The Impact of Bilateral Investment Treaties and Financial Development on Foreign Direct Investment: Evidence from Eurasia

Annie Tortian
Facultyof Business Administration and Economics,
Haigazian University
Beirut, Lebanon

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Annie Tortian
Haigazian University
Beirut, Lebanon

Abstract: The last decade of the twentieth century has brought about important changes to the global economy and the international financial architecture. The 1990s has witnessed: (1) Financial crises leading to a major transformation in the structure and size of international capital flows. FDI has grown dramatically relative to other forms of international financial flows; (2) Dramatic increase in the number of Bilateral Investment Treaties (BITs); (3) Since the 1990s, the South East European, South Caucasus, and Central Asian countries (EURASIA) have made tremendous efforts in integrating with the global economy. The financial integration of EURASIA is reflected by their extensive signature of BITs, membership of international organizations such as IMF and WTO, and attraction of impressive amounts of FDI. The impact of BITs on FDI in EURASIA remains unexplored despite the proliferation of BITs and FDI since the 1990s. This paper aims at examining empirically the impact of BITs on FDI through the capital flow experience of EURASIA. To estimate the impact of BIT ratification, and financial institutions' level of development and efficiency on FDI in EURASIA, the study uses panel data on bilateral FDI outward position from 20 OECD to 20 EURASIA host countries for the period 1992-2010. The empirical results show that BITs and "efficiency" and "quality" of financial institutions individually exert a highly significant positive impact on inward FDI in EURASIA. The answer to the question, raised by the study, are BITs more effective in well-developed and efficient financial system, is no. Each has a separate and distinct role in creating a favorable "investment environment" in attracting FDI.

Keywords: Bilateral Investment Treaties, Foreign Direct Investment, Financial Development, EURASIA Region, Panel Data.

JEL Codes: C23, F15, F21, F23, F53, G21.

I. Introduction

The last decade of the twentieth century witnessed a number of major events, including the fall of communism, the dissolution of the Union of Soviet Socialist Republics (USSR), a radical shift in economic and political regimes in many countries of East and South East Europe, the South Caucasus, and Central Asia, globalization, financial crises in many emerging countries leading to voices calling for a reform of the international financial architecture, and an explosion in the number of international investment agreements (IIAs) between countries, especially, at the bilateral level.

The ongoing process of integration of the world economy, which gained momentum since the beginning of the 1990s, coinciding with the fall of the Berlin Wall in 1989, and the opening up of the USSR countries to the world, has led to a significant change in the attitude of these countries with respect to international investment, and private capital flows, especially the FDI type. The countries of South Caucasus, Central Asia, South and South East Europe, in addition to The Russian Republic, Ukraine, Moldova, and Belarus (EURASIA) have made tremendous efforts in integrating with the world economy. The financial openness of EURASIA countries and their commitment to participate in the global economy is reflected by their extensive signature of bilateral investment treaties (BITs) with OECD member countries since the beginning of 1990s, their membership of international organizations such as the IMF and WTO, and their attraction of impressive amounts of private capital flows since the 1990s. An analysis of the structure of capital inflows in EURASIA shows that FDI has been an important component.

The EURASIA countries have also undertaken radical reforms to address administrative, regulatory, legal, and institutional barriers to investment, with the overarching objective of improving the "climate for investment" and private sector activity. Foreign investments were no longer regarded with suspicion by these emerging countries. Controls and restrictions over entry and operations of foreign investors were replaced by policies aimed at encouraging FDI inflows (UN, ESCAP, 2003). Along with this, there has also emerged an extensive network of bilateral, and regional economic, and trade agreements, which seek to promote and protect international investments, especially FDI, coming from the partner countries. The main provisions of these agreements whether bilateral or regional are linked with the gradual decrease or elimination of measures and restrictions on the entry and operations of foreign investors, the application of positive standards of treatment with a view to eliminate discrimination against foreign enterprises and international legal protection for foreign investments (UN, ESCAP, 2003).

As a result of these developments, private capital flows, particularly FDI, surged to EURASIA during the last two decades. According to UNCTAD, at the end of 2010, FDI inward stock in EURASIA region were more than US$ 870 billion compared to US$ 13 billion in 1992 (UNCTAD, FDI/TNC electronic database). Investigating sources of FDI led to fact that they originate mainly from the OECD area (OECD International Direct Investment Statistics electronic Database).

Research Question

Having explained the motivation and the reasons for deciding on this topic, the questions addressed by the study are:

a. Does the ratification of a BIT between source-host country pair increase bilateral inward FDI in EURASIA?

b. Do BITs exert a different impact on FDI in an environment with well-developed and "*efficient*" financial institutions?

Purpose of Research

The purpose of this research is to examine empirically the impact of BITs on FDI through the capital flow experience of EURASIA countries during the period 1992 to 2010 included. Statistical figures show that these countries have been experiencing sizeable amounts of FDI, since the early 1990s, coinciding with their signature of BITs with OECD countries (UNCTAD investment instruments online database: www.unctad.org//iia). Most of these treaties were entered into force by the mid and late 1990s. In particular, 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. The signature of BITs reflects the fact that establishing international economic relations was a priority concern for EURASIA countries, and confirms their strong commitment for external liberalization, economic and financial integration with the global economy. Foreign investors consider BITs as part of a "good" investment environment.

The author claims also that host country "institutions" have a crucial role in attracting FDI to a country. The study focuses on "financial institutions" and argues that the level of development and efficiency of financial institutions is crucial for the "investment environment" in a host country. Foreign investors' decisions are strongly influenced by the level of development, quality and efficiency of financial institutions of a host country.

Thus, the main purpose of this study is to examine empirically whether or not the existence of BITs attracts FDI, and how BITs interact with financial institutions. Achieving the objective of this study requires the examination of the link between BITs, FDI, and financial institutions.

Need for this Study

To the researcher's knowledge, the literature is lacking studies on the impact of BITs on FDI in EURASIA counties. Despite the proliferation of the number of BITs concluded by EURASIA countries since the early 1990s, coinciding with their attraction of impressive amounts of FDI, the impact of BITs on FDI in EURASIA remains unexplored. The question of whether BITs actually do affect FDI in EURASIA has not been addressed in available literature. Another issue is the role of "financial institutions" in attracting FDI in EURASIA. The EURASIA countries applied serious financial sector reforms in order to adhere to the EU standards and the *acquis communautaire*. Financial institutions' level of development, quality and efficiency, whether BITs exert a different impact on FDI in well-developed and efficient financial institutions, have not been given due attention in available literature. Therefore, there is a gap in the literature and a need for this study.

Contribution of this Research

This study will make a major contribution to the literature on FDI, by verifying the significant positive impact of BITs and financial institutions' level of development and efficiency on FDI in EURASIA.

a. Impact of BITs on FDI in EUARSIA

It is the first attempt to test empirically the significance of BITs in attracting FDI to EURASIA. The author focuses on BITs and expects investment activity between source–host country pairs to change positively as a consequence of BIT ratification.

The EURASIA countries started concluding BITs during their early stages of transition, in the early 1990s. They needed foreign capital and foreign investment, especially FDI, to help them grow and develop at a time when they had weak markets and institutions. For that purpose they opted to signing investment treaties extensively with the developed countries of OECD, since most FDI in the world originates from the OECD area. They hoped and believed that the existence of an investment treaty will influence foreign investors' choice for their country. From foreign investors' point of view, investment treaties provide international legal protection and hedge against political risk. Clearly, a BIT is not a necessary condition to receive FDI. There are many source-host country pairs with substantial FDI that do not have a BIT. In addition, there are also numerous examples of countries that have concluded many BITs and yet have received only moderate inflows.

b. Impact of financial institutions' level of development and efficiency on FDI, and the relationship between BITs and financial institutions vis-à-vis FDI.

This study adds to the existing literature by testing empirically whether or not the level of development and efficiency of financial institutions have a significant role in attracting FDI into EURASIA, and whether or not ratified BITs exert a different impact on FDI in well-developed and efficient financial institutions.

While it may seem natural to argue that BITs serve as commitment device, and that foreign investors regard BITs as improving the "investment environment", a country's capacity to take advantage of FDI spillovers and externalities might be limited by the "quality" of local institutions. In an effort to further examine the impact of BITs on FDI the study takes its cue from the recent emphasis on the role of "institutions" in the capital flows literature, especially FDI. It emphasizes on the role of "financial institutions" and argues that the lack of development of local financial institutions and their efficiency can limit a country's ability to take advantage of FDI spillovers.

Although most FDI by its very nature relies on capital from abroad, it is important to recognize that foreign investors' decisions might crucially depend on the extent of the level of development and efficiency of domestic financial institutions. Progress in establishing financial infrastructure and capital markets is important for foreign investors because it facilitates access to local capital markets. Well developed and efficient financial institutions encourage foreign investors to set up operations, as they can have access to complementary local finance more easily, and face lower transaction costs for local financial services, such as the payment system. Moreover, their customers too, are more likely to have access to bank credit, which should accelerate the demand for their products that are often bought on credit. Therefore, a developed and efficient financial system is an important part of the "investment environment" in an economy.

Structure of the Paper

The remainder of this paper is structured as follows: the next section reviews existing studies which have examined the effects of BITs on FDI and discusses their shortcomings. Section 3 presents the research hypotheses formulation. Section 4 presents the research methodology and data. Section 5 presents the empirical framework, econometric model specification, and the variables. Section 6 reports results from the main estimations and robustness tests, while section 7 concludes.

II. Literature Review

The existing literature on capital flows to the emerging economies of Post Soviet Union, and Soviet satellite countries (Central, Eastern, South Eastern Europe, and CIS countries) has concentrated on the analysis of the "traditional" determinants of FDI and the "transition economies" as a whole. The two main approaches have been survey-type studies and formal quantitative analyses. Examples of the former are found in Lankes and Venables (1996). Quantitative studies are based on a number of different empirical models, the gravitational approach being the most commonly adopted. Among the quantitative studies in the literature one can mention the works by Ramcharran (2000), Bevan, Estrin and Meyer (2000, 2004), Balaz and Williams (2001), Campos and Kinoshita (2003), Bevan and Estrin (2004). All the mentioned studies have used "traditional" variables, such as market size, growth prospects, macroeconomic factors (inflation, exchange rate levels and volatility, and fiscal deficit), labor cost, availability of skilled labor, geopolitical considerations, distance, common border, trade linkages, etc..; and "transition-specific" variables, such as the speed and method of privatization. Some have used country credit ratings, and the impact of EU accession announcements.

Other researchers have also put considerable effort on the analysis of foreign investment in CEEC and transition economies since the late 1980s. In this respect, one can mention the works by The World Bank (2002), Michalet (1997), Stiglitz (2002), Altomonte (2000), UN/ECE (2003), Popov (2002), Andreff (2006).

Within the economic literature BITs have generated very little attention. The role of BITs has received some discussion in law journals. There the focus has been on the issue of providing a commitment device to overcome the dynamic inconsistency problem (Vandevelde, 1998 and 2000).

It is most astonishing that despite the rising number of BITs since the early 1990s, there are only few serious studies examining the effect of such treaties on the location of FDI. UNCTAD sponsored one of the first analyses in 1998 (UNCTAD, 1998). It studied the impact of 200 BITs on bilateral FDI data, examining years prior to and after their conclusion. It found a weak correlation between the signing of BITs and changes in FDI flows, but used minimal control variables in generating this result and did not control for the strong upward trend in FDI over time.

The first serious study has been undertaken by Hallward-Driemeier (2003), looking at a panel dataset of bilateral FDI outflows from 20 OECD countries to 31 developing countries during the period 1980 to 2000. Using source-host country fixed effects estimations she finds little evidence that the existence of a BIT between two countries does stimulate investment from the developed to the developing signatory country.

The second study, Banga (2003) examines the impact of BITs on aggregate FDI inflows to 15 developing countries of South, East and South East Asia for the period 1980-81 to 1999-2000. She undertakes a separate analyses for FDI inflows from developed and developing countries using a panel data for ten developing countries for the period 1986-87 to 1996-97. She finds that BITs have a significant impact on aggregate FDI. But it is BITs with developed countries rather than developing countries that are found to have a significant impact on FDI inflows to developing countries.

The third study, Egger and Pfaffermayr (2004) use the largest available panel of outward FDI stocks provided by OECD, which contains FDI of OECD countries into both OECD and non-OECD economies to evaluate the impact of BITs. They restrict their study to the period from 1982 to 1997. They find that BITs exert a significant positive effect on outward FDI, if they actually are implemented.

The fourth study, Tobin and Rose-Ackerman (2005) analyze the impact of BITs from developed to developing countries from 1984 to 2000, with data averaged over five – year periods, covering 63 countries. In a fixed effects model, Tobin and Rose-Ackerman find that a higher number of BITs signed with a high income country raises the FDI a country receives as a share of global FDI flows only at low levels of political risk.

The fifth study by Salacuse and Sullivan (2005) provides three cross-sectional analyses of FDI inflows to up to 99 developing countries in the years 1998, 1999 and 2000, respectively. They find the signature of a BIT with the US to be associated with higher FDI inflows in both types of estimations, whereas the number of BITs with other OECD countries is statistically insignificant.

The sixth study by Neumayer and Spess (2005) finds that the more BITs a country signs, the greater the FDI flows to that country. Their study includes 119 countries over the period 1970 to 2001.

The seventh study by Desbordes and Vicard (2006) investigates whether the quality of diplomatic relations between a country and the rest of the world influences the volume of FDI that it receives. Their sample of study includes 88 developing countries over the period 1991-2000. The econometric results indicate that the quality of diplomatic relations and the existence of an armed conflict on a host country territory strongly influence the location choice of multinational enterprises.

III. Hypotheses Formulation

In this study the researcher hypothesizes that:

1. Macroeconomic Risk

Macroeconomic risk is related to the fundamentals of the economy. Sound macroeconomic fundamentals are necessary conditions to attract foreign investment flows. Macroeconomic risk works at the macroeconomic level, and consists of two major components: (a) economic risk, and (b) financial risk.

(a) Economic Risk

(i) Macroeconomic Performance (GDP and Growth)

Hypothesis 1: The higher the economic performance of a host country, the higher the foreign investment inflows. Foreign direct investment is also positively related to host country market size. Therefore, the larger a host country's market size, the higher the FDI.

(ii) Macroeconomic Stability (Price Stability): Inflation

Hypothesis 2: The higher the inflation rate of a host country, the lower the foreign investment inflows.

(iii) Financial Institutions' Level of Development and Efficiency

Hypothesis 3: The better developed and efficient are the financial institutions of a host country, the higher the foreign investment inflows.

(b) Financial Risk and Country Creditworthiness

(i) External Debt Position

Hypothesis 4: The lower the external debt obligations of a host country, the higher its creditworthiness, thus the higher the foreign investment inflows.

(ii) International Liquidity Position

Hypothesis 5: The higher the international liquidity position of a host country, the higher its creditworthiness, thus the higher the foreign investment inflows.

2. Political Risk

Political stability and the regulatory regime can make a location more or less attractive for foreign investors. International obligations – BITs, and regional economic, trade and investment agreements, would help reduce investor political risk perceptions and narrow the gap between the actual risk of policy instability that may be suggested by a host country's domestic legislation, and the risk as perceived by foreign investors (UNCTAD, *WIR*, 2003). Why political risk? Because, BITs between two countries, and regional economic agreement is a political decision; and political risk is related to the political events and / or decisions.

(i) Bilateral Investment Treaties (BITs)

Countries with weak markets and institutions are a concern for foreign investors. Given the weakness of the domestic political / legal environment in EURASIA countries in the early stages of their transition (1990s), foreign investors seek alternatives tailored to their needs. This is what BITs do. They provide enforceable rules to protect foreign

investment and reduce the political risk faced by investors. Typically BITs establish international rules concerning the treatment of foreign investors and their investment by host countries, including national treatment and most-favored nation treatment, prompt, adequate and effective compensation in the case of expropriation, and free movement of capital and other financial flows related to the investment. In addition, BITs include rules on dispute settlement, both with regard to state-state arbitration and investor-state arbitration. Foreign investors consider BITs as a hedging instrument against political risk in a host country. The analysis of BITs leads to two main suppositions regarding their implications for EURASIA countries:

1) EURASIA countries signed BITs in an effort to attract greater amounts of FDI,
2) BITs serve as a substitute for a stable "investment environment".

Therefore, if BITs actually have these effects, it is expected the following:

Hypothesis 6: Foreign investment inflows will be positively related to a BIT between a foreign investor's home country and a host country.

(ii) *Regional Economic, Trade, and Investment Agreement*

Hypothesis7: Foreign investment inflows will be positively related to a regional economic, trade and investment agreement concluded by a host country.

3. Other Factors

(i) Natural Resources Endowment

EURASIA region countries possess substantial natural resources, including copper, zinc, gold, coal, natural gas, oil, precious stones, and other materials. Besides, the region has the potential for development of agriculture and processing of agricultural products. Favorable climate conditions and fertile territory contribute to a rich variety of products, including cotton, grain, tobacco, tea, nuts, fruits and vegetables.

Hypothesis 8: Foreign investment inflows will be positively related to a host country natural resources endowment.

(ii) Trade and Openness to International Markets

Foreign investors prefer countries with relatively liberal trade regimes, possibly within free trade arrangements. However, depending on the type of FDI, the level of openness of a host country could have a positive or negative impact on a country's ability to attract FDI. FDI focused on exploiting the local market would be attracted to a country with a less open economy, and FDI focused on exports (export-oriented FDI) would be positively related to openness. Despite the opposing nature of the theory one can still hypothesize as follows:

Hypothesis 9: Openness is expected to have a positive effect on FDI in EURASIA.

(iii) Trend

Global FDI grew dramatically during the period under study 1992 – 2010.

Hypothesis 10: Global trend is expected to have a positive effect of FDI in EURASIA.

IV. Research Methodology

Econometric Estimation Method

The impact of BITs on bilateral FDI outward position from 20 OECD countries to 20 EURASIA countries is estimated for the period from 1992 to 2010 included. This is the period for which data are available. The study estimates also the impact of EURASIA countries core economic fundamentals, such as, market size, growth prospects and macroeconomic stability; the level of development and efficiency of financial institutions; country financial risk, creditworthiness, external debt management ability, natural resources endowment, and the membership in a regional economic and trade agreement on bilateral inward FDI in EURASIA.

One of the major obstacles in the empirical analysis of the impact of BITs on inward FDI in EURASIA is data constraints. One strategy to minor this problem is to use *panel data methodology* in the estimation process. This methodology is able to produce superior results, and thus more precise conclusions. There are several benefits from using panel data. The first benefit from moving to panel data is the ability to exploit the time-series and cross-sectional variation in the data. Second, panel data suggest that countries are heterogeneous. Time-series and cross-section studies not controlling for this heterogeneity run the risk of obtaining biased results. Third, they give more informative data, more variability, less collinearity among variables, more degrees of freedom and more efficiency. Fourth, they are better able to identify and measure effects that are simply not detectable in pure cross-section or pure time-series data. They prevent an estimation bias related to the specification of FDI invariant determinants (like the distance variable, a common border, or a common language dummy) since these determinants are accounted for in the bilateral specific effect[1]. Finally, panel data allows control more easily the correlation between some explanatory variables and the error term (Baltagi, 1998, and 2009). Thus, panel data methodology answers the "good" economic policy question: does the ratification of a BIT between a source-host country pair increases bilateral inward FDI activity in the host EURASIA?

The econometric specifications use country-pair specific effects to capture time invariant unobservable effects that might affect bilateral inward FDI. The country-pair specific effects are taken into consideration because one might suspect that there are factors making the host EURASIA countries attractive to OECD foreign investors that are not captured by the explanatory variables, and that are time invariant, such as historical ties, culture, language, common border, knowledge of mentality of host country people. Both fixed-effects and random-effects methods are used in the estimations. The Hausman test (1978) is applied to detect the efficiency of the estimation method, and to test whether there is a correlation between the country-pair specific effects and the explanatory variables.

[1] This justifies the reason for not using the gravity model for the econometric specification.

Data

Data are originally collected by the researcher. They are compiled from the World Bank World Development Indicators, the IMF International Financial Statistics, OECD International Direct Investment Statistics online database, and UNCTAD's FDI/TNC, and International Investment Instruments online (electronic) databases.

For the purpose of the empirical analysis of the impact of BITs on FDI in EURASIA, the study uses data on bilateral FDI from the OECD International Direct Investment Statistics. The data set covers FDI bilateral outward position (stocks) from 20 OECD source countries, to 20 EURASIA host countries, from 1992 to 2010 included. This is the period for which data are available. Since the OECD area is the source of over 90 percent of FDI in EURASIA, the study covers the majority of FDI that are covered by BITs.

One of the major obstacles in the analysis of the impact of BITs on FDI is data constraints. As noted earlier, this begins with measuring the treaty activity. However, there are also significant measurement issues with respect to the data on bilateral FDI activity as well. This study uses OECD data on bilateral FDI stocks as reported by OECD member countries. Such data were not even compiled into a publicly-available form until 1993 with the first annual OECD International Direct Investment Statistics Yearbook. Since data are collected from national sources in each country, there is substantial variation in coverage by country source and by year, and there is variation in measurement of FDI activity itself. The data sets use *un-balanced panel data* from 1992 through 2010.

Noteworthy to mention that since the purpose of a BIT between two countries is the "reciprocal" encouragement, promotion and protection of investments in each other's territories by companies based in either country, one would expect that *outward FDI* from EURASIA to the 20 OECD countries to increase also. But data available on outward FDI from EURASIA to 20 OECD, suggest that there are some outward FDI but they are negligible and cover few years. Due to the paucity of data, an empirical examination is thus not expected to provide statistically significant results. For this reason, the empirical analysis focuses on bilateral inward FDI in EURASIA from 20 OECD countries.

V. Empirical Framework

There is a broad empirical literature on the determinants of FDI. A review of the literature shows that there is no clear agreement on the factors that determine FDI inflows. Studies use diverse variables and often come to opposing findings on the relationship between certain variables and FDI. John Dunning's "eclectic" theory and the theory of "country risk" have been the most successful in explaining FDI. In addition, the factors of both "eclectic" and "country risk" theories can be utilized also as "pull-factors" within the "pull and push approach" that has been widely adopted in the empirical literature on capital flows. Thus, to specify a reasonable model for examining the impact of BITs on FDI in EURASIA, the empirical analysis adopts an "integrated" theory of both the "eclectic" and "country risk" theories.

Impact of BIT Ratification

As the rationale for a host country to ratify a BIT is most applicable for countries where "political risk", "institutional quality", "investment environment", and "property rights" are generally weaker than in OECD countries, this focus facilitates the testing of the hypothesis that the lowering of political risk, providing international legal protection and strengthening of property rights significantly affects bilateral FDI activity. Moreover, foreign investors have many other considerations for deciding whether or not to invest in a country. They are concerned with the "economic conditions" - market size, growth prospects, macroeconomic stability (inflation), financial system's level of development and efficiency, the presence of a dynamic private sector, relative labor costs, availability of skilled labor, infrastructure, natural resources, etc… For this reason, the empirical analysis addresses the hypothesis that the ratification of a BIT signed by a EURASIA country with a particular OECD country merely reassures OECD home country investors, thus encouraging investment only if an investor's home country has signed a BIT with the host country. If this is the case, the analysis expects bilateral FDI inward activity to increase with the ratification of a treaty. However, the strength of the signal could be related to the "economic conditions" and the "institutions" of the host country.

Econometric Model Specification

The economic model that acts as the basis for the determinants of FDI in EURASIA is specified by the following equation:

$$\text{FDI}_{\text{Activity in EURASIA}} = f\{\text{Political Risk, Economic Risk, Financial Risk, Natural Resources Endowment}\} \quad (1)$$

The formal econometric model is derived from (1) and is specified as:

$$\begin{aligned}\ln(\text{FDI}_{ijt}) = {} & \alpha + \gamma_1 \text{BIT}_{ijt} + \beta_1 \ln(\text{GDP}_{jt}) + \beta_2 \text{Growth}_{jt} + \beta_3 \ln(\text{INFL}_{jt}) \\ & + \delta \text{ Financial Institutions}_{jt} + \theta \text{ Creditworthiness}_{jt} \\ & + \beta_4 \ln\text{NATRESOURCE}_{jt} + \mu_{ij} + \varepsilon_{ijt} \end{aligned} \quad (2)$$

FDI is assumed to depend upon host country's market size (GDP), economic growth (Growth), macroeconomic stability indicated by the inflation rate (INFL), financial institutions' level of development and efficiency (Financial Institutions), creditworthiness (Creditworthiness), and natural resources endowments. In addition, a group of dummies are added to capture the impact of BIT which stands for bilateral investment treaties, and BSEC for a regional economic and trade agreement. The model uses the natural logarithm, abbreviated ln of the dependent variable (FDI_{ijt}) and some of the explanatory variables to reduce the skewness in data distribution. The subscript (i) stands for the source country, (j) the host country, and (t) the time. μ_{ij} represents time-invariant unobserved country-pair specific effects, ε_{ijt} represents the omitted other influences on FDI activity.

The formal econometric model (2) represents the Baseline Model. It examines the impact of (BIT) on FDI, in addition to economic, financial, creditworthiness, and natural resources variables. Next, the dummy variables (BSEC), (CAUCASUS), and (SSE), are added to the Baseline Model, to capture the impact of a regional economic agreement, the

Caucasus, and non-EU South and South East Europe. This will check the robustness of the estimation results of the Baseline Model, and is specified as:

$$\ln(FDI_{ijt}) = \alpha + \gamma_1 BIT_{ij}t + \gamma_2 BSEC_{jt} + \gamma_3 CAUCASUS_{jt} + \gamma_4 SSE_{jt} + \beta_1 \ln(GDP_{jt}) + \beta_2 Growth_{jt} + \beta_3 \ln(INFL_{jt}) + \delta \text{ Financial Institutions}_{jt} + \theta \text{ Creditworthiness}_{jt} + \beta_4 \ln NATRESOURCE_{jt} + \mu_{ij} + \varepsilon_{ijt} \quad (3)$$

BIT Interaction with Financial Depth and Efficiency

In the case of the above two models (2) and (3), the reasoning is that a host country signs BITs in order to attract FDI. That is, BITs are often justified by an emerging country as a signal that they will protect foreign investment by providing international legal protection, thereby strengthening the "investment environment". However, the credibility of this signal will be affected by the "quality of institutions" of the host country. The study emphasizes on the role of "financial institutions" and argues that the lack of development of local financial institutions can limit a country's ability to take advantage of FDI. Within this framework, the study in a further analysis, examines empirically whether the effect of BITs changes significantly with the level of development and efficiency of financial institutions. It examines empirically the impact of the interaction of BIT with financial institutions' depth and efficiency on FDI. The purpose is to test whether or not BITs exert different impact on FDI in well-developed and efficient financial institutions. The econometric model including an interaction term is specified as:

$$\ln(FDI_{ijt}) = \alpha + \gamma_1 BIT_{ij}t + \beta_1 \ln(GDP_{jt}) + \beta_2 Growth_{jt} + \beta_3 \ln(INFL_{jt}) + \delta \text{ Financial Institutions}_{jt} + \gamma_2 (\mathbf{BIT_{ijt} * Financial\ Institutions_{jt}}) + \mu_{ij} + \varepsilon_{ijt} \quad (4)$$

Equation (4) represents the model with an interaction term. All the variables are the same as in the baseline model.

Variables and Sources

Dependent Variable

As dependent variable for the empirical analysis, the study uses bilateral FDI outward position (stock) from each 20 OECD source country into each 20 EURASIA host country over the period 1992-2010. Appendix A supplies further details on the covered 20 OECD source and the 20 EURASIA host countries. Data limitation on bilateral FDI activity necessitates the adoption of an *un-balanced panel data*[2].

The empirical analysis examines the dependent variable (FDI_{ijt}) as the bilateral FDI outward position of a specific OECD source country (i) in a host EURASIA (j), in year (t). To the extent that FDI flows may be reversible, FDI stock provides a better measure of the actual "inflow of FDI". The data set of FDI outward stock consists of 7580 observations,

[2] A panel data set where certain years (or periods) of data are missing for some cross-sectional units.

majority having positive values. Only 42 values have negative signs, and 5761 are blank. According to OECD's explanation, the blank values represent confidential values. The empirical analysis examines the dependent variable (FDI_{ijt}) by recoding the blank values of FDI. For blank values of FDI stock, the study has recoded their logarithm as zeros [(FDI_{ijt}) = 1 for all (FDI_{ijt}) is blank, this implies ln (1) = 0]. Then the number of observations in the panel data is increased. Using the natural logarithm of FDI outward stock generates 42 missing observations in the panel data, because the natural logarithm of a negative number or a zero is undefined. The results of recoded FDI outward stock are reported in Appendix E.

Data are from the OECD International Direct Investment Statistics online database. Original values are in current US dollars. They are converted to constant 2000 US$ by using the US GDP deflator from the World Bank WDI. This procedure ensures that the valuation of the constant price FDI stock is not affected by movements in the nominal exchange rate of the host country. That is, this approach eliminates source-host bilateral exchange rate changes. The regressions use the natural logarithm of the dependent variable (FDI_{ijt}) in constant 2000 US$.

Explanatory Variables

The explanatory variables on the right hand side of equation (2) are the variables specific to both "Country Risk" and "Eclectic" theories' frameworks. They can be utilized also as "pull- factors" within the "pull and push approach".

(i) Bilateral Investment Treaties (BIT)

The explanatory variable BIT_{ijt} *is the focus variable*, a measure of bilateral investment treaty ratified between OECD source country (i) and a EURASIA host country (j) in year (t). There are substantial measurement issues that determine how to define this variable. One can observe when countries make bilateral investment treaties with each other, but these treaties certainly differ from each other along many dimensions which are very difficult to quantify. In addition, the same treaty on paper can have different consequences for different pairs of countries depending on the unilaterally-adopted practices of countries before entering the treaty.

Because of these difficulties, this study measures investment treaty activity as a binary variable taking the value of "1" if two countries have a BIT in place in year (t) and after, "0" otherwise. Hence, a dummy is included in a panel regression that takes the value of "1" once a BIT has been ratified[3] between a pair of source-host countries. The significance of the coefficient on this variable is then a test of the importance of the treaty[4]. As a result, it will be able to estimate the impact of BITs. Hallward-Driemeier (2003), and Egger and Pfaffermayr (2004) have used a BIT variable in the same way.

[3] UNCTAD publishes both the date of signing of BITs and the date it was ratified. The distinction is important as the treaty only goes into effect once it is ratified – and there are several cases where 'signed' treaties have never been ratified. The thesis uses the date of ratification of the BIT in all the empirical work.

[4] This thesis does treat all BITs equally, when in fact there are some differences between them. The general point that BITs strengthen property rights holds across all of them. It is possible that there would be more of an effect if one looked only at those treaties with the strongest investor protections. Given this would require reading and devising an index measure of tens of BITs, it is beyond the scope of this study. However, if BITs are acting as a substitute for property rights, one would expect that the stronger clauses would be included in treaties with countries that have lower domestic property rights. That there is no evidence that

Data on BITs are available from a listing published by UNCTAD international investment instruments online (electronic) database (http://www.unctad.org//iia) that documents the parties to every bilateral investment treaty, the date of signature, and the date of entry into force.

(ii) Market Size and Growth Prospects: GDP and Growth

Market size is universally accepted as the leading determinant of FDI inflows. FDI attracted by this factor is called market-seeking FDI (Dunning, 1993). Many studies have used Gross Domestic Product (GDP) as an indicator of the "size" of an economy. This study follows them and uses this variable as an indicator for market size, and expects to have a positive impact on inward FDI. The proxy used is the natural logarithm of host country GDP in constant 2000 US $.

Beyond market size, there is general disagreement on the determinants of FDI. Theoretically, the rate of growth of a country's economy (Growth) would seem to be important for attracting FDI, as a fast growing economy in the present would indicate future market potential (Schneider and Frey, 1985, Tobin and Rose-Ackerman, 2005, Neumayer and Spess, 2005). The expected relationship between the economy's rate of growth and FDI is positive. Proxy used is real GDP growth (annual %). Data for both GDP and GDP growth are from the World Bank WDI.

(iii) Macroeconomic Stability: Inflation Rate: INFL

Inflation rate (INFL) is a proxy for macroeconomic stability. High inflation rate indicates domestic policy failure that discourages both savings and investment. Where inflation rates are high, potential direct investors find difficulty even in making short-term pricing decisions. Considering that investors prefer to invest in more stable economies, that reflect a lesser degree of uncertainty, it is reasonable to expect that inflation would have a negative effect on FDI (Schneider and Frey, 1985). The proxy used is the natural logarithm of inflation, consumer prices (annual %). Data are from World Bank WDI.

(iv) Financial Institutions' Level of Development and Efficiency

The study employs various ratios used by the World Bank for the assessment of a country's financial system's size, level of development and efficiency. Different specifications are used to examine separately the impact of each financial indicator on inward FDI in EURASIA. Data are from the World Bank WDI.

Domestic Credit Provided by the Banking Sector (% of GDP): BANKCR

The ratio of domestic credit provided by the banking sector to GDP is a measure of the development and growth of the banking system because it reflects the extent to which savings are financial. It includes all credit to various sectors on a gross basis, with the exception of credit to the central government, which is net. Because the banking system represents the financial intermediaries, the growth of the banking system, reflects the level of development of financial intermediaries, and is an indicator of financial depth. The banking sector includes: (a) monetary authorities, (b) deposit money banks, and (c) other banking institutions for which data are available. Examples of other banking institutions include savings and mortgage loan institutions, and building and loan associations.

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these countries receive additional FDI after signing a BIT would indicate that the effort to classify individual BIT terms is unlikely to be fruitful.

The ratio (BANKCR) is important in the sense that credit is an important link in the money transmission process; it finances production, consumption, and capital formation, which in turn affects the level of economic activity. Foreign investors' decisions are affected by host country credit conditions, as they can have access to complementary local finance more easily, and face lower transaction costs for local financial services. Moreover, their customers too, are more likely to have access to bank credit, which should accelerate the demand for their products that are often bought on credit. Therefore, the study expects BANKCR to have positive impact on inward FDI to EURASIA. It is employed in natural logarithm in all regressions.

Interest Rate Spread (lending rate minus deposit rate % points): INTSPREAD

No less important than the size and depth of the financial sector is its efficiency, as indicated by the margin between the cost of mobilizing liabilities and the earnings on assets - or the interest rate spread. Interest rate spread is the interest rate charged by banks on loans to prime customers minus the interest rate paid by commercial or similar banks for demand, time, or savings deposits. A small spread indicates that the market considers its best corporate customers to be low risk (World Bank, WDI). Interest rates reflect the responsiveness of financial institutions to competition and price incentives. Narrowing of the interest rate spread reduces transaction costs, which lowers the overall cost of investment and is therefore crucial for investment decisions.

The interest rate spread, also known as the intermediation margin, is a summary measure of a banking system's efficiency or financial efficiency. It indicates also the "quality" of financial institutions (Andreff and Andreff, 2006). For the EURASIA countries, a narrow spread means that financial sector reforms are advanced enough to have banking sector or financial institutions that can be compared to the EU ones or that complies with the acquis communautaire (Andreff and Andreff, 2006). Thus, the study expects INTSPREAD to have a positive impact on inward FDI. Interest rates are expressed as annual averages

(v) Financial Risk and Country Creditworthiness

Many studies have used country credit ratings provided by various institutions, such as the Political Risk Services Group's (PRS) International Country Risk Guide (ICRG), Economist Intelligence Unit (EIU), Euromoney, and Institutional Investor as an indicator of overall economic stability that includes both political and macroeconomic stability. However, there arises the question of subjectivity in these ratings since it is found that the ranking of countries based on these ratings differ across estimates provided by different agencies. To avoid the problem of subjectivity, this study prefers to use separately the most frequently used variables in assessing a country's ongoing financial position.

Financial Risk

A country's financial risk refers to the ability of an economy to generate enough foreign exchange to meet payments of interest and principal on its foreign debt (Clark and Marois, 1996, Bouchet, Clark and Groslambert, 2003). The variables most frequently used by international financial institutions and financial analysts in assessing cross-border financial risk include those variables that give information on a country's foreign debt and interest payments (ICRG, EIU, Euromoney, Institutional Investor). To capture financial risk and country creditworthiness, the empirical study employs some of the most common financial ratios. These ratios are:

- *Total External Debt / Exports of Goods and Services (EDT/XGS) (%)*
- *Total Debt Service / Exports of Goods and Services (TDS/XGS) (%)*

The ratio EDT/XGS can be interpreted as a measure of an economy's financial leverage. Financial leverage measures the extent to which the assets are financed with debt. The higher a country's external debt obligations relative to its export revenues (EDT/XGS), the higher is its financial risk and default on payment. Foreign investors consider high external debt ratios of a host country as unfavorable. Alternatively, one might argue that, a high external debt might motivate a host country to sell-off State properties to reduce the burden of the government and attract foreign capital to pay-off its external debt, thus attracting "*privatization-related FDI*". Therefore, the study does not predict a sign for (EDT/XGS) on inward FDI.

The ratio TDS/XGS resembles a cash flow coverage ratio. It relates export earnings to total current financial obligations including payments of interest and principal. A low ratio indicates a better financial position. However, the same argument as above applies for TDS/XGS. High current financial obligations of a host country, including payments of interest and principal, might motivate a country to sell-off State properties and attract "privatization-related FDI". Thus, the study does not predict a sign for the impact of (TDS/XGS) on FDI.

International Liquidity Position (or Liquidity Risk)

International liquidity position or liquidity risk refers to a country's ability to meet its maturing short-term obligations. The ratios which indicate the liquidity risk are:

- *Reserves / Imports of Goods and Services (RES/MGS) (months)*
- *Reserves / Total External Debt (RES/EDT) (%)*

The RES/MGS ratio measures a country's ability to maintain import levels with current cash in hand. The higher the reserves of a host country in months of imports (i.e. the higher the import coverage period), the higher is its international liquidity position, thus the higher is its international creditworthiness (Bouchet, Clark, and Groslambert, 2003). The RES/EDT measures a country's ability to maintain its external debt obligations with current cash in hand. A higher ratio indicates higher liquidity position, thus higher creditworthiness. Reserves may be interpreted also as proxy for exchange rate stability, at least in the short run (Matyas 1997, Matyas et al. 1997, and Egger and Pfaffermayer, 2004). Foreign investors consider high reserve ratios as favorable. Thus, the study expects both RES/MGS and RES/EDT to have positive impacts on inward FDI.

Different specifications are used to examine separately the impact of each indicator on inward FDI in EURASIA. All financial risk and creditworthiness indicators are employed in natural logarithms in all the regressions, as indicated in the tables. Data are from the World Bank WDI.

(vi) Regional Economic trade and Investment Agreement (BSEC)

A dummy is included to capture the impact of concluding a regional economic, trade and investment agreement, the Black Sea Economic Cooperation. $BSEC_{jt}$ is a binary variable that takes the value of "1" if the host country (j) has joined the BSEC in year (t) and after, "0" otherwise. The study expects the membership of a regional economic organization to have a positive impact on inward FDI.

(vii) Other Variables

Openness: Trade (export plus import)/GDP

The term "openness" of the economy refers to the share of trade (import plus export) in GDP. International trade in goods and services is a principal channel of economic integration. A convenient way to measure the importance of international trade is to calculate the share of trade in GDP. Many studies tested the impact of openness of trade and regional trade agreements on FDI inflows and found them to be important determinants (Gastanaga, Nugent and Pashmova, 1998, Yeyati, Stein and Daude, 2003, Hallward-Driemeier, 2003). The expected effect may differ by the type of investment regarding local market or export orientation. Thus, the study does not predict a sign for the effect of Openness on FDI. Trade indicator is entered in the regressions in natural logarithmic form. Data are from World Bank WDI.

Trend

Global FDI grew dramatically during the period under study (the 1990s). Trend is included in the regressions to capture this global trend in FDI inflows, business cycle and technological change. The study expects a positive relationship between Trend and FDI activity in EURASIA. In order to capture the same year effect, the trend starts with 1992 for all countries regardless of each country's first year of observation. It is equal to 1 for 1992, 2 for 1993, 3 for 1994, 4 for 1995, etc…

Table 1 summarizes the definitions of the explanatory variables and reports their expected signs. Appendix B describes the variables and provides information on data sources. Appendix C reports summary statistics for the variables, and Appendix D presents a pair-wise correlation matrix for the variables.

Estimation Method

The study uses panel data methodology in the estimation process. A panel data regression differs from a regular time-series or cross-section regression in that it has a double subscript on its variables. In general, it appears as follows:

$$y_{it} = \alpha + X'_{it}\,\beta + u_{it} \qquad i = 1,\ldots, N;\ t = 1,\ldots, T \tag{5}$$

$$u_{it} = \mu_i + \varepsilon_{it} \tag{6}$$

Where y represents the dependent variable, X' represents a set of explanatory variables, α is a scalar, β is a Kx1 vector, and X_{it} is the itth observations on K explanatory variables. u_{it} is the error component model for the disturbances, where μ_i denotes the unobservable specific effects and ε_{it} denotes the remainder disturbance. The subscript I denotes the cross-section dimension, and t denotes the time-series dimension (Baltagi, 1998, 2001, Wooldridge 2002, and 2010).

The data set of this study gives rise to a specific panel model with two cross-section dimensions (source countries i, i = 1, …, Ni , and host countries j, j = 1,…, Nj) and one time dimension t, t = 1,… T. Thus, the panel data regression that will be specified for the empirical analysis of this study appears as follows:

$$y_{ijt} = \alpha + X'_{ijt}\,\beta + u_{ijt} \quad (7)$$
$$u_{ijt} = \mu_{ij} + \varepsilon_{ijt} \quad (8)$$

Where the dependent variable y_{ijt} represents bilateral FDI activity from source country i into host country j at time t, β is Kx1, and X'_{ijt} denotes a vector of exogenous variables which vary in the cross-section (either with the host country j, or with both source country i and host country j) and in the time dimension t. The explanatory variable vector X'_{ijt} represents the selection of variables described in the economic model for FDI activity in EURASIA specified in the previous section.

The typical error component model is given in (8). Here, μ_{ij} is a term unique to the country-pairs, for which $\mu_{ij} \sim (0, \sigma\mu 2)$, known as the time-invariant unobservable country-pair specific effects. The fact that μ_{ij} does not have a (t) subscript tells that it does not change over time. The remaining error ε_{ijt} is the idiosyncratic error or time-varying error. It varies with countries and time and can be thought of as the usual disturbance in the regression, follows a normal distribution with zero mean and constant variance, $\varepsilon_{ijt} \sim (0, \sigma\varepsilon 2)$, and is assumed to be uncorrelated over all i, j and t. That is, $E[\varepsilon_{ijt}\,\mu_{ij}] = 0$ and $E[\varepsilon_{ijt}\,X_{ijt}] = 0$ (Wooldridge, 2010).

Country-pair specific effects (μ_{ij}) are considered in the econometric model to take into account all unobservable country-pair specific effects that are time-invariant and may affect FDI activity between two countries. They are taken into consideration because one might suspect that there are factors making a country attractive to foreign investors that are not captured by the mentioned explanatory variables (X'_{ijt}) and are time-invariant such as history, culture, language, frontier, climate, geographical distance to the centers of the Western developed countries, and other effects.

The country-pair specific effects (μ_{ij}) may or may not be correlated with the explanatory variable vector (X'_{ijt}). The existence of a correlation between the country-pair specific effect and the regressors may be detected by applying the Hausman test (1978), whose null hypothesis is the non-correlation between (μ_{ij}) and (X'_{ijt}). In the case of there being a correlation, estimation must be done with a fixed-effects estimator (LSDV)[5]. Otherwise, the random effect estimator would be the most appropriate. In other words, (μ_{ij}) can be treated as being fixed or random, depending on the data sample.

The specified model is estimated by both fixed-effects and random-effects estimation methods. For all of the specifications, a Hausman test (1978) did not reject the null hypothesis of no correlation between the country-pair specific effects (μ_{ij}) and the explanatory variables (X'_{ijt}). Therefore, a random-effects estimation method is adopted and the Generalized Least Squares (GLS) methodology is employed to obtain consistent and efficient estimates. The results are displayed in the tables of the following section.

[5] Least Squares with Dummy Variables

Table 1: Variables and Theoretical Predictions of FDI Determinants in EURASIA

Determinant	Variable Name	Proxy Used	Abbreviation	Expected Sign
International Investment Agreements	Bilateral Investment Treaties	BIT with OECD Countries (Dummy)	BIT	(+)
	Regional Economic, Trade, and Investment Agreement	Black Sea Economic Cooperation (Dummy)	BSEC	(+)
Economic Performance	Market Size	GDP (constant 2000 US$)	GDP	(+)
	Growth Prospects	GDP Growth (annual %)	Growth	(+)
Macroeconomic Stability	Inflation Rate	Inflation, consumer prices (annual %)	INFL	(-)
Financial Institutions' Level of Development and Efficiency	Financial Sector Depth	Domestic Credit Provided by the Banking Sector (% of GDP)	BANKCR	(+)
	Financial Sector Size	Domestic credit to private sector (% of GDP)	PRIVCR	(+)
	Financial Sector Efficiency	Interest Rate Spread (lending rate minus deposit rate % points)	INTSPREAD	(+)
Financial Risk and Creditworthiness	External Debt Position	Total External Debt / Exports of Goods and Services (%)	EDT/XGS	(+) / (-)
		Total Debt Services / Exports of Goods and Services (%)	TDS/XGS	(+) / (-)
	International Liquidity Position	Reserves / Imports of Goods and Services (in months of imports)	RES/MGS	(+)
		Reserves / Total External Debt (%)	RES/EDT	(+)
Natural Resources Endowment	Natural Resources	Total natural resources rents (% of GDP)	NATRESOURCE	(+)
Trade Openness	Share of Trade in GDP	Trade (Exports plus Imports) (% of GDP)	Openness	(+) / (-)
Energy	Energy	Energy production (kt of oil equivalent)	ENERGY	(+)
Technology	Research and Devlopment	Research and development expenditure (% of GDP)	RESEARCHDEVELOP	(+)
	ICT	ICT goods exports (% of total goods exports)	ICT	(+)
Global FDI Trend	Trend	Trend	TREND	(+)

Table 2: Summary of Empirical Results

Determinant	Variable Name	Proxy Used	Coefficient Sign	Significance Level
International Investment Agreements	Bilateral Investment Treaties	BIT with OECD Countries (Dummy)	(+)	1%
	Regional Economic Agrement	BSEC (Dummy)	(+)	not significant
Economic Performance	Market Size	GDP (constant 2000 US$)	(+)	1%
	Growth Prospects	GDP Growth (annual %)	(+)	1%
Macroeconomic Stability	Inflation Rate	Inflation, consumer prices (annual %)	(-)	1%
Financial Risk and Creditworthiness	External Debt Position	EDT/XGS (%)	(+)	1%
		TDS/XGS (%)	(+)	1%
	International Liquidity Position	RES/MGS (in months of imports)	(+)	1%
		RES/EDT (%)	(+)	5%
Financial Institutions' Level of Development and Efficiency	Financial Inst. Size and Development	BANKCR: Domestic credit provided by the Banking Sector (% of GDP)	(+)	1%
	Financial Inst. Depth	PRIVCR: Domestic credit provided to the Private Sector (% of GDP)	(+)	1%
	Financial Inst. Efficiency	Interest rate spread (% points)	(+)	1%
Trade Openness	Share of Trade in GDP	Trade (Exports plus Imports) (% of GDP)	(+)	1%
Natural Resources Endowments	Natural Resources	Total natural resources rents (% of GDP)	(+)	1%
Energy Use	Energy	Energy production (kt of oil equivalent)	(-)	1%
Research & Development	Research & Development	Research and development expenditure (% of GDP)	(-)	1%
ICT	ICT	ICT goods exports (% of total goods exports)	(-)	insignificant
Global FDI Trend	Trend	Trend	(+)	1%

VI. Discussion of Results

To estimate the impact of BITs on FDI activity in EURASIA, both fixed-effects and random-effects estimation methods have been used. However, the analysis is based on random-effects GLS estimation results because for all specifications the Hausman Statistic shows that the regressors are not correlated with the country-pair specific effects (μ_{ij}).

Baseline Model: FDI and BITs

To investigate the impact of BITs on FDI in EURASIA, a Baseline Model is estimated with the (*BIT*), *the focus variable*, in addition to economic, financial, creditworthiness, and other variables. Appendix E reports random-effects GLS estimation results of FDI inward stock as dependent variable. Different specifications are estimated to examine separately the impact of each indicator. Each regression uses a different indicator for financial institutions, financial risk, creditworthiness, openness, natural resources endowment, and trend. Most of the variables, reported under the different specifications have the expected signs and are consistent with the literature. They test in accordance with theoretical predictions.

Regarding the impact of *BIT*, *the focus variable*, the findings emphasize the following: in all the specifications the coefficient of *BIT* is significantly different from zero and it ranges from 3.63 to 2.10. *BIT* shows a statistically highly significant positive coefficient at 1% level in all specifications. Hence, the estimated impact of *BIT* is relatively unaffected by the choice of specification, and that *BIT* is not correlated with other variables. Since FDI stocks are measured in logs, the study must transform the *BIT* effect to percentage figures. Following Wooldridge (2000, p.219)[6], the overall effect of implementing a treaty is calculated as $100*[\exp(\gamma_1) - 1]$[7]. According to Tables of Appendix E, this estimated effect of *BIT* on bilateral real inward FDI stock ranges from about 3670 % to about 700%. Such results clearly demonstrate the highly significant favorable role BITs play in attracting FDI to EURASIA. The ratification of BITs between OECD countries and EURASIA (in the early 1990s they were considered as Transition economies) provided guarantees to foreign OECD investors. International legal protection through the provisions concerning investor-State dispute settlement, protection against nationalization and expropriation, transfer of funds, non-discriminatory treatment of foreign firms (NT) and (MFN), removal of restrictions on their operations, and protection of property rights appear to be a significant determinant of FDI to EURASIA from OECD countries.

All the specifications in the tables of Appendix E clearly demonstrate the importance of market size (*GDP*) and (*Growth*) for attracting FDI. The coefficients of (*GDP*) and (*Growth*) are highly significant and positive in all specifications (1%). This underscores the importance of market size and growth prospects as important determinants for FDI. In other words, considerations for market-size and growth prospects have indeed dominated

[6] Generally, if γ_1 is the coefficient on a dummy variable, say x_1, when log (y) is the dependent variable, the exact percentage difference in the predicted y when $x_1 = 1$ versus when $x_1 = 0$ is $100*[\exp(\gamma_1) - 1]$. The estimated γ_1 can be positive or negative, and it is important to preserve its sign in computing $100*[\exp(\gamma_1) - 1]$.

[7] Egger and Pfaffermayr (2004a) follow Kennedy (1981) and compute the percentage impact of BIT ratification as $100*[\exp(\gamma_1 - 0.5 \text{ Var}(\gamma_1)) - 1]$.

investment decisions of OECD investors. This reflects the fact that OECD investors are "*market-seeking*" investors, because they are attracted by the market size of the EURASIA.

Macroeconomic instability indicated by the inflation rate *(INFL)* shows a statistically highly significant and negative coefficient in all specifications. This suggests that instability in prices creates uncertainty in the economy and deters inward FDI. The inclusion of each, domestic credit provided by the banking sector (*BANKCR*), the external debt relative to export levels (*EDT/XGS*), and (*RES/EDT,*) have dropped the significance of (INFL). Such results show that a country's inflation rate level is correlated with financial institutions' depth and efficiency, and external debt management ability, and international liquidity position. When (*RES/EDT*) is introduced (*INFL*) turns to be insignificant. Moreover, this finding confirms that reserves do act as proxy for price stability, at least in the short run, thus, attracting "market-seeking" FDI.

The external debt position relative to export revenues (*EDT/XGS*) and the ratio of total debt services to export revenues (*TDS/XGS*) show highly significant positive coefficients. The significant positive effect of an external debt ratio on FDI might be explained by the fact that the current external debt obligations (payments of interest and principal) have motivated the EURASIA governments to sell off State-properties, thus attracting "*privatisation-related*" FDI.

The international liquidity position indicators, *RES/MGS* and *RES/EDT* show highly significant positive coefficients (1% level). This shows that the international liquidity position of a host country and the ability to meet short-term payments, adds to its creditworthiness, and affects foreign investor's decisions favorably. High reserve levels, is a sort of guarantee to foreign investors that the host country will not face balance of payments problems in the near future. Thus, investors feel more secured concerning the transfer of funds (repatriation of profits, and dividends), and transactions.

The indicators of financial institutions' level of development and efficiency, domestic credit provided by the banking sector in percent of GDP (*BANKCR),* which indicates the level of development of the banking system, domestic credit to private sector in percent of GDP (*PRIVCR*), interest rate spread (*INTSPREAD),* have statistically highly significant positive relationships with FDI. Tables of Appendix E show that these variables are significant at 1% levels. Especially, they indicate that the "Depth" of financial institutions reflected by (*BANKCR*), and (*PRIVCR*), and "efficiency" reflected by the interest rate spread (*INTSPREAD*), have extremely crucial role in determining inward FDI (significant at 1%). Foreign investors are very sensitive to the "efficiency and quality" of financial institutions. This reflects the fact that banks in EURASIA have provided enough domestic credit to the extent of attracting inward FDI significantly.

Natural resources endowment (*NATRESOURCE*) reveals a highly significant positive coefficient, indicating that the richness of EURASIA in natural resources such as oil, coal, natural gas, minerals, and precious stones have been an important factor for inward FDI.

FDI, BIT, and Regional Economic Cooperation Agreement (BSEC)

The study extends the empirical analysis and examines the impact of a regional economic agreement on FDI in EURASIA. The new variable introduced to the Baseline *Model is Black Sea Economic Cooperation* (*BSEC*). A new set of regressions are run under both fixed-effects and random-effects estimations. A Hausman test (1978) prefers the random-effects estimation method for all specifications. Hence, the analysis is based on the random-effects GLS estimation results (Appendix E). As in the Baseline Model, different specifications are estimated to examine separately the impact of each indicator for financial institutions, financial risk, creditworthiness, openness, natural resources, and trend. The results report that the variables tested in the different regressions do not change their magnitude, significance and sign, and they test in accordance with theoretical expectations. The results are consistent with the baseline model results.

The coefficients of greatest interest concern the effects of (*BIT)*, and (*BSEC)*; what do they reveal? *BIT, the focus variable,* appears to be significant and positive. It continues to show a statistically highly significant positive coefficient in all specifications (1% level). The introduction of a regional economic agreement (*BSEC*), does not affect the significance of (*BIT*). Such a result confirms that BITs, by providing international legal protection, play an important role and have significant favourable impact on FDI in EURASIA.

The negative surprise is that a regional economic agreement, (*BSEC)*, is not correlated with deeper FDI activity in EURASIA. The coefficient of BSEC is insignificant throughout all specifications. *Why this is the case?* In part, the insignificance of the result could be due to the following factors. First, BITs are *enforceable*, whereas the BSEC *is not enforceable*. BITs provide provisions that are much important to foreign investors. For example, BITs provide international legal protection to foreign investors through two key provisions concerning State-State and investor-State dispute settlement procedures. The majority of BITs refer to ICSID (International Centre for Settlement of Investment Disputes) arbitration, an affiliate agency of the World Bank, or to a choice between ICSID and other international arbitration systems, most commonly the UNCITRAL Arbitration Rules (United Nations Commission on International Trade Law) (UNCTAD 1998a, b, 2003). In these arbitration proceedings, three arbiters are selected – generally with each party selecting one and the forum selecting the third. These proceedings are not bound by precedents, are not necessarily obliged to be open to the public, or to publish final decisions. The decisions have only limited avenues for appeal and cannot be amended by the domestic legal system or the supreme-court (Hallward-Driemeier, 2003). The BSEC does not provide an article for the settlement of dispute between a foreign investor and the host country. Also, the *BSEC* does not provide provisions for the compensation of damages or losses, and protection against nationalization, and expropriation. Therefore, the EURASIA by concluding BITs with individual OECD countries in the early 1990s has offered international legal protection and guarantees to OECD investors.

Another factor which might explain the insignificance of the (*BSEC)* is that BITs provide non-discriminatory treatment to foreign investors through special provisions concerning standards of treatment. Two key provisions are the ones concerning national treatment (NT) and most-favored-nation treatment (MFN). These issues are of extreme importance to foreign investors.

Robustness Checks

To check the *robustness* of the estimation results, the empirical analysis uses different specifications and runs different sets of regressions for the *BIT*s. The study repeats the same set of regressions but uses different variables, such as, (*Energy*), (*Research and Development*), *(ICT*), (*Trend*). Appendix E displays results of specifications introducing all variables simultaneously to the economic, financial, creditworthiness, and openness variables. The coefficient of greatest interest is that of (*BIT),* which demonstrates statistically highly significant positive impact on inward FDI throughout all specifications (1% level). Moreover, the estimated coefficients stay almost unchanged. All the other variables maintain their significance, sign and magnitude. They reveal the same level of significance and sign whether introduced individually or simultaneously to the regressions. Clearly, the results show that BIT is not correlated with other variables.

Interaction Term Analysis: BIT Interaction with Financial Depth and Efficiency

Appendix E reports also results by introducing an interaction term to the regressions – the interaction of (*BIT*) with each financial indicator – (*BANKCR*), (*PRIVCR*), and (*INTSPREAD*). The regressions are estimated under both fixed-effects and random-effects methods. A Hausman test is more efficient under random-effects, thus the analysis is based on random-effects GLS estimation results.

The results of regressions including the interaction of BIT with financial depth: (*BIT*lnBANKCR*), and (*BIT*lnPRIVCR*) reveal the following: When an interaction term is introduced, the BIT variable loses its significance but maintains its positive coefficient. The two financial variables (*BANKCR),* and *(PRIVCR)* are highly significant and positive. The interaction terms (*BIT*lnBANKCR),* and (*BIT*lnPRIVCR*) are highly significant with positive coefficients. *How to interpret this result?* With an interaction term included, one cannot interpret the coefficients on the individual components in the conventional way. Instead, the coefficients on (*BANKCR*), and (*PRIVCR)* in a model with highly significant interaction terms (*BIT*lnBANKCR),* and (*BIT*lnPRIVCR*) are the effect of (*BANKCR*) and (*PRIVCR)* on FDI when the BIT variable is zero. It follows from the estimations that the depth of the financial sector measured by (*BANKCR*), and level of development of the private sector (*PRIVCR*) have significant positive impact on FDI in the absence of BITs. The interaction term is highly significant and positive; however, the individual effect of BITs is insignificant and positive. The significant and positive effect of BIT on FDI becomes smaller and insignificant in the presence of well-developed financial institutions, but never to the extent that the effect would become negative. Furthermore, this demonstrates that both the level of development of financial institutions, and the private sector have stronger effect on FDI than BITs. This suggests that BITs and financial institutions complement each other, and that a BIT is not a substitute for institutions, specially, financial institutions.

Appendix E reports also the impact of BIT interaction with the "efficiency" or "quality" of financial institutions (*INTSPREAD*). With the introduction of an interaction term the individual effects of BIT and INSPREAD are still highly significant and positive. However, the interaction term BIT* INTSPREAD is insignificant. Such a result demonstrates that BITs and "efficiency" or "quality" of financial institutions individually exert a significant positive impact on FDI. They are complementary in creating a favorable investment environment. This is very strong empirical evidence that in the presence of

"efficient" financial system BITs do not have significant positive impact on FDI. Each exerts an individual significant positive effect on inward FDI. Therefore, the answer to the question, raised by the study, are BITs more effective in well-developed and efficient financial system, is no. Each has a separate and distinct role in creating favorable "investment environment" in attracting FDI. The economic performance and stability variables maintain their level of significance and sign. Market size (*GDP*), and Growth prospects appear to be significant determinants of FDI. Inflation (*INFL*) is a significant deterrent to FDI. The financial variables (BANKCR*), (PRIVCR),* and (*INTSPREAD)* have very significant positive coefficients, suggesting that inward FDI is positively correlated with host country financial institutions' the level of development and efficiency.

VII. Conclusion

This study aimed at the examination of the impact of BITs in attracting FDI. In particular, it assessed the extent to which the ratification of a BIT between a source-host country pair increases bilateral inward FDI in EURASIA. The study dwelt on the experiences of twenty EURASIA countries since the 1990s.

The study found out that the ratification of BITs between OECD and EURASIA countries exert a highly significant positive effect on bilateral inward FDI in EURASIA during the period under study. The Black Sea Economic Cooperation, as a regional economic, trade, and investment agreement, does not have any significant effect on inward FDI in ERASIA. It was interesting to see that global FDI trend has a significant positive effect on inward FDI. Among the variables market size, growth prospects, well developed and efficient financial institutions, high levels of international liquidity position, and high external debt obligations, and natural resources were found to have significant positive impact on inward FDI. Macroeconomic instability reflected by high inflation rates revealed to be a strong deterrent to inward FDI.

In an additional effort, the empirical analysis examined the interaction of BIT with the financial system's level of development and efficiency. It investigated whether or not BITs are more effective in well-developed and efficient financial system. The empirical results revealed that BIT, financial depth and efficiency, individually exert significant positive effects on inward FDI. The insignificance of the coefficient of the interaction term demonstrated that BITs do not play an additional role on FDI in the presence of well-developed and efficient financial system. Each has separate, distinct and significant favorable impact on inward FDI in EURASIA. The presence of BITs, well developed and efficient financial institutions create a favorable "investment environment" and attract foreign investments.

The Uniqueness of This Study

This study is original in that it makes an important contribution to the determinants of FDI. It is unique in that it taps previously unexplored horizons related to the impact of BITs on FDI. Other studies, such as Hallward-Driemeier (2003), Banga (2003), Egger and Pfaffermayr (2004a), Salacuse and Sullivan (2004), Tobin and Rose-Ackerman (2005), Neumayer and Spess (2005), Desbord and Vicard (2006) have examined only the impact of BITs on FDI. Some of these authors found that BITs exert a significant positive effect on inward FDI (Banga, 2003, Egger and Pfaffermayr, 2004, Neumayer and Spess, 2005, Salacuse and Sullivan, 2005, Desbord and Vicard, 2006). Others found very weak

relationship between BITs and FDI (Hallward-Driemeier, 2003, and Tobin and Rose-Ackerman, 2005). Clearly, there is a disagreement and contradiction in the mentioned studies. Part of the variation is explained by differing empirical approaches and methodologies. Some studies look at country dyads while others look at cumulative number of BITs and total FDI. Additionally, there are differences in the dependent variables as the various studies look at total FDI inflows, bilateral FDI inflows, FDI inflows as a share of global FDI and FDI inflows as a share of global FDI going to developing countries. Also, the differences in the results are due to the different samples of countries and different time periods. All these studies have examined the impact of BITs on FDI in developing countries. Only the study of Egger and Pfaffermayr (2004a) takes into consideration both OECD and non-OECD countries. Given the conflicting results and different model specifications it is hard to determine who is correct. The simplest conclusion is that this study is completely different and unique.

This study is the first to estimate the impact of financial institutions' level of development and efficiency, and country creditworthiness on FDI, in addition to the impact of BITs. Furthermore, the empirical analysis of the study utilized variables and indicators not used previously in available empirical literature on FDI. For example, the level of development of financial institutions using domestic credit provided by the banking sector (*BANKCR*), quality and efficiency of financial institutions using interest rate spread (*INTSPREAD)*, the international liquidity position of a country and country creditworthiness using the ratios of reserves to import levels (RES/MGS) and external debt (*RES/EDT*), the financial health of an economy using external debt obligations relative to export revenues (*EDT/XGS*), or external debt services to export revenues (*TDS/XGS*). The impact of such indicators on FDI has not been examined before in available empirical literature. Therefore, this study is an addition to the existing empirical literature, is unique and original.

Limitations of the Study

One of the limitations facing this study is data constraints. Studies analyzing the impact of BITs on FDI in developed or developing countries have the advantage of using a long time period, for example, since the early 1980s. Unfortunately, that is impossible in the case of the EURASIA. These countries were centrally planned and data are only available from the early 1990s. This study uses OECD data on bilateral FDI stocks, as reported by OECD member countries. Such data were not even compiled into a publicly-available form until 1993 with the first annual OECD *International Direct Investment Statistics Yearbook*. Since data are collected from national sources in each country, there is substantial variation in coverage by country source and by year, and there is variation in measurement of FDI activity itself. The data set use *un-balanced panel* data from 1992 through 2010. For example, to estimate the impact of BITs on FDI, having as dependent variable bilateral FDI inward stock, data for the Greece are available for the period 2001-2010. The study faces greater difficulty in case of bilateral FDI inflows. For this reason, the main results of the study are based on estimations using bilateral FDI inward stock, as dependent variable, since regressions have larger number of observations.

Another limitation is the measuring of BIT activity. There are substantial measurement issues that determine how to define this variable. One can observe when countries make bilateral investment treaties with each other, but these treaties certainly differ from each other along many dimensions which are very difficult to quantify. In addition, the same treaty on paper can have different consequences for different pairs of

countries depending on the unilaterally-adopted practices of countries before entering the treaty. Because of these difficulties, this study measures investment treaty activity as a *binary variable* taking the value of "1" if two countries have a bilateral investment treaty in place in year (t) and after, "0" otherwise. Hence, a dummy is included in panel regression that takes the value of "1" once a BIT has been ratified between a pair of source-host countries. The significance of the coefficient on this variable is then a test of the importance of the treaty. As a result, it will be able to estimate the impact of BITs.

Another limitation is the potential endogeneity problem. The study is not able to test empirically the direction of causality between BITs and FDI. Other studies examining the impact of BIT on FDI (Hallward-Driemeier, 2003, Egger and Pfaffermayr, 2004a, and Neumayer and Spess, 2005) have tested this endogeneity issue, because they have longer period of data. Their period of study extends from the early 1980s till 2000, and their sample of countries is larger. They have examined the impact of BITs on FDI in developing countries. In the case of this study, data constraints on bilateral FDI inflows and inward stock from the 20 OECD source to 20 EURASIA host countries do not allow the study to use some econometric procedures. For example, the study is not able to test the impact of BIT ratification on bilateral FDI inward stock for years before ratification and years after ratification. But in all cases, the study does not expect that there is a reverse causation, and that the EURASIA concluded BITs because of the existing FDI. That is the EURASIA did not conclude BITs with the 20 OECD to cover the existing FDI. On the contrary, according to the statistical figures, foreign investments were rare in EURASIA during the 1980s. They received impressive amounts of FDI during the 1990s, after their ratification of BITs.

Recommendations for Further Research

This study dealt with the impact of IIAs, particularly, BITs on bilateral inward FDI in CEC4. My research found that BITs exert a significant positive impact on FDI in CEC4. The CEC4, in the late 1980s and early 1990s, with weak institutions, have gained and benefited from the conclusion of BITs with the developed OECD countries. They concluded BITs with the overarching objective of attracting foreign investment and capital in order to restructure and develop their economies.

The mashrooming growth of the number of BITs is justified by the belief and hope of policy makers that investment is a critical requirement if countries are to move, globally, towards a more sustainable future. Investments are needed to add sustainable resources, sound industrial processes, better natural resource use, as well as to achieve the economic and social factors at the heart of the development agenda. But the relationship between BITs and sustainable development remains unclear. BITs are seen and sold as a development tool; countries sign BITs expecting to see significant inflows of investments due to the protections for foreign investors that the agreements provide. Regardless of such claims there is a lot more to be done in order to assess the impact of BITs on development, and to what extent FDI contributes to development. A question that is left to future research is to what extent BITs contribute to sustainable development. This aspect requires further in depth research in order to assess the real impact of BITs on sustainable development.

Appendices

Appendix A: List of Countries in the Regressions

Appendix B: Description and Sources of Variables

Appendix C: Summary Statistics

Appendix D: Pair-Wise Correlation Matrix

Appendix E: Estimation Results

Appendix A: List of Countries Included in the Regressions

Source OECD Countries		Host Central European Countries		
1)	Austria	1)	South Caucasus	Armenia
2)	Belgium-Luxembourg	2)		Azerbaijan
3)	Canada	3)		Georgia
4)	Czeh Republic	4)	Central Asia	Kazakhstan
5)	Denmark	5)		Kyrgyz Republic
6)	Estonia	6)		Tajikistan
7)	Finland	7)		Turkmenistan
8)	France	8)		Uzbekistan
9)	Germany	9)	South-East Europe	Albania
10)	Greece	10)		Bosnia & Herzegovina
11)	Hungary	11)		Croatia
12)	Italy	12)		Montenegro
13)	Japan	13)		Serbia
14)	Korea	14)		Serbia & Montenegro
15)	Netherlands	15)		FYR Macedonia
16)	Norway	16)		Belarus
17)	Sweden	17)		Moldova
18)	Switzerland	18)		Russian Federation
19)	United Kingdom	19)		Turkey
20)	United States	20)		Ukraine

Appendix B: Description and Sources of Variables

Variable Name	Description and Source
Dependent Variables	
ln FDI Stock	Natural logarithm of FDI inward stock of each 20 OECD source country in each EURASIA country expressed in constant 2000 US$. Due to data limitation, the period of data available for each host country varies Original values are in current US dollars. They are further converted into constant 2000 US$ using the GDP deflator from the World Bank WDI. *Source: OECD International Direct Investment Online Database.*
Explanatory Variables	
BIT	A dummy variable, equal to 1 in the year that a BIT was ratified between the source OECD country and the host EURASIA country in each year and thereafter, 0 otherwise. Source: UNCTAD database on bilateral investment treaties. Available via internet at: http://www.unctad.org//iia
BSEC	A dummy variable, equal to 1 in the year that a country joined BSEC and thereafter, 0 otherwise.
ln GDP	Natural logarithm of host country GDP expressed in constant 2000 US$. *Source: World Bank, WDI.*
GDP Growth	GDP growth (annual %). Annual percentage growth rate of GDP at market prices based on constant local currency. Aggregates are based on constant 2000 US$. *Source: World Bank, WDI.*
ln INFL	Natural logarithm of Inflation, consumer prices (annual %). Inflation as measured by the consumer price index reflects the annual percentage change in the cost to the average consumer of acquiring a fixed basket of goods and services that may be fixed or changed at specified intervals, such as yearly. The Laspeyre formula is generally used. *Source: World Bank, WDI.*
ln EDT/XGS	Natural logarithm of Total External Debt to Exports of Goods and Services (including workers' remittances) (EDT/ XGS) (%). *Source: World Bank, GDF*.
ln TDS/XGS	Natural logarithm of Total Debt Service to Exports of Goods and Services (TDS/XGS) (%). Total Debt Service is the sum of principal repayments and intrest actually paid in foreign currency, goods, or services on long-term debt, interest paid on short term debt, and repayments (repurchases and charges) to the IMF. Exports of goods and services includes income and workers' remittances. *Source: World Bank, GDF*.
ln RES/MGS	Natural logarithm of total reserves (RES) in months of imports of goods and services (MGS) (months). They are calculated as: RES * 12/ MGS. *Source: World Bank, WDI.*
ln RES/EDT	Natural logarithm of total reserves (RES) to total external debt(RES/ EDT) (%). *Source: World Bank, WDI.*

Appendix B: (Cont'd)

Variable Name	Description and Source
ln BANKCR	Natural logarithm of domestic credit provided by the banking sector (% of GDP). Domestic credit provided by the banking sector includes all credit to various sectors on a gross basis, with the exception of credit to the central government, which is net. The banking sector includes monetary authorities and deposit money banks, as well as other banking institutions where data are available (including institutions that do not accept transferable deposits but do incur such liabilities as time and savings deposits). Examples of other banking institutions are savings and mortgage loan institutions and building and loan associations. *Source: World Bank, WDI.*
lnPRIVCR	Natural Logarithm of Domestic credit to private sector (% of GDP). Domestic credit to private sector refers to financial resources provided to the private sector, such as through loans, purchases of nonequity securities, and trade credits and other accounts receivable, that establish a claim for repayment. For some countries these claims include credit to public enterprises. Source: World Bank, WDI.
INTSPREAD	Interest rate spread (lending rate minus deposit rate % points). It is the interest rate charged by banks on loans to prime customers minus the interest rate paid by commercial or similar banks for demand, time, or savings deposits. *Source: World Bank, WDI.*
lnOpenness	Natural Logarithm of Trade (% of GDP). Trade is the sum of exports and imports of goods and services measured as a share of gross domestic product. *Source: World Bank, WDI.*
lnENERGY	Natural Logarithm of Energy use (kt of oil equivalent). Energy use refers to use of primary energy before transformation to other end-use fuels, which is equal to indigenous production plus imports and stock changes, minus exports and fuels supplied to ships and aircraft engaged in international transport. *Source: World Bank, WDI.*
lnRESEARCHDEVELOP	Natural Logarithm of Research and development expenditure (% of GDP). Expenditures for research and development are current and capital expenditures (both public and private) on creative work undertaken systematically to increase knowledge, including knowledge of humanity, culture, and society, and the use of knowledge for new applications. R&D covers basic research, applied research, and experimental development. *Source: World Bank, WDI.*
lnICT	Natural Logarithm of ICT goods exports (% of total goods exports). Information and communication technology goods exports include telecommunications, audio and video, computer and related equipment; electronic components; and other information and communication technology goods. Software is excluded. *Source: World Bank, WDI.*
lnNATRESOURCES	Natural Logarithm of Total natural resources rents (% of GDP). Total natural resources rents are the sum of oil rents, natural gas rents, coal rents (hard and soft), mineral rents, and forest rents. *Source: World Bank, WDI.*
Trend	Trend starts with 1992 for all countries. For example, 1992= 1, 1993=2, 1994=4, etc…

Appendix C: Summary Statistics

Variable	Obs	Mean	Std. Dev.	Min	Max
LNFDI	7538	4.159693	7.635267	0	25.79478
LNGDP	7440	22.82879	1.587549	20.38852	26.7918
gdpgrowtha~l	7400	2.713454	10.99033	-44.9	88.95766
LNINFL	5445	2.585565	1.678365	-2.99537	8.462719
LNEDTXGS	4765	4.688967	.6403481	2.566788	6.523518
LNTDSXGS	4765	2.300377	.9258815	-.9028811	4.267913
LNRESMGS	5025	1.051924	.7323121	-1.307432	2.781144
LNRESEDT	5562	3.29701	.8188842	.5070067	5.671158
LNOPENNESS	7180	4.433869	.3541243	3.101382	5.296691
LNBANKCR	5942	3.293498	.645994	.1175699	5.001048
LNPRIVCR	5982	2.76379	.9499972	-.5845596	4.466129
LNSPREAD	4683	2.411899	1.022524	-3.688879	6.970068
LNICT	3354	-.8754573	1.376565	-5.556638	1.536268
LNRESEARCH~P	3877	-.9636106	.9205885	-4.128172	.2515633
LNENERGY	6715	8.902935	2.191767	3.962031	14.04179
LNNATRESOU~S	6908	1.020839	1.906596	-4.151046	5.368273
bit	7580	.3559367	.4788277	0	1
caucasus	7580	.1503958	.3574825	0	1
ca	7580	.2506596	.4334215	0	1
see	7580	.3484169	.4765003	0	1
bsec	7580	.4505277	.4975793	0	1
trend	7580	10.00119	5.476973	1	19

.

Appendid D: Pair-Wise Correlation Matrix

	LNFDI	LNGDP	gdpgro~l	LNINFL	LNEDTXGS	LNTDSXGS	LNRESMGS
LNFDI	1.0000						
LNGDP	0.5223	1.0000					
gdpgrowtha~l	0.0772	0.0395	1.0000				
LNINFL	-0.0643	0.1968	-0.4142	1.0000			
LNEDTXGS	0.0418	-0.0605	-0.1199	-0.1402	1.0000		
LNTDSXGS	0.2382	0.2759	0.0060	-0.1520	0.6649	1.0000	
LNRESMGS	0.2700	0.2571	0.0409	-0.4205	0.4195	0.4212	1.0000
LNRESEDT	0.1012	0.0608	0.2071	-0.4749	-0.2942	-0.2114	0.6627
LNOPENNESS	-0.1747	-0.4369	0.0586	-0.0482	-0.3548	-0.2182	-0.3463
LNBANKCR	0.2205	0.2701	-0.1757	-0.0208	0.2069	0.2082	0.2205
LNPRIVCR	0.2791	0.2592	0.0951	-0.2303	0.1752	0.3484	0.2990
LNSPREAD	-0.1291	-0.0410	-0.2520	0.3947	0.1303	0.1397	-0.2295
LNICT	0.1457	0.2457	-0.3866	0.0798	0.3734	0.3829	0.0635
LNRESEARCH~P	0.2325	0.4562	-0.2328	0.2382	-0.1906	0.1082	0.0693
LNENERGY	0.3209	0.7575	0.0242	0.2264	-0.1341	0.1560	0.1970
LNNATRESOU~S	0.0462	0.2848	0.0783	0.0999	-0.3584	-0.1702	0.1296
bit	0.3959	0.3419	0.1195	-0.1930	0.0168	0.1682	0.2381
caucasus	-0.0852	-0.1961	0.0258	-0.0775	-0.1452	-0.2580	-0.0935
ca	-0.1848	-0.1998	0.0104	-0.0228	0.1831	0.2098	-0.0518
see	-0.0858	-0.1892	0.0438	-0.2358	0.1813	-0.0765	0.2674
bsec	0.2114	0.2517	-0.0555	0.0742	0.0707	-0.0037	0.1615
trend	0.2852	0.1300	0.4036	-0.5726	0.0316	0.2897	0.4091

	LNRESEDT	LNOPEN~S	LNBANKCR	LNPRIVCR	LNSPREAD	LNICT	LNRESE~P
LNRESEDT	1.0000						
LNOPENNESS	0.0624	1.0000					
LNBANKCR	-0.0714	-0.0727	1.0000				
LNPRIVCR	0.0296	0.0489	0.6120	1.0000			
LNSPREAD	-0.4648	-0.2206	-0.2273	-0.3569	1.0000		
LNICT	-0.2188	-0.2323	0.4500	0.2819	-0.0015	1.0000	
LNRESEARCH~P	-0.0578	-0.2441	0.2225	0.0883	0.0682	0.3942	1.0000
LNENERGY	0.0843	-0.2939	0.0028	0.0482	0.1284	-0.1210	0.3846
LNNATRESOU~S	0.2893	0.0526	-0.2483	-0.2823	-0.0285	-0.5843	0.0219
bit	0.1402	-0.1292	0.1639	0.2051	-0.1699	0.1428	0.1716
caucasus	0.0435	-0.0560	-0.3987	-0.2902	0.0843	-0.4233	-0.2006
ca	-0.1044	0.1460	-0.3217	-0.2395	0.1768	-0.3466	-0.4291
see	0.1855	-0.0362	0.4292	0.4248	-0.0819	0.3065	-0.0106
bsec	0.0610	-0.3494	-0.0047	-0.2127	0.0435	-0.0171	0.2738
trend	0.3334	0.1086	0.2221	0.5686	-0.5288	-0.0098	-0.1855

	LNENERGY	LNNATR~S	bit	caucasus	ca	see	bsec
LNENERGY	1.0000						
LNNATRESOU~S	0.6807	1.0000					
bit	0.1830	0.0634	1.0000				
caucasus	-0.1598	0.0086	-0.0592	1.0000			
ca	0.1621	0.4465	-0.1210	-0.2433	1.0000		
see	-0.2157	-0.3390	-0.0659	-0.3077	-0.4229	1.0000	
bsec	0.0186	-0.1408	0.1830	0.4646	-0.5237	-0.2392	1.0000
trend	0.0398	0.0424	0.3591	-0.0001	-0.0001	-0.0002	0.0015

	trend
trend	1.0000

.

Appendix D: Regression Results

```
Random-effects GLS regression                   Number of obs      =      7538
Group variable: codea                           Number of groups   =       399

R-sq:  within  = 0.1070                         Obs per group: min =        11
       between = 0.2094                                        avg =      18.9
       overall = 0.1567                                        max =        19

                                                Wald chi2(1)       =    956.28
corr(u_i, X)   = 0 (assumed)                    Prob > chi2        =    0.0000
```

LNFDI	Coef.	Std. Err.	z	P>|z|	[95% Conf.	Interval]
bit	5.673901	.1834802	30.92	0.000	5.314286	6.033515
_cons	2.155335	.2511327	8.58	0.000	1.663124	2.647546
sigma_u	4.6928626					
sigma_e	5.2128513					
rho	.44765044	(fraction of variance due to u_i)				

```
Random-effects GLS regression                   Number of obs      =      5414
Group variable: codea                           Number of groups   =       359

R-sq:  within  = 0.1483                         Obs per group: min =         2
       between = 0.4593                                        avg =      15.1
       overall = 0.3356                                        max =        19

                                                Wald chi2(4)       =   1183.33
corr(u_i, X)   = 0 (assumed)                    Prob > chi2        =    0.0000
```

LNFDI	Coef.	Std. Err.	z	P>|z|	[95% Conf.	Interval]
bit	3.423745	.2512324	13.63	0.000	2.931339	3.916152
LNGDP	2.686219	.1324986	20.27	0.000	2.426527	2.945911
gdpgrowthannual	.0296154	.0117006	2.53	0.011	.0066825	.0525482
LNINFL	-.4545243	.0588808	-7.72	0.000	-.5699285	-.33912
_cons	-56.74344	3.020053	-18.79	0.000	-62.66263	-50.82424
sigma_u	4.0614662					
sigma_e	5.4865105					
rho	.35400132	(fraction of variance due to u_i)				

```
Random-effects GLS regression                   Number of obs      =      4318
Group variable: codea                           Number of groups   =       339

R-sq:  within  = 0.1298                         Obs per group: min =         1
       between = 0.3866                                        avg =      12.7
       overall = 0.3426                                        max =        19

                                                Wald chi2(5)       =    794.86
corr(u_i, X)   = 0 (assumed)                    Prob > chi2        =    0.0000
```

LNFDI	Coef.	Std. Err.	z	P>|z|	[95% Conf.	Interval]
bit	2.981984	.2909223	10.25	0.000	2.411787	3.552181
LNGDP	2.849081	.1516128	18.79	0.000	2.551926	3.146237
gdpgrowthannual	.0546389	.0135747	4.03	0.000	.0280329	.081245
LNINFL	-.2813772	.0704543	-3.99	0.000	-.4194652	-.1432892
LNEDTXGS	.8551448	.2119943	4.03	0.000	.4396435	1.270646
_cons	-64.7091	3.703497	-17.47	0.000	-71.96782	-57.45038
sigma_u	4.6948209					
sigma_e	5.3468843					
rho	.43533714	(fraction of variance due to u_i)				

```
Random-effects GLS regression                   Number of obs      =      4318
Group variable: codea                           Number of groups   =       339

R-sq:  within  = 0.1337                         Obs per group: min =         1
       between = 0.3801                                        avg =      12.7
       overall = 0.3426                                        max =        19

                                                Wald chi2(5)       =    814.21
corr(u_i, X)   = 0 (assumed)                    Prob > chi2        =    0.0000
```

LNFDI	Coef.	Std. Err.	z	P>|z|	[95% Conf.	Interval]
bit	2.812884	.2912695	9.66	0.000	2.242006	3.383762
LNGDP	2.672303	.1518978	17.59	0.000	2.374589	2.970017
gdpgrowthannual	.0528351	.0134327	3.93	0.000	.0265074	.0791627
LNINFL	-.1766191	.0737846	-2.39	0.017	-.3212342	-.032004
LNTDSXGS	.8903734	.1546558	5.76	0.000	.5872536	1.193493
_cons	-58.89116	3.424159	-17.20	0.000	-65.60239	-52.17993
sigma_u	4.6962909					
sigma_e	5.3383828					
rho	.43627361	(fraction of variance due to u_i)				

```
Random-effects GLS regression                   Number of obs      =      4558
Group variable: codea                           Number of groups   =       339

R-sq:  within  = 0.1482                         Obs per group: min =         1
       between = 0.4159                                        avg =      13.4
       overall = 0.3406                                        max =        19

                                                Wald chi2(5)       =    974.81
corr(u_i, X)   = 0 (assumed)                    Prob > chi2        =    0.0000
```

LNFDI	Coef.	Std. Err.	z	P>|z|	[95% Conf.	Interval]
bit	3.09299	.2775031	11.15	0.000	2.549094	3.636886
LNGDP	2.562904	.1580929	16.21	0.000	2.253047	2.87276
gdpgrowthannual	.0467028	.0134958	3.46	0.001	.0202516	.073154
LNINFL	-.0596366	.0764874	-0.78	0.436	-.209549	.0902759
LNRESMGS	1.593608	.1978048	8.06	0.000	1.205918	1.981298
_cons	-56.56205	3.552951	-15.92	0.000	-63.52571	-49.5984
sigma_u	4.6287691					
sigma_e	5.4118478					
rho	.42248043	(fraction of variance due to u_i)				

```
Random-effects GLS regression                   Number of obs      =      4815
Group variable: codea                           Number of groups   =       339

R-sq:  within  = 0.1327                         Obs per group: min =         2
       between = 0.4604                                        avg =      14.2
       overall = 0.3371                                        max =        19

                                                Wald chi2(5)       =    978.66
corr(u_i, X)   = 0 (assumed)                    Prob > chi2        =    0.0000
```

LNFDI	Coef.	Std. Err.	z	P>|z|	[95% Conf.	Interval]
bit	3.018768	.2742651	11.01	0.000	2.481218	3.556318
LNGDP	2.555575	.1347604	18.96	0.000	2.291449	2.8197
gdpgrowthannual	.0317109	.0127505	2.49	0.013	.0067205	.0567014
LNINFL	-.3262472	.0681503	-4.79	0.000	-.4598193	-.192675
LNRESEDT	.544174	.1386287	3.93	0.000	.2724668	.8158812
_cons	-55.68061	3.017756	-18.45	0.000	-61.5953	-49.76592
sigma_u	3.9959918					
sigma_e	5.5195001					
rho	.34389353	(fraction of variance due to u_i)				

```
Random-effects GLS regression                   Number of obs      =      5134
Group variable: codea                           Number of groups   =       359

R-sq:  within  = 0.1555                         Obs per group: min =         2
       between = 0.4617                                        avg =      14.3
       overall = 0.3342                                        max =        19

                                                Wald chi2(5)       =   1188.61
corr(u_i, X)   = 0 (assumed)                    Prob > chi2        =    0.0000
```

LNFDI	Coef.	Std. Err.	z	P>|z|	[95% Conf.	Interval]
bit	3.061782	.2621561	11.68	0.000	2.547966	3.575599
LNGDP	2.391275	.1371507	17.44	0.000	2.122464	2.660085
gdpgrowthannual	.0594074	.0125016	4.75	0.000	.0349048	.0839101
LNINFL	-.4517553	.0622846	-7.25	0.000	-.5738308	-.3296797
LNBANKCR	1.90011	.1930606	9.84	0.000	1.521718	2.278502
_cons	-56.25736	3.043204	-18.49	0.000	-62.22193	-50.29279
sigma_u	4.0877929					
sigma_e	5.5389011					
rho	.352611	(fraction of variance due to u_i)				

```
Random-effects GLS regression                   Number of obs      =      5134
Group variable: codea                           Number of groups   =       359

R-sq:  within  = 0.1648                         Obs per group: min =         2
       between = 0.4584                                        avg =      14.3
       overall = 0.3378                                        max =        19

                                                Wald chi2(5)       =   1255.14
corr(u_i, X)   = 0 (assumed)                    Prob > chi2        =    0.0000
```

LNFDI	Coef.	Std. Err.	z	P>|z|	[95% Conf.	Interval]
bit	2.88093	.2619623	11.00	0.000	2.367493	3.394367
LNGDP	2.216963	.138829	15.97	0.000	1.944863	2.489063
gdpgrowthannual	.0240436	.0121149	1.98	0.047	.0002988	.0477884
LNINFL	-.2976016	.0630003	-4.72	0.000	-.4210799	-.1741232
LNPRIVCR	1.574327	.1270996	12.39	0.000	1.325216	1.823437
_cons	-50.64696	3.078407	-16.45	0.000	-56.68053	-44.6134
sigma_u	4.0868336					
sigma_e	5.5134344					
rho	.35461039	(fraction of variance due to u_i)				

```
Random-effects GLS regression                   Number of obs      =      4324
Group variable: codea                           Number of groups   =       319

R-sq:  within  = 0.1534                         Obs per group: min =         2
       between = 0.4124                                        avg =      13.6
       overall = 0.3180                                        max =        19

                                                Wald chi2(5)       =    956.10
corr(u_i, X)   = 0 (assumed)                    Prob > chi2        =    0.0000
```

LNFDI	Coef.	Std. Err.	z	P>|z|	[95% Conf.	Interval]
bit	3.540202	.2736821	12.94	0.000	3.003795	4.076609
LNGDP	2.489204	.1617347	15.39	0.000	2.17221	2.806198
gdpgrowthannual	.044073	.0138177	3.19	0.001	.0169907	.0711553
LNINFL	-.2256254	.0736281	-3.06	0.002	-.3699338	-.0813171
LNSPREAD	-.6837636	.103834	-6.59	0.000	-.8872746	-.4802526
_cons	-51.08847	3.679154	-13.89	0.000	-58.29948	-43.87747
sigma_u	4.0831794					
sigma_e	5.2844558					
rho	.37383781	(fraction of variance due to u_i)				

```
Random-effects GLS regression                   Number of obs      =      5334
Group variable: codea                           Number of groups   =       359

R-sq:  within  = 0.1559                         Obs per group: min =         2
       between = 0.4521                                        avg =      14.9
       overall = 0.3330                                        max =        19

                                                Wald chi2(5)       =   1218.02
corr(u_i, X)   = 0 (assumed)                    Prob > chi2        =    0.0000
```

LNFDI	Coef.	Std. Err.	z	P>|z|	[95% Conf.	Interval]
bit	3.136809	.2555001	12.28	0.000	2.636038	3.63758
LNGDP	2.893775	.1360528	21.27	0.000	2.627116	3.160434
gdpgrowthannual	.0201505	.0119202	1.69	0.091	-.0032126	.0435136
LNINFL	-.4642455	.0597351	-7.77	0.000	-.581324	-.3471669
LNOPENNESS	2.973016	.3847578	7.73	0.000	2.218905	3.727128
_cons	-74.46172	3.816234	-19.51	0.000	-81.9414	-66.98204
sigma_u	4.0891447					
sigma_e	5.4920624					
rho	.35664953	(fraction of variance due to u_i)				

```
Random-effects GLS regression                   Number of obs      =      4899
Group variable: codea                           Number of groups   =       332

R-sq:  within  = 0.1691                         Obs per group: min =         2
       between = 0.4847                                        avg =      14.8
       overall = 0.3472                                        max =        19

                                                Wald chi2(5)       =   1232.46
corr(u_i, X)   = 0 (assumed)                    Prob > chi2        =    0.0000
```

LNFDI	Coef.	Std. Err.	z	P>|z|	[95% Conf.	Interval]
bit	3.623145	.2607874	13.89	0.000	3.112011	4.134279
LNGDP	3.552567	.2241369	15.85	0.000	3.113267	3.991868
gdpgrowthannual	.0256745	.0119943	2.14	0.032	.0021661	.0491829
LNINFL	-.4276818	.0619745	-6.90	0.000	-.5491495	-.306214
LNENERGY	-.7154935	.1706441	-4.19	0.000	-1.04995	-.3810372
_cons	-70.684	4.08806	-17.29	0.000	-78.69645	-62.67155
sigma_u	4.0461054					
sigma_e	5.4014395					
rho	.35943404	(fraction of variance due to u_i)				

```
Random-effects GLS regression                   Number of obs      =      3627
Group variable: codea                           Number of groups   =       352

R-sq:  within  = 0.1227                         Obs per group: min =         2
       between = 0.4203                                        avg =      10.3
       overall = 0.3481                                        max =        14

                                                Wald chi2(5)       =    703.27
corr(u_i, X)   = 0 (assumed)                    Prob > chi2        =    0.0000
```

LNFDI	Coef.	Std. Err.	z	P>|z|	[95% Conf.	Interval]
bit	3.636924	.3353793	10.84	0.000	2.979593	4.294255
LNGDP	3.005672	.1658553	18.12	0.000	2.680601	3.330742
gdpgrowthannual	.0173191	.0163352	1.06	0.289	-.0146973	.0493355
LNINFL	-.5667434	.105269	-5.38	0.000	-.7730668	-.3604201
LNRESEARCHDEVELOP	-.5495621	.2399957	-2.29	0.022	-1.019945	-.0791793
_cons	-64.28565	3.840342	-16.74	0.000	-71.81259	-56.75872
sigma_u	4.6553224					
sigma_e	5.2252912					
rho	.44250575	(fraction of variance due to u_i)				

```
Random-effects GLS regression                   Number of obs      =      3175
Group variable: codea                           Number of groups   =       332

R-sq:  within  = 0.0540                         Obs per group: min =         2
       between = 0.4089                                        avg =       9.6
       overall = 0.3146                                        max =        11

                                                Wald chi2(5)       =    398.36
corr(u_i, X)   = 0 (assumed)                    Prob > chi2        =    0.0000
```

LNFDI	Coef.	Std. Err.	z	P>|z|	[95% Conf.	Interval]
bit	2.515504	.4016663	6.26	0.000	1.728252	3.302755
LNGDP	2.903145	.177765	16.33	0.000	2.554732	3.251558
gdpgrowthannual	-.0439314	.020447	-2.15	0.032	-.0840068	-.003856
LNINFL	-.20295	.1152313	-1.76	0.078	-.4287991	.0228991
LNICT	-.2740257	.1390095	-1.97	0.049	-.5464793	-.0015722
_cons	-61.1455	4.059117	-15.06	0.000	-69.10123	-53.18978
sigma_u	4.9748254					
sigma_e	5.3725208					
rho	.46162216	(fraction of variance due to u_i)				

```
Random-effects GLS regression                   Number of obs      =      5222
Group variable: codea                           Number of groups   =       352

R-sq:  within  = 0.1495                         Obs per group: min =         2
       between = 0.4465                                        avg =      14.8
       overall = 0.3306                                        max =        19

                                                Wald chi2(5)       =   1139.29
corr(u_i, X)   = 0 (assumed)                    Prob > chi2        =    0.0000
```

LNFDI	Coef.	Std. Err.	z	P>|z|	[95% Conf.	Interval]
bit	3.480845	.2575423	13.52	0.000	2.976071	3.985618
LNGDP	2.61231	.1418125	18.42	0.000	2.334362	2.890257
gdpgrowthannual	.0274678	.0123038	2.23	0.026	.0033528	.0515828
LNINFL	-.4718109	.0622694	-7.58	0.000	-.5938566	-.3497651
LNNATRESOURCES	.1712148	.116194	1.47	0.141	-.0565213	.3989508
_cons	-55.09906	3.224336	-17.09	0.000	-61.41864	-48.77947
sigma_u	4.098152					
sigma_e	5.5188344					
rho	.35542863	(fraction of variance due to u_i)				

```
Random-effects GLS regression                   Number of obs      =      3547
Group variable: codea                           Number of groups   =       352

R-sq:  within  = 0.1386                         Obs per group: min =         2
       between = 0.4351                                        avg =      10.1
       overall = 0.3604                                        max =        14

                                                Wald chi2(6)       =    792.41
corr(u_i, X)   = 0 (assumed)                    Prob > chi2        =    0.0000
```

LNFDI	Coef.	Std. Err.	z	P>|z|	[95% Conf.	Interval]
bit	3.264676	.339426	9.62	0.000	2.599413	3.929939
LNGDP	2.566144	.1708019	15.02	0.000	2.231378	2.900909
gdpgrowthannual	.0403514	.0167834	2.40	0.016	.0074566	.0732462
LNINFL	-.6179909	.1059077	-5.84	0.000	-.8255662	-.4104155
LNBANKCR	2.267045	.2504396	9.05	0.000	1.776192	2.757898
LNRESEARCHDEVELOP	-.3563894	.239435	-1.49	0.137	-.8256734	.1128947
_cons	-61.26888	3.808198	-16.09	0.000	-68.73281	-53.80495
sigma_u	4.5955103					
sigma_e	5.2446584					
rho	.43431664	(fraction of variance due to u_i)				

```
Random-effects GLS regression                   Number of obs      =      5414
Group variable: codea                           Number of groups   =       359

R-sq:  within  = 0.1766                         Obs per group: min =         2
       between = 0.4665                                        avg =      15.1
       overall = 0.3475                                        max =        19

                                                Wald chi2(5)       =   1403.98
corr(u_i, X)   = 0 (assumed)                    Prob > chi2        =    0.0000
```

LNFDI	Coef.	Std. Err.	z	P>|z|	[95% Conf.	Interval]
bit	2.391079	.2587249	9.24	0.000	1.883987	2.89817
LNGDP	2.162736	.136453	15.85	0.000	1.895293	2.430179
gdpgrowthannual	.0256025	.0115096	2.22	0.026	.0030441	.0481609
LNINFL	.017636	.0675933	0.26	0.794	-.1148445	.1501165
trend	.2895161	.0213912	13.53	0.000	.2475901	.3314421
_cons	-48.82688	3.039123	-16.07	0.000	-54.78345	-42.87031
sigma_u	4.0178977					
sigma_e	5.3980992					
rho	.35650267	(fraction of variance due to u_i)				

Regression Results: BIT & Regional Economic Agreement (BSEC)

```
Random-effects GLS regression                   Number of obs      =      5134
Group variable: codea                           Number of groups   =       359

R-sq:  within  = 0.1554                         Obs per group: min =         2
       between = 0.4623                                        avg =      14.3
       overall = 0.3348                                        max =        19

                                                Wald chi2(6)       =   1188.16
corr(u_i, X)   = 0 (assumed)                    Prob > chi2        =    0.0000
```

LNFDI	Coef.	Std. Err.	z	P>|z|	[95% Conf.	Interval]
bit	3.056412	.2624675	11.64	0.000	2.541985	3.570839
bsec	.2119923	.4765556	0.44	0.656	-.7220394	1.146024
LNGDP	2.376652	.1412957	16.82	0.000	2.099717	2.653587
gdpgrowthannual	.0595229	.0125046	4.76	0.000	.0350144	.0840313
LNINFL	-.4537205	.0624461	-7.27	0.000	-.5761126	-.3313284
LNBANKCR	1.910093	.1943333	9.83	0.000	1.529206	2.290979
_cons	-56.05897	3.080588	-18.20	0.000	-62.09681	-50.02113
sigma_u	4.0926815					
sigma_e	5.5393249					
rho	.35312191	(fraction of variance due to u_i)				

```
Random-effects GLS regression                   Number of obs      =      5414
Group variable: codea                           Number of groups   =       359

R-sq:  within  = 0.1767                         Obs per group: min =         2
       between = 0.4680                                        avg =      15.1
       overall = 0.3490                                        max =        19

                                                Wald chi2(6)       =   1408.07
corr(u_i, X)   = 0 (assumed)                    Prob > chi2        =    0.0000
```

LNFDI	Coef.	Std. Err.	z	P>|z|	[95% Conf.	Interval]
bit	2.368875	.2591319	9.14	0.000	1.860986	2.876764
bsec	.6561675	.4661068	1.41	0.159	-.2573851	1.56972
LNGDP	2.115672	.1403064	15.08	0.000	1.840676	2.390667
gdpgrowthannual	.0253805	.0115116	2.20	0.027	.0028182	.0479428
LNINFL	.0185198	.0675981	0.27	0.784	-.1139701	.1510097
trend	.2936166	.0215936	13.60	0.000	.251294	.3359392
_cons	-48.1273	3.073366	-15.66	0.000	-54.15099	-42.10361
sigma_u	4.0001303					
sigma_e	5.397988					
rho	.35448127	(fraction of variance due to u_i)				

```
Random-effects GLS regression                   Number of obs      =      5414
Group variable: codea                           Number of groups   =       359

R-sq:  within  = 0.1240                         Obs per group: min =         2
       between = 0.4199                                        avg =      15.1
       overall = 0.2990                                        max =        19

                                                Wald chi2(4)       =    955.85
corr(u_i, X)   = 0 (assumed)                    Prob > chi2        =    0.0000
```

LNFDI	Coef.	Std. Err.	z	P>|z|	[95% Conf.	Interval]
bsec	-.0959329	.48604	-0.20	0.844	-1.048554	.856688
LNGDP	3.208147	.135263	23.72	0.000	2.943037	3.473258
gdpgrowthannual	.0328501	.0118846	2.76	0.006	.0095566	.0561435
LNINFL	-.7073876	.0568682	-12.44	0.000	-.8188472	-.5959281
_cons	-66.60546	3.076247	-21.65	0.000	-72.6348	-60.57613
sigma_u	4.2110212					
sigma_e	5.5522834					
rho	.36516677	(fraction of variance due to u_i)				

Robustness Tests

```
Random-effects GLS regression                   Number of obs      =      4138
Group variable: codea                           Number of groups   =       339

R-sq:  within  = 0.1529                         Obs per group: min =         1
       between = 0.3801                                        avg =      12.2
       overall = 0.3404                                        max =        19

                                                Wald chi2(7)       =    901.26
corr(u_i, X)   = 0 (assumed)                    Prob > chi2        =    0.0000
```

LNFDI	Coef.	Std. Err.	z	P>|z|	[95% Conf.	Interval]
bit	2.359747	.302528	7.80	0.000	1.766803	2.952691
LNGDP	2.302707	.1582365	14.55	0.000	1.992569	2.612845
gdpgrowthannual	.0628431	.0140399	4.48	0.000	.0353254	.0903607
LNINFL	-.1280053	.079652	-1.61	0.108	-.2841203	.0281097
LNEDTXGS	.938413	.2796534	3.36	0.001	.3903023	1.486524
LNRESEDT	1.182074	.2000237	5.91	0.000	.790035	1.574113
LNBANKCR	2.077805	.2388549	8.70	0.000	1.609658	2.545952
_cons	-63.55888	3.85909	-16.47	0.000	-71.12256	-55.99521
sigma_u	4.650856					
sigma_e	5.371454					
rho	.42847039	(fraction of variance due to u_i)				

```
Random-effects GLS regression                   Number of obs      =      4138
Group variable: codea                           Number of groups   =       339

R-sq:  within  = 0.1580                         Obs per group: min =         1
       between = 0.3878                                        avg =      12.2
       overall = 0.3516                                        max =        19

                                                Wald chi2(7)       =    941.26
corr(u_i, X)   = 0 (assumed)                    Prob > chi2        =    0.0000
```

LNFDI	Coef.	Std. Err.	z	P>|z|	[95% Conf.	Interval]
bit	2.230732	.3022122	7.38	0.000	1.638407	2.823057
LNGDP	2.173451	.1594861	13.63	0.000	1.860864	2.486038
gdpgrowthannual	.0342626	.0141764	2.42	0.016	.0064774	.0620479
LNINFL	-.031464	.0793453	-0.40	0.692	-.186978	.1240501
LNEDTXGS	.9227068	.274106	3.37	0.001	.3854689	1.459945
LNRESEDT	.7422347	.2080218	3.57	0.000	.3345196	1.14995
LNPRIVCR	1.54004	.1468582	10.49	0.000	1.252203	1.827876
_cons	-56.6416	3.99384	-14.18	0.000	-64.46938	-48.81381
sigma_u	4.6551881					
sigma_e	5.3568361					
rho	.43026196	(fraction of variance due to u_i)				

Regressions Results: BIT Interaction with Financial Development

```
Random-effects GLS regression                   Number of obs      =      5134
Group variable: codea                           Number of groups   =       359

R-sq:  within  = 0.1592                         Obs per group: min =         2
       between = 0.4586                                        avg =      14.3
       overall = 0.3349                                        max =        19

                                                Wald chi2(6)       =   1209.32
corr(u_i, X)   = 0 (assumed)                    Prob > chi2        =    0.0000
```

LNFDI	Coef.	Std. Err.	z	P>|z|	[95% Conf.	Interval]
bit	-1.4927	1.097144	-1.36	0.174	-3.643063	.6576634
LNGDP	2.378743	.1373051	17.32	0.000	2.10963	2.647856
gdpgrowthannual	.0616562	.0124895	4.94	0.000	.0371772	.0861352
LNINFL	-.4232423	.0625355	-6.77	0.000	-.5458097	-.3006749
LNBANKCR	1.360383	.2305803	5.90	0.000	.9084539	1.812312
BITLNBANKCR	1.371287	.3208268	4.27	0.000	.742478	2.000096
_cons	-54.32444	3.079997	-17.64	0.000	-60.36112	-48.28775
sigma_u	4.0943328					
sigma_e	5.5268928					
rho	.35433363	(fraction of variance due to u_i)				

```
Random-effects GLS regression                   Number of obs      =      5134
Group variable: codea                           Number of groups   =       359

R-sq:  within  = 0.1680                         Obs per group: min =         2
       between = 0.4592                                        avg =      14.3
       overall = 0.3409                                        max =        19

                                                Wald chi2(6)       =   1277.58
corr(u_i, X)   = 0 (assumed)                    Prob > chi2        =    0.0000
```

LNFDI	Coef.	Std. Err.	z	P>|z|	[95% Conf.	Interval]
bit	.1619043	.6695055	0.24	0.809	-1.150302	1.474111
LNGDP	2.19696	.1390118	15.80	0.000	1.924501	2.469418
gdpgrowthannual	.0296814	.0121586	2.44	0.015	.0058511	.0535118
LNINFL	-.2984038	.0628826	-4.75	0.000	-.4216514	-.1751563
LNPRIVCR	1.174446	.15606	7.53	0.000	.8685738	1.480318
BITLNPRIVCR	.9510428	.2156348	4.41	0.000	.5284064	1.373679
_cons	-49.13453	3.09999	-15.85	0.000	-55.2104	-43.05866
sigma_u	4.0946976					
sigma_e	5.503549					
rho	.35631357	(fraction of variance due to u_i)				

```
Random-effects GLS regression                   Number of obs      =      4324
Group variable: codea                           Number of groups   =       319

R-sq:  within  = 0.1535                         Obs per group: min =         2
       between = 0.4125                                        avg =      13.6
       overall = 0.3180                                        max =        19

                                                Wald chi2(6)       =    955.92
corr(u_i, X)   = 0 (assumed)                    Prob > chi2        =    0.0000
```

LNFDI	Coef.	Std. Err.	z	P>|z|	[95% Conf.	Interval]
bit	3.333307	.513413	6.49	0.000	2.327036	4.339578
LNGDP	2.493895	.1621083	15.38	0.000	2.176169	2.811621
gdpgrowthannual	.043894	.013824	3.18	0.001	.0167994	.0709886
LNINFL	-.221959	.0740223	-3.00	0.003	-.3670399	-.076878
LNSPREAD	-.7174839	.125616	-5.71	0.000	-.9636868	-.471281
BITLNSPREAD	.0877659	.1842417	0.48	0.634	-.2733412	.4488729
_cons	-51.11624	3.681714	-13.88	0.000	-58.33226	-43.90021
sigma_u	4.086625					
sigma_e	5.2847353					
rho	.37420802	(fraction of variance due to u_i)				

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