Finance*, 11 (5), pp. 601-622.

Buthe, T. and H. Milner (2008). The Politics of Foreign Direct Investment into Developing Countries: Increasing FDI through International Trade Agreements?. *American Journal of Political Science*, 52 (4), pp. 741-762.

Economic Commission for Europe (UNECE) (2005). Spring Seminar 2005-Financing for Development in the ECE Region: Promoting Growth in Low-income Transition Economies, Geneva.

Franck, S. (2007). Foreign Direct Investment, Investment Treaty Arbitration, and the Rule of Law. *Global Business & Development Law Journal*, 19, pp. 337-367.

Gamberger, D. and N. Lavrac (2002). Expert-guided Subgroup Discovery: Methodology and Application. *Journal of Artificial Intelligence Research*, 17, pp. 501-27.

Global Opportunity Index (2013). Attracting Foreign Investment, Global Opportunity Index. Top 10, Milken Institute: Retrieved 4 July 2013 from: http://www.globalopportunityindex.org/?ref=MIP

Gugler, P. and X. Tinguely (2010). Swiss Inward FDI and its Policy Context. The Vale Columbia Centre on Sustainable International Investment, Working Papers Series, June 1st 2010.

Hallward-Driemeier, M. (2003). Do Bilateral Investment Treaties Attract FDI? Only a bitand they could bite. World Bank Working Papers Series, DECRG, June 2003.

International Monetary Fund (IMF) (2003). Foreign Direct Investment in Emerging Markets. Report of the Working Group of the Capital Market Consultative Group, September 2003.

Kaufmann, D., A. Kraay, and M. Mastruzzi (2010). The Worldwide Governance Indicators: A Summary of Methodology, World Bank Policy Research Working Paper, No. 5430. http://papers.ssrn.com/sol3/papers.cfm?abstract_id=1682130

Kerner, A. (2009). Why Should I Believe You?. The Costs and Consequences of Bilateral Investment Treaties. *International Studies Quarterly*, 53(1), pp.73-102.

Khanna, T., K. Palepu, and S. Jayant, (2005). Strategies that Fit Emerging Markets. *Harvard Business Review*, 83(6), pp. 405-440.

Neumayer, E. and L. Spess (2005). Do Bilateral Investment Treaties Increase Foreign Direct Investment to Developing Countries? World Development, 33 (10), pp.1567-1585.

Neumayer E. (2006). Do Double Taxation Treaties Increase Foreign Direct Investment to Developing Countries? *Journal of Development Studies*, 43 (8), pp. 1501-1591.

Pfahringer, B., G. Holmes, and C. Wang, (2004). Millions of random rules. In Proc. of the Workshop on Advances in Inductive Rule Learning, 15th European Conference on Machine Learning (ECML).

Rios-Morales R., D. Gamberger, T. Smuc and F. Azuaje (2009). Innovative Methods in Assessing Political Risk for Business Internationalization. *Research in International Business and Finance*, 23 (2), pp. 144-156.

Rios-Morales, R., D. Gamberger, M. Schweizer, and L. Brennan (2013). Institutional Environment Features and Swiss Foreign Direct Investment. *Global Business and Economics Review*, 15(2/3), pp. 196-209.

Salacuse, J. W. and N. P. Sullivan (2005). Do BITs Really Work?: An Evaluation of Bilateral Investment Treaties and Their Grand Bargain. *Harvard International Law Journal*, 46, pp. 67-130.

Sauvant, K. P. and L. E. Sachs (eds.) (2009). The Effect of Treaties on Foreign Direct Investment: Bilateral Investment Treaties, Double Taxation Treaties, and Investment Flows. Oxford: Oxford University Press.

Schneider, F. and B. Frey (1985). Economic and Political Determinants of Foreign Direct Investment. World Development, 13, pp. 161-175.

Smuc, T., D. Gamberger and C. Krstacic (2001). Combining Unsupervised and Supervised Machine Learning. In Proceedings of the 8th Conference on AI in Medicine in Europe: Artificial intelligence Medicine Lecture Notes In Computer Science, vol. 2101. Springer-Verlag, 109-112.

Schill, S. (2009). Enhancing International Investment Law's Legitimacy: Conceptual and Methodological Foundations of a New Public Law Approach. *Journal of International Law*, 52, pp.57-102.

The State Secretariat for Economic Affairs (SECO) (2013). International Investment, Foreign Investment. Obtained from the following web link: http://www.seco.admin.ch/themen/00513/00594/04174/?lang=en

United Nations Conference on Trade and Development (UNCTAD) (1999). Trends in International Investment Agreements: An Overview, United Nations, New York and Geneva.

United Nations Conference on Trade and Development UNCTAD (2004). Investment Instruments Online, updated: 17 August 2004 16:13. Retrieved July 2nd 2013 from: http://www.unctadxi.org/templates/Page_1006.aspx

United Nations Conference on Trade and Development UNCTAD (2007). Bilateral Investment Treaties 1995-2006: Trends in Investment Rulemaking, New York-Geneva.

United Nations Conference on Trade and Development UNCTAD (2011). Foreign Direct Investment and Transnational Corporations Database, available at http://www.unctad.org/fdistatistics.

United Nations Conference on Trade and Development (UNCTAD) (2013a). Country-specific Lists of Bilateral Investment Treaties: Switzerland concluded as at 1 June 2013. Retrieved on July 2013 from: http://unctad.org/en/Pages/DIAE

United Nations Conference on Trade and Development (UNCTAD) (2013b). Foreign Direct Investment and Transnational Corporations Database. Retrieved 6th April 2013 from: www.unctad.org/fdistatistics

Vandevelde, K. (2005). A Brief History of International Investment Agreements, *Davis Journal of International Law & Policy,* 12, pp. 157-194.

Van Harten, G. (2008). Investment Treaty Arbitration and Public Law, *Journal Compilation The Modern Law Review Limited*, 7(1), pp.145-158.

Vernon, R., (1966). International Investment and International Trade in the Product Cycle. *Quarterly Journal of Economics*, 80, pp. 190-207.

Wells, L.T and R. Ahmed (2007). Making Foreign Investment Safe: Property Rights and National Sovereignty. Oxford: Oxford University Press, 2007.

World Economic Forum (WEF) (2011). Global Competitiveness Report 2010-2011, Geneva, Switzerland. World Bank (2012). Golden Growth: Restoring the Lustre of the European Economic Model. International Bank for Reconstruction and Development 2012: Washington D.C.

World Bank (2013). Good Governance and Anti-Corruption: Good Governance Indicators Database. Data retrieved from: www.worlbank.org/wbi/governance