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Evaluating the Impact of BITs and Preferential Trade and Investment Treaties on Foreign Direct Investment between Developed Countries

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Abstract

This paper focuses on the effect of Bilateral Investment Treaties and Preferential Trade and Investment Agreements on outwards FDI stocks of developed countries (proxied by OECD countries) in one another in the period of 1985-2013. Estimations are obtained with use of the gravity equation in a large panel based on OECD FDI positions data, where the “knowledge-and-physical-capital model” of international investment motivates the choice of independent variables. This research is the first one to analyze the effect of both types of investment agreements on FDI of developed countries; moreover the most recent data available is used.

Empirical analysis reveals an absence of statistically significant positive effect for FDI of both BITs and PTIAs with exception of a strong positive effect associated with joining the EU. Although the results are robust to changes in independent variables and estimation techniques, sensitivity analysis suggests that BITs had a stronger positive effect on FDI (34%) in the period of 1985-2000. PTIAs appear to have mixed effect on FDI because of the connection between trade and investment. Overall the findings reinforce doubts voiced about the effectiveness of bilateral treaties as a policy measure for increasing FDI attractiveness. Existence of such treaties between OECD countries may be partly explained by a growing wish on their part to create more liberalized and open markets rather than simply protect investment abroad.

Keywords: Foreign direct investment, bilateral investment treaty, preferential trade and investment agreement, gravity equation, OECD.

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I. Introduction

The attitude of governments towards foreign direct investment has changed significantly over the last decades. It shifted from extremely protective policies regarding foreign ownership in host countries after the Second World War to abandoning of nationalization practices and recognition of the importance of foreign capital for economic growth and know-how transfer in the late 1970s (UNCTAD, 1999a). Trend of increase in flows of international investment signifies the continuing process of globalization although some divestment occurs on regular basis. Actual decline of FDI flows in 2014 reveals “fragility of the global economy, policy uncertainty for investors and elevated geopolitical risks” (UNCTAD, 2015, p.17). It is evident that countries, especially developing, engage in competition for FDI for multiple reasons such as stimulating economic activity, increase in employment, technological spillovers which demonstrates how important the global flow of FDI has become for further economic development (Luski & Rosenboim, 2009; Neunmayer et al., 2016).

There are different ways in which a country can make itself more attractive to foreign investors and multinational companies. Unilateral measures aiming at liberalization of trade policies, specifically targeting foreign investment is one option. Another popular measure is signing of so called bilateral investment treaties (BITs), double-taxation treaties (DDTs) as well as bilateral or regional free trade agreements with specific provisions regarding foreign investment treatment which have proliferated since creation of NAFTA. Both are included by UNCTAD under the umbrella term of international investment agreements (IIAs) (UNCTAD, 2016a). Moreover certain steps have been made towards a broader multilateral liberalization of investment regime which are reflected in such agreements as GATS, TRIMs etc.

Among these measures analysis of the impact of BITs and certain other IIAs is particularly interesting for the following reasons: the great number of such agreements concluded to date and the tendency of such agreements to go beyond most multilateral instruments in terms of depths of provisions, which in theory should make their impact pronounced. The number of existing bilateral investment treaties (BITs) is truly impressive – more than 2900 BITs have been concluded to date (2276 in force) as well as 361 PTAs with investment provisions and other IIAs (economic partnership agreements, cooperation agreements etc.) – known together as PTIAs with 285 in force (UNCTAD, 2016a).

Because of this features many researchers turned to quantifying the effect of BITs and PTIAs on FDI flows in recent decades, however most of the literature is devoted to analyzing such effect in

case of agreements between developed and developing countries. Indeed most BITs were historically concluded between these categories to guarantee source country's investors certain standard of treatment and protection from expropriation and as noted by Busse et al. (2010, p.14): "It is mainly for them [developing economies] that BITs may compensate for less developed local institutions and can, thus, be expected to promote FDI inflows". Nevertheless BITs among developed (and industrialized) countries exist as well and account for about 8% of total number of such treaties (UNCTAD, 2016a). This case is worth examining as developed countries are both the main exporters of international FDI and know-how and major recipients of FDI (Markusen, 2002). Between 1982 and 2004, an average of 80% of yearly FDI was transferred OECD countries (Jang, 2011). Moreover developed economies lead in conclusion of PTAs with separate investment chapters and some other IIAs. Very limited research (bringing together analysis of different types of IIAs) on the effects of such agreements on attracting FDI in developed countries has been done so far. Therefore the main purpose of this paper is to analyze the effect of both BITs and other IIAs on FDI stocks in developed countries using the recent panel data. This will contribute to filling the certain existing gaps in empirical trade literature.

Bilateral investment treaties and free trade agreements with investment provisions have been shown to have mixed effect on investment in case of developed-developing/developing-developing countries, although according to some more recent studies the effect is positive (see Ch. IV). This research will argue that in case of OECD countries conclusion of BITs and other IIAs have a minor effect on attracting foreign direct investment (the result as one would expect is nevertheless sensitive to depth of liberalization commitments in case of PTAs and time periods for BITs). The aim of the study is to demonstrate this by empirically analyzing the impact of investment related agreements concluded between 34 OECD countries (plus Singapore) on bilateral FDI stocks over the period 1985-2013 under gravity equation approach using panel data with a set of control variables and robustness tests.

The remainder of this paper is organized as follows: chapter 2 presents the stylized facts about BITs and other IIAs and its connection with international FDI. Chapter 3 is devoted to a theoretical framework and arguments behind the hypotheses; it is followed by review of previous empirical literature on the matter in chapter 4. Chapter 5 describes the selected estimation method, design of gravity equation, sample and data used. Results are reported in chapter 6, they are then followed by a selection of robustness and sensitivity tests. A final discussion and conclusion are presented in chapter 7.

II. Stylized Facts about IIAs and FDI

During the last 25 years FDI flows around the world increased tremendously growing on average by 15% each year, although periods of divestment occurred on many occasions following the shocks to the world economy. Developed countries have traditionally been the main capital-exporters with the share of the group accounting for 91% and 81% on average in periods 1985-1999 and 1999-2013 respectively (see Appendix A). Stocks of developed countries account for 92% and 86% on average in the same periods (UNCTAD, 2016b). Despite the growing significance of developing countries as source of FDI outflows, developed countries still accounted for 61% of outflows and 39% of inflows in 2013 (UNCTAD, 2014). Inflows of FDI to developed countries has been highly sensitive to economic cycles peaking in 2000, 2007 and 2012, nevertheless remaining comparatively high reflecting the horizontal motivation for FDI which shall be discussed later (UNCTAD, 2016b). The numbers demonstrate obvious importance of developed countries and companies from them as sources for international FDI flows, which are welcomed by most of the countries because of the boost to economic and technologic development they may provide. Expansion of FDI volumes over time reflects the trend of increasing global integration, investment promotion and liberalization of policies regarding foreign capital, while developed countries stand in the forefront of policymaking with regards to investment. This is evident from the fact that most novel provisions regarding protection in admission phase are included in IIAs where USA, Japan, Canada, the EU and Finland are one of the signatories (UNCTAD, 2015).

But what does the legal framework supporting the ever increasing flows of investment around the globe consist of? The answer to this question is international agreements or more specifically international investment agreements (IIAs) that are presented by a range of different types of such instruments. They are found on the global level (WTO, GATS), regional level (preferential trade agreements with investment provisions - PTIAs) and most commonly on bilateral level (bilateral investment treaties). The latter two are particularly interesting not only due to the number of existing BITS or PTIAs but also due to the fact investment treaties and investment chapters in PTAs (modeled after BITS) are tailored to deal specifically with investment issues. Positive effect on FDI from such treaties is usually expected to be a result of higher degree of protection enjoyed by an investor from partner country, more transparency and stability in host country or potentially deeper level of liberalization of investment regime (UNCTAD, 2009). There is evidence that IIAs are associated with increase inflows of investment to countries signing them as

a result of their features (see chapter IV). Highlighting the brief history of such IIAs, the scope of included provisions in connection with developed countries is the goal of this chapter.

II.1 Bilateral Investment Treaties and OECD States

Although the provisions related to international investment (included in trade agreements and limited to protection of property abroad) can be traced as far back as the late 18th century it is not really until the Second World War that countries turned their attention to liberalizing investment and trade regimes worldwide through multilateral and bilateral frameworks. Indeed the period that led up to first bilateral investment treaties was characterized by emergence of newly independent states and heightened risk of expropriation as a result of developing countries' fear that trade and investment relationships with developed countries might be exploitative (Vendeveld, 2009). Signature of the Charter of Economic Rights and Duties of States (CERDS) in 1974 proclaimed countries' full sovereignty over natural resources including expropriation rights with non-binding obligation of compensation in accordance with local laws (UNCTAD, 1999a).

The response of developed countries came in form of BITs - a specific type of international investment agreement defined as "an agreement between two countries regarding promotion and protection of investments made by investors from respective countries in each other's territory" (UNCTAD, 2016a). The signing of first BITs dates back to 1959 when Germany signed agreements with Pakistan and Dominican Republic and other Western European countries followed the idea. However BITs gained much more momentum in the end of 1970s, after a period when a number of cases of expropriation in developing countries peaked (UNCTAD, 1999a). The desire to guarantee protection for investment was the main motivation for developed countries, while developing countries hoped to attract more investment. In the following decade the rate of conclusion of BITs accelerated reaching its peak in the 1990s (see Appendix A) as a result of market ideology becoming more and more prevalent among the globe and investment becoming the major source of foreign capital (Vendeveld, 2009).

The number of BITs concluded to date amounts to staggering 2900 (2276 in force) agreements (UNCTAD, 2016a). Developing countries and economies in transition as one of the signatories represent majority of the agreements (see Appendix B). Nevertheless agreements between OECD countries (as a proxy for a number of treaties between the developed countries) through the years account for about 8% of the total number making such arguably uncharacteristic case worth looking into. Thus it is important first of all to consider particular features of BITs to get

an idea of what have led to phenomenal proliferation of this type of IIA especially in the period of 1980-1990s.

Table 1. Most important characteristics of the two types of IIAs analyzed in the paper.

	BITs	PTIAs
Number of parties	2	≥ 2
Subject matter covered	Investment	Trade (+ services) and investment
First appeared	1959	1994 (NAFTA)
Key provisions	Traditional structure: 1. Admission rules 2. General standard of treatment (<i>fair treatment, NT, MFN treatment</i>) 3. Specific standard of treatment (<i>guarantees of compensation and free repatriation of capital and profits</i>) 4. Dispute settlement mechanism	Different depending on a form of PTIA: Binding “BIT-like” provisions are only found in certain preferential trade agreements. Framework and cooperation agreements don’t include clauses found in BITs.
Liberalization of admission rules	Only few BITs provide MFN and NT in the admission (“pre-establishment”) phase.	Most of FTAs with binding investment provisions tend to liberalize investment in the “pre-establishment” phase.

As the name implies BITs are instruments that deal exclusively with investment, this feature makes it easier to negotiate the content of the agreement. It should be noted that BIT as one of the types of IIA have the structure and legal framework similar to other types, with certain differences. Moreover BITs are not homogenous, so the scope of application of commitments may vary depending on sectors which are listed in a document. Agreements are designed to last typically for the period of 10 years, although some can be shorter or terminated prior to that by mutual consent. Subject matter covered by typical BITs includes 4 main components: *admission rules, general and specific standards of treatment and dispute settlement mechanism.*

1. Usually after defining the investment to which a treaty applies *admission criteria* are stated. Regulation of what inward investment is allowed can range from “controlled entry” model to “full liberalization” which extends national and MFN treatment to pre-entry stage (the first more common), moreover sometimes provisions do not cover prior investment (Muchlinski, 2007). National treatment means treatment as favorable as one enjoyed by domestic companies, while

MFN treatment means that if a certain country concludes BIT that provides more privileges to a partner, the same (increased) level of treatment automatically applies to signatories of earlier agreements if they contain MFN clause.

2. The main part of the treaty deals with standard of treatment, whereas *general standard of treatment* contains principles of fair and equitable treatment, NT (national treatment) and MFN (most-favored-nation) standard. Documents also range in the way nationals of signatories are defined (especially complex is the issue of locally incorporated subsidiaries).

3. *Specific standard of treatment* usually concerns the free outward transfer of payments relating to investment, compensation for losses from expropriation or armed conflict. These are particularly important as lack of ability to repatriate capital produced from investment would render such activities futile (however host countries may impose some limits to free transfer of currency). “The issue of expropriation was the first and the most important single protection issue addressed in investment agreements” (UNCTAD, 2006, p.106). As highlighted by this statement and proven by the course of history danger of expropriation is perceived as the most relevant one by investors, thus almost all BITs include obligation of “adequate” (and prompt) compensation for any case of expropriation. Most BITs also prescribe compensation for “indirect measures that have the effect of neutralizing the value of the investor’s assets, while leaving their formal ownership intact” (Muchlinski, 2007, p. 63). Such mistreatment also known as indirect expropriation can occur in many forms, for example non-payment to investor, termination of “investment authorizations or the denial of justice” (UNCTAD, 2009).

4. Last but not least BITs provide *mechanism of settlement of disputes* arising between the host and foreign investor or contracting parties. In general parties are to seek settlement by negotiating and in case of failure to reach agreement international arbitration can be demanded. Modern BITs recognize ICSID (International Centre for Settlement of Investment Disputes) jurisdiction and some third independent party arbitration. However in case of ICSID it is important to mention that BITs differ in respect to “pre-consents to investor-initiated arbitration”, since full pre-consent allows unilateral initiation of dispute, while under weaker forms of consents it can be binding in limited types of disputes or be promissory rather than binding (Yackee, 2008).

The legal framework of BITs explains quite well why traditionally they have been concluded between developed investment-exporting and developing or transition economies, however based on the UNCTAD list of IIAs more than 200 agreements have been concluded between OECD countries. It is clear that countries have joined the organization over time, but even if we take intra-OECD treaties at the time of ratification we would end up with about 70 treaties – the number that

increases further if one is to include new developed countries which are not part of it like Singapore or Hong Kong. Arguably the risk of expropriation in that case is lower which would decrease the importance of the most important feature of a treaty – investment protection. BITs are also thought to be to some extent substitutes to institutional development of a host country, since signaling intention to adhere to provisions set in a treaty may help to attract investment while institutional quality of a host country may still be weak. Arguably this would apply to developed countries to much lesser extent. Indeed OECD countries did not succeed to sign the Multilateral Agreement on Investment (MAI) and discontinued talks in December 1998 not least because “there were no truly compelling problems of investment protection in the OECD area” in national policymakers’ view (UNCTAD, 1999b, p.25). Reduced interest of the business representatives, inability to reach consensus on some substantive provisions and political concerns were also among the key factors. This raises the question of effectiveness of BITs in case both parties are advanced economies.

On the other hand BIT-like provisions between developed countries tend to be increasingly included in preferential trade agreements, highlighting the fact that the instrument is seen as important part of liberalization of trade and investment regimes. The role of treaties is changing as the process of globalization continues and more countries achieve the status of developed nations (or become capital exporting developing nations). It may be that perception of international FDI shifts from ideology-driven to cooperation-driven one and agreements between developed countries represent the wish to create integrated, liberalized markets rather than simply protect home investment (Muchlinski, 2007). However achieving that on multilateral level as the example of MAI shows may be quite a difficult undertaking in the presence of number of contentious issues within a group, which would explain the choice of bilateral level of investment agreements as the prevailing one.

II.2 Trade Agreements with Investment Provisions between Developed Countries

When dealing with investment agreements between developed countries it is crucial to consider the more recent development in the field – conclusion of preferential trade agreements which include investment-related provisions. This type of IIA first appeared in 1994, when North American Free Trade Agreement was ratified as a result of pursue of a deeper integration than the WTO or BIT frameworks provided. Since then more than 120 agreements combining trade and investment provisions (mainly in form of FTAs - free trade agreements and EIAs – economic integration agreements) have been ratified according to the WTO list (see Appendix C for data sources).

UNCTAD refers to such agreements as PTIAs (Preferential Trade and Investment Agreements) and includes a broader scope of types of IIAs. Additionally cooperation, partnership and framework agreements are included which would increase the total number of trade agreements with investment component to 363. Out of this number agreements where at least 2 signatories are OECD countries amount to 47 (UNCTAD, 2016a). The majority of agreements with substantial investment provisions between OECD countries were concluded after 2002.

While BITs constitute the main portion of IIAs, shift towards regional agreements especially between developed countries is evident. Australia, the United States, Chile, Singapore and New Zealand as well as such country groupings as EU, EFTA and ASEAN are leaders by number of concluded FTAs with investment provisions (Houde et al., 2007). Recent signing of Trans-Pacific Partnership Agreement (TPP) as well as negotiations on Transatlantic Trade and Investment Partnership (TTIP) represent the most ambitious developments in the field of megaregional agreements combining trade and investment provisions. It should be noted that there is a link between BITs and PTIAs - that is the fact that “stronger” PTIAs tend to include BIT-equivalent provisions, like standards of investment protection and dispute settlement mechanism (investor-state arbitration). Generally all clauses mentioned previously when describing content of a typical BIT are included. This partly explains why the rate of conclusion of new BITs is slowing down. At the same time PTIAs may have only limited investment provisions for example with regards to scope of national treatment or provision of international dispute settlement standard. Some, like framework or cooperation agreements usually have even minimal amount of binding provisions and represent “mandate for future negotiations on investment issues” (UNCTAD, 2016a). For this reason the latter two will be excluded from the analysis as their potential to affect investment is arguably much more limited compared to FTAs with investment chapters. As Houde et al. (2007) put it: “the level of investment protection provided by RTAs is largely comparable if not interchangeable to that traditionally provided by BITs”, however such agreements have the ability differ substantially (p. 9). Interestingly sometimes BITs remain in force even when PTIA is ratified, such that they complement each other (for example some European countries maintained BITs with Western European counterparts even after Lisbon Treaty of 2009).

There is however an important distinction: most FTAs with investment component contain provisions liberalizing foreign capital entry in pre-establishment phase (Berger et al., 2013). To this extent agreements would adopt either “negative-list modality” (excluded sectors are named in annexes) or “positive-list modality” (provisions only apply to the listed sectors), whereas the first

one is prevalent in IIAs (UNCTAD, 2015). Such commitments in comparison are found in BITs concluded by only a few countries: Canada, the USA and Japan (UNCTAD, 2009).

While the rate of conclusion of BITs has slowed down considerably, the future may bring more agreements that deal with the whole range of issues – from trade to investment as countries seek to reform their IIA policies and approach multilateral angle of investment liberalization. The fact that the whole range of issues from trade and services to investment may be covered by a single agreement makes it hard to predict the aggregate effect of establishment of FTA under such rules. Trade-creation and investment attraction goals are not always complementary, much depends on motivation of firms accessing the new market created (Miroudot et al., 2009). This topic will be discussed in more detail in the next chapter, however it is certain that when analyzing the determinants of FDI flows in the 21st century one shouldn't overlook the effect of free trade agreements with investment provisions.

III. Theoretical Framework

FDI is traditionally divided into two main types – vertical FDI and horizontal FDI. Horizontal FDI is represented by investment with a goal of producing more or less the same goods or services in a host country directly rather than exporting to avoid large trade costs. Hence horizontal FDI is a positive function of trade costs and market size (larger consumer base is preferred). When trade costs are low enough companies may choose to export finished goods directly to the target market that is why trade and horizontal FDI are to some extent substitutes as empirical analysis suggests (Carr et al., 2001). Horizontal FDI is also sometimes referred to as “tariff-jumping” FDI. On the other hand vertical FDI occurs when a company wishes to carry out skilled- or unskilled-labour-intensive production activities abroad to reduce its labour costs, because of differences in relative labour endowment across countries. This type of FDI was described by Helpman (1984) and is also known as “efficiency-seeking” FDI. Vertical FDI is thus believed to be negatively associated with trade costs (higher trade costs increase costs of importing intermediate or finished products back to the home market) and positively with differences in labour endowment (Leshner & Miroudot, 2006).

One model that has emerged more recently as a synthesis of several of these approaches is the so called “knowledge-capital” model developed by J. Markusen. In case of very low trade costs there is no reason for horizontal investment to happen between very similar countries, so mainly vertical FDI should be observed, however “the weight of empirical evidence suggests the dominance of horizontal motives for foreign production” (Markusen, 2002, p.128). Knowledge-capital model assumes that knowledge-generating activities relying on skilled labour can be provided remotely at low cost such that firms may separate them spatially from unskilled-labour-intensive activities. Moreover knowledge-based activities have a joint-input characteristic so they can be used in different production facilities, which account for horizontal FDI (Carr et al., 2001). The model was extended by Bergstrand and Egger (2007) to the “knowledge-and-physical-capital model” which adds physical capital to the theory such that national exporters and horizontal MNEs (multinational enterprises) can exist in pairs of countries “with identical relative and absolute factor-endowments” (p. 279). In this paper I will use knowledge-and-physical-capital model approach recognizing the importance of market sizes, labour endowments, skill differences as well as trade and investment costs for capturing attractiveness of countries both for vertical and horizontal FDI. This way underlies many similar empirical studies attempting to quantify the effect of BITs and FTAs on FDI:

Hallward-Driemeier (2003), Egger and Pfaffermayr (2004), Tobin and Rose-Ackerman (2005), Neumayer and Spess (2005) to name a few.

Like any testable hypothesis mine relies on a certain set of assumptions related to the reasons why countries conclude trade agreements, specifically those related to investment. First of all I assume that developed source countries' MNEs and private investors prefer to invest in countries with a more liberalized policy regarding foreign capital reflected in more generous admission rules, less ownership restrictions and guarantees of accountability (in case of expropriations and other investment related disputes). This can be summarized as *lower investment costs* for foreign enterprises due to risk of mistreatment by the government of a host state. It is well-known that FDI is associated with initial *sunk-costs* and thus it is important that the governments of host countries do not decide that profits from expropriation outweigh benefits of increased attractiveness for foreign capital once these initial investments were made. Potential investors may find it too risky to open affiliates in countries where national legislation concerning foreign capital has a history of radical changes over time. That is why protection of investment specified in almost all BITs and PTIAs is arguably the main reason for their conclusion. Binding commitments in this regard can be assumed to be theoretically more important for investors than non-binding commitments like unilateral liberalization (Busse et al., 2010).

The signing of BIT or other form of IIA is thus aimed at signaling host country willingness to adhere to a certain well-defined set of rules when dealing with FDI, such that breach of an agreement would allow investor to initiate arbitration (in the best case for investor international third-party dispute settlement). OECD countries list today includes 34 economies however some of them only recently joined the organization and were formerly recognized as economies in transition or developing countries. These countries account for majority of BITs concluded in the 1980s-1990s in this sample of OECD countries (UNCTAD, 2016a). For economies in transition the causality may follow the reasoning described above, since after economic regime changes in the 1990s investors lacked information about the credibility of institutions in transition countries thus the need for investment treaties was natural. However the reason for conclusion of BITs between historically developed countries is less obvious, since the risk of direct expropriation is quite limited and conclusion of such agreements may lead to the loss of sovereignty to some degree as argued by Neumayer et al. (2016). Moreover it has been argued that conclusion of FTAs is associated with lower intra-regional investment in case of similar countries as trade costs decrease and horizontal FDI is replaced by trade (Bergstrand & Egger, 2007). But of course replacement of FDI flows with trade flows per se is not a negative outcome for the partner countries, plus lower trade cost may also

attract efficiency-seeking (vertical) FDI as firms with low fixed costs find it profitable to locate in multiple countries in the bloc and trade intermediate inputs (Leshner & Miroudot, 2006).

I include analysis of both BITs and PTIAs since arguably it is not the form of an agreement but actual provisions that matter for increasing country's attractiveness for foreign capital. There are similar clauses to be found in the mentioned types of agreements as discussed earlier (Berger et al., 2013). Like Berger et al. (2013) and Neumnayer et al. (2016) I formulate the further assumption in the following way: FDI flows would be positively associated with stricter provisions included in BITs and other IIAs (agreements are indeed not homogenous, some BITs for example signed by the US have more extensive provisions than many PTAs with investment chapters). Newer PTIAs would however theoretically affect FDI in both directions in member countries (depending on the actual provisions which may affect tariff-jumping FDI negatively in contrast to efficiency-seeking FDI), while simultaneously increasing trade flows among them. There is evidence that the effect may be stronger for investment from non-member countries: they may prefer to consolidate activities in one of the member countries if before creation of RTA members were served through foreign affiliates (te Velde & Bezemer, 2006; Leshner & Miroudot, 2006). Thus complex interactions between trade and investment make it difficult to predict the exact aggregated effect of "new-age" agreements on FDI. The related empirical literature and findings will be discussed in the following chapter.

IV. Literature review

A large body of research on the effects of BITs on FDI appeared in the last decade, however general focus of most of them is the analysis of the effect of treaties on aggregate or bilateral FDI to developing countries. The aim of BITs is of course to increase investment flows between partners, however quite contrasting findings emerged from the panel data studies in recent years, depending largely on the empirical strategy and data used.

Hallward-Dreimeier (2003) analyzes data on bilateral FDI flows from 20 OECD states to 32 developing countries from 1980 to 2000 and finds that there is no significant effect associated with signing of BITs. Egger and Pfaffermayr (2004) are one of a very few to address the issue of BITs and outwards FDI stocks of OECD countries including both extra- and intra-OECD economies. After examining panel data for bilateral FDI stocks of 19 OECD source countries and 57 host states (27 OECD members) from 1982 to 1997 they conclude that conclusion of BITs has significant positive effect on bilateral FDI stocks “with a lower bound of 15%” even when controlling for inclusion of new OECD members or endogenous treatment (p. 270). Tobin and Rose-Ackerman (2005) select a sample of 63 countries and unlike Hallward-Dreimeier examine combined FDI flows rather than bilateral ones and find a positive effect of BITs but only at low levels of political risk, whereas most developing countries fall into high-risk category.

Neunmayer and Spess (2005) arguing that smaller sample could have biased previous research also use overall FDI approach and study sample of 119 countries instead from 1970 to 2001 and in contrast to Tobin and Rose-Ackerman find positive (and quite significant) robust effect of BITs on FDI inflows to developing countries. Yackee (2007) reexamines the sample used by Neunmayer and Spess (2005) to find that slight changes in specification can cause significantly different estimations of the effects of BITs. His estimates show far weaker effect of the treaties, moreover it appears that the effectiveness of BITs increases as political risk falls. The differences in results of studies raise the following question: is it justified to analyze the effect of BITs on FDI flows not accounting for simultaneous unilateral liberalization which may take place or other instruments for FDI promotion like the ones mentioned in introduction. Account for unilateral liberalization and endogeneity concerns is provided for the case of developed-developing countries FDI from 1978 to 2004 by Busse et al. (2010) who conclude that BITs do indeed promote FDI inflows to developing countries (significant and robust result) and may partly substitute for weak institutional environment while controlling for unilateral liberalization allows not to overestimate

the effect of BITs. Egger and Merlo (2007) study effect of BITs on intra-OECD and OECD-transition economies investment (24 home, 28 host countries) under assumption of slow adjustments of FDI stocks in response to changes in policy. The authors use difference GMM estimator on panel data from 1980 to 2001 and find evidence of positive effect of BIT ratification and "...sluggish adjustment of bilateral outward FDI stocks in response to, for example, ratifying a BIT" thus stressing the importance of use of dynamic empirical framework for analysis of the subject matter (Egger & Merlo, 2007, p. 10). However, neither of two studies mentioned which have OECD countries as hosts for FDI takes into account that similar effect can be expected from ratification of preferential trade and investment agreements (this may be justified by proliferation of "new-age" agreements quite lately, which brings up complications related to data).

Most of the literature treats agreements as "black boxes" meaning that they are assumed to be homogenous in content, the assumption which to this date is dictated by very limited attempts to classify large number of such treaties and construct special indices of "deepness" of liberalization commitments they provide. Analyzing contents of over 2900 BITs is a very difficult undertaking and thus far attempt has been given to analyze BITs in terms of dispute settlement procedures variation (in relation to partners' pre-consent to arbitration) by Yackee (2007). Author's database of ISDS provisions in BITs was included in the research on the effect of BITs and RTAs with pre-establishment national treatment (NT) on FDI inflows to developing countries between 1978 and 2004 by Berger et al. (2013) and although significant positive effect of RTAs with NT provisions was identified, stricter dispute settlement mechanism provisions had no significant influence on FDI flows in any specification examined.

Turning to literature concerning other forms of IIAs it should be noted that apart from studies related to the EU and NAFTA analysis of effect of other PTIAs on FDI is relatively rare. Establishment of preferential trade agreement between two or more countries may trigger a complex interaction between trade and FDI adjustments primarily because of the fact that a larger regional market is being created which according to theories affect horizontal FDI flows. As argued earlier FDI may be affected in both directions, however if conclusion of PTIA leads to creation of common market which has large and important economies, FDI both within and from outside of the region would arguably increase. Indeed there has been some evidence that PTAs with investment provisions have a positive effect on FDI flows from non-member countries (UNCTAD, 2009). Early works on analysis of the effect of PTAs with investment chapters and other IIAs include paper by Dee and Gali (2003) which however studies only nine PTAs with commitments on FDI liberalization. The researchers study the sample of 77 countries in panel data from 1988 to 1997

with outward FDI stocks as a dependent variable. Specialized “member liberalization index” (MLI) is used to account for differences in scope of liberalization provisions. The study concludes that there is certain investment creation effect associated with the majority of agreements. Most PTIAs studied (including NAFTA, MERCOSUR, AFTA, CER and the EU) attracted investment mainly from non-member countries as a result of their “third wave” provisions (Dee & Gali, 2003, p. 34). Subsequently te Velde and Bezemer (2006) investigate real stock of FDI from 2 developed countries – UK and US in 68 and 97 developing countries respectively in 1980-2001 in an attempt to move beyond “black box” treatment of RTAs, since they create and use regional integration index that accounts for investment and trade provisions. The authors conclude that creation of “...CARICOM, ASEAN, ANDEAN and NAFTA has resulted in attracting additional extra-regional FDI...” (i.e. FDI from US and UK) contrary to SADC, COMESA and MERCOSUR (te Velde & Bezemer, 2006, p.58). More far reaching trade and investment provisions were shown to positively correlate with inward FDI stocks, which shows that the type of RTA matters for attracting FDI.

Leshner and Miroudot (2006) have developed their own composite index of “deepness” of investment provisions in 24 North-South PTIAs with special attention paid to bilateral PTIAs – the case which attracted less attention than RTAs. Using this index and taking FDI flows between developed and 154 developing countries as dependent variable they found that investment provisions are positively associated with both trade and to a greater extent FDI in the period from 1990 to 2004. The authors argue that in case of such agreements trade and investment are complement rather than substitutes (Leshner & Miroudot, 2006, p.27). Investment agreements are also likely to result in higher investment flows from third countries and result in investment creation. Some authors tried to integrate variation of agreements in accordance with provision of NT/MFN clauses in the gravity equation, for example as mentioned earlier Berger et al. (2013) do that for analysis of effect on FDI to developing countries to find “strong evidence that liberal admission rules promote bilateral FDI” independent of type of IIA (Berger et al., 2013, p.22).

Overall this chapter highlights the fact that there exists no clear consensus with regards to the extent of positive effect of BITs even for developing host countries (with very limited research considering intra-developed countries FDI at all). At the same time PTIAs were shown to have a certain positive effect on FDI flows from non-member countries, while intra-block FDI responds ambiguously to such agreements. This underscores the importance of accounting for both BITs and PTIAs when analyzing the impact which IIAs can have on investment, especially since slowing down process of conclusion of BITs and rising popularity of PTIAs in the developed countries.

V. Model specification

V.1 Estimation method, sample and explanatory variables

Since the research is based on a panel data of bilateral investment stocks in OECD countries I use gravity model approach to estimate the effect of IIAs, while also including important coefficients as proxies for those described by knowledge-capital model. Gravity equation has been traditionally used by researchers to estimate the effect of PTAs on trade flows between countries, so the complementarity of trade and FDI allowed arguing that it can be analyzed with help of gravity model in a similar way as well. In fact Bloningen et al. (2006) mention that “gravity model is arguably the most widely used empirical specification for FDI” (p.1309). Bergstrand and Egger (2007) puzzled by absence of theoretical framework behind application of gravity for FDI, demonstrate using well-defined theoretical foundation why bilateral trade, foreign affiliate sales and FDI flows can coexist in case of equally labour-endowed countries and be “well-approximated by gravity equations” in three-country world case (p.281). This allows me to believe that the gravity model can be applied to account for both vertical and horizontal FDI.

The dependent variable of choice in the gravity type equation is the stock of FDI of one country in the partner country in a given year. As for the independent variables it should be noted that their set tends to vary across studies as theory of FDI gets developed over time. Firstly I include these suggested by knowledge-and-physical-capital model, namely total GDP of partners, similarity in countries (GDP) size and difference in skilled labour endowment. I largely follow approach described by Carr et al. (2001), Markusen and Maskus (2002), Egger and Pfaffermayr (2004) and Bergstrand and Egger (2007). Additionally I control for macroeconomic and institutional characteristics of partners. Independent variables are listed in the table 2, more information on them is provided below.

Fair amount of researchers using knowledge-capital foundation for gravity approach use specific interaction terms between for example skilled-labour endowment and country-pair size, but this leads to multicollinearity among the regressors as suggested by Egger and Merlo (2007). They argue against using it since the effect can be “particularly harmful in the time dimension of FDI panel data” (p.1540). This provides rationale for excluding interaction terms from the analysis and formulating the gravity equation as follows:

$$\ln FDI_{ijt} = \beta_0 + \beta_1 \ln SumGDP_{ijt} + \beta_2 \ln SIM_{ijt} + \beta_3 \Delta SK_{ijt} + \beta_5 \ln Inflation_{jt} + \beta_6 \ln PolCon_{jt} \\ + \beta_7 BIT_{ijt} + \beta_8 PTIA_{ijt} + \lambda_t + \mu_{ij} + \varepsilon_{ijt}$$

Where $\ln FDI_{ijt}$ is the dependent variable for the stock of FDI of country i in country j in the given year t . Although analysis of both stocks and flows of FDI is performed in empirical literature Egger and Merlo (2007) recommend using FDI stocks when dealing with panel data rather than FDI flows, as flows represent first difference in stocks in which we are interested under fixed effect estimation. Moreover FDI stocks data in OECD database has fewer gaps than data on FDI flows as flows tend to fluctuate quite significantly over the years increasing number of zero observations. Some countries like Canada do not report flows altogether and some other start reporting outward stocks earlier than outflows (Czech Republic, Slovakia, Greece). At the same time this leads to exclusion of countries that do not report outward stocks from the analysis: Ireland, Spain, Hungary, Turkey. The sources for the used data are described in the Appendix C.

Table 2. Independent variables and predictions of effect on FDI

Variable name	Description	Expected effect on FDI
$SumGDP_{ijt}$	Absolute bilateral country size: $GDP_{it} + GDP_{jt}$	+ (horizontal FDI)
SIM_{ijt}	Similarity in country size: $(\frac{GDP_{it}}{GDP_{it}+GDP_{jt}}) * (\frac{GDP_{jt}}{GDP_{it}+GDP_{jt}})$	+ (horizontal FDI)
ΔSK_{ijt}	Difference in skilled labour endowment: $\ln[(TSE_{it} - TSE_{jt})^2]$	+ (vertical FDI)
$Inflation_{jt}$	Host country inflation rate	-
$PolCon_{jt}$	Host country political constraints index	+

Similarity in country size is defined according to knowledge-and-physical-capital model by Bergstrand and Egger (2007) and is expected to be positively associated with both horizontal FDI and trade. The reason behind are shifts of physical and knowledge capital costs in partner countries in the presence of the rest of the world in general equilibrium defined by the authors. The same applies to the joint economic size defined as a sum of partners' GDPs. Horizontal FDI overall is a substitute to trade as the number of multinational enterprises becomes higher than number of national exporters (generating trade flows) when countries become more similar in size (Bergstrand & Egger, 2007). But in contrast to knowledge-capital model it doesn't completely displace trade even if partners have identical factor endowments and sizes. Squared difference in skilled labour endowment is under theoretical rationale for vertical FDI is supposed to affect FDI positively if a

difference of such kind exists. Tertiary school enrollment data is used as proxy for skilled labour endowments. In robustness test I also allow difference in GDPs per capita to act as proxy for ΔSK .

It should also be mentioned that political-economic environment plays an important role in attracting investment. Indeed, the Worldwide Survey of Foreign Affiliates of Investment Agencies conducted in 2007 showed that political and macroeconomic stability as well as institutional framework and taxation policies are of biggest concern to CEOs of foreign affiliates (UNCTAD, 2009). Indeed, it has been a tradition in empirical literature to include proxies for institutional development, inflation, openness to trade, quality of telecommunications as independent variables in gravity equations (see for example Egger and Pfaffermayr, 2004; Busse et al., 2010; Berger et al., 2013). Some authors demonstrate that conclusion of IIAs is more of a complement rather than substitute weak institutional environment and thus highlight the importance of including such factors as determinants of FDI flows (Hallward-Dreimeier, 2003). These parameters are especially important when having countries in transition in a panel data, as I do since these countries have undergone a process of transformation of economic model and thus experienced a turbulent period of relatively high inflation and changes in quality of institutions. The inflation rate provided by World Bank is used as a proxy variable for macroeconomic stability. POLCON is an index developed by Henisz (2000) which measures the level of political constraint on executive/legislative branches lowering a chance of radical shifts in state policy. It can be viewed as a proxy for political stability of a country which is intuitively positively associated with FDI inflows (sunk costs argument) by virtue of reducing uncertainty. Higher values of the index mean higher constraints on a policymaker thus lowering chance of the change in legislation, so there should be a positive link between PolCon variable and FDI stocks abroad. However since the countries included in the analysis are mostly developed I expect only a minor effect of this variable.

I also include a set of dummies evaluating effects of which is the goal of this study: BIT is the dummy variable for bilateral investment treaty and PTIA – for preferential trade and investment agreements with “strong” investment provisions. Dummies are the standard way to deal with investment agreements in gravity equations if they are treated as “black boxes” (i.e. homogenous in extent of commitments). Data restrictions in regards to categorization of BITs prevent me from including any in this particular study, as Yackee (2007) coding for strictness and binding character of dispute settlement provisions is provided for BITs concluded only up to 2002. Additionally Yackee (2008) notes that “the ubiquity of the MFN clause also makes it a largely useless and virtually impossible task for the analyst to construct any sort of index of the relative substantive favorableness of the various treaties...” (with an exception of U.S. BITs) (p.416). It seems

important to analyze effect of NAFTA and EU agreements separately from the rest of PTIAs, as they represent examples of RTAs with deepest level of liberalization commitments both with regards to trade and investment; this is the motivation for inclusion of respective dummies in the subsequent specifications.

Literature on the gravity models highlights the importance of accounting for the so called “multilateral resistance” (MR) as the potential source of omitted variable bias in such equations (Anderson & van Wincoop, 2003, p.176). In cross-sectional studies the authors suggest using country-specific fixed effects as one of the ways to account for the suggested effects. When dealing with a panel data and effects of FTAs on trade Baier and Bergstrand (2007) show that it is important to account for time-varying MR terms. To get most accurate estimates they suggest using both bilateral fixed effects and country-and-time effects. Bilateral (pair) fixed effects would then in theory eliminate omitted variable bias from unobserved time-invariant pair-specific heterogeneity while country-and-time FE would account for time series MR effects, however this method has been shown to lead to confusing results (see Baldwin & Taglioni, 2006). Bergstrand and Egger (2007) as mentioned earlier reason why gravity can be used to measure effects on FDI flows in the same way as on trade. The authors assume that “MR terms are slow moving, so bilateral pair “fixed” effects should capture the (most important) cross-sectional influence of these terms” thus suggesting that pair FE coupled with year dummies are sufficient to account for the mentioned concerns (p.284). Thus I include bilateral pair fixed effects (μ_{ij}) and year dummies (λ_t) in the main specification. Additionally inclusion of country-and-time FE will be performed as part of robustness tests.

I would test several different estimation strategies: OLS refers to simple ordinary least squares estimator which will require dropping all zero values of the dependent variable because of the log-linearization of gravity equation. However since the OECD bilateral data on FDI stocks provides distinction between actual absolute zero values, missing values as well as confidential and non-publishable observations I have the ability to include zero observations in the estimations and exclude all the other types (transformation of missing values into zeroes is arguably only viable for countries in transition since intra-developed countries stocks would less likely have zero values than stocks of developed countries in developing countries – assumption used in similar studies). To be able to include zero values of the dependent variable in the gravity equation I also employ Poisson-Pseudo-Maximum-Likelihood (PPML) estimator. Silva and Tenreyro (2006) suggest that “besides being consistent in the presence of heteroskedasticity, this method also provides a natural way to deal with zero values of the dependent variable” (p. 641). Moreover in panel data setting with fixed

effects PPML estimator was shown to perform better than log-linear fixed effect method (Westerlund & Wilhelmsson, 2011).

V.2 Data

Balanced panel data for the sample of 34 source and 35 host countries (see Appendix D for the list of included countries) would have 34,510 observations. OECD bilateral positions database (BDM3 methodology) that I use for the estimation provides 19,913 observations, meaning that 14,597 are missing (mainly due to the nature of historical reporting from economies in transition and the fact that countries joined the organization over time). Absolute zero values account for 2564 observations while confidential and non-publishable for 1324 and 215 respectively. Sources for independent variables data are given in Appendix C.

BIT and PTIA dummies are included in the dataset based on the year when an agreement enters into force, since this date determines when the provisions become legally binding for parties (as opposed to the year of signing the agreement). Framework and cooperation agreements reported by UNCTAD are excluded from the analysis due to absence of real enforceable investment liberalization commitments. Moreover preferential trade and investment agreements differ in scale of provisions regarding investment so to measure a somewhat more optimistic effect of PTIAs only ones with strongest commitments to investment liberalization are included as dummies. The list of such agreements comes from two sources: a more recent WTO “Anatomy of PTAs” dataset and research by Leshner and Miroudot (2006). The first one provides agreements that have legally enforceable “obligations that are outside the current mandate of the WTO” with regards to investment liberalization (WTO, 2013). The second one has an actual ranking for PTAs, which is however only available for agreements entering into force before 2006, however it is useful since it adds a couple of PTAs absent in WTO database. All agreements listed in this research have been added to the analysis.

It is important to highlight the fact that the original panel data had to be modified when merged with statistics on BITs and PTIAs entering into force over time. The reason for this is the existence of gaps in FDI positions reporting for some countries in certain time periods. For example if BIT enters into force during the period when source country provides no information on FDI outward stocks (missing or confidential observations) while having previously reported this statistics then the regression may produce incorrect estimates of the effect of such BIT. To prevent this from happening I have to exclude from the analysis any statistics on FDI previously reported by a country

in such cases. This essentially leads to wiping out of variation in BIT dummy variable for some of the countries which is unfortunate as this prevents any researcher from estimating the impact of some of the investment treaties when using OECD statistics (especially many observations are marked as confidential by Australia and Iceland). Obviously identical reporters and partners are excluded from the panel as well.

Transforming data to logarithmic scale means losing observations with negative values, which becomes an issue when dealing with difference in skilled labour endowment statistics. As can be seen from the table 3 which presents descriptive statistics for all the variables included after initial manipulations with the data. Since most of the countries appear both as partners and as reporters ΔSE_{ijt} variable ranges from -91% to 91% (enrolled in tertiary education). In the analysis I will be squaring the variable with a bit simplistic assumption that vertical FDI is maximized when countries differ in skilled labour endowments the most. This allows me to maintain bigger number of observations for a more precise estimation of other variables. Later on I will also report coefficient estimations when excluding negative ΔSE_{ijt} as well as when using difference in GDPs per capita instead. A small number of observations where negative inflation is reported is also excluded as transforming negative numbers to small positive values would be detrimental for coefficient estimation, since negative inflation (deflation) can signify adverse economic conditions in the reporting country.

Table 3. Descriptive statistics

Variable	Obs.	Mean	Std. Dev.	Min	Max
Full sample (34510)					
FDI_{ijt}	17265	8036.084	29136.12	-30237	645098
$\ln FDI_{ijt}$	14997	6.152	3.214	-6.91	13.377
$\ln \Sigma GDP_{ijt}$	30207	27.41	1.28	22.776	30.727
SIM_{ijt}	30207	-2.285	1.01	-7.5	-1.386
SE_{it} (%)	30380	49.2	22.21	2.44	110.2
ΔSE_{ijt}	30315	-1.138	23.95	-91.87	91.87
Inflation _{jt} (%)	32586	5.927	14.67	-5.204	259.99
PolCon _{jt}	31459	0.424	0.16	0	0.72
BIT	32586	0.245	0.43	0	1
PTIA	32586	0.079	0.27	0	1

VI. Empirical results

VI.1 Main results

Main regression results are reported for OLS (Table 4) and for PPML (Table 5) estimation methods. Each table contains a number of specifications different in number of independent variables which I estimate. Firstly I report results for regression where the EU agreement (The Treaty of Rome of 1957 contains investment provisions) and NAFTA are both included in the set of PTIA dummies (column I). Immediately it is apparent that bilateral investment treaties affect investment ambiguously while all the other variables behave in accordance with the theory. Notably PTIAs, joint economic size and similarity in sizes show positive and significant effect, inflation, being a proxy for macroeconomic stability - significant small negative effect. The results for continuous variables can be understood as elasticities, they reflect percent change in FDI stocks in a response to changes in studied independent variables, for example according to column I if similarity between states grows by 10% stocks of FDI grow by approximately 8,3%. It has also been suggested that to be able to understand the effect of a dummy variable in the same way it has to be calculated as follows:

$$g^* = \exp[\hat{c} - \frac{1}{2} * var(\hat{c})]$$

where \hat{c} is the obtained estimate for the dummy and its expected variance ($var \hat{c}$) is calculated as the square of the standard error of \hat{c} (van Garderen & Shah, 2001). This formula originally developed by Kennedy (1981) aims at reducing an upward bias generated by a more commonly known variation of a formula (without variance). Calculated in such way effect of a dummy can be now regarded as elasticity. Results from specification I suggest that PTIA entering into force would increase value of outward FDI stocks by approximately 56,3%.

However in the next specification (II) EU and NAFTA agreements are treated separately through the use of the respective dummies and it leads to PTIA variable losing significance which suggests that EEC (subsequently EC and EU) existence had the strongest positive effect on FDI stocks in OECD countries among agreements of such kind. On average across all specifications presented in Table 4 joining the European Union is estimated to result in approximately 76,5% growth in outward FDI stocks from other members of the union. The effect of NAFTA is not so clear with a negative point estimate and significance reached only at 10% and only in the second specification. This hints at the existence of complex processes of adjustments of both trade and investment since 1994, as some gross divestment might have occurred as a result of lowering of

trade barriers. Although it is suggested by Bezemer and Te Velde (2006) that NAFTA creation “has resulted in attracting additional extra-regional FDI” my specification capturing intra-regional FDI suggests that over time investment may have been displaced by trade (p.58).

Table 4: Results for OLS estimation

	(I)	(II)	(III)	(IV)
BIT	0.03 (0.19)	0.09 (0.18)	0.07 (0.18)	0.1 (0.18)
PTIA	0.45*** (0.08)	0.17 (0.16)	0.13 (0.16)	0.138 (0.16)
ΣGDP	2.12*** (0.19)	2.12*** (0.19)	2.18*** (0.19)	
Inflation	-0.04** (0.02)	-0.04** (0.02)	-0.034** (0.017)	-0.04** (0.02)
POLCON	0.05 (0.06)	0.05 (0.06)	0.045 (0.06)	0.05 (0.06)
Similarity	0.83*** (0.15)	0.81*** (0.15)	0.8*** (0.16)	
EU		0.6*** (0.09)	0.58*** (0.095)	0.56*** (0.09)
NAFTA		-0.42* (0.21)	-0.31 (0.23)	-0.26 (0.25)
ΔSE²			0.008 (0.008)	0.0076 (0.008)
GDPit				1.4*** (0.14)
GDPjt				0.8*** (0.13)
Observations	13651	13651	12834	12834
R2 within	0.5569	0.5592	0.5497	0.5516
R2 between	0.3362	0.3402	0.3414	0.3999
R2 overall	0.4182	0.4177	0.4149	0.4539

Note: Robust standard errors adjusted for clustering in pairs are reported in parentheses with ***, ** and * indicating significance at the 1, 5 and 10% levels respectively. The model is estimated with pair fixed effects and year dummies.

Vertical investment is accounted for by adding squared difference in skilled labour endowment in the third column. This addition doesn't change the overall picture and ΔSE^2 coefficient shows no statistical significance. I have also tried estimating the aforementioned interaction terms (not reported), however the point estimates also appear to have minimal effect on FDI and no significance. This can be explained by the fact that the sample used for the estimation contains countries with similar levels of skilled labour endowments and little variation over time (needed for fixed effect estimation). Moreover as argued by Markusen and Maskus (2002) the vertical investment model while being more important for certain industries is “a poor characterization of the overall pattern of world FDI activity” (p.706). Finally estimation of separate partners' GDP instead of sum of GDPs is provided under the forth specification (IV). This however

prevents me from estimating the importance of similarity variable at the same time, since the later is collinear with countries' GDPs. Knowledge-and-physical-capital model of FDI predicts that point estimates of partners' GDPs should be close to unity, however source country GDP elasticity should be higher than host country GDP elasticity (Bergstrand & Egger, 2007). The model seems to produce results in line with these theoretical expectations.

The results are reinforced by PPML estimation technique (reported in table 5) which increases the number of observations by more than a thousand. Point estimates turn out to be universally lower than in OLS regression but there are no drastic deviations. Inflation variable loses significance, political constraints index is still insignificant and negative effect of NAFTA on FDI stocks is more apparent in specification II. Otherwise the results are comparable and coincide with theoretical predictions.

Table 5: Results for FE PPML estimation

	(I)	(II)	(III)	(IV)
BIT	0.04 (0.11)	0.035 (0.11)	0.022 (0.1)	0.04 (0.11)
PTIA	-0.01 (0.12)	-0.05 (0.14)	-0.07 (0.15)	-0.06 (0.15)
ΣGDP	1.55*** (0.17)	1.55*** (0.18)	1.6*** (0.19)	
Inflation	0.005 (0.015)	0.01 (0.015)	0.014 (0.016)	0.01 (0.015)
POLCON	-0.06 (0.05)	-0.06 (0.05)	-0.06 (0.06)	-0.067 (0.056)
Similarity	0.76*** (0.17)	0.74*** (0.18)	0.82*** (0.19)	0.08 (0.2)
EU		0.372*** (0.106)	0.33*** (0.1)	0.34*** (0.11)
NAFTA		-0.4*** (0.11)	-0.19* (0.11)	-0.18 (0.11)
ΔSE²			0.004 (0.008)	0.004 (0.008)
GDP_{it}				0.91*** (0.19)
GDP_{jt}				0.675*** (0.15)
Observations	14721	14721	13880	13880
Log pl	-6599669.8	-6486800.9	-6017846.7	-6002601.8
Wald chi² (35)	2849.09	3477.82	2845.72	2642.52

Note: Robust standard errors adjusted for clustering in pairs are reported in parentheses with ***, ** and * indicating significance at the 1, 5 and 10% levels respectively. The model is estimated with pair fixed effects and year dummies.

The PolCon coefficient which acts as a proxy for host country's institutional development has no significant impact on FDI positions in any specification, which is not what one would

intuitively expect. However it should be said that the index developed by Henisz is a more broad measure of political hazards than more specialized and subjective ones (ICRG and the likes) since it takes into account a variety of objective criteria, and statistical insignificance may be explained by certain degree of similarity between countries in the sample (OECD countries). This fact also suggests that there is little point in using alternatives to PolCon index. Moreover none of them provides the same breadth of coverage, often being limited in number of reporters, years or both.

Importantly the minor and ambiguous effect of bilateral investment agreements is consistent across specifications, suggesting that a BIT entering into force doesn't necessarily lead to an increase in FDI stocks in the partner country in case of OECD countries in the given period. This result seems to reinforce concerns about the effectiveness of such type of investment agreements as vehicles for attracting more FDI in case of the developed countries. However to be able to make any claims appropriate robustness and sensitivity tests should be performed first, the next chapter is devoted to such analysis.

VI.2 Robustness tests

To further test soundness of the model and robustness of the main findings it is important to perform additional regression analysis by introducing new independent variables and changing estimation methods and time frames. The results of the tests are presented in tables 6 and 7. First of all as mentioned earlier I will estimate logarithm of difference in skilled labour endowments (without squaring it), which would mean that the sample will be drastically reduced and contain only observations where source country SE is higher than host country SE. While in this setting significance of the ΔSE coefficient increases slightly the positive effect is quite weak. This can signify that in the sample of OECD countries vertical motivation for FDI plays a secondary role, while horizontal FDI are predominant, as demonstrated by high impact of GDP sum and similarity in economic sizes variables. I also test if there is any difference when replacing tertiary school enrollment statistics with a more common GDP per capita data in specification "b". Both approaches are found in the empirical literature since they are used as proxies for the same concept. The result shows that GDP per capita difference has low impact on FDI and once again no statistical significance can be established.

It should be noted that pair fixed effects are supposed to capture all time invariant effects between countries thus making estimations of influence of common border, distance, common language or common colonial history impossible. These variables are often used as proxies for trade

costs together with information on tariff/non-tariff barriers to trade. Taylor (2000) additionally explores effects of the trade openness index calculated on the basis of World Competitiveness Report and finds trade openness has significant positive effect on the US FDI stocks in partner countries. Subsequently many later empirical research papers include host country's trade openness as one of the independent variables. I follow them in defining trade openness as the sum of imports and exports divided by the GDP of a country. It is presumed that trade openness would have ambiguous effect depending on the type of FDI prevalent in the sample.

In my case trade openness added in specification "c" appears to be strongly positively associated with FDI stocks. In the sample highest trade openness is attributed to economically small countries, which are mostly skilled labour abundant. As Carr et al. (2001) points out this combination should in theory maximize motivation to locate vertically investing firms ("type-V firms") in such countries (p.696). It should be however said that trade openness index in this form is not a good proxy for trade costs (sometimes defined as 1-Trade Openness) since higher factual trade volumes don't necessarily signify that barriers to trade are lowered. The results obtained in the third column would suggest that certain amount of vertical "market-seeking" FDI is associated with higher trade to GDP ratio. Perhaps this reflects vertical FDI from the countries of Western Europe as a result of certain Eastern European countries undergoing economic transformation and joining the EU. There is however a good reason to be concerned about endogeneity between trade and FDI if for example there is investment leading to creation of new plant that becomes a part of production chain and imports and exports materials/parts from the affiliate abroad. In specification "d" I test if lagging FDI stocks variable 1 period has significant effect on regression results. The reason for using lagged dependant variable is an assumption of "sluggish adjustment of FDI over time" in response to external shocks (Egger & Merlo, 2007, p.1540). Changing the model in such way has no impact on significance of any of the estimated variables, some point estimates change (notably information about inflation in the given year influences next year's FDI more) but this can also be attributed to a diminished number of observations.

Lastly I check whether using alternative fixed-effects strategies could lead to significant changes in independent variable effects estimation. The rationale behind using different combinations of fixed effects is the need to account for time series multilateral resistance effects as discussed in the empirical specification section. Using both reporter-and-time and partner-and-time dummies together with pair fixed effects and year dummies (tested but not reported) is problematic (although some authors suggest this setup). When so many variables are fixed, meaningful estimates

Table 6: Robustness tests (OLS)

	(a)	(b)	(c)	(d)	+ Reporter-Time dummies	+ Partner-Time dummies
BIT	0.22 (0.21)	0.09 (0.18)	0.03 (0.17)	0.03 (0.18)	0.3 (0.19)	0.33 (0.19)
PTIA	-0.13 (0.16)	0.17 (0.16)	0.14 (0.15)	0.03 (0.15)	-0.127 (0.154)	0.36* (0.17)
Σ GDP	2.8*** (0.25)	1.89*** (0.19)	2.31*** (0.19)	2.08*** (0.2)		
GDPit					-	1.42*** (0.13)
GDPjt					0.8*** (0.1)	-
Inflation	-0.05** (0.02)	-0.04** (0.017)	-0.03** (0.016)	-0.064*** (0.02)	-0.044*** (0.015)	-
POLCON	-0.07 (0.07)	0.05 (0.05)	0.03 (0.05)	0.055 (0.06)	0.035 (0.049)	-
EU	0.53*** (0.11)	0.6*** (0.09)	0.51*** (0.1)	0.61*** (0.1)	0.48*** (0.09)	0.45*** (0.12)
NAFTA	-0.18 (0.323)	-0.42** (0.2)	-0.56** (0.18)	-0.53** (0.2)	-0.14 (0.21)	0.1 (0.3)
Similarity	1.24*** (0.22)	0.8*** (0.15)	0.88*** (0.15)	0.68*** (0.16)	-	-
Δ SE	0.04* (0.02)					
Δ GDPpc ^{^2}		-0.006 (0.009)	-0.006 (0.009)	-0.006 (0.009)		
TrOpenness			0.92*** (0.18)	1.00*** (0.19)		
Observations	6918	13651	13651	12872	13651	13651
R2 within	0.5445	0.5592	0.5627	0.5611	0.6385	0.6094
R2 between	0.3475	0.3401	0.4091	0.3953	0.0394	0.0969
R2 overall	0.3976	0.4178	0.4701	0.4617	0.1144	0.1556

Note: Robust standard errors adjusted for clustering in pairs are reported in parentheses with ***, ** and * indicating significance at the 1, 5 and 10% levels respectively. The model is estimated with pair fixed effects and year dummies in specifications a-d.

can only be obtained for time-varying variables changing pair wise, since all country characteristics are captured by fixed effects. Importantly even this rigorous model doesn't change the significance of BIT or PTIA variables. Instead I use reporter dummies for each year and partner dummies for each year (separately) in last two columns of table 6. This requires estimating coefficients of GDPs separately and dropping the similarity variable for the reasons of colinearity. Interestingly the BIT effect estimations have higher point estimates than before, shifting 95% confidence interval slightly upwards, but significance still fails to reach even 10% level. Compared to specification IV in table 4 EU variable point estimate is reduced while the effect of NAFTA is similarly insignificant. Other variables exhibit predicted properties.

Since the panel that I study has a large time dimension and considering the fact that the number of signed BITs dropped significantly since the 1990s (opposite is true for PTIAs) it is also beneficial to examine if BITs/PTIAs' estimations would be affected by the choice of time periods. Table 7 reports the estimates obtained from analyzing 2 periods separately (1985-2000 and 2000-2013) as well as ones obtained from consequently increasing the time dimension of the panel. The results demonstrate an interesting property of the BIT variable - as the time dimension increases its point estimates fall. If we only look at the 20th century (column 1) BIT estimate would be high enough to signify confidence at the 10% level, with positive effect reaching around 34% of increase in outward FDI stocks. This highlights a possibility that bilateral investment treaties had some significant positive effect on FDI in OECD countries in the period of 1985-2000. It is difficult to compare these results with estimation of the same variable from 2000-2013 (column 4) because the later is statistically insignificant. Increasing the time dimension of the panel (columns 2 and 3) leads to reduction in the coefficient and loss of significance of the BIT variable, however the positive correlation between EU dummy and outward FDI stocks is higher in more recent observations (currency union and deeper integration had positive impact on FDI flows to partners in the same union). The effect of NAFTA is not very sensitive to changes in the specification, remaining ambiguous (slightly negative). The only surprising result is the significance in BIT variable estimated effect when using PPML estimation for 2 separate time periods. However the results from the last column seem somewhat suspicious since the impact of EU is reduced dramatically while BIT effect gains in significance. There is a possibility that in the presence of large number of zeroes and gaps combined with shorter panel the PPML estimation has difficulty in distinguishing between BIT and EU variables so the results are biased. The PTIA coefficient overall also remains insignificant which might be explained by the fact that horizontal direct investment and trade are substitutes according to the theory.

Table 7: Sensitivity tests (OLS and PPML)

	Baseline 85-13	(I) 85-00	(II) 85-05	(III) 85-10	(IV) 00-13	(V) 85-00 PPML	(VI) 00-13 PPML
BIT	0.09 (0.18)	0.33* (0.19)	0.15 (0.16)	0.05 (0.2)	0.264 (0.28)	0.164* (0.09)	0.26** (0.1)
PTIA	0.17 (0.16)	-	0.23 (0.17)	0.12 (0.165)	0.18 (0.28)	-	-0.05 (0.14)
ΣGDP	2.12*** (0.19)	1.94*** (0.25)	1.77*** (0.24)	2.05*** (0.2)	1.97*** (0.23)	1.22*** (0.19)	1.38*** (0.185)
Inflation	-0.04** (0.02)	-0.07*** (0.024)	-0.076*** (0.022)	-0.05*** (0.018)	-0.001 (0.017)	0.05 (0.03)	0.02 (0.016)
POLCON	0.05 (0.06)	-0.16 (0.1)	0.09 (0.07)	0.05 (0.055)	-0.05 (0.05)	0.06 (0.07)	-0.05 (0.05)
EU	0.6*** (0.09)	0.326*** (0.1)	0.34*** (0.087)	0.52*** (0.1)	0.515*** (0.13)	0.28* (0.16)	0.11 (0.07)
NAFTA	-0.42* (0.21)	-0.12 (0.24)	-0.335* (0.2)	-0.3 (0.24)	-	-0.22* (0.12)	-
Similarity	0.81*** (0.15)	1.09*** (0.19)	0.98*** (0.18)	0.89*** (0.16)	0.73*** (0.2)	0.58*** (0.17)	0.62*** (0.17)
Observations	13651	5225	8351	12722	8968	5368	9137
R2 within	0.5592	0.5239	0.5139	0.5003	0.3398		
R2 between	0.3402	0.3809	0.3475	0.3666	0.3909		
R2 overall	0.4177	0.4649	0.4323	0.4224	0.3892		

Note: Robust standard errors adjusted for clustering in pairs are reported in parentheses with ***, ** and * indicating significance at the 1, 5 and 10% levels respectively. The model is estimated with pair fixed effects and year dummies.

VII. Conclusion

The goal of this paper was to study the relationship between bilateral investment treaties / trade agreements with specific investment provisions and outward FDI stocks between the OECD countries. The topic is relevant in the context of the major role played by foreign investment for economic development in a globalized world. Such agreements in theory should lower investment costs thus increasing attractiveness for FDI since signing BIT/PTIA is used as policy measure signifying country's readiness to adhere to certain obligations regarding minimum standard of treatment of foreign investors. This assumption describes motivation behind signing BITs with developing countries however it doesn't explain existence of BITs between developed countries assumedly posing lesser risk of foreign investor's mistreatment.

Main findings of this paper reinforce the concerns that the positive effect of BITs signed between developed countries (OECD countries) may be rather weak. The positive effect (of approximately 34%) could only be identified for the observations in the period of 1985-2000 and only at 10% significance level. Significance and point estimates then drop as time dimension of the panel increases. The results are robust to the inclusion of additional variables and fixed-effects. Unfortunately poor quality of statistics reporting regarding FDI stocks and gaps in the data make it difficult to estimate the impact of BIT more precisely.

As for the preferential trade and investment agreements' effect on intra-regional FDI stocks - the result are inconclusive across the specifications if we are to differentiate between the EU and other PTIAs. In this case joining the EU is associated on average with 76,5% increase in FDI stocks from other member countries (also being members of the OECD), reflecting expansion of the Union to the east. Effect of the remaining PTIAs could not be established with statistical significance thus supporting the theory that trade and horizontal FDI are overall substitutes. This conclusion is drawn since the sample of countries selected for study is characterized by predominantly horizontal FDI flows, which is highlighted by significant coefficient of "similarity" and GDP sum variables. Such difference in estimates between the EU and other PTIAs demonstrates that "deepness" of investment liberalization commitments and the size of newly created market both have an influence on the effectiveness of PTIA with regards to FDI flows. Creation of NAFTA however appears to have affected intra-regional FDI ambiguously/negatively, despite the fact that the agreement contains substantial provisions liberalizing investment.

All this suggests that in contrast to certain effectiveness of BITs for developing countries (suggested by many authors) this mean of promoting FDI inflows is less effective in cases when a treaty is signed between two developed countries. Slowing down rate of conclusion of BITs in recent years and attempts to reform/terminate previous agreements by some countries as well as failure to create Multilateral Agreement on Investment (MAI) demonstrate that this instrument is seen as increasingly less relevant by policymakers in OECD countries. At the same time PTIAs are becoming more popular, however due to containing provisions related both to trade and investment it can potentially affect investment both ways. This paper does find positive effect of preferential trade and investment agreements on FDI but only due to the significant effect of the EU.

The study also highlights areas for future research. First of all looking at trade and investment flows simultaneously in a larger sample of countries could tell us more about the ways in which PTIAs affect investment and show how investment and trade interact. Ranging PTIAs according to some objective criteria was also outside the scope of this paper, updating classification suggested by Leshner and Miroudot (2006) and using it with selected country samples would allow us to differentiate between agreements. Lastly examining not only intra-regional but also extra-regional FDI flows response to BIT/PTIA creation could tell if participating countries attract FDI from non-members due to the fact that a larger market is being created, thus giving one more reason to sign such agreements.

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Appendix A. FDI outflows by group of economies / Total number of BITs by year

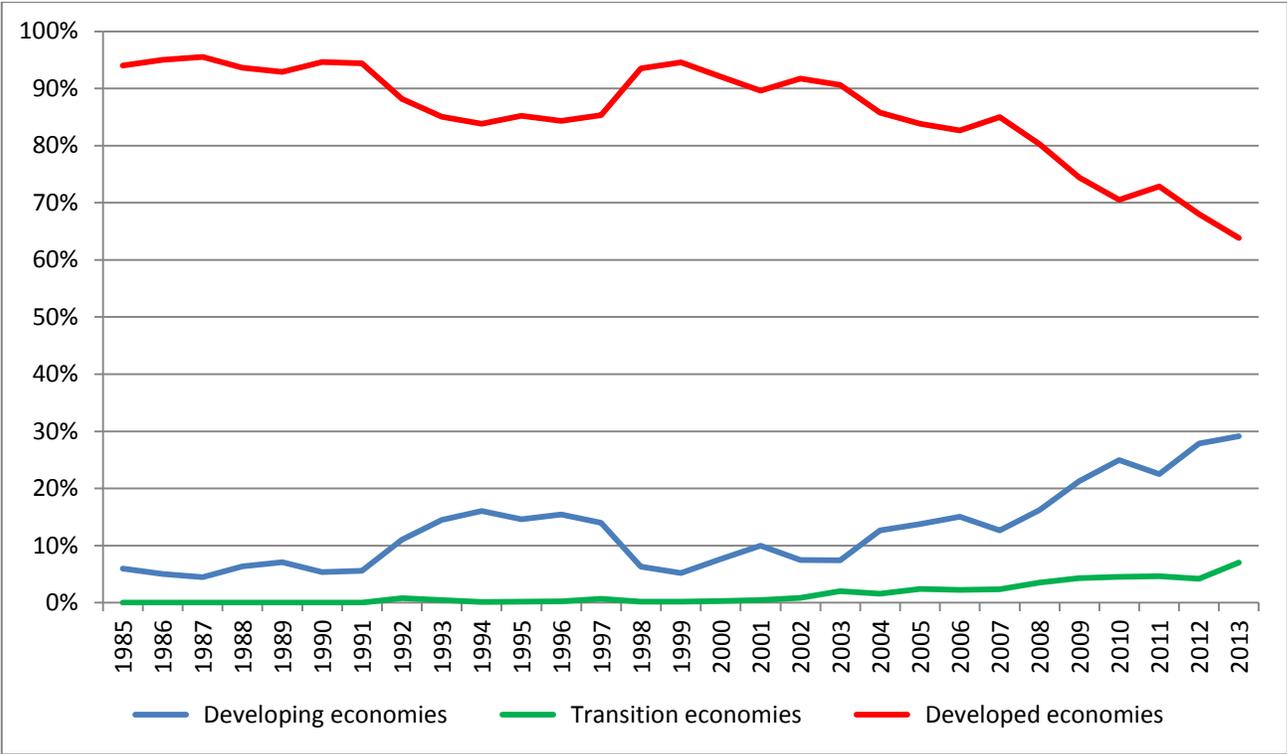


Fig. 1 Share of FDI outflows by group of economies, 1985–2013 (Per cent). Source UNCTAD (2016b)

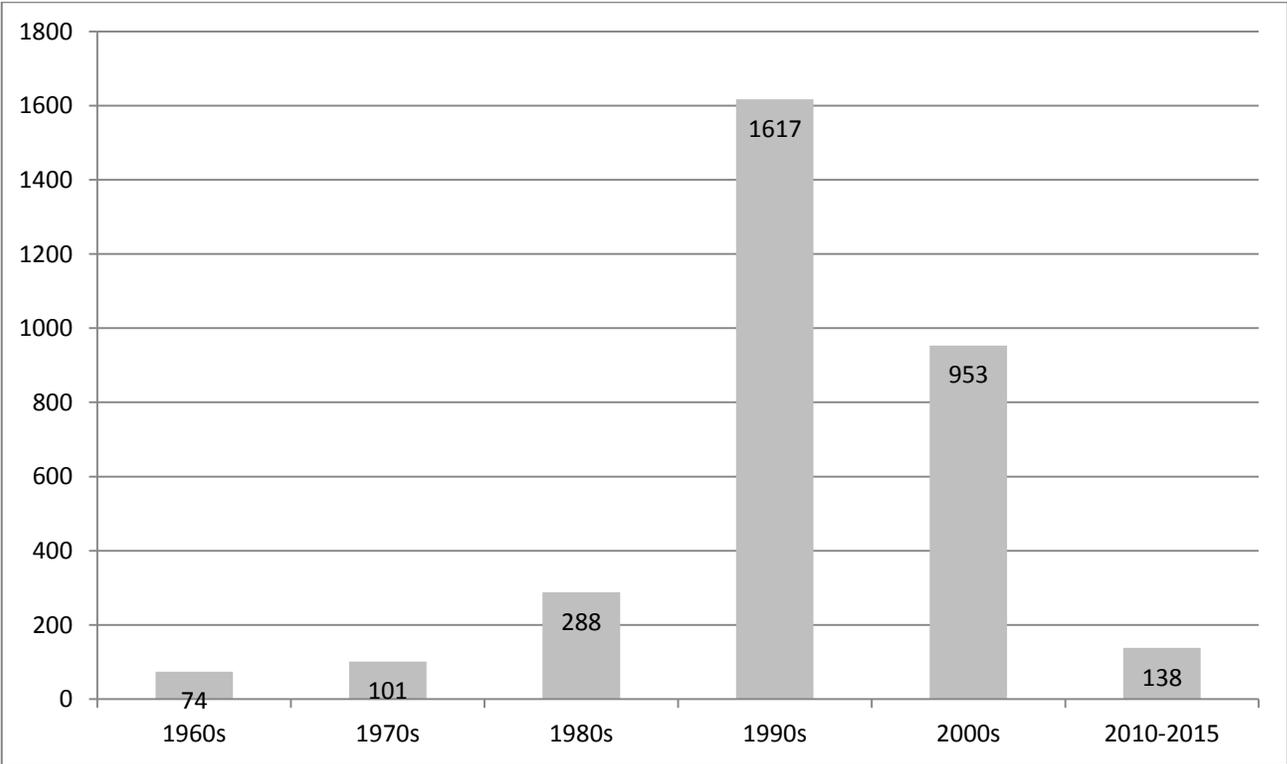


Fig. 2 Total BITs concluded, by year, as of the end of 2015. Source UNCTAD (2016a)

Appendix B. Total number of BITs by country group

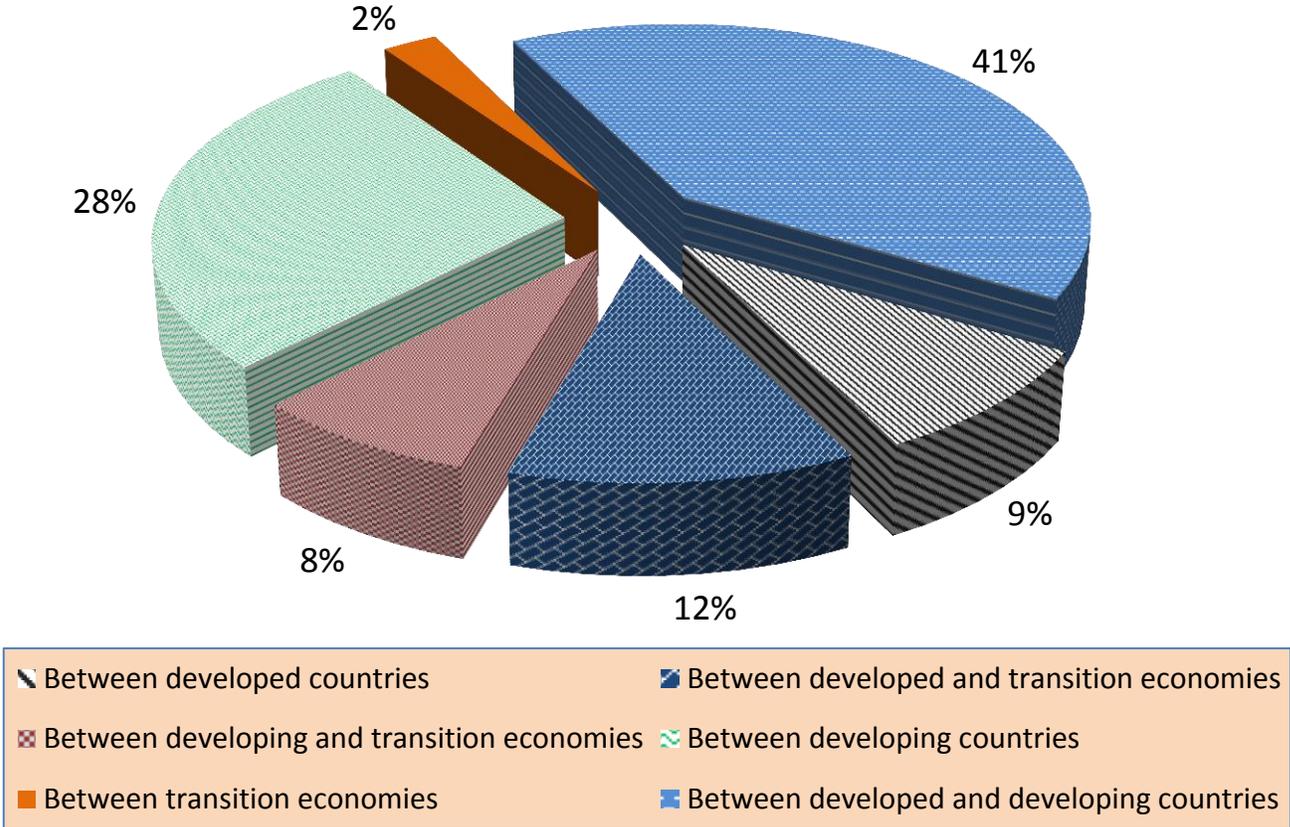


Fig. 3 Total BITs concluded, by country group, as of the end of 2015. Source UNCTAD (2016a)

Appendix C. Data sources

Table 8 Data sources

Variable	Source
FDI outward positions by country (BMD3)	OECD International direct investment database; http://www.oecd-ilibrary.org/finance-and-investment/data/oecd-international-direct-investment-statistics_idi-data-en
GDP (Current US Dollars)	World Bank, World Development Indicators
Difference in labour endowments (tertiary school enrollment in percentage of total population)	World Bank, World Development Indicators
Difference in GDP per capita	World Bank, World Development Indicators
Inflation in the host country, annual (GDP deflator)	World Bank, World Development Indicators
Trade Openness	World Bank, World Development Indicators
PolCon	Heinisz (2000); https://whartonmgmt.wufoo.com/forms/political-constraint-index-polcon-dataset/ (2013 Dataset)
BIT dummy	UNCTAD International Investment Agreements Navigator; http://investmentpolicyhub.unctad.org/IIA
PTIA dummy	UNCTAD International Investment Agreements Navigator; http://investmentpolicyhub.unctad.org/IIA WTO Anatomy of PTAs Dataset (2013); https://www.wto.org/english/res_e/publications_e/wtr11_dataset_e.htm Leshner, M. & Miroudot, S. (2006)

Appendix D. Samples of countries and PTIAs included in the analysis

Table 9 Sample of countries included

Australia, Austria, Belgium, Canada, Chile, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Israel, Italy, Japan, Republic of Korea, Luxembourg, Mexico, The Netherlands, New Zealand, Norway, Poland, Portugal, Singapore (only host), Slovakia, Slovenia, Spain, Sweden, Switzerland, Turkey, United Kingdom, United States
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Table 10 Sample of PTIAs

Agreement	Year (In force)
ASEAN-Australia-New Zealand	2010
Australia-Singapore	2003
Canada-Chile	1997
Chile-Australia	2009
Chile-Japan	2007
Chile-Korea	2004
EC-Chile	2003
EC-Mexico	2000
EC-Israel	2000
EC Enlargement 1986 and 2007 (as EU)	1986
EEA	1994
EFTA-Republic of Korea	2006
EFTA-Singapore	2003
Japan-ASEAN	2008
Japan-Mexico	2005
Japan-Singapore	2002
Japan-Switzerland	2009
NAFTA	1994
New Zealand - Singapore	2001
US-Australia	2005
US-Chile	2004
US-Singapore	2004
