

Castillo-Murciego, Ángela; López Laborda, Julio

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The effect of Double Taxation Treaties and Territorial Tax Systems on Foreign Direct Investment: evidence for Spain

Ángela Castillo-Murciego and Julio López-Laborda

Abstract

The present paper evaluates the effect of Double Taxation Treaties and the Territorial Tax System of countries on Spain's inward and outward FDI for the period 1993–2013. Estimations produce a positive and statistically significant effect of Treaties for both samples when using a simple binary variable for measuring the effect of the mere existence of the same. These outcomes keep for old and new Treaties and for the sub-sample of developed partner countries of Spain. However, regarding developing countries, the positive result exists only for the outbound sample. Also for the global samples and the sub-samples of developed countries, there is an additional positive effect on investments for countries applying the Territorial Tax System for taxing foreign income.

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Keywords Foreign Direct Investment; Double Taxation Treaty; Territorial Tax System; Spain

Authors

Ángela Castillo-Murciego, ✉ Department of Public Economics, University of Zaragoza, Spain, acasmur@unizar.es

Julio López-Laborda, Department of Public Economics, University of Zaragoza, Spain

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1. Introduction

The sovereignty of national governments in establishing its own tax policy together with the lack of worldwide harmonization regarding direct taxes leads frequently to uncoordinated international taxation situations. The traditional double international taxation and the double non taxation problems emerge. The first one refers to the same foreign income being taxed simultaneously twice or more. The second one is usually related to Multinational Enterprises (MNE) tax avoidance and evasion strategies. Companies take advantage of the existing tax loopholes caused by the different rules of countries for artificially reducing their tax burden. Therefore, this result is not frequently a direct effect of the international taxation system, but the result of such a system and the tax optimizer behaviour of MNE, instead.

Initially, the international taxation problem was double taxation. The OECD and the UN Model Tax Conventions were created for avoiding such problem. Conversely, nowadays the main problem is double non taxation. This change of paradigm has reflected into the name of the OECD Model Tax Convention itself, which is not longer for avoiding double taxation. Current and innovative features of the economy, like digitalisation and global value chains of companies, have eased and fostered sophisticated and tricky MNE's strategies. As a result, existing international taxation standards, based on the Separate Accounting System and the transfer prices are in crisis. Supranational institutions like the OECD and the European Commission are looking for possible solutions to fight these strategies and the erosion of the tax bases and tax collection worldwide. It stands out the Base Erosion and Profit Shifting project of the OECD and the Common Consolidated Corporate Tax Base one of the European Commission.

As Blonigen, Oldenski and Sly (2014: 1) state, Foreign Direct Investment (FDI) "and related foreign affiliate activities by multinational firms play a primary role in the global economy" at present. While in the 90s the inward and outward worldwide FDI stock of countries accounted for around 9-10 per cent of GDP, such a percentage was getting bigger to reach a figure of 34 per cent in 2015 (UNCTAD)¹. As Barrios and Benito (2010) noted, there was a similar rise in FDI in Spain during the same period. From the 90s Spain became a net capital exporter, in "*the most advanced phases of the FDI development cycle*" (López Duarte and García Canal, 2002: 31). Latin American countries were the most important destination countries of Spanish investments at that time (Gordo, Martín and Tello, 2008). Today Spain has become a chief country in terms of FDI. According to Myro (2014), Spain's inward and outward investment represented around 2.8% of total worldwide FDI in 2014.

Double Taxation Treaties (DTT) are the main instrument for coordinating the tax systems of countries at international taxation situations. Despite this fact, there is not consensus about the effect of these Treaties on FDI in the empirical literature, yet. Since a theoretical point of view, on the one hand DTT could foster FDI as they limit double taxation situations of MNE and offer legal certainty of the fiscal conditions for investors. On the other hand, they could affect investments negatively as they reduce their possibilities for developing tax minimizing strategies.

¹ <http://unctadstat.unctad.org/wds>. Similarly, worldwide international trade of good and services went from 18 per cent of GDP in the 90s to 27 per cent in 2015.

The Spanish economic literature has barely done research into these topics. It is only possible to point at the papers of Domínguez and López-Laborda (2008) and Castillo-Murciego and López-Laborda (2017), both in the issue of profit shifting. Thus, it is these two reasons -the relevance of the topic and the lack of papers around the same- which justify and make relevant the content of the present paper. The particular objective of the same is to evaluate the effect of DTT on the level of Spanish Foreign Direct Investments for the period 1993-2013. In addition to examine the mere effect of the existence of the Treaties, as usually made by the literature, the impact of some of their content and that of the internal legislation of countries is also evaluated.

The remainder of the paper is structured as follows. Section 2 describes the functions of DTT and the mechanisms used to fulfil them. Section 3 reviews the empirical literature on the effect of DTT on FDI. Section 4 carries out the empirical analyses. Section 5 accomplishes additional analyses and robustness checks. Finally, conclusions are summarized in section 6. Results show, in general terms, a beneficial impact of DTT and the Territorial Tax System of countries on Spain's inward and outward FDI. But, this does not fulfil for the sub-samples of developing partner countries of Spain: the impact of Treaties is only positive for Spanish FDI to these countries and a favourable impact of Territorial Tax Systems is never found.

2. The theory of Double Taxation Treaties

Worldwide, the number of DTT has risen from being 100 in the 60s (Egger et al., 2006) to being approximately 3000 at present and Spain is a signatory to 86 of them, the first going back to the 60s. As well as FDI, the main increase happened from the 90s and 00s and nowadays most FDI flows are covered by them (Radaelli, 1997).

The original function of these bilateral Conventions was to reduce double international taxation of foreign income in an increasing globalized world during the 60s and 70s. DTT contemplate several provisions devoted to achieve this function. They allocate the taxing rights for each kind of income and capital between the residence and the source country; delimitate double taxation relief mechanisms for scenarios at which both contracting states have the right for taxing the same tax base; limit the withholding tax rates applied by the source country; and harmonize main fiscal definitions. From this function, DTT should affect FDI positively, since MNE would have stopped paying taxes to more than one jurisdiction. This is the main theoretical argument that predicts a positive effect of DTT on FDI and it is the one referred to into the OECD Model Tax Convention. Moreover, DTT remove uncertainty of the fiscal conditions, what could also reinforce the MNE's investments. They do that by preventing double taxation, limiting the unilateral action of governments (Jones, 1996) and introducing mechanisms for solving fiscal conflicts (Gravelle, 1988).

On the other hand, DTT reduce tax evasion and avoidance of MNE by improving the exchange of information between the contracting states, helping in the fulfilment of the *arm's length prices* principle, and more recently, limiting the treaty shopping strategy of corporations (Baker, 2014). This function might limit the possible extra profits MNE could gain and thus, it could affect their investments negatively. Lawyers specialized in international taxation, like Gravelle (1988), Radaelli (1997) or Dagan (2000), emphasise this last function of Treaties.

Taking into account all the above argumentation, the average result of DTT on FDI is not clear as not all their functions exert an impact on investment in the same direction (Davies, Norbäck and Tekin-Koru, 2010). Thus, the result has to be determined empirically. Finding a positive outcome is important given the high creation costs of these agreements, which are similar to those originated by other international agreements².

3. Review of the empirical literature on the effect of Double Taxation Treaties on Foreign Direct Investment

The huge growth in FDI during the 90s together with governments' interest in attracting such flow has generated a great deal of empirical literature on the determinants of this kind of investment. As to government policies, much of the attention has focused on tax policies (Davies, Norbäck y Tekin-Koru, 2010). De Mooij and Ederveen (2003) estimated an elasticity of -3.3 of FDI to tax rates from a meta-analysis of 25 empirical studies. There are also other kind of policies which might have also affected FDI, like the institutional quality of governments (see, for instance, Garcimartín, Pérez Garrido and Anchuelo, 2011 or Goodspeed, Martinez-Vazquez and Zhang, 2011).

Within the tax policy area, the effect of DTT is fairly new for the empirical economic examination of the determinants of FDI³ and there are not conclusive results around the same. Blonigen and Davies (2000) were the first authors who examined the effect of these international agreements on investments. Initially, they found a positive effect of DTT on US bilateral FDI data from 1966 to 1992. But, they obtained conflicting results subsequently: they derived a negative effect from the denominated new DTT-those signed over the sample period-, from a sample of OECD countries (Blonigen and Davies, 2002) and from a sample of the US (Blonigen and Davies, 2004).

It is possible to point to several methodological reasons for this inconclusive result: the model and the sample used or the selected indicators. Regarding the model on the determinants of FDI, there is not a unique one. Specific studies investigating the effect of DTT on FDI have usually used either the gravity model of Tinbergen (1962) and Poyhbnen (1963) or the knowledge-capital model of Markusen (1997, 2002). As to the sample used, Barthel, Busse and Neumayer (2010) noticed that positive results of DTT on FDI were obtained when authors had access to bigger samples, which were those constructed by aggregate data (di Giovanni, 2005 or Neumayer, 2007). Conversely, authors who used smaller samples of bilateral data got negative results (Davies, 2003; Blonigen and Davies, 2004; Egger et al., 2006; or Coupé, Orlova and Skiba, 2009).

² The creation costs of DTT are especially high for developing countries. An analysis about the effect of DTT on FDI regarding Latin American countries can be seen in Peragón (2013).

³ There are also some Spanish papers on the determinants of FDI. For instance, regarding Spanish inbound FDI, one can point at Bajo-Rubio and Sosvilla-Rivero (1994), Rodríguez and Pallás (2008), Villaverde and Maza (2012) or Gutiérrez-Portilla et al. (2016). As to Spanish outbound FDI, one can mention Barrios and Benito (2010), Gordo and Tello (2008), Martínez-Martín (2011) or Alguacil, Martí and Orts (2013). However, none of them analysed the effect of DTT.

With reference to the employed indicators, there is not an only one for measuring FDI: stock, flows or sales of foreign affiliates have been the most used ones. Alternatively some authors took other different measures of FDI: Mergers and Acquisitions (di Giovanni, 2005) or rates of return on FDI (Loui and Rousslang, 2008).

From our point of view, more important than the previous aspects is the issue of the indicator used for measuring the effect of DTT. It has usually been a binary variable representing the existence or not existence of a treaty. This could be not very accurate. Despite all of them accomplish the same functions and much of governments take the OECD Model Tax Convention as reference for their elaboration, the particular content of DTT can vary with each other alongside different clauses: *“...treaties certainly differ from each other along many dimensions which are very difficult to quantify. In addition, the same treaty on paper can have vastly different consequences for different pairs of countries depending on the unilaterally-adopted tax practices of the countries before entering the treaty”* (Blonigen and Davies, 2002: 11-12).

Studies delving into the content of DTT are scarce due to the difficulty of measuring the referred differences. Blonigen and Davies (2000) estimated the effect of the limitation of withholding tax rates introduced by Treaties and concluded that this was not the only function of them that impacted FDI positively. More recently, Bösenberg, Egger and Erhardt (2016) analysed the effect of DTT regarding three specific dimensions of their content: complexity; generosity, depending on the double taxation relief method; and the exchange of information clause. They obtained that while DTT complexity and, to a lesser extent, information exchange seem to affect FDI negatively, Treaty generosity seems to benefit it.

Literature has also referred to a possible endogeneity problem coming from the denominated old DTT, which are those signed before the beginning of the data sample. This could be another reason of the conflicting results obtained by literature. As Blonigen and Davies (2002: 15) state:

“If we get a positive correlation between our tax treaty variable and our dependent variable, FDI activity, it is not clear whether other unobservable characteristics of the tax treaty country pairings may be leading to both increased FDI activity and a tax treaty. This occurs because the tax treaty variable...will pick up any residual effects on FDI that are not measured by the other control regressors. This problem, known as simultaneity, makes identification of the treaty effect difficult to measure.... However, ... “new” treaties afford a much better opportunity to measure the impact of a tax treaty, as we have data on FDI activity both before and after the treaty takes place. Presuming that there are no other changes occurring at the time of the treaty that would affect FDI (besides those captured by our control regressors), we can estimate the effect of these new treaties on FDI more precisely by comparing the pre- and post-treaty information”.

Apart from the methodological matters, some authors have demonstrated that the effect of DTT vary depending on some circumstances, like the level of investment of the contracting states (Millimet and Kumas, 2017), the composition of sales (Davies, Norbäck and Tekin-Koru, 2010) or the economic sector (Blonigen, Oldenski and Sly, 2014). The last authors derived a

higher positive effect of DTT on FDI for firms using differentiated inputs. They justified that such firms benefit from the Mutual Agreement Procedure once a DTT is in place. Table A1 in Annex summarizes and completes this review.

4. Empirical analysis

4.1. Methodology and data

The econometric specification we use to examine the effect of DTT on Spain's FDI is based on the knowledge-capital model. It is a general equilibrium model which reconciles the two traditional motivations of FDI⁴: horizontal and vertical. Horizontal FDI originates in Markusen (1984) and is based on market access reasons and vertical FDI originates in Helpman (1984) and is based on labour costs saving reasons. There are other previous and subsequent models about the determinants of FDI. However, the knowledge-capital model captures the two traditional motives of cross-border investments and fits the data well. Moreover, literature on the effect of DTT on investments has generally used either the gravity model or the knowledge-capital model. Comparing both, while the gravity model captures the horizontal motive of cross-border direct investments only and has not theoretical support for FDI⁵, the knowledge-capital model covers these two aspects⁶.

With regard to newer FDI models, they are more sophisticated and complex than older ones, but are also based on the two traditional motivations of foreign investments, horizontal and vertical. The main difference between older and newer models is that while the former are based on bilateral FDI relationships, the latter take into account multilateral relationships. As a consequence, both traditional motivations can exist behind an only FDI pattern. An example is export platform FDI (Ekholm, Markusen and Forslid, 2007), "where a MNE places FDI into a host country to serve as a production platform for exports to a group of (neighbouring) host countries" (Blonigen, 2005: 393). At this example, the vertical motivation underlies the decision of where to locate FDI and the horizontal one underlies the decision of which countries to serve since there.

The equation estimated here rests on the Carr, Markusen and Maskus (2001) specification of the knowledge-capital model and it is the following:

$$\begin{aligned} \ln(fdi_{sht}) = & \alpha_0 + \alpha_1 \ln(sg_{sht}) + \alpha_2 \ln(dg_{sht}^2) + \alpha_3 dq_{sht} + \alpha_4 \ln(dq_{sht} dg_{sht}) \\ & + \alpha_5 (to_{ht} dq_{sht}^2) + \alpha_6 to_{st} + \alpha_7 to_{ht} + \alpha_8 ib_{ht} + \alpha_9 \ln(dist_{sh}) + \rho dtt_{sht} + \eta_{sh} + \varepsilon_{sht} \end{aligned} \quad (1)$$

The dependent variable of equation (1) is an indicator of the bilateral FDI flows between Spain and foreign countries, where "s" is the country that issues investments (the residence country

⁴ First theories on MNE and FDI go back to the 60s and are based on perfect competition models (Latorre, 2009). The denominated traditional FDI motivations originated from the 80s.

⁵ The gravity model has theoretical foundation regarding international trade and this is the reason why it has been used for examining the determinants of FDI, as FDI literature has traditionally taken trade literature as reference.

⁶ For further information about the empirical and theoretical motivations for FDI, see for example, Blonigen and Piger (2014), Helpman (2011) or Navaretti and Venables (2004).

in terms of taxation), “ h ” is the country that receives investments (the source country in terms of taxation) and “ t ” is the time period. From the knowledge-capital model variables, which are those multiplied by the parameter “ α ”, it is necessary to distinguish between the knowledge-capital variables in the strict sense and the control variables.

With regard to the knowledge-capital model variables in the strict sense, those capturing the horizontal FDI are constructed from the GDP of the residence and source country in terms of taxation: logarithm of GDP sum ($\ln(sg_{sht})$) and logarithm of GDP difference squared ($\ln(dg_{sht}^2)$). Those capturing the vertical FDI are created from the level of qualification of the countries: level of qualification difference ($dq_{sht_{ijt}}$) and level of qualification difference squared times the trade openness of the source country ($to_{ht}dq_{sht}^2$). Additionally, non-linearity is captured by the interaction term of the logarithm of the level of qualification difference times the GDP difference: ($\ln(dq_{sht}dg_{sht})$). Differences in the countries’ GDP and qualification are calculated in absolute values, following Blonigen, Davies and Head (2003).

The control variables are the trade openness of the country pairs (to_{ht}, to_{st})⁷, the investment barriers of the source country (ib_{ht}) and the logarithm of the geographical distance between both countries ($\ln(dist_{ij})$). Additionally we add to the model a binary variable for measuring the effect of DTT (dtt_{sht}). It takes the value of one those years at which a DTT had existed between Spain and the corresponding country (ant zero otherwise). Lastly, non-observable country-pair effects (η_{sh}) are also incorporated into the model.

For most of the variables, the expected sign depends on the kind of FDI motivation because the selected econometric specification is in absolute terms (Blonigen, Davies and Head, 2003). Letting the interpretation of the non-taxation-related variables aside, this paper concentrates on examining the effect of DTT. Such effect is a priori uncertain as deduced from sections 2 and 3: DTT could foster FDI by reducing the double taxation problem and creating a greater legal security environment or on the contrary, they could affect it negatively by preventing the tax evasion and avoidance strategies of MNE and such, the tax minimizing possibilities for them.

The estimation is made for two data samples: Spain’s inward and outward FDI. Each sample encompasses an unbalanced panel of country-level bilateral FDI between Spain and the OECD⁸, the EU-28⁹, the BRIC¹⁰ and some Latin American countries¹¹, for the period 1993-2013. The aforementioned groups of countries comprise those countries which are the main partners for

⁷ We use the trade openness of countries instead of the trade costs to avoid losing observations when applying logarithms to the negative values of the variables, as Blonigen and Davies (2002) did.

⁸ Australia, Austria, Belgium, Canada, Chile, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Israel, Italy, Japan, Latvia, Luxembourg, Mexico, Netherlands, New Zealand, Norway, Poland, Portugal, Slovak Republic, Slovenia, Sweden, Switzerland, South Korea, Turkey, United Kingdom and United States.

⁹ Austria, Belgium, Bulgaria, Croatia, Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Poland, Portugal, Romania, Slovakia, Slovenia, Sweden and United Kingdom.

¹⁰ Brazil, Russia, India and China.

¹¹ Argentina, Bolivia, Chile, Colombia, Costa Rica, Dominican Republic, Ecuador, Guatemala, Mexico, Panama, Paraguay, Peru, Uruguay and Venezuela.

Spain in terms of investments. A supplementary criterion is data availability. Moreover, the use of symmetric samples let us compare the effect of DTT for each one of both.

FDI data are measured as gross inflows and outflows in millions of euros and are taken from DataInvex¹², from the Spanish Ministry of Economy and Competitiveness. Data include all economic sectors and exclude holding company operations, as these operations are not real economic activity of corporations. Moreover, they are selected according to the immediate holder criteria, which do not reflect the last origin of investment to Spain, not the last destination of investment from Spain. These data are converted into real 2005 USD using the euro-dollar exchange rate and a deflator calculated from the nominal and real GDP of countries. Data on Spanish GDP (in USD) is used for the FDI outflow sample and on the counterpart countries' GDP (in USD) for the FDI inflow sample.

Data on Spanish DTT come from the Tax Agency¹³ and the Ministry of Finance and Public Function¹⁴. The date of publication of DTT in the Official State Bulletin is taken as the start date¹⁵. The wide net of Spanish DTT is similar to that of other developed countries. Table 1 displays DTT contracted between the country pairs of the samples, i.e., Spain and a third country.

¹² <http://datainvex.comercio.es/>

¹³ http://www.agenciatributaria.es/AEAT.internet/Inicio/La_Agencia_Tributaria/Normativa/Fiscalidad_Internacional/Convenios_de_doble_imposicion_firmados_por_Espana/Convenios_de_doble_imposicion_firmados_por_Espana.shtml

¹⁴ <http://www.minhafp.gob.es/es-ES/Normativa%20y%20doctrina/Normativa/CDI/Paginas/cdi.aspx>

¹⁵ This is not an unanimous rule in the empirical literature, either. Some authors “take the year of signature (e.g., Neumayer, 2007), while others take the year of ratification (e.g., Coupé, Orlova and Skiba, 2009)” (Barthel, Busse and Neumayer, 2010: 7). Barthel, Busse and Neumayer (2010) take the year when DTTs came into force, instead.

Table 1. Spanish Double Taxation Treaties: 1993-2013

Signature	Country
1964	France*, Norway*
1967	Switzerland
1968	Austria, Finland, Germany*, Portugal*
1972	Belgium*, Netherlands
1974	Denmark**, Japan
1975	Brazil
1976	United Kingdom
1977	Sweden
1980	Italy, Romania
1981	Canada, Czech Republic , Slovakia
1982	Poland
1987	Hungary, Luxembourg
1990	U.S.
1991	Bulgaria
1992	Australia, China
1993	Ecuador
1994	Argentina**, Ireland, Mexico, South Korea
1995	India
1998	Bolivia
2000	Russia
2001	Israel
2002	Iceland, Greece, Slovenia
2004	Chile, Lithuania, Turkey, Venezuela
2005	Estonia, Latvia
2006	Croatia, Malta, New Zealand
2008	Colombia
2011	Costa Rica, Panama, Uruguay

Note: (*) Renegotiations: Portugal (1995), France (1997), Norway (2001), Belgium (2003) and Germany (2012); (**) Denounced DTT: Denmark (2008) and Argentina (2013).

Source: Own elaboration from information of the Tax Agency: http://www.agenciatributaria.es/AEAT.internet/Inicio_es_ES/La_Agencia_Tributaria/Normativa/Fiscalidad_Internacional/Convenios_de_doble_imposicion_firmados_por_Espana/Convenios_de_doble_imposicion_firmados_por_Espana.shtml; and the Ministry of Finance and Public Function: http://www.minhfp.gob.es/es-ES/Normativa%20y%20doctrina/Normativa/CDI/Paginas/CDI_Alfa.aspx.

As deduced from Table 1, there are some countries of the bilateral samples which did not contract a DTT with Spain any year during the entire sample period. They are Cyprus, Dominican Republic, Guatemala, Panama, Paraguay and Peru. For them, the DTT variable takes always the value of zero. On the contrary, the variable takes always the value of one for Spanish DTT created before the starting period of the sample.

Data for the other explanatory variables are the following. The real GDP and the trade openness of the contracting states is gathered from the World Bank Development Indicators database¹⁶; the level of qualification of the countries from Barro and Lee (2013); the

¹⁶ <http://databank.worldbank.org/data/views/variableSelection/selectvariables.aspx?source=world-development-indicators#>

investment barriers of the source country from the Economic Freedom Network¹⁷; and the geographical distance from the Website <http://es.distance.to/>.

4.2. Estimation and results

Table 2 below displays the results of the direct effect of DTT on bilateral FDI flows for the two samples. Estimations of the variables regarding the Markusen model are omitted for space and because our focus is on taxation-related variables. But they generally respond to the horizontal motivation of FDI. The three first columns show the result for the sample of Spanish outbound FDI and three following columns for the sample of Spanish inbound FDI. For each sample, basic results corresponding to Equation (1) are first shown. Then, the temporal effect is controlled for by including yearly and sub-period¹⁸ dummy variables, respectively. Estimations are carried out by applying panel data techniques, being fixed and random effects discriminated by using the Hausman test.

Table 2. Effect of DTT on Spanish inbound and outbound FDI

	Spanish outbound FDI			Spanish inbound FDI		
	No time effect (1)	Yearly effect (2)	Sub-period effect (3)	No time effect (4)	Yearly effect (5)	Sub-period effect (6)
<i>dttsht</i>	0.74** (2.12)	0.85** (2.43)	0.88** (2.55)	0.52** (2.55)	0.57*** (2.74)	0.52** (2.54)
N	860	860	860	1,013	1,013	1,013
R²	0.15	0.21	0.18	0.35	0.36	0.36
Bilateral FE	Yes	Yes	Yes			
Bilateral RE				Yes	Yes	Yes

When fixed effects apply, estimations are made by corrected least squares; ***, ** and * denote statistical significance at 1, 5 and 10 per cent levels, respectively.

As can be seen in Table 2, DTT seem to have exerted a statistically significant positive effect on the volume of Spanish inbound and outbound FDI. Hence, DTT provisions affecting FDI positively would have had, on average, a greater impact on investments than the limitation of the tax fraud function.

Interpretation of the results has to be made with caution when fixed effects are applied because the referred technique eliminates time constant variables from the estimation. As a consequence, results display, basically, the effect of Spanish DTT created during the sample period. A priori that does not seem a problem as long as such DTT are the ones that better capture the effect according to the empirical literature. As explained in Section 3, an endogeneity problem could exist with regard to old DTT. It is not possible to gather information on the determinants of FDI for the first years of the existence of such Treaties and therefore, they could be capturing the effect of such other determinants¹⁹. Furthermore, the effect of Treaties might disappear over time, which especially affects old DTT.

¹⁷ <http://www.freetheworld.com/>

¹⁸ The time sub-periods are: 1993-1999, when Spain became a net exporter country; 2000-2007, when EU countries reached leading positions in terms of FDI for Spain; and 2008-2013, when the economic crisis was in place.

¹⁹ The simultaneity problem could also exist for another reason for both, old and new DTT. They could have been created between countries with high exchange levels of FDI, since international taxation problems may arise to a

In any case, for the sake of obtaining more accurate results, the effect of old ($odtt_{sht}$) and new Treaties ($ndtt_{sht}$), or Treaties created during the data sample period, is estimated separately. To this end, renegotiated old DTT are considered new DTT from the renegotiation year on (see Table 1).

Table 3. Effect of old and new DTT on Spanish inbound and outbound FDI

	Spanish outbound FDI			Spanish inbound FDI		
	No time effect (1)	Yearly effect (2)	Sub-period effect (3)	No time effect (4)	Yearly effect (5)	Sub-period effect (6)
$odtt_{sht}$	1.08* (1.74)	1.20** (2.09)	1.17** (2.02)	0.94** (2.40)	0.81** (2.18)	0.89** (2.32)
$ndtt_{sht}$	0.68** (2.00)	0.78** (2.28)	0.83** (2.44)	0.46** (2.22)	0.52** (2.46)	0.46** (2.23)
N	860	860	860	1,013	1,013	1,013
R²	0.16	0.21	0.18	0.35	0.36	0.35
Bilateral FE	Yes	Yes	Yes			
Bilateral RE				Yes	Yes	Yes

When fixed effects apply, estimations are made by corrected least squares; ***, ** and * denote statistical significance at 1, 5 and 10 per cent levels, respectively.

As Table 3 shows, coefficients keep positive for both kind of Treaties and samples, although the estimated magnitude is higher for old DTT, which is in line with the mentioned endogeneity problem.

5. Additional analyses and robustness tests

5.1. Additional analyses

The additional analyses developed here try to deep into the effect of DTT by examining their particular content and that of the internal legislation of countries.

5.1.1. The economic development of the contracting states

This sub-section analyses the effect of DTT on FDI depending on the level of economic development of the contracting states. To this end, the samples are divided into developed and developing countries²⁰. As the samples contain bilateral information and Spain is always in the dyads, the classification refers to the other contracting state²¹. While the OECD and most

greater extent for them in absolute terms. However, we are not concerned by this other cause of endogeneity because although such problem had existed, it would have been present at the moment countries decided to create the corresponding Convention. From such moment until the publication of the treaty at Official State Bulletin a long time passes (for information about the creation process of DTT see Falcón y Tella and Pulido, 2010, note 13).

²⁰ Information on the classification of countries by their level of economic development comes from the World Bank.

²¹ Developed countries are Australia, Austria, Belgium, Canada, Chile, Czech Republic, Croatia, Cyprus, Denmark, Estonia, Finland, France, Germany, Greece, Ireland, Iceland, Israel, Italy, Japan, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Norway, New Zealand, Poland, Portugal, Slovenia, South Korea, United Kingdom, United States, Russia, Sweden, Switzerland, Slovakia and Uruguay. Developing countries are Argentina, Bolivia, Brazil, Bulgaria, China, Colombia, Costa Rica, Dominican Republic, Ecuador, Guatemala, Hungary, India, Mexico, Panama, Paraguay, Peru, Romania, Turkey and Venezuela.

of the EU countries are developed countries, Latin American and the BRIC countries are usually less developed ones.

In general terms, the internal law of economically developed countries contemplates unilateral mechanisms for solving international taxation situations, i.e. double taxation and the tax evasion (Baker, 2014). As a result, functions carried out by DTT are also sometimes performed by the internal law of countries. At this setting, the role of DTT would be restricted to modify the particular mechanisms of such internal law. For instance, DTT might modify the double taxation relief mechanism established by the internal legislation of countries or reduce the withholding tax rates of the source country. Additionally, they may strengthen the legal security conditions for investors by limiting the unilateral performance of countries or reinforcing the rules of the game.

Differently, the internal law of poorer countries is usually less developed than that of the richer ones. Hence, the importance of DTT might be higher when contracting states are developing countries. Legal certainty conditions provided by DTT could be a key positive determinant for FDI from Spain to less developed countries, since the latter might not provide a sufficient level of certainty of the fiscal conditions for investors. Rules could be loose or non-existent. According to Edmiston, Mudd and Valev (2003) uncertainty is an important barrier for investments.

Table 4 shows the results for the inbound and outbound subsamples of developed countries and Table 5 for the developing ones. Additionally, taking advance of this categorization of countries, the effect on FDI of another kind of international bilateral agreement is estimated: the Bilateral Investment Treaties (BIT). These agreements are usually signed between developed and less developed countries for fostering investments to the second group of countries. We estimate their effect simultaneously to the effect of DTT for the group of less developed countries. Similarly to DTT, a binary variable is created (bit_{sht}). It takes the value of one when a BIT exists between a pair of countries. Information on Spanish BIT can be seen in Table A2 in Annex.

Table 4. Effect of old and new DTT on Spanish inbound and outbound FDI: developed countries

	Developed countries					
	Spanish outbound FDI			Spanish inbound FDI		
	No time effect (1)	Yearly effect (2)	Sub-period (3)	No time effect (4)	Yearly effect (5)	Sub-period (6)
$odtt_{sht}$	1.22* (1.93)	1.45** (2.50)	1.33** (2.29)	1.21*** (2.78)	1.32*** (3.16)	1.22*** (2.83)
$ndtt_{sht}$	0.59 (1.38)	0.80* (1.90)	0.74* (1.76)	0.52** (1.98)	0.66** (2.41)	0.56** (2.15)
N	552	552	552	660	660	660
R²	0.24	0.32	0.28	0.40	0.48	0.47
Bilateral FE	Yes	Yes	Yes			
Bilateral RE				Yes	Yes	Yes

When fixed effects apply, estimations are made by corrected least squares; ***, ** and * denote statistical significance at 1, 5 and 10 per cent levels, respectively.

Table 5. Effect of old and new DTT (and BIT) on Spanish inbound and outbound FDI: developing countries

	Developing countries					
	Spanish outbound FDI			Spanish inbound FDI		
	No time effect (1)	Yearly effect (2)	Sub-period effect (3)	No time effect (4)	Yearly effect (5)	Sub-period effect (6)
<i>odtt_{sht}</i>	X	X	x	-2.39** (-1.98)	-2.82** (-2.17)	-2.43* (-1.89)
<i>ndtt_{sht}</i>	0.91** (2.40)	0.98** (2.52)	0.84** (2.18)	0.24 (0.7)	0.30 (0.86)	0.26 (0.74)
<i>bit_{sht}</i>	-0.74* (-1.79)	-1** (-2.49)	-0.79* (-1.90)	-0.11 (-0.38)	-0.05 (-0.18)	-0.12 (-0.41)
N	308	308	308	353	353	353
R²	0.22	0.27	0.22	0.22	0.27	0.26
Bilateral FE	Yes	Yes	Yes			
Bilateral RE				Yes	Yes	Yes

When fixed effects apply, estimations are made by corrected least squares; ***, ** and * denote statistical significance at 1, 5 and 10 per cent levels, respectively.

It seems from Table 4 that DTT have exerted a positive effect similar to the one estimated for the whole sample for the group of developed countries. The only exception is old DTT for the outbound sample: they are not statistically significant for the estimation of the first column. According to the reasoning above, as Spain and the counterpart contracting states are developed countries, a deeper analysis is necessary for knowing the particular reasons behind this result. An examination of the particular content of DTT and that of the internal law of countries is required. Results may, for instance, come from a favourable double tax relief mechanism designated by the corresponding DTT or from the higher legal security standards provided by the Conventions. As stated above, DTT limit the tax sovereignty of countries, set the allocation of taxing rights, harmonize tax definitions, and introduce mechanism to solve conflicting situations derived from international taxation.

The same positive effect of new DTT²² is estimated for FDI from Spain to the developing countries (Table 5). This result could be related to a reinforcement of the fiscal conditions of developing countries provided by DTT. As argued previously, DTT might additionally modify the internal mechanisms of Spain for the correction of double taxation or reduce the level of withholding tax rates of the developing countries.

As to the effect of DTT on FDI from developing countries to Spain, results are less clear (Table 5). On the one hand, one has to be cautious as to the effect of old DTT, as it refers to a few number of DTT: those signed between Spain and Brazil, Rumania, Hungary, Bulgaria and China, respectively. On the other hand, the non-significant effect of new DTT might mean that non-fiscal related FDI motivations of MNE precede fiscal ones. Traditionally investments go from developed countries to either developing or developed countries.

²² The effect of old DTT is not estimated due to the within transformation of the model. None of the Spanish old DTT contracted with the developing countries disappeared during the sample period nor it was renegotiated, i.e., the value of the old DTT variable is always one for them.

Lastly and contrary to our expectations, a significant and negative effect of BIT is found for FDI from Spain to developing countries and a null one is found for FDI in the opposite direction.

5.1.2. The International Tax System of countries

This second sub-section evaluates the effect of a specific part of the content of DTT and the internal legislation of countries in addition to examine the average effect of the Conventions. Thus, it goes beyond the simple use of a binary variable.

Exploring the content of DTT becomes very interesting at a time at which international taxation rules are being rethought and new ones could be implemented. Particularly, this analysis is more interesting than the simple use of a binary variable for countries like Spain which already have an extensive net of DTT.

Although most DTT take as reference the OECD Model Tax Convention, the specific content of them vary with each other alongside different aspects. Besides, related to the preceding subsection 5.1.1., such content has to be interpreted and completed with that of the internal law of the contracting states. That is, although the content of DTT was the same for two countries, the effect of such DTT could differ between them if their domestic laws are different.

Here, the focus is set on the part of DTT and the internal law of countries that defines the tax treatment given to foreign dividends by the residence country of the company when repatriated, i.e., the International Tax System of countries. There are two main systems: Territorial and Worldwide. Since in general terms both, the residence and the source country, have the right for taxing foreign dividends, each system differentiates each other in the way they solve double taxation. The Territorial system exempts foreign dividends from taxation and the Worldwide system corrects it through a tax credit.

It would be expected that MNE resident in countries which apply the Territorial Tax System would have higher incentives to invest in countries with taxes lower than those of their residence country, in comparison to MNE resident in countries with the Worldwide one. The reason is that Territorial systems let them enjoy such lower taxes. To check this hypothesis, two important assumptions must be made. The first is that, sooner or later, profits are repatriated²³. This hypothesis assures that differences between the two systems trigger and thus, that the Territorial Tax System generates a tax saving in comparison to the Worldwide one. The second one is that dividends are repatriated as qualified dividends. This other assumption allows for the classification of the International Tax System of the countries into Territorial and Worldwide, since Territorial systems usually apply for dividends that accomplish certain participation requirements²⁴.

²³ Although some countries keep huge amounts of profits abroad, at the end of the day if those profits belong to MNE situated in Worldwide Tax Systems, they will be taxed at the residence country of the investor.

²⁴ Apart from these two main assumptions, there are other ones. For example, the classification between pure Worldwide and Territorial systems does not actually exist as such. In general terms, Territorial systems do not exempt foreign dividends completely, not all Worldwide Tax Systems set the same type of tax credit. They can establish direct credits for eliminating juridical double taxation or direct and indirect credits for correcting economic double taxation in addition to juridical double taxation.

The classification of countries into Territorial and Worldwide is made in a bilateral way for the full sample period. For the sample of Spanish outbound FDI, the system of Spain was classified with reference to each of the source countries of the sample. For the sample of Spanish inbound FDI, the system of the residence countries of the sample was classified with reference to Spain. Sources of information are PWC (2010, 2013a, 2013b), ZEW (2012) and diverse Web sites²⁵.

Most countries had a Territorial system at any time within the period. Spain applied a Territorial system during the whole sample period with Brazil as defined by the DTT signed with this country; it also applied it with some other sample countries from 1996 (basically those countries with which a DTT had been signed); and applied it generally from 2000 if some requirements were accomplished. From this classification a binary variable is created, which takes the value of one the years when countries applied a Territorial system (and the value of zero, otherwise): its_{sht} . This variable is added to the model as an interaction term: $its_{sht}t_{sht}$; t_{sht} being a binary variable identifying those scenarios at which foreign tax burdens are lower than domestic tax burdens.

Tax burdens are calculated using the corresponding corporate income and withholding tax rates. The formulas can be seen at Table A3 in Annex. Information on corporate income tax rates comes, basically, from KPMG (2006) and the KPMG Website²⁶. When necessary, it is completed with information from the Ernst and Young (2004, 2005,..., 2013) guides, Coopers and Lybrand (1994, 1995, 1998), TAXUD (2016) and the *Centro Interamericano de Administraciones Tributarias*²⁷ and the OECD²⁸ Websites. Bilateral information on withholding tax rates comes from DTT and the internal law of countries, like the information on International Tax Systems. For source countries in the sample of Spanish outbound FDI, information comes from Ernst and Young (2004, 2005,..., 2013), Coopers and Lybrand (1994, 1995, 1998) and the EUR-Lex database regarding the date of application of the parent-subsidiary directive 90/435/CEE²⁹.

The estimated equation is the following:

$$\begin{aligned} \ln(fdi_{sht}) = & \alpha_0 + \alpha_1 \ln(sg_{sht}) + \alpha_2 \ln(dg_{sht}^2) + \alpha_3 dq_{sht} + \alpha_4 \ln(dq_{sht} dg_{sht}) \\ & + \alpha_5 (to_{ht} dq_{sht}^2) + \alpha_6 to_{st} + \alpha_7 to_{ht} + \alpha_8 ib_{ht} + \alpha_9 \ln(dist_{sh}) \\ & + \rho_1 odtt_{sht} + \rho_2 ndtt_{sht} + \rho_3 (its_{sht} t_{sht}) + \eta_{sh} + \varepsilon_{sht} \end{aligned} \quad (2)$$

²⁵ Information of the aforementioned classification of countries can be submitted on request.

²⁶ <http://www.kpmg.com/global/en/services/tax/tax-tools-and-resources/pages/corporate-tax-rates-table.aspx>

²⁷ <http://www.ciat.org/index.php/es/productos-y-servicios/ciatdata/aliquotas.html> and Coopers and Lybrand (1994, 1995, 1998)

²⁸ http://www.oecd.org/tax/tax-policy/tax-database.htm#C_CorporateCapital

²⁹ The parent-subsidiary directive set a zero withholding tax rate for dividends distributed from EU subsidiaries to their EU parent companies, subject to some requirements.

As can be seen at equation (2), the binary variables measuring the average effect of DTT remain in it. This is because the International Tax System of countries accounts for solely some part of the content of DTT (and the internal legislation).

Table 6. Effect of old and new DTT and the International Tax System of countries on Spanish inbound and outbound FDI

	Spanish outbound FDI			Spanish inbound FDI		
	No time effect (4)	Yearly effect (5)	Sub-period effect (6)	No time effect (1)	Yearly effect (2)	Sub-period effect (3)
<i>odtt_{sht}</i>	1.14* (1.80)	1.27** (2.16)	1.23** (2.08)	0.82** (2.07)	0.71* (1.9)	0.78** (2.01)
<i>ndtt_{sht}</i>	0.80** (2.19)	0.85** (2.34)	0.93*** (2.57)	0.42** (2.02)	0.48** (2.23)	0.42** (2.02)
<i>its_{sht}t_{sht}</i>	0.77* (1.66)	0.69 (1.39)	0.73 (1.55)	0.60* (1.9)	0.60* (1.89)	0.52* (1.65)
N	812	812	812	999	999	999
R²	0.15	0.21	0.18	0.36	0.37	0.36
Bilateral FE	Yes	Yes	Yes			
Bilateral RE				Yes	Yes	Yes

When fixed effects apply, estimations are made by corrected least squares; ***, ** and * denote statistical significance at 1, 5 and 10 per cent levels, respectively.

As shown in Table 6, in general terms, the Territorial system of countries had a more positive impact on the volume of investments at places with comparatively low taxes than the worldwide system. That is consistent with the tax saving for MNE provided by the former. Results also show that the parameter of the variable examining the influence of the mere existence of DTT is similar to that estimated in the basic equation (equation 1), which do not include the International Tax System variable. This is also coherent. Most of the Spanish net of DTT declares the tax credit system for correcting the double taxation problem. Thus, the positive effect of the Territorial system in comparison to the Worldwide one comes almost entirely from the content of the internal legislation of Spain and its partners, respectively. At the same time, this could also be meaning that there could have been scope for the positive effect of DTT to be higher if the definition of the Territorial system of countries had originated in the content of DTT itself.

Table 7 below replicates estimation of equation 2 by subsamples, without including temporal effects and adding the Bilateral Investment Treaties variable to the model for the group of developing countries.

Table 7. Effect of old and new DTT and the International Tax System of countries on Spanish inbound and outbound FDI by subsamples

	Spanish outbound FDI		Spanish inbound FDI	
	Developed Countries (1)	Developing Countries (2)	Developed Countries (3)	Developing Countries (4)
<i>odtt_{sht}</i>	1.20* (1.87)	x	1.07** (2.42)	-2.75 (-1.5)
<i>ndtt_{sht}</i>	0.65 (1.43)	1.03* (2.40)	0.47* (1.77)	0.32 (0.9)
<i>its_{sht}t_{sht}</i>	1.05* (1.73)	-0.3 (-0.39)	0.65* (1.94)	0.17 (0.12)
<i>bit_{sht}</i>	x	-0.9** (-2.09)	x	-0.14 (-0.46)
N	539	273	648	351
R²	0.24	0.20	0.40	0.19
Bilateral FE	Yes	Yes		
Bilateral RE			Yes	Yes

When fixed effects apply, estimations are made by corrected least squares; ***, ** and * denote statistical significance at 1, 5 and 10 per cent levels, respectively.

As can be seen in Table 7, for sub-samples results also keep similar to that estimated from equation 1 regarding the DTT variables (Table 4 and Table 5). With regard to the International Tax System variable, a positive effect of Territorial systems in comparison to Worldwide ones is only observed for investments between Spain and developed countries. The variable is not statistically significant for the sub-samples of developing countries. As stated before, investments from developing countries to developed ones, like Spain, might not be sensitive to tax factors because other ones have priority. Regarding investments from Spain to developing countries, although DTT played a major role, such role could be mainly related to the legal security of fiscal conditions function of DTT. The tax saving provided by Territorial systems in comparison to Worldwide ones may not be so important for this kind of investments.

5.2. Robustness tests

Robustness tests accomplished here are based on equation (2). They are performed for the global sample and the subsamples of developed and developing countries.

5.2.1. Alternative data series on investments

Immediate investor countries might be used more frequently than ultimate investor countries for accomplishing tax minimizing strategies by MNE. Indeed, the use of immediate investor countries by MNE could be justified by a reduction of their tax burden. Thus, the anti-tax evasion and avoidance function of Treaties could have a more negative impact on investments when countries are used as immediate holders. As a consequence, the average effect of DTT may be different depending on the use of the immediate or ultimate holder criterion for selecting the FDI data. In order to test this hypothesis, we replicate estimations using the ultimate owner criterion for the sample of Spain's inward FDI, the one for which data according to such criterion is available in DATAINVEX.

Results can be seen at Table A4 in Annex. They are similar to that estimated in Table 6 and Table 7. The only difference is with regard to old DTT. They keep positive, but are not statistically significant. However, since according to the empirical literature the effect of new DTT is more reliable, it is possible to say that the relative importance of DTT functions seem not to depend on the condition of a country as an immediate or ultimate investor country.

5.2.2. Renegotiated Double Taxation Treaties as the prolongation of old Double Taxation Treaties

Renegotiated Treaties could have increased the positive effect of new DTT or on the contrary, they could have reduced it, which depends on the kind of modifications they were introduced. To test the impact of such group of Treaties, the present analysis considers them as the prolongation of the old DTT they modify instead of considering them as new DTT.

Results of the reclassification of renegotiated DTT can be seen at Table A5 in Annex. Higher positive effects of old DTT can be observed at the expense of new DTT for the outbound samples, which might indicate that renegotiated Treaties have been beneficial for Spain's outward FDI. No differences are found for the inbound sample, with the sole exception of the old DTT: as in the previous test, their effect turns not statistically significant.

6. Concluding remarks

International taxation policy places at the core of the international institutions agendas nowadays. The reason is the tax minimizing strategies of MNE, which are causing the erosion of the corporate income tax bases and the tax collection worldwide. Proposals for solving this problem require changes in the laws governing international taxation situations, i.e., DTT and the internal law of countries.

Our efforts focus on better understanding the functioning of DTT by examining their effect on the real economic decision of MNE of how much to investment in a given country. We analysed the impact of DTT and the Territorial Tax System of countries on FDI using Spanish data for the period 1993-2013. The motivation behind the paper is twofold. On the one hand, the paper attempts to shed some light on the conflicting results found in the empirical literature regarding the role of DTT in fostering cross-border economic activities. It does it by going beyond the analysis of the mere existence of DTT. On the other hand, it contributes to filling the gap in the Spanish economic literature regarding international taxation issues.

We found that DTT exerted a positive effect on Spain's inward and outward FDI, which could have compensated, at least partially, the high costs of concluding international Conventions. This is in line with the main theoretical argument, which emphasizes the traditional function of double taxation relief of Treaties. Also the Territorial Tax Systems had a positive effect on FDI in comparison to the Worldwide ones, which matches the tax saving for MNE generated by the former systems when foreign taxes are lower than domestic taxes.

These positive results keep when we estimated the sub-samples of developed partner countries of Spain. But regarding the ones of developing partner countries, we only found a positive effect coming from new Treaties on Spain's outward investments. DTT did not have any effect on Spain's inward FDI and the Territorial Tax System of countries did not seem

relevant either for fostering investments in any direction for such sub-samples. We relate these outcomes to the internal law and the particular FDI motivations of developing countries.

On the one hand, while the positive effect of new DTT on Spain's outward FDI to developing countries could come from the higher security level of the fiscal conditions provided by the Conventions, the null effect of the Territorial Tax Systems on these same investments could be explained by the lesser importance of the particular mechanisms used for solving international taxation situations when the internal legislation of countries is poor. On the other hand, the null effect of DTT and the Territorial Tax System on investments from developing countries into Spain might be related to the less sensitivity of MNE to taxation when the traditional FDI motivations do not underlie, i.e., when a developed country is not the one that issues investments.

Focused on examining the heterogeneous content of DTT and the internal law of countries, there is supplementary work to be done in the future. Given the main double non taxation problem at present, one interesting research line could consist of analysing those Treaty provisions related to the anti-tax avoidance and evasion function of DTT.

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Annex

Table A1: Review of the empirical literature on the effect of Double Taxation Treaties on Foreign Direct Investment

	Sample	Empirical model and econometric technique	Variables		Results
			FDI indicators	DTT indicators	
Blonigen and Davies (2000)	U.S.; 1966-1992	Gravity model and Markusen model; OLS	Bilateral inbound and outbound FDI: stock, flows, sales and number of foreign affiliates	DTT; Number of years of DTT (also squared)	Positive (at least some time later the DTT signature)
Blonigen and Davies (2002)	OECD; 1982-1992	Markusen model; Pool, FE	Bilateral FDI: stock, flows	DTT; New DTT Old DTT	Negative or null from new DTT
Davies (2003)	U.S.; 1996-2000	Markusen model; OLS	Bilateral inbound and outbound FDI: stock and sales	DTT Renegotiated DTT	Null
Blonigen and Davies (2004)	U.S.; 1980-1999	Markusen model; FE	Bilateral inbound and outbound FDI: stock	DTT; New DTT Old DTT	Negative or null from new DTT
di Giovanni (2005)	193 countries; 1990-1999	Gravity model; FE	Aggregate data on cross-border Merger and Acquisitions: flows	DTT	Positive
Egger et al. (2006)	OECD; 1985-2001	Model similar to the Markusen one; Differences in differences	Bilateral outbound FDI: stock	New endogenous DTT	Negative
Neumayer (2007)	Developing countries; 1970-2001	Alternative model; FE	U.S. bilateral FDI: stocks and aggregate data on OECD FDI: flows and stock; in relative terms to developing countries total inbound FDI	DTT	Positive, but only on investment received by middle-income developing countries
Stein and Daude (2007)	OECD; 1997-1999 (average).	Gravity model and Markusen model; OLS, Tobit	FDI from 17 OECD countries to 58 countries: stock	DTT	Positive
Louie and Rouslang (2008)	U.S.; 1992, 1994 y 1996	Alternative model	Rates of return on FDI	DTT	Null from old and new DTT

Coupé, Orlova and Skiba (2009)	Transition countries; 1990-2001	Gravity model; OLS, RE, FE	Bilateral FDI from OECD countries to transition countries: flows	DTT Old and new DTT Temporal effects	Null (positive and negative effects are compensated)
Barthel, Busse and Neumayer (2010)	30 FDI residence countries (10 developing countries) and 105 FDI source countries (84 developing countries); 1978-2004	Model based on the typical determinants of FDI; FE, GMM	Bilateral FDI: stock	DTT; Years of DTT	Positive
Davies, Norbäck and Tekin-Koru (2010)	Sweden; 1965-1998	Gravity model; OLS, Probit	Affiliate level FDI data: sales, composition of sales	New DTT	Heterogeneous on the composition of sales: null on the margin and positive on the establishment of a new affiliate
Ohno (2010)	Japan; 1981-2003	Gravity model; GMM	Outbound FDI to 13 Asian countries: flows	New DTT (short, medium and long term) Reviewed DTT New DTT (indirect effect) Reviewed DTT (indirect effect)	Positive in the long term from new DTT
Blonigen, Oldenski and Sly (2014)	U.S.; 1987-2007	Markusen model; FE	Affiliate level FDI data: sales, number of affiliates	New DTT	Positive
Baker (2014)	Transition countries; 1991-2006	Markusen model; Differences in differences	Outbound FDI from OECD countries to developing countries: flows	New DTT contracted between developed and less developed countries	Null: DTT do not exert any effect on FDI
Bösenberg, Egger and Erhardt (2016)	187 signatory countries; 1900-2013	The most important observable non-DTT (economic and political) determinants; Exponential-family generalized-linear models	Number of affiliates held by headquarters bilaterally	Content of three dimensions of 3.300 DTT and 11 OECD model Tax Treaties	Heterogeneous: specific content of DTT
Hong (2017)	70 countries; 2012	Five bilateral variables to describe the relationship between a pair of countries (a shared border, a common official language, a common	Bilateral FDI: stock	Tax rate matrix from a network of DTT between 70 countries	A tax-minimizing direct route is positively related to FDI via the direct route

		legal origin, a colonial relationship and distance), Corporate Income Tax and GDP			
Millimet and Kumas (2017)	U.S.; 1980-1999 [sample of Blonigen and Davies (2004)]	Model similar to the Markusen one; OLS, panel data	Bilateral inbound and outbound FDI: stock, flows, sales	New DTT; Temporal effects	Heterogeneous: positive effects of Tax Treaties at lower quantiles of the distribution of FDI, but negative effects in the upper quantiles

Source: own elaboration

Table A2: Spanish Bilateral Investment Treaties: 1993-2013

Signature	Country
1992	Argentina, Czech Republic, Hungary, Russia, Slovakia
1993	Poland
1994	South Korea, Uruguay
1995	Romania
1996	Dominican Republic, Lithuania, Peru
1997	Latvia, Paraguay, Venezuela
1998	Bulgaria, Croatia, Ecuador, Estonia, Panama, Turkey
1999	Costa Rica, India
2000	Slovenia
2002	Bolivia
2004	Guatemala
2007	Colombia
2008	China, Mexico

Source: Own elaboration from the Ministry of Trade: <http://www.comercio.es/acuerdos>

Table A3: Domestic and foreign tax burden of the contracting states

The domestic and foreign tax burden of Spain and its partners is calculated for each year of the sample to identify those situations at which the Territorial Tax Systems provides a tax saving in comparison to the Worldwide one, i.e., the foreign tax burden is lower than the domestic tax burden. The foreign tax burden of Spain is calculated for the sample of Spanish inbound FDI and the foreign tax burden of the counterpart contracting states for the sample of Spanish outbound FDI. Similarly, the domestic tax burden of Spain is calculated for the sample of Spanish outbound FDI and the domestic tax burden of counterpart sample countries for the sample of Spanish inbound FDI.

Formulas for the calculation of the tax burdens are the following:

$$\textit{Foreign Tax Burden} = \textit{CITr}_{\textit{foreign}} + \textit{wht} * (1 - \textit{CITr}_{\textit{foreign}}) \quad \text{A3.1}$$

$$\textit{Domestic Tax Burden} = \textit{CITr}_{\textit{domestic}} \quad \text{A3.2}$$

Equation A3.1 assumes that Worldwide Tax Systems allow for the application of both a direct and an indirect tax credit of foreign taxes. $\textit{CITr}_{\textit{foreign}}$ of equation A3.1 is the standard corporate income tax rate of the country that receives investments (the source country in terms of taxation); \textit{wht} is the withholding tax rate on foreign dividends of the same aforementioned country; $\textit{CITr}_{\textit{domestic}}$ of equation A3.2 is the standard corporate income tax rate of the country that issues investments (the residence country).

Table A4: Spanish inbound FDI. Ultimate owner

	Global Sample(1)	Developed Countries(2)	Developing Countries(3)
<i>odtt_{sht}</i>	0.62 (1.59)	0.93** (2.17)	-2.92 (-1.57)
<i>ndtt_{sht}</i>	0.52** (2.48)	0.67** (2.55)	0.16 (0.43)
<i>its_{sht}t_{sht}</i>	0.67** (2.14)	0.67** (2.55)	0.37 (0.24)
<i>bit_{sht}</i>	X	x	-0.36 (-1.17)
N	999	648	351
R²	0.38	0.44	0.18
Bilateral FE			
Bilateral RE	Yes	Yes	Yes

When fixed effects apply, estimations are made by corrected least squares; ***, ** and * denote statistical significance at 1, 5 and 10 per cent levels, respectively.

Table A5: Renegotiated DTT as the prolongation of old DTT

	Spanish outbound FDI			Spanish inbound FDI		
	Global sample(1)	Developed Countries(2)	Developing Countries(3)	Global sample(4)	Developed Countries(5)	Developing Countries(6)
<i>odtt_{sht}</i>	3.34*** (2.58)	3.42*** (2.63)	x	0.95 (1.58)	1.40* (2.04)	-2.74 (-1.50)
<i>ndtt_{sht}</i>	0.47 (1.29)	0.26 (0.59)	1.03* (2.40)	0.42** (1.99)	0.46* (1.69)	0.32 (0.90)
<i>its_{sht}t_{sht}</i>	0.78* (1.68)	1.11* (1.84)	-0.3 (-0.39)	0.64** (2.06)	0.72** (2.16)	0.17 (0.12)
<i>bit_{sht}</i>	x	X	-0.90** (-2.09)	X	x	-0.14 (-0.46)
N	812	539	273	999	648	351
R²	0.16	0.26	0.20	0.37	0.43	0.19
Bilateral FE	Yes	Yes	Yes			
Bilateral RE				Yes	Yes	Yes

When fixed effects apply, estimations are made by corrected least squares; ***, ** and * denote statistical significance at 1, 5 and 10 per cent levels, respectively.

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