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The Influence of the Tax Burden in Attracting Foreign Direct Investment

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Biographic Note

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Abstract

The influence of taxes on FDI attraction has been the subject of extensive empirical literature in the past few decades. However, the results have been far from consensual. The present research draws upon a group of 9 OECD countries with different characteristics through 7 years (2000-2006 for independent variables and 2001-2007 for the dependent variable) which means 36 different country pairs and a total of 72 different pairs-year. A 1 year lagged gravity-model is used in order to explain the importance of taxes (BEATR – bilateral effective average tax rates) on FDI (inward bilateral stocks) attraction. The gravity variables explain most of the variations in FDI stocks but the BEATR is an equally important factor along with infrastructure and the economic freedom of the host country. The semi-elasticity of FDI with respect to taxes is about -4.2 (one percentage point rise in taxes causes a decrease of 4.2% in FDI), which is a value in line with recent major studies using similar methodologies. This dissertation introduces features of symmetry in tax regimes between home and host country of investor in the models tested. The results are not conclusive concerning the relationship of symmetry aspects with the level of FDI. However, it is possible to acknowledge that, on the one hand, perfect symmetry between tax regimes is difficult to find and, on the other hand, accounting for approximate symmetry in the models tested reduces the significance and impact of taxes on FDI.

This study reinforces the idea that tax-lowering strategies have an important effect on foreign firms' investment location decisions regardless of the different characteristics of the home and host country. Furthermore, by decomposing taxes into tax-related features, such as symmetry, it opens a new pathway for research concerning the understanding of which aspects of taxes mostly influence FDI attraction.

Keywords: Foreign Direct Investment, Taxes, Tax Symmetry, Multinational Enterprises, Host Country, Home Country.

Resumo

A influência dos impostos na atracção de IDE (Investimento Directo Estrangeiro) tem sido objecto de um vasto trabalho de investigação nas últimas décadas sem ter sido ainda reunido consenso quanto aos resultados. O presente trabalho analisa 9 países da OCDE com diferentes características durante 7 anos (2000-2006 para variáveis independentes e 2001-2007 para a variável dependente), o que resulta em 36 pares diferentes de países num total de 72 pares-ano. É utilizado um modelo de gravidade diferenciado um ano para explicar a importância dos impostos (TBME – taxa bilateral média efectiva) na atracção de IDE (“stocks” bilaterais). As variáveis gravíticas explicam a maior parte das variações encontradas no IDE. No entanto, a TBME é igualmente importante na explicação do investimento, assim como a quantidade de infraestruturas e nível de abertura económica do país de destino. A semi-elasticidade do IDE em relação aos impostos é de cerca de -4.2 (crescimento dos impostos em 1 ponto percentual origina um decréscimo do IDE em 4.2%), o que está em linha com os estudos mais recentes que utilizam metodologias semelhantes. Este trabalho introduz, ainda, o estudo de aspectos de simetria entre sistemas tributários dos países de origem e destino do investimento. Embora os resultados não sejam conclusivos quanto à influência que a simetria possa ter na atracção de IDE, é possível verificar que, por um lado, é muito difícil encontrar casos de simetria perfeita entre países e, por outro lado, alguns aspectos de simetria influenciam o impacto dos impostos no IDE.

Este trabalho reforça a ideia de que as estratégias de redução de impostos têm um papel importante nas decisões de localização do investimento estrangeiro independentemente das diferentes características dos países. Considera-se, ainda, que a inovação proposta no detalhe dos impostos em componentes que lhe são intrínsecos, neste caso, a simetria entre sistemas tributários, enceta um novo rumo de investigação em que se preconiza o entendimento dos aspectos relacionados com impostos que efectivamente afectam o IDE.

Palavras Chave: Investimento Directo Estrangeiro, Impostos, Simetria nos Sistemas Tributários, Empresas Multinacionais, País de Origem, País de Destino.

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Index of Acronyms

ATR: Average Tax Rate

BEATR: Bilateral Effective Average Tax Rate

CEEC: Central and Eastern European Countries

DB: Declining Balance

DTT: Double Taxation Treaty

EATR: Effective Average Tax Rate

EC: European Community

EFREE: Index of Economic Freedom

EMTR: Effective Marginal Tax Rate

EU: European Union

FDI: Foreign Direct Investment

FIFO: First In First Out

GDP: Gross Domestic Product

GDPPC: Gross Domestic Product Per Capita

GNP: Gross National Product

IBFD: International Bureau of Fiscal Documentation

IRR: Industrial Rate of Return

LCOST: Unit Labour Cost

LDC: Least Developed Countries

LIFO: Last In First Out

M&A: Mergers and Acquisitions

MNE: Multinational Enterprise

NPV: Net Present Value

OECD: Organization for Economic Co-operation and Development

OLI: Ownership, Location and Internalization

PDV: Present Discounted Value

P&M: Plant and Machinery

PPE: Property Plant and Equipment

R&D: Research and Development

SEEC: South-Eastern European Countries

SL: Straight Line

STR: Statutory Tax Rate

UNCTAD: United Nations Conference on Trade and Development

US: United States

WDI: World Development Indicators

Introduction

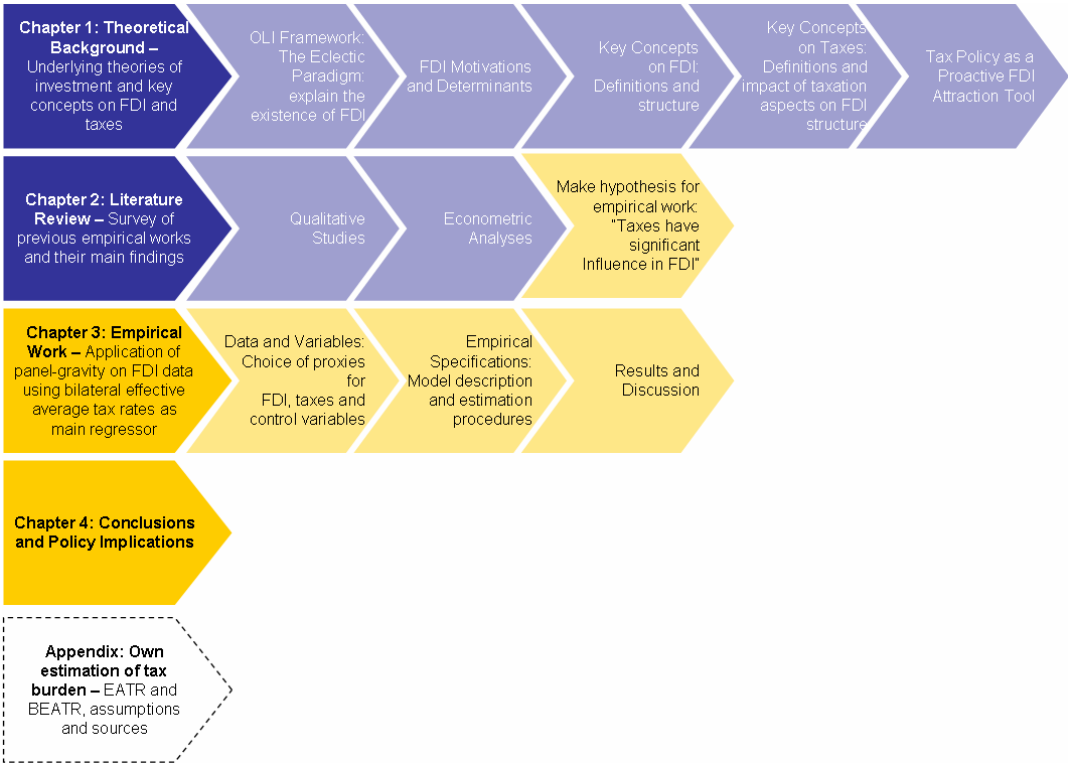
The belief that low taxes attract Foreign Direct Investment (FDI) has led to a substantial body of work in the past two to three decades (Gorter and de Mooij, 2001). In theory, differences in tax rates between territories lead to profit shifting, affect the amount of dividends subsidiaries repatriate to headquarters and, most importantly, influence the allocation of MNEs' investments (Hines, 1999).

Concerned with the positive impact of international capital flows on welfare, policy makers engage in locational tournaments to attract investors' attention (Mytelka, 2000). Both developed and developing countries compete fiercely to win FDI projects (Chudnovsky and Lopéz, 2000) by offering aggressive incentives such as lowering taxes. This behaviour has been called a "race" for FDI attraction (Oxelheim and Ghauri, 2004) and occurs mainly between neighbouring countries or jurisdictions (Buckley, 2004; Yao and Zhang, 2008). Evidence for the "race" in the European Union (EU) is patent in the decline of corporate tax rates from an average of 38% in 1990 to 33% in 2000 (Gorter and De Mooij, 2001).

However, whether the decrease in taxes effectively attracts FDI has remained a research question with ambiguous results. Earlier studies such as those performed by Agodo (1978) and Hartman (1984) found an insignificant relation between host country taxes and FDI attraction while more recent works, for example Bellak *et al* (2009a, 2009b) and Egger *et al* (2008), found a significant impact of taxes on FDI attraction. De Mooij and Ederveen (2005, 2008), in their summary of empirical findings on the effects of taxes on FDI, suggest that investment location choices are significantly affected by taxes but results vary according to the type of FDI data, type of sample and tax measure. This dissertation aims at clarifying the relevance of taxes in the attraction of FDI using a sample of 9 OECD countries over the period 2000-2007 and addressing bilateral issues such as double taxation treaties and also a novelty concerning symmetry in tax policy between the host and home country of the investor. This innovation intends to capture an aspect of taxation that might give further depth in the understanding of the role of bilateral tax elements in the attraction of FDI. More specifically, the analysis proposed seeks to answer following research question: *Does the tax burden influence foreign direct investment?*

In order to answer competently the research question, the dissertation is organized as follows:

Figure 1: Structure of the dissertation and main contents.



Source: Own Elaboration (2010).

Chapter 1 – Theoretical Background

This chapter aims to clarify some of the most important theoretical concepts underlying FDI and Taxes. Understanding these concepts is crucial in order to answer the research question: *does the tax burden influence foreign direct investment?*

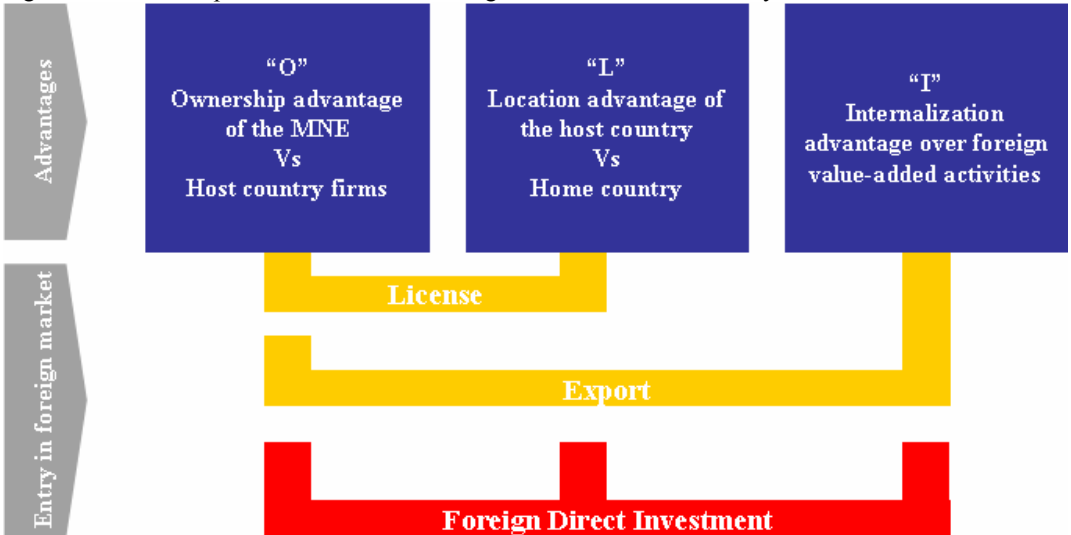
Firstly, a theoretical framework that seeks to explain the conditions under which firms choose to invest abroad is presented. Following that, there is an overview of the main motivations and determinants of FDI considered in research. Finally, after clarifying some key basic definitions concerning FDI and Taxes, it is explained how host governments use tax-related incentives as a tool to attract inward investment.

1.1. OLI Framework – The Eclectic Paradigm

Dunning (1977) proposed the Eclectic Paradigm in order to explain the existence of FDI alternatively to other entry modes in a foreign market, such as exports and licensing.

Multinational enterprises (MNEs) are companies which undertake productive activities outside the country they are incorporated (see, for instance, Dunning 1993; Bellak, 1997; Bloningen, 2005). According to Dunning’s (1977) seminal work, FDI takes place when MNEs have simultaneously three advantages, Ownership (O), Location (L) and Internalization (I) as presented in the following figure.

Figure 2: Relationship between the OLI advantages and international activity.



Source: Own Elaboration (2010) based on Dunning (1977).

Ownership (O) advantages are firms' unique tangible or intangible assets that confer them an advantage over competitors in the host country. These advantages may be either proprietary rights that MNEs offer to foreign affiliates – *Oa* advantages – or the efficient coordination of assets across related activities – *Ot* or transaction cost minimizing advantages (Dunning, 1993). The first encompass aspects such as technical capability, human skills and competence, ability to raise financial resources and product differentiation; the latter refer to advantages arising from economies of scale, size of firms and pre-existence of multi-plant activities (see Caves, 1974; Saunders, 1982).

Location (L) advantages are external to the MNE and consist of specific resources not equally distributed in all locations. These include not only natural resources but also cultural, legal, political and institutional features along with market structure and governments' legislation and policies such as taxation on corporate activity.

Internalization (I) advantages represent the perceived benefits of hierarchical control of foreign production. Dunning (1993) refers to I advantages as arising from structural and transnational market failures, causing MNEs to pursue different strategies towards the exploitation of O and L advantages:

- Structural market failures (emphasized by Hymer, 1968) explain that firms tend to increase their monopoly rents by raising barriers to entrants. Those barriers include acquisition of competitors, a form of internalization.
- Transnational market failures relate to the inability of the host market to organize transactions in an optimal way due, for example, to asymmetric information between buyers and sellers; exploitation of international capital, exchange markets and different fiscal policies; required trade-off between the overall costs of the value-added activity and the benefits of scale economies and geographical diversification.

In short, firms establish their value-added chain in order to overcome market imperfections, maximize their economic rent and lower production or transaction costs. Alternatively to setting up facilities abroad, a firm possessing O advantages over other firms tends to outright knowledge through cross-border *licensing* when no economies of scale arise from common governance; or it has the incentive to *export* when there are not enough L advantages to be exploited in the host country, thus making intra-national production more profitable than international production (see Figure 2).

For the purpose of this dissertation, taxes can be classified as L factors affecting FDI. Hence, MNEs may perceive them as an advantage if the host country's taxes are lower than those of the home country or those of other potential host countries, or a disadvantage in the opposite situation because higher taxes reduce the after tax return in the location (Hines, 1999; De Mooij and Ederveen, 2001, 2005, 2008). Furthermore, taxation may affect each of the other OLI factors (Hajkova *et al*, 2006). On the one hand, taxation may influence the incentive of MNEs to establish a foreign subsidiary by increasing the advantage associated with O through royalties' treatment and dividend repatriation. On the other hand, taxes affect the wedge between pre-tax and post-tax rate of return on FDI, determining whether the MNE should internalize or license.

1.2. FDI Motivations and Determinants

Scholars have identified a multiplicity of motivations for firms to undertake FDI and research seems to indicate that several factors can determine where and how MNEs expand overseas.

Dunning (1993), based in Behrman (1972), proposed a useful typology of MNE activity according to the type of *motivation* for FDI:

Resource Seeking enterprises are prompted to invest abroad in order to acquire specific resources at a lower cost making foreign affiliates more profitable in the markets they serve. Some MNEs seek physical resources such as raw materials and agricultural products; others look for a cheap supply of motivated low-skilled work; and finally, there are firms that want to acquire intangible skills such as technological capability or managing expertise.

Market Seeking MNEs invest in a particular country to serve that market or adjacent countries. This behaviour may be due to additional legal barriers imposed to exports, to protect existing markets or to promote new markets. In practice, MNEs often shift production to the host market following their suppliers, looking forward to better adapt to foreign market tastes or even to reduce costs of supplying from a distant location.

Efficiency Seeking enterprises are usually large and diversified MNEs which find gains from the common governance of geographically dispersed activities. The benefits range from economies of scale to risk diversification and the final objective is to supply multiple markets from a limited number of locations.

Strategic Asset Seeking MNEs engage in FDI usually by acquiring foreign corporations. The motivation behind this type of firms is to add a portfolio of assets that will strengthen the overall competitive position or weaken the competitors' position.

There are also other reasons for MNEs' activity abroad which do not fall into the previous categories. First, FDI can be made to escape a certain type of restrictive legislation from the home governments, such as a high taxation burden or a complex labour system. Others settle activity in a host country to support other existing affiliates. Finally, MNEs may have a motivation to acquire a small part of an indigenous firm for the sole purpose of financial gains without an active managerial input (see Dunning, 1993 and Dunning and Lundan, 2008).

Many researchers have also investigated the main *determinants* of FDI flows. Root and Ahmed (1978) obtained some of the most considerable results (Raudonen, 2008) in their seminal work and point out to 44 different economic, social, political and policy determinants. The breakdown of those four categories follows in Table 1.

Table 1: Categories of Determinants of FDI.

Category	Variable
Economic	1. GDP (or GNP) 2-4. GDP per capital, GDP growth rate, per capital growth rate 5. Manufactured imports/GDP 6. Ratio of exports to imports 7. International liquidity (average annual percentage change) 8,9. Purchasing power of currency (change in external value relative to internal value) 10,11. Local credit (ratio of banking sector claims on economy to GDP and on private sector to GDP) 12. Ratio of commerce, transport and communication to GDP 13. Energy production (equivalent tonnes of coal per 1000 population) 14. Degree of economic integration 15. Ratio of manufacturing to GDP 16. Ratio of raw material exports to GDP
Social	17,18. Ratio of literacy and school enrolment 19. Availability of technical and professional workers (size of middle class) 20. Modernization of outlook 21. Strength of labour movement 22. Extent of urbanization
Political	23-28. Frequency of government change by type and period 29,30. Number of internal armed attacks per period 31. Degree of administrative efficiency 32. Degree on nationalism 33-35. Per capita foreign and from U.S., non-U.S. sources, and sum of both 36. Colonial affiliation 37, 38. Role of government in economy
Policy	39. Corporate taxation (typical manufacturing burden) 40. Tax incentive laws: complexity vs. simplicity 41. Tax incentives: liberality 42. Attitude toward joint ventures 43. Local content requirements 44. Limitations on foreign personnel

Source: Root and Ahmed (1978).

The *economic* factors include mainly foreign market characteristics, such as market size and growth; variables connected to stability and infrastructure's development (See Grčić

and Babić, 2003; Bellak *et al*, 2009a). *Social* determinants are related to human capital skills and overall host country development. *Political* stability is also highlighted as influencing FDI, especially in least developed countries (LDC) (see Shamsuddin, 1994 and Nnadozie, 2000). Finally, *Policy* factors include, among others, legislative restrictiveness towards foreign companies and issues related to taxation. The latter were divided into corporate taxation burden, availability of tax incentives and their overall complexity (see also OECD, 2003). The determinants mentioned in Root and Ahmed's (1978) work have repeatedly been considered in the most important empirical studies focusing on FDI attractiveness. Their expected influence follows in table 2.

Table 2: Overview of the main FDI determinants used in relevant studies, their effects on FDI and methodological issues (*¹).

Determinant	Description	References	Effect	Issues
Market Size and Growth	Measures the intention of MNEs to capture new markets, being the dynamics of the market and the purchasing power combined in host country GDP measures.	Mold (2003)	+	In percapita terms some of the most successful countries attracting FDI are the smallest economies such as Luxemburg (Mold, 2003). On the other hand, using GDP percapita together with other location factors creates multi-colinearity problems requiring the use of lagged variables (Bellak <i>et al</i> , 2009a).
		Bellak <i>et al</i> (2009b)	+	
		Bellak and Leibrecht (2009)	+	
Operating costs	Includes factors such as labour costs that are usually appointed to be determinants for MNEs investing in transition countries (Grčić and Babić, 2003).	Mold (2003)	ambiguous	Although lower labour costs might be attractive for investing in transition countries, ambiguity may exist since MNEs are reluctant to invest in countries with very low productivity level (Grčić and Babić, 2003).
		Bellak <i>et al</i> (2009b)	-	
		Bellak <i>et al</i> (2009b)	-	
Trade Effects	Represent the reasons that may lead FDI benefits to outweigh exporting benefits. The main point is that there is a natural progression from exports to FDI with scale (size of exports).	Lipsej and Weiss (1981,1984)*	+	Necessary to account for other endogenous variables from host country that may induce MNEs to increase FDI, exports, both or neither.
		Bloningen (2001)*	+ (for intermediate products of the same kind) - (for finished products of the same kind)	

¹ References cited in Bloningen (2005).

Trade Protection	Includes measures that raise the costs of FDI which may force firms to find that activity not profitable. For example, Anti-dumping and tariffs.	Grubbert and Mutti (1991)*	ambiguous	Difficult to account for non-tariff forms of protection in a consistent way across firms (Bloningen, 2005).
		Bloningen (1997)*		
		Bloningen (2002)*	-	
Exchange Rate	Measure of the bilateral rate of appreciation or depreciation of host country currencies relative to home countries ⁷ .	Froot and Stein (1991)*	-	The results, although consistent were tested mainly with US data.
		Klein and Rosengren (1994)*	-	
		Bloningen (1997)*	-	
Exchange Rate volatility	Uncertainty and expectations about future changes in the exchange rates.	Cushman (1985)*	ambiguous	Hided effects when using either aggregated data or firm-level FDI (Bloningen, 2005).
		Campa (1993)*	-	
		Goldberg and Kolstad (1995)*	+	
Distance	Measure of efficiency or transaction costs between home and host country.	Mold (2003)	ambiguous	The handicap of geographical remoteness can be overcome through investment in infrastructure and market liberalization in transport (Mold, 2003). It may also be considered an internalization advantage (Bellak and Leibrecht, 2009).
		Bellak and Leibrecht (2009)	+	
Taxes	How host and/or home countries taxation systems affect firms return on investments.	Hartman (1984)	+/- depending on type of FDI	Difficult to find measure that accounts for the complexity of worldwide taxation systems (see table #).
		Swenson (1994)*	+	
		Hines (1996)	-	
		De Mooij and Ederveen (2001, 2008)	-	
		Bellak <i>et al</i> (2009a)	-	
Institutions	Measures of the quality of institutions, infrastructures, facilities that promote development and governments' public expenditure or ICT-infrastructure endowment as used in Bellak, et al (2009a).	Wheeler and Moody (1992)*	ambiguous	There are no accurate measures of institutions and these are usually compound indexes based on surveys that do not change severely through time (Bloningen, 2005).
		Wei (2000)*	+	
		Bellak <i>et al</i> (2009a)	+	
Corruption	Stands for the estimation of how bribery and "helping hand" affect MNEs behaviour in a host country.	Egger and Winner (2006)	- (for intra OECD) ambiguous (from OECD to developing countries)	Expected to have different effects depending on the relative sizes, labour costs and endowments of home and host countries (Egger and Winner, 2006).

Source: Own Elaboration (2010).

Since FDI generally takes place when the investment allows the firm to earn a higher return from some special advantage it possesses (Grubert and Mutti, 2000) there is no

surprise in finding that most studies are unanimous in that market size and growth are some of the most significant FDI determinants. On the contrary, the research on taxes as determining FDI location decisions is not consensual. Depending on the type of taxes, type of FDI and tax treatment by home and host countries (Hartman, 1984; Blonigen, 2005) taxes may appear to have a negative, positive or insignificant effect on FDI as will be developed in more detail in the following sections.

1.3. Key Concepts on FDI

In order to describe the influence of taxation on FDI attraction it is crucial to clarify the concepts the underlie assumptions and approaches raised throughout this work. In particular, these concepts will be of utmost importance for understanding how different types of FDI operations in terms of form/mode of entry and in terms of type of transfer are impacted by host and home countries' tax policies.

FDI is defined as an investment involving a long-term relationship reflecting a lasting interest and control by a resident entity in one economy – foreign direct investor or parent company – in a resident enterprise (direct investment enterprise) in an economy other than that of the foreign direct investor (UNCTAD, 2009). The lasting interest implies the existence of a long-term relationship between the direct investor and the direct investment enterprise and a significant degree of influence on management of this enterprise. Direct investment involves both the initial transaction between the two entities and all subsequent capital transactions between them and among affiliated enterprises (OECD, 1996, 2006). The direct investment enterprise is defined as an incorporated or unincorporated enterprise in which a foreign investor owns 10% or more of the ordinary shares or voting power. This means that the direct investor is able to influence or participate in the management of an enterprise even if he doesn't control it (OECD, 1996, 2006).

FDI is either referred to as a *Stock* (also denominated “position”) or a *Flow*. Stocks correspond to share of a foreign affiliate's capital and reserves which is attributable to the parent enterprise plus the net indebtedness of affiliates to the parent, while Flows correspond to capital transactions between the parent company and the affiliate and may be decomposed into three main components:

Equity Capital is the foreign direct investor's purchase of shares of an enterprise in a foreign country or direct provision machinery; *Reinvested Earnings* comprise the direct investor's share of earnings not distributed as dividends by affiliates or not remitted to the direct investor; *Intra-Company Loans* (or debt) refer to borrowing or lending between the parent company and the foreign affiliate.

FDI may also be classified according to form, the so called modes of entry in the foreign country:

*Mergers & Acquisitions (M&A)*² occur when an inward direct investment enterprise in the host country is taken over by a concern in the home country, which means a disinvestment by the host country and a direct investment by the foreign investor's home country (OECD, 1996). There are three types of cross-border M&A, those that involve a sale of a domestic company to a foreign company, those that consist of the sale of a foreign affiliate to a domestic company and those that involve the purchase of a foreign company by another foreign company operating in the same host country (UNCTAD, 2009).

Greenfield direct investment is basically the setting up abroad of a completely new business establishment and it is the result of organic growth strategies. Some authors also consider *Brownfield* investment as denoting an investment which adds to capacity when established fixed capital already exists (letto-Gillies, 2005).

Recent research has focused attention on optimal design of tax rules concerning FDI. However, the resulting tax policies are not only important determinants of location decisions of MNEs but also of the financial structure of investment (Moore and Ruane, 2005). According to Eurostat (2002), in spite of an average FDI composition of about 75% equity and retained earnings there is a great heterogeneity within European countries that may be explained by differences in the way home and host country treat taxes (Taxation Systems). Specifically, because interest payments on loans can shield profits from taxation, it is expected that countries with high corporate tax rates, such as Germany, have FDI predominantly composed by intra-company loans (Moore and Ruane, 2005).

² According to the World Investment Report (UNCTAD, 2009), cross-border M&As accounted for around 52% of total FDI inflows in 2007.

1.4 Key Concepts on Taxes

Taxation affects FDI in a number of complex ways (Devereux *et al*, 2002). Taxes paid by firms depend on the profitability of the investment, the legal status of the firm and the source of finance.

1.4.1 Tax Measures

Several measures may be used to compute these taxes. This dissertation draws attention on measures based on tax legislation, ranging from the simple Statutory Tax Rate (STR) of the host country to measures that take into account the different sources of finance of FDI, such as the Effective Tax Rates (ETRs), and those considering the international regulations on taxes, such as the Bilateral Effective Average Tax Rates (BEATRs).

Table 3: Summary of Tax measures.

Tax measure	Description
Statutory tax rate (STR)	Basic measure of corporate income taxes – marginal rate of tax applied to any additional income including profits and surcharges given the level of allowance
Tax Base	Percentage of the MNE income available for tax deductions calculated through depreciation allowances and other allowances or credits such as inventory valuation systems (Yoo, 2003).
Average tax rate (ATR)	Taxes paid by firms divided by a measure of operating surplus.
Effective tax rate (either marginal or average)	Percentage reduction in the financial rate of return on an investment due to the fiscal system of the host country
Effective marginal tax rate (EMTR)	Measures the gap between pre and pos tax return on a marginal investment project that does not yield economic rent
Effective average tax rate (EATR)	Measures the gap between pre and pos tax return on an investment project on which firms might earn an economic rent
Bilateral corporate effective tax rates (BEATR)	Refers to the scaled difference between the pre- and post-tax net present values of FDI with a given infra-marginal financial rate of return

Source: Own elaboration based on Devereux *et al*, 2002; Bellak *et al*, 2007.

The overall tax liabilities are generally calculated by applying the STR to the firms' tax base (See Devereux *et al*, 2002; Devereux and Griffith, 1998, 2003; Yoo, 2003). However, from the measures mentioned in table 3, the BEATR is the only one taking into account the diverse tax systems and how they influence the firms' after-tax return. Actually, there is a great difference between taxation of domestic economic activity and taxation of international transactions, in part because of the complications that arise from taxation of the same income by multiple governments. Thus, some mechanism is

needed that reverses the discouragement for international business that would be represented by double taxation (Hines, 1999).

1.4.2 Taxation Systems

To avoid double taxation of FDI in host and home country most countries formalize double taxation treaties (DTTs) based on the OECD Model Tax Convention (de Mooij and Everdeen, 2001). By the end of 2008, there were 2805 DTTs (UNCTAD, 2009). In most cases, the treaties result in one of two systems for the home country³.

Exemption System or Territorial Taxation happens when foreign income taxed in the host country is exempt in home country. However, exemption may differ from country to country, for in some countries firms can only claim tax exemption if they control a certain share of a company and when a minimum foreign income tax is paid.

Credit Systems or Worldwide Taxation, on the other hand, force that tax liabilities in the host country are credited against taxes in the parent's home country (de Mooij and Everdeen, 2001), that is, foreign paid taxes can be claimed in the home country to reduce tax liability. These credits are generally limited; for example, in some countries if the foreign tax payments exceed tax liability in the home country, firms can only claim the domestic tax liability, while there are countries where excess of foreign credit may compensate deficit tax credit in subsequent years. Countries using this system also allow tax deferral, which means that profits of foreign affiliates that are reinvested are only subject to taxation in the home country when they are repatriated (Hines, 1999).

Cross-border investment may be subject to two additional taxes: a host country's *withholding tax rate*, which can be levied on dividend or interest payments from the subsidiary to the parent, and a home country's tax on foreign-source income (Yoo, 2003). Whether these tax burden elements lead to additional taxes on foreign-source income depends on the home country's taxation system and, specifically in presence of a credit system, depends on whether the tax paid abroad is bigger or smaller than the total tax liability of the parent firm.

In a concluding remark, while for exempt investors home taxes do not matter, they matter a lot for credit investors (De Mooij and Everdeen, 2001).

³ In the EU Parent-Subsidiary Directive it is ensured that countries adopt a credit or exemption system to avoid double taxation, while the US and Japan both adopt credit systems (De Mooij and Everdeen, 2001).

Hence, from an exemption's country point of view, higher tax rates in the host country should make it less attractive to investors. This holds for FDI financed by retained earnings and equity transfers but not for debt-financed investment because, for M&A, domestic and foreign owners are affected the same. On the contrary, when focusing on foreign investors whose parent is located in country using credit system, and supposing there is no credit excess, the higher the host country tax rate, the lower is the tax liability in the home country, hence, having no negative effect on FDI. One might even expect a positive influence of taxes on M&A, since the foreign owners are shielded from the higher tax rate by the credit system (de Mooij and Everdeen, 2001).

1.5 Tax Policy as a Proactive FDI Attraction Tool

Over the past few decades governments have been actively promoting their countries as investment locations partly due to belief in the existence of spillovers accruing from FDI (see, among many others, UNCTAD, 2000; Görg and Greenaway, 2003).

There is no consensus in the literature about the existence of positive spillovers arising from FDI (Tavares and Young, 2005). However, a considerable number of empirical studies have found significant productivity spillovers in different countries: Caves (1974) in Australia, Globerman (1979) in Canada, Blomström and Persson (1983) in Mexico, Hubert and Pain (2001) in the UK and Ruane and Ügur (2002) in Ireland are a few examples. The latter study categorize the main spillovers found into *direct effects*, which relate to capital formation, employment and trade associated with FDI projects; and *indirect effects*, which arise from indigenous contact with new managerial skills and home country technology.

Görg and Greenaway (2003) made a further identification of the main channels through which the host country may acquire those spillovers. Local firms may be able to adopt the new production methods through *Imitation*; *Competition* with foreign investors may also create a pressure for efficiency improvements; the foreign investor is likely to provide training and increase productivity of the *Human Capital*; finally, MNEs usually undertake fixed costs such as transport infrastructure in order to *Export*.

In face of the benefits, policy makers are trying to go beyond simple attraction of FDI and promote these spillovers from MNEs to domestic firms (Tavares and Young, 2005) using a multiplicity of proactive tools and incentives. Generally, FDI incentives are

measurable advantages agreed between an investor and the host country government in order to persuade the first to behave in a certain manner (UNCTAD, 2000). According to OECD (2003), the incentives provided by host governments can be divided into financial, regulatory and fiscal. *Financial* incentives are usually subsidies offered to foreign investors in order to level the investment area with other sites, including wage subsidies, creating new infrastructure, job training subsidies and supporting expatriation costs. These measures drag directly out of government's funds and thus are less common in developed countries (UNCTAD, 2000). *Regulatory* incentives are derogations from national or sub-national rules negotiated with the investor and might include easing environmental, labour or social rules. *Fiscal* incentives are tax provisions granted to qualified investment projects that represent a favourable deviation from general regulations (Fletcher, 2002) and aim at increasing the rate of return of a certain FDI project or reducing its risks and costs by reducing the tax burden (UNCTAD, 2000). Table 4 provides a survey of some of the most important tax-related incentives.

Table 4: Summary of tax incentives, their advantages and pitfalls.

Incentive	Description	Advantages	Disadvantages
Reduced Corporate Income Tax Rate	Governments, especially from small economies, set particularly low tax rates in order to attract investment to certain regions	Transparent revenue costs and simple to administer.	Acts as windfall for old capital owners (Morisset, 2003) and benefits high investment companies that were likely to invest even without incentives. Furthermore, invites tax avoidance through profit shifting (Fletcher, 2002).
Loss Carry Forwards	Allow losses to be carried forward or backward a specified number of years.	Useful for investors that have losses in the first years as they penetrate markets or increase production	Should be used together with low corporate income tax rates in order to become highly attractive to investors

Investment Allowances	Deductions from taxable income that are based on a percentage of the investment (depreciation). They are deducted against the tax base, so their value to the firm depends on the corporate tax rate applicable to the tax base.	Firms are provided with faster or more generous write-offs. Promotes new investments (Morisset, 2003) and enables authorities to target certain projects.	Requires well developed accounting systems due to managerial burden (Morisset, 2003). Potential abuse from selling and buying the same assets to make diverse claims. Discriminates against investments with delayed returns if loss carry-forward provisions are inadequate.
Accelerated depreciation	Type of investment allowance: firms are allowed to write-off capital costs in a shorter period than dictated by the capital's useful economic life.	Increases the present value of the claims by shifting them closer to the time of investment not making discrimination against long-lived assets.	
Enhanced Deduction	Type of investment allowance: firms are allowed to claim deductions that are a multiple of the actual capital cost.		
Investment Tax Credits	Flat: earned as a fixed percentage of the investment made in a certain year; Incremental: fixed percentage of the expenditures that were made in excess of a certain moving average.	Investor has incentive to incur in extraordinary expenditures that would not occur in the absence of the relief	It is only relevant for firms if they can move it backward/forward and making unused credits refundable can entail significant higher revenue costs for the government
Reduced Taxes on Dividends and Interest paid Abroad	Reduce the taxes on dividends (usually 10%) remitted abroad by foreign investors	Does not discriminate the investment in the future	Lower incentive to reinvest dividends
Preferential Treatment of Long-Term Capital Gains	Capital retained over a certain minimum period is taxed at half the percentage of short-term capital gains.	Benefit from foreign presence for longer periods	Difficult start-ups
Zero or Reduced Tariffs	Reduce or eliminate tariffs on equipment or spare parts for the investment project/ increase tariffs on the import of finished goods of the same category.	Allows taxpayers to avoid contact with tax administrators.	Often leads to an inefficient, high-cost and distorted industrial structure since tax on outputs may still be great.
Tax Havens	Suppress all direct income taxes and rely on consumption related taxes	Straightforward method	No clear results and often associated with suspicious capital flows

Source: Own elaboration (2010) based on UNCTAD (2000), Fletcher (2002) and Morisset (2003).

Countries usually employ a mix of incentives referred to in Table 4 in order to channel investment to a certain region. However, calculating the breakeven point for when the value of tax incentives exceed the accruals for host economy is not straightforward. Advocates of such measures indicate that tax holidays are effective in attracting new companies shielding them from start-up costs; tax credits attract new investments in that

they benefit extraordinary expenditure; investment allowances induce firms to stay for longer periods in the country since they enjoy reduced taxes only if they invest; reduced tariffs promote export oriented MNEs (see Hines and Rice, 1994; Morisset and Pirnia, 2000; Morisset, 2003). Opponents tend to highlight that, for example, new firms will be in non tax-paying situation during the first years and, thus reduced tax rates or tax holidays will not be effective and will complicate the tax system, distort investment, increase government's revenue costs (see Friedman, 2003; Auerbach, 2006) and facilitate corruption, especially in LDCs (see Diaw and Gorter, 2002; Fletcher, 2002).

Despite the controversial views on benefits, disadvantages and effectiveness of tax incentives, there is clear evidence that high tax rates may generate tax revenue at the cost of considerable loss of foreign investment (Hines, 1999). Thus, lowering corporate income tax rates and broadening tax bases has been the most common incentive (Becker and Fuest, 2009). Figures show that the average STR in OECD countries was about 50% in the early 80s, it dropped to below 35% in 2000 (Devereux *et al*, 2002b) and has reached around 26% in 2009 (Own calculation based on OECD, 2010).

These competitive reductions on taxes are considered by most literature as a "race to the bottom" or even a "beauty contest", where regions want to stay fit and attractive industry locations (Schön, 2003). Devereux *et al* (2002a) explain that the "race" is inevitable due to increasing capital mobility. Buckley (2004) indicates that fierce competition mainly occurs between countries belonging to the same geographical or economic area or between regions in the same country since the investor intends, in principle, to locate in a particular region and in a particular industry theory. Empirical evidence of tax competition comes from all around the globe: within regions in China (Yao and Zhang, 2008), counties in US (Oates, 2002; Gurtner and Christensen, 2008) and, of course, between countries in Europe (Davies and Voget, 2008; Hansson and Olofsdotter, 2008). The following chapter will focus on empirical literature which has evaluated whether or not there has been a significant increment in investment due to the mentioned decreases in taxes.

Chapter 2 – Literature Review on the Importance of Tax Policy for FDI Attraction

FDI is carried out by MNEs in order to earn profits. The profitability of MNEs is expected to decrease with labour costs, energy prices, and other costs such as taxes (Bellak and Leibrecht, 2009). In the theoretical section it was briefly introduced that the effectiveness of low taxes in attracting significant FDI is far from consensual among authors. This chapter aims to overview the extant leading empirical literature on the influence of taxes on FDI and posit hypotheses based on major findings and trends in state-of-the-art works. The chapter starts by examining the main results of *qualitative studies*, which include surveys and meta analyses, and then *econometric analyses*. Based on its conclusions and the theoretical considerations presented, the hypothesis for this research will be formulated.

Generally, major studies about FDI attraction might suggest that the importance of taxes in FDI attraction is ambiguous since many analyses have shown that the most important factors have to do with the quality of infrastructure, political stability and the cost and availability of labour (Morisset, 2003) making taxation less important when put in comparison. Nevertheless, this does not mean necessarily that taxes are not relevant. In fact, FDI grew more than fivefold in Caribbean tax-havens between 1985 and 1994 and Ireland was able to attract investors with low taxes indicating that in some occasions taxes may attract some investors (Morisset, 2003).

2.1 Qualitative Studies

Among some of the most used methodologies in order to understand which factors contribute to FDI location decisions, selective surveys of international investment and meta analyses play an important role. The first are basically interviews/questionnaires made to managers of MNEs and government officials and the latter are statistical summaries of previous empirical findings. The results are again ambiguous and differ according to the sample and period of research (see Table 5).

In most of the surveys, researchers find that host governments believe that tax incentives are determinant for attracting FDI while managers consider taxes less

relevant in their decisions. This conclusion was reached in some of the first studies, by Robinson (1961) and Aharoni (1966). Seemingly, Barlow and Wender (1955) found that the most important factors mentioned were guarantees against expropriation, political stability and currency convertibility without highlighting taxes. During the 70s, Reuber (1973) indicates in his survey that there is little evidence that taxes alone foster investment decisions. In turn, research conducted in the 90s by Ernst & Young (1994) and Deloitte & Touche (1997) confirm the earlier findings that tax policy seems to matter but it is not as important as other factors (Morisset and Pirnia, 2001). Friedman *et al* (1996) summarize these qualitative studies' findings indicating that general economic factors are central for attracting investment.

Some meta analyses, such as the one performed by Grčić and Babić (2003) do not even take taxes into account when creating an hierarchy for the most important factors in attracting investment to South-eastern European Countries (SEEC). Finally, in Ernst & Young's (2010) European Attractiveness Survey managers state that after the global crisis in 2009 all factors seem equally important. However, when ranked, investors' top concerns are the quality in the way they receive and deliver goods (52%), the stability and predictability of the legal environment (49%) and the level of labour skills (49%).

Other studies acknowledge that taxes play a central role in attracting investment. Guisinguer (1985) shows strong awareness from both managers and governments of worldwide fiscal incentive packages. From this seminal work, Wells (1986) finds a pattern positing that managers with projects oriented to small domestic markets consider tariff protection and fiscal incentives very relevant while managers leading large scale world market projects consider fiscal incentives highly important (Moran, 1999).

More recent meta analyses such as the ones performed by Raudonen (2008) and De Mooij and Ederveen (2001, 2008) summarize a variety of studies using different methodologies and samples. They show that at least in some decisions taxes have a significant effect in FDI.

Table 5: Summary of qualitative studies on FDI responsiveness to taxation and other determinants (*¹ **²).

Year	Reference	Research Focus	Empirical method	Tax effects on FDI inflows
1950s	Barlow and Wender (1956)*	Companies' strategy to invest abroad	Interview of 247 U.S. firms	10% of the firms listed favourable taxes as an incentive (ranked 4th in the list of determinants)
1960s	Robinson (1961)*		Survey of 205 firms	Host governments consider tax incentives determinant while investing firms omit them
	Aharoni (1966)*	How foreign investment decisions are made by U.S. manufacturing firms	Interviews in 38 US corporations	
1970s	Reuber (1973)**	Effect of tax incentives on different investor profiles	Survey of 69 international firms	Impact of tax rates greater in export-oriented companies than in domestic market seekers.
1980s	The Group of Thirty (1984)*	Which factors most influence the investment decisions of MNEs	Survey of 52 MNE over 19 factors identified as affecting FDI inflow	Inducements offered by host countries ranked 7th in developing countries and 8th in industrialized countries
	Guisanguer (1985)**	Impact of location incentives on international investment decisions	Survey to 30 international firms with regard to 74 investment decisions in 20 countries	More than 65% of investors report that without an incentive package they would have abandoned the project and re-located
1990s	Rolfe (1993)*	Firms' responsiveness to different types of tax incentives	Surveys to U.S. firms' managers	Start-up companies prefer incentives that reduce their initial burden while established firms prefer incentives that target profit
	Wilson (1999)	Firms' responsiveness to different types of tax incentives	Summarize the main results of the literature on tax competition	Identified several examples of corporate investment location decisions driven by tax
2000s	Grčić and Babić (2003)	Evaluation of CEEC attractiveness to foreign investors in face of most important previously confirmed incentives	Analytic Hierarchy Process (AHP), assuming institutional development poses the most important factor	Does not consider taxes as a main determinant

¹References cited in Morisset and Pirnia (2001).

²References cited in Moran (1999).

	Devereux (2006)	Analysis of empirical evidence on the effects of taxation on investment location decisions of MNEs	Survey on previous studies' results grouped by variable-choosing approach	Taxation plays a role affecting MNE's choices; however, tax is not equally important in all decisions
	Raudonen (2008)	Review of literature on determinants of FDI with emphasis to taxation in order to prevent negative effects of taxation in Estonia	Analysis of previous studies which found significant impact of taxation on FDI, including surveys and empirical models	Semi-elasticities to tax differentials are significant for both credit and exemption systems (Raudonen, 2008)
	De Mooij and Ederveen (2008)	Summary of the results of previous econometric studies that find taxation as a determinant factor of FDI but are based on different frames	Meta-Analysis	The largest tax based elasticity concerns effect of statutory tax rate (STR) in Profit Shifting FDI

Source: Own elaboration (2010)

The previous table leads to infer that although surveys' results are very ambiguous, more recent works tend to refer a higher importance of taxes for investors. This pattern appears in line with the steep increase of tax competition and inward FDI after the 1990s. Despite the trend in considering taxes significant FDI attraction factors, contradictory results remain from the early studies until now. Moreover, there are some major pitfalls in the survey methodology that may lead to biased results. First, most of the studies are based on final location choice only, not knowing which territories were in option and second, they make assumptions on rules used by the firms while the decisions are made by managers (Buckley *et al*, 2006). For these reasons it is necessary to extend the literature review to econometric analyses in order to support a better understanding of the role of taxes in FDI attraction.

2.2 Econometric Analyses

There is ample empirical literature on the influence of taxes on FDI. Econometric studies generally regress a dependent variable measuring investment (e.g. amount of FDI, plant, property or equipment) on an independent variable accounting for taxes using other independent variables thought also to influence FDI. Extant studies differ in the proxies considered for FDI and tax rates, and apply to different regions during

different periods (De Mooij and Ederveen, 2005). Thus, a careful evaluation of results is needed in order to draw the appropriate conclusions.

One of the first econometric studies focusing on taxation and FDI was done in the *1980s* by Hartman (1984). He explains FDI as dependent on the after-tax rate of return on investment (ROI) of foreign investors. Gross ROI is reduced by taxes levied on FDI. Hartman also distinguishes between FDI financed by retained earnings and by transfers of funds (equity and debt), as the latter are not supposed to be sensitive to taxes as stated in the previous chapter. Hartman's intention was to test the responsiveness of foreigners' investments in the US to changes in domestic tax parameters. He demonstrated that a decline in the total rate of tax collection on foreign income of 20.9%, FDI in the U.S increases 20.39% (i.e. a semi-elasticity³ of taxes on investment around -0.97), which represents a responsiveness to taxes that almost balances the decline in tax revenue, thus having little welfare effects (Morriset and Pirnia, 2001).

Over the same period, other studies such as Gordon and Wilson (1986) compared the responsiveness of domestic and foreign firms to overall tax rates and to the presence of unitary and nonunitary tax structures in several states in the U.S. Moore, Steece and Swenson (1987) actually found out that foreign firms were unresponsive to overall tax cuts but negatively influenced by the presence of unitary tax structures.

In the early *1990s*, one of the main criticisms raised upon previous works was that they did not isolate tax effects on FDI, i.e. they did not consider independent variables, other than taxes, that would help explain variations in FDI biasing downward tax significance. For this purpose, Slemrod (1990b) used controls for other variables considered FDI determinants, such as GDP, unemployment and exchange rates. He found that, against previous beliefs, transfers of funds have a more significant semi-elasticity than retained earnings. Slemrod also controls for taxation system in the home country. He argued, like it was stated in the theoretical background, that tax response by investors from credit countries is different from those of exemption countries. Those from exempt countries are expected to be more responsive to higher taxes, in other words, have higher elasticity of taxes on investment. However he found no clear pattern indicating that investors from exemption countries are more sensitive to tax changes than others.

³ Semi-elasticity of x on y may be defined as the percentage change in y due to 1% increase in x, or $E_{yx} = (\Delta Y/Y) / (\Delta X/X)$ and can be understood as a mathematical definition for sensitiveness (see De Mooij and Ederveen, 2005).

Over the same period, authors increasingly tried to adopt measures of FDI that would better approximate real investment in capital instead of using aggregated data (De Mooij and Ederveen, 2005). Hines and Rice (1994) differentiated FDI into “Aggregate Earnings” (with property, plant and equipment as proxies) and “Reported Profits” and found a high semi-elasticity between -3,3 and -6,6 of taxes that represents the sensitivity of US investors in 33 countries with respect to foreign effective tax rates. Swenson (1998) distinguished between six different types of FDI: new plants, plant expansion, mergers and acquisitions, joint ventures, equity increases and others. It resulted that the tax elasticity of new plants and plant expansion turned out significantly negative while significantly positive for mergers and acquisitions, as it would be expected after reviewing section 1.3 and 1.4. Hence, one may conclude that as mergers and acquisitions become a larger share of aggregated FDI, the tax elasticity is less likely to be significantly negative. By the end of the decade, some authors such as Billington (1999) and Broekman and Van Vliet (2000) tried using aggregate FDI flows to estimate the sensitivity to taxes (tax elasticity), regressing the logarithm of FDI to the square of the statutory tax rates. Although they do not distinguish retained earnings from transfers of funds, significant elasticity was found using panel data of seven to ten years.

It should also be noted that during the 1990s there were other studies that, in spite of using some differentiation on FDI flows, report insignificant tax elasticity. Jun (1994), who constructed a panel of 10 OECD countries investing in the US is one example. Friedman *et al* (1996) also found no evidence of host country’s STR affecting the number of US manufacturing branch plants by site of location.

In the beginning of the 2000s, after Devereux and Griffiths’ (1999) work on how to calculate the effective average tax rate (EATR) most empirical literature started using more refined measures for taxes. Grubert and Mutti (2000) use aggregated data from more than 500 U.S. MNEs to identify the role of host country effective tax rates in determining FDI in 60 potential countries. Results showed that the local average effective tax rates have significant effect on the amount that MNEs headquartered in the U.S. invest in that location. The elasticity was also found to grow with the opening of the trade regime, for the more restrictive is the regime, the higher the costs of exports.

These authors raise other issues such as ignoring the residual home country taxes and debt finance as previously done by Hartman (1984) and Sinn (1993), claiming that this

procedure will bias downward the estimated tax responsiveness of MNEs, because the variation in the tax burden across locations will be less than implied by the local rate. For example, if the home country holds a credit system and the parent does not expect to have excess credits, the residual home tax on potential repatriations may become relevant, since they will tend to narrow tax differentials between locations because the home country repatriation tax would be higher on distributions from low-tax countries (Grubert and Mutti, 2000). As a final result, they found that there is a highly significant effect of average effective tax rates on the location and investment decisions of U.S. manufacturing firms. This elasticity is lower on restrictive trade regimes for they have more restrictions to business in general and are less capable of lowering taxes to attract FDI, while it reaches approximately -3 for open regimes.

Table 6: Evolution of the empirical works on FDI responsiveness to taxation and other determinants through the last four decades⁴ (*⁵).

Year	Reference	Research Focus	FDI proxies	Tax proxies	Main independent variables	Tax effect on FDI	Host Country/ Home country /Period
1970s	Root and Ahmed (1978)*	Responsiveness of FDI to annual changes in tax rates	Aggregate FDI	Statutory Corporate tax rates	44 independent variables including market and political features and three tax-related variables	Corporate tax rates may determine investment attractiveness, however tax laws and liberality no	41 developing countries / ---- / 1966-1970
	Agodo (1978)*	Responsiveness of 33 U.S. Manufacturing firms to tax policy in developing host countries			Market and political characteristics	Insignificant	20 African countries/ U.S./ ???
1980s	Hartman (1984,1985) *	Determine the responsiveness of foreign investors to changes in the fiscal policy in the U.S.	FDI financed by retained earnings; FDI financed by external funds (equity + debt), called Transfer FDI	Federal corporate tax rate + local state tax rate + property tax applicable to foreigners	after tax rate of return	Retained earnings FDI responds to tax rates while Transfer FDI does not	U.S./ ---- / 1965 – 1979

⁴Dashed spaces correspond to irrelevant data for the study: the studies focus on host country rather on investors' home countries.

⁵References cited in Morisset and Pirnia (2001).

1990s	Swenson (1994)*	Differential impact of U.S. 1986 tax reform over FDI across diverse industries with varying taxes after the reform	FDI disaggregated by type of industry	Average tax rate (ATR)	no control variables	FDI increased with higher tax rates after the reform	U.S./ ---- / 1979 – 1991
	Devereux and Griffith (1998, 2003) ²	Firm level analysis used to estimate the impact of a new measure EATR in FDI location decision	Marginal/ Unitary investment	Effective average tax rate (EATR); Effective Marginal tax rate (EMTR)	no control variables	Average effective tax rate has greater impact on location decisions than marginal effective tax rate	EU / U.S. / 1997
2000s	Mold (2003)	Impact of the European Single Market on the location determinants of U.S. manufacturing FDI	Deflated FDI inflows at constant 1990 prices (real FDI)	(mentions taking EATR into consideration)	Supply side variables: labor cost (RULC), capital cost (BOND), exchange rates (REER), transaction costs (DIST, as distance between host country's capital and Frankfurt) Demand side variables: market size (GDP), market growth such as education, transport, infrastructure (GDPG)	Not used	EU/ U.S./ 1978-1995
	Vlahinić-Dizdarević and Biljan-August (2005)	FDI performance in the Southeast European Countries (SEEC)	Aggregate FDI inflow	not used	GDP percapita, GDPG, Index of infrastructure reform, Indexes of privatization, Index of trade liberalization, Inflation rate	Not used	SEEC/ --- -- / 1996-2002
	Bellak <i>et al</i> (2007)	Compare STR to BEATR as valid determinants for FDI inflow using Levenestest	Aggregate FDI inflow	STR and BEATR	no control variables	Elasticity derived from using STR is lower than from using BEATR and not accurate	CEEC/ --- -- / 1995-2005
	Wei and Zhu (2007)	The determinants of outward FDI	Discrete number of outward FDI	not used	Inflation (IFL), Economic growth rate (EG), ratio of imports and exports to GDP (openness), unemployment (U)	Not used	34 countries worldwide / ---- / 1985-2003
	Egger <i>et al</i> (2008)	How bilateral effects of taxation affect bilateral outbound FDI in OECD using panel-gravity model	Bilateral outbound FDI	BEATR, EMTR, EATR	GDP and GDPcap of home and host countries and market potential (using the inverse-distance weighted average size of all third-markets)	unilateral tax rates have a robust positive effect on FDI while bilateral tax rates have a robust negative effect	OECD/ --- -- / 1991-2002

	Bellak and Leibrecht (2009)	Evaluate whether low corporate income tax rates affect FDI inflow in Central and Eastern European Countries (CEEC), using panel-gravity model	Net-FDI-outflows	BEATR	GDP of home and host countries, Real unit labor costs, Annual privatization revenues, Inflation, Distance between countries and Political risk index	Tax lowering policies in CEEC have important impact on FDI growth	CEEC/ --- -- / 1995-2003
	Bellak et al (2009a)	The role of taxes and infrastructure in FDI attraction into CEEC.	Total bilateral FDI inward stocks.	BEATR	GDP of home and host countries, total and per capita; Aggregated measures of infrastructure (transport and telecommunications); wages and inflation.	High elasticity and high significance of taxes in attracting FDI. The significance only vanishes when the infrastructure index is very high.	CEEC 8 / OECD 7 / 1995-2004
	Bellak et al (2009b)	The role of public policy in attracting FDI	Bilateral Inward stock of industry level FDI.	EATR	R&D expenditures as percentage of GDP, political risk level, macroeconomic risk level (through Inflation), labour cost, labour productivity, ICT-infrastructure endowment and GDPcap	Significant reaction of FDI to EATR, although with a moderate elasticity	U.S.;old-EU;CEEC / ---- / 1995-2004

Source: Own elaboration (2010).

Table 6 shows a pattern that has been detected in more recent studies – most of them find a significant impact of taxes in FDI. Among other important methodological issues, these works have in common the use of Bilateral FDI stocks and account for international issues of taxation through bilateral effective tax rates (BEATRs). Concerning the control variables, choices are in line with what was discussed in section 1.2 of the previous chapter: Demand-side variables prevail over of supply-side variables since the first are more reliable determinants of FDI, since market-seeking investments are more prevalent than factor-seeking ones (Mold, 2003). Most authors refer to Dunning’s (1977) eclectic approach in order to choose these variables.

Bellak *et al* (2009a) found both taxes and infrastructure to be highly significant FDI determinants using a model which basically regresses the total bilateral inward FDI stocks on BEATR. It also found some interrelation between infrastructure endowment and the importance of taxes: the latter decreases with the previous as infrastructures generate rents that can be taxed without loss of FDI (Bellak *et al*, 2009a). Taxes are found to be significant determinants in other studies using industry level bilateral FDI stocks (Bellak *et al*, 2009b) and firm level bilateral FDI (Egger *et al*, 2008). According

to Bellak *et al* (2007), finding empirical evidence of the impact of taxes on FDI is mainly related to the use of an appropriate measure for taxes, which should be the conceptually superior BEATR.

Given all the literature surveyed, in particular the most recent empirical results (themselves arising from more sophisticated methodologies) summarized in De Mooij and Ederveen (2008), it is fair to conclude that that lower taxes would represent a location advantage for the host country, hence leading to FDI attraction. Following this reasoning, we posit the following hypothesis:

- **Hypothesis – Taxes have a significant negative effect on FDI attraction**

Chapter 3 – Empirical Analysis

This chapter aims at testing empirically the hypothesis postulated in the previous chapter and contrast the results obtained with the theoretical background and with prior literature on the same theme. This empirical application gathers the latest empirical and methodological insights on the effects of fiscal policy on FDI, combines them with other independent variables, i.e. other potential factors considered to influence MNEs' location decision, and performs a regression using data only from the last decade (2000-2007) for 9 OECD countries¹. This approach tests the hypothesis that high taxes have in fact a deterrent role on FDI attraction.

The present chapter starts by presenting the methodology used in the research. This includes the choice of proxies for all variables, some descriptive statistics on the calculation of tax burden and models used to test the hypothesis that *Taxes have a significant negative influence on FDI*. Finally, the results are presented and discussed.

3.1. Data and Variables

Before presenting the empirical model and the methods and assumptions used for calculating the proxies used, the advantages and drawbacks of different covariates used in the most relevant studies are analyzed. From the combination of this evaluation with data availability, FDI and Tax proxies are chosen for the core model in the next section.

3.1.1 Dependent variable: FDI (Bilateral inward FDI stocks)

As dependent variable, this research uses the bilateral inward FDI stocks expressed in millions of US dollars for nine OECD countries - Austria, Canada, Denmark, Finland, France, Germany, Italy, Netherlands and US - for the years 2000 to 2007. According to own calculations based on UNCTAD (2009) and OECD (2010), these bilateral stocks account for near 20% of the total world FDI stocks.

The purpose of this research is to capture the effects of taxes on real allocation of capital. As many proxies aim at doing this, we shall explain how we selected the FDI measure among the many options available. There are two main groups of FDI

¹In this dissertation, the countries and year span subject to analysis were chosen according to availability of data, primarily concerning FDI and taxes.

measures, *Real* and *Financial* data. The first group comprises FDI stocks and flows and the second includes firm-level real investment data (Bellak, 1998). Table 7 shows proxies used on empirical studies on FDI, their main advantages and drawbacks based on these two categories.

Table 7: Overview on proxies used for FDI and comments on their suitability.

Type of Proxy	FDI proxy	Pros	Cons
Real	Number of employees in foreign subsidiaries weighted by, for example, percentage share in nominal capital or intra company trade. PPE.	Gaining importance over financial indicators with the increasing of non equity arrangements (Bellak, 1998). Account for value added assets.	Information seldom available at the level and extent needed
	Number of patents, trademarks or R&D.	Anecdotal evidence suggests that intangible assets play an important role in the profit shifting of MNEs (Karkinsky and Riedel, 2009)	Requires firm-level information which is difficult or not possible to get for many important control variables
Financial	Flow - net sales of shares and loans to parent company + parent firm's share of the affiliate's retained earnings + total net inter-company loans provided by the parent company	Considered in many studies to represent the annual MNEs decisions.	The volatility of investment flows implies that single-period observations can be very misleading (Bellak, 1998). Does not necessarily account for real capital formation in the host country (Bellak and Leibrecht, 2009)
	Accumulated flow		Does not take into account for inflation changes through the years, which may have been fairly small in early years
	Stock – share of subsidiaries' capital and reserves attributable to the parent enterprise plus the net indebtedness of the associate to the parent firm	Considers inflation changes Closer measure of real capital.	Outflows and Inflows are booked separately in the parent and affiliate which may produce negative "book" figures Do not include locally raised funds and under or over estimate value-added activity (See Beugelsdijk et al (2010) for criticism on stocks as FDI measure).

Source: Own elaboration based on Bellak (1998).

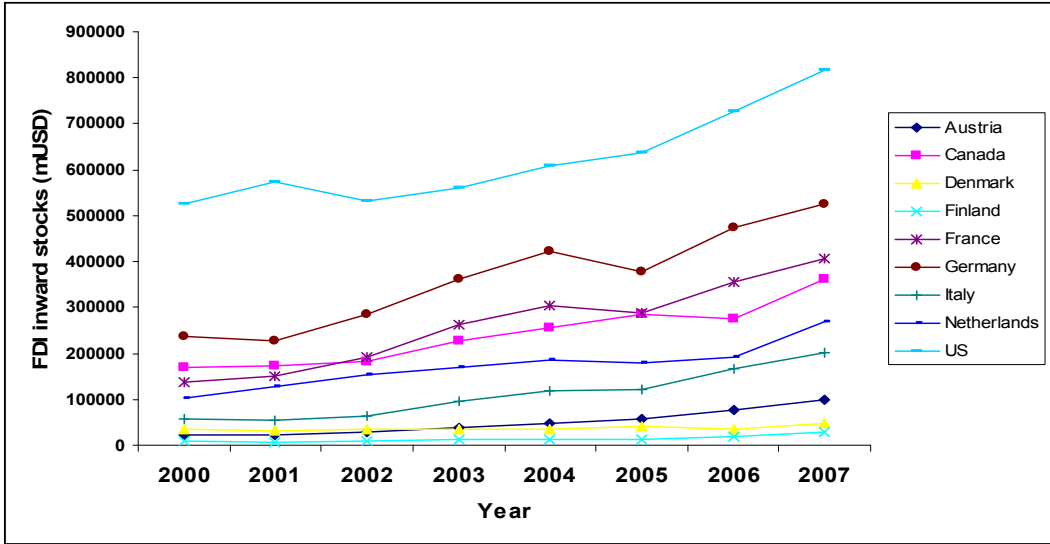
It is difficult to control many features of individual investments using financial aggregate data (De Mooij and Ederveen, 2005). First, characteristics such as particular transaction costs, risk of losing task shields (through increased excessive borrowing) or amount of fixed asset investments should be accounted for in a robust model (Moore and Ruane, 2005). This detailed information is particularly interesting for studies that aim to determine the sensitivity of asset-debt ratios to home country tax policies.

Second, as introduced in Chapter 1, one should expect a different reaction to taxes from M&A, greenfield or expansion capital - greenfield being more sensitive to taxes. This distinction among different modes of establishment may be relevant, as aggregate FDI may hide some important tax effects (Bellak and Leibrecht, 2005; De Mooij and Ederveen, 2001, 2008). Despite this, some authors assert that the bias that may be introduced by the use of more common data on flows and stocks does not seem to be substantial (Hajkova *et al*, 2006). Hence, given that there are no available bilateral FDI stocks differentiating among modes of establishment, this empirical part relies on financial aggregate data for exploring the impact of taxes in overall foreign capital.

Many studies have used either stocks or flows and either bilateral or unilateral data. Concerning the first issue, stocks are considered a closer proxy for real capital as they are taken directly from MNEs book values and include real and financial assets (Bellak *et al*, 2005), whereas flows might not even represent real capital formation. Addressing the second issue, bilateral data allow for controlling host and source country features of taxation and other variables such as market characteristics and distance possibly highlighting comparative advantages (Benassy *et al*, 2005a). The use of bilateral data has also shown small variability in tax elasticities and according to De Mooij and Ederveen (2005) two thirds of these results are significantly different than zero.

The following figure represents the evolution of the FDI measure chosen for the 72 country pairs under analysis (9 countries times 8 years).

Figure 3: Evolution of FDI inward stocks from partner countries under analysis from 2000 to 2007



Source: Own elaboration (2010) based on OECD statistics (2010).

All countries analyzed present a growing trend in FDI stocks with a general decline between 2004 and 2006. The annual growth rate was 11.4% for the period considered and the US, Canada, France and Germany receive together around 80% of total stocks.

3.1.2 Choice of proxy for the main independent variable: Taxes (BEATR)

The aim of this dissertation is to find whether or not taxes are a determinant location factor for host countries to attract inward investment. For this reason, one of the most important issues in the empirical part is to choose the appropriate measure for taxes. The proxy chosen is the Bilateral Effective Average Tax Rate (BEATR) and takes into consideration several aspects of home and host countries' taxation policies. As mentioned in Chapter 2, studies investigating a similar research question to this dissertation's have used a variety of measures to correctly evaluate the role of taxes in investment. At this stage it is important to compare measures and clarify the motivations for using the BEATR.

The following table summarizes some of the most widely used taxation measures, referred to in the Theoretical Background (Chapter 1), their advantages and pitfalls.

Table 8: Survey on tax proxies used for determining FDI responsiveness to taxation systems and comments on their performance.

Tax measure	Pros	Cons
Statutory tax rate (STR)	May determine the incentive for firms to shift income between countries, conditional on where their real activity takes place (Devereux <i>et al</i> , 2002)	High tax rate does not mean high tax payments, since the latter depend on the tax base (Devereux <i>et al</i> , 2002 and Bellak <i>et al</i> , 2007)
Tax Base	inversely related with the present discounted value (PDV), a measure of the generosity of the host country	Extremely complex to estimate, involving a vast range of legislation covering allowances for capital expenditure, the valuation of assets, the extent to which expenses can be deducted, etc.
Average tax rate (ATR)	Take into account tax planning activities and tax provisions	Industry level data often misleads firm level models' interpretation. Often inconsistent with EATR (Bloningen, 2005)
Effective tax rate (either marginal or average)	Combines both effects of tax rate and tax base	Estimations usually do not account for all complexities of the tax system such as the type of asset purchased and the way it is financed

Effective average tax rate (EATR)	Affects directly the profit level	In most estimations, it accounts only for the broad structure of the taxation system
Corporate income tax revenues as proportion of GDP	Combined with income tax revenues as proportion of all tax revenues, may indicate the extent to which the government relies on corporate income taxes	May hide the effects of attracting profitable inward investment with low tax rates
Bilateral corporate effective tax rates (BEATR)	Function of host country policies along with home country taxation system, international laws and supranational tax law (Bellak <i>et al.</i> , 2007)	Requires several assumptions when applied to aggregate investment instead of firm-level data.

Source: Own elaboration based on Devereux *et al.*, 2002; Bellak *et al.*, 2007 among other authors.

Most studies use STR to measure tax effects on FDI, but although these are important for profit shifting by MNEs, they do not capture all details of tax systems. For instance, a country with a high nominal corporate tax rate may offer a diverse range of dispensations which reduce the tax base. To overcome issues arisen by critics of earlier econometric studies, recent studies usually consider an effective tax rate to summarize the interaction between the various tax rules (de Mooij and Ederveen, 2001). Within the effective tax measures, accounting for the final impact of the tax burden in the investor, choices for proxies have varied from using EMTRs or EATRs (Effective marginal and average tax rates, respectively). The question relies on which type of behaviour of the MNEs the researcher wants to evaluate: The amount invested or the decision to invest, i.e, a marginal or discrete approach, respectively.

The unilateral framework of the EMTR has been developed by King and Fullerton (1984) and models the impact of taxation on the cost of capital (Devereux and Griffith, 2003), since the marginal tax rates are designed to capture incentives to the use of new capital (Fullerton, 1984). The EATRs, as proposed by Devereux and Griffith (1999, 2003), summarize the distribution of effective tax rates for an investment project over the range of profitability, being equal to an weighted average of the EMTR and STR.

Traditional analysis of the taxation of income from capital has focused on the impact of tax on marginal investment decisions (Devereux and Griffith, 1999). However, in this paper it is considered that the investor faces a choice between two or more mutually exclusive projects which translates the situation of MNEs' location decision. This consideration makes the EATR a better proxy relatively to the EMTR. Furthermore, the latest empirical works show that the EATRs developed by Devereux and Griffith (1999, 2003) and Yoo (2003) are more likely to show elasticity when the dependent variable is

FDI. The meta-data analysis performed by De Mooij and Ederveen (2008) indicates that approximately 80% of the studies using EATR show a significant elasticity, above the 47% of EMTR and 48% of STR as shown in the following table.

Table 9: Proxies on FDI and Tax and survey of the semi-elasticity obtained.

	Number of semi-elasticities	Number of significant semi-elasticities
Capital data		
<i>Financial data</i>		
Foreign direct investment (FDI)	208	115
Property plant & equipment (PPE)	73	45
<i>Count data</i>		
Number of locations	88	32
Number of new plants/plant expansions	43	15
Number of mergers & acquisitions	24	7
Other	11	7
All	427	221
Type of tax data		
Effective marginal tax rate	74	35
<i>Approximation average tax</i>		
Country statutory rate	29	14
Statutory rate in US states	133	48
Effective average tax rate	36	29
Micro tax rate	94	67
Macro average tax rate	61	28
All	427	221
Source of finance		
Retained Earnings	39	18
Transfers	84	47
Mixed	304	156
System for double tax relief		
Exempt	162	60
Credit	118	67
Mixed	147	94

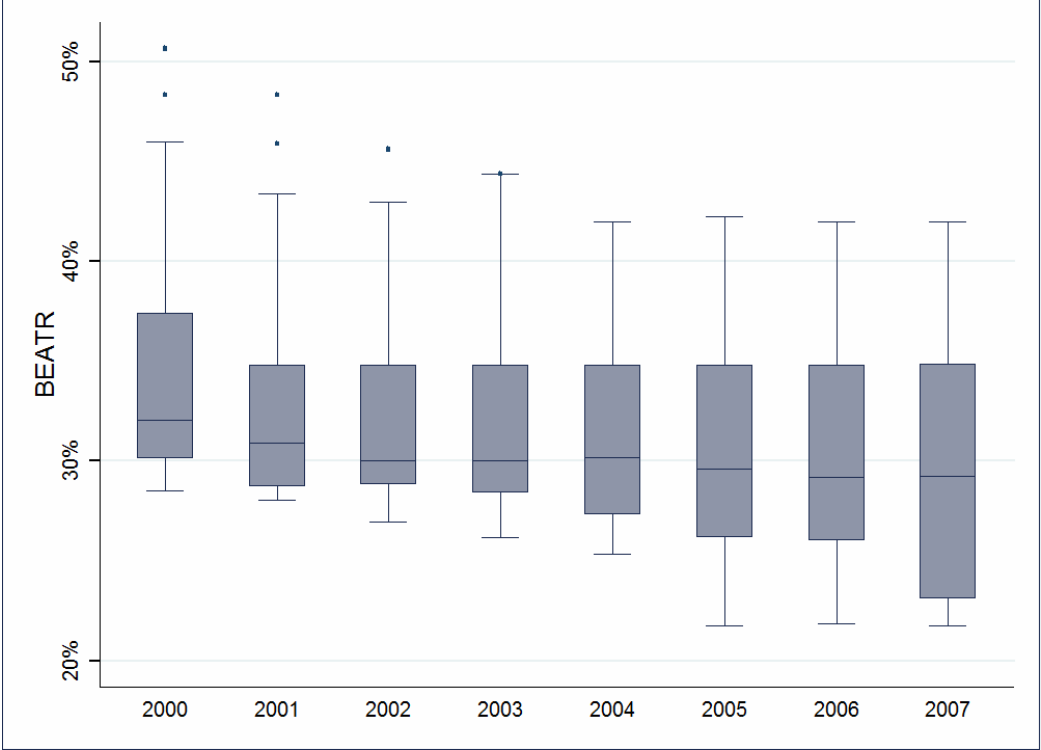
Source: de Mooij and Ederveen (2008).

Another study performed by Bellak *et al* (2007), states that tax rate elasticity derived from models using early proxies such as STR should not be used for policy decisions unless they are confirmed by using BEATRs. The latter are an upgraded version of an effective tax measure, (also called EATR for international investment: see Devereux and Griffith, 1999, 2003; Yoo, 2003) which takes into account the most diverse aspects affecting FDI mentioned in previous chapters. These vary from home country tax policy towards retained earnings and distributed profits, to the international tax laws arising from several international treaties and to the supranational tax laws referring to parent-subsidiary directives or interest-royalties directives. This measure is adopted by more recent studies (Hajkova *et al*, 2006; Egger *et al* 2008; Bellak and Leibrecht, 2009; Bellak *et al*, 2009a) with considerable positive results concerning the suitability for determining the elasticity of FDI location decision to taxes. Following the latest

developments in tax measures, this dissertation uses the BEATR as proxy for the overall taxation burden faced by MNEs.

The values of the BEATRs given in the following figures were calculated according to the methodology developed by Devereux and Griffith (1999, 2003) and Yoo (2003). The assumptions used for the estimation of the BEATR are detailed in appendix.

Figure 4: Boxplot evolution of host country BEATRs from 2000 to 2007 for the countries under analysis².



Source: Own elaboration (2010) using STATA.

Figure 3 shows that the median BEATR imposed by host countries on inward investment has declined from 34.5% in 2000 to 30.0% in 2007, in line with major empirical works listed previously. The high variation found may be explained due to diverse aspects of DDTs and different withholding tax rates on cross country flows of dividend and interest income (Hajkova *et al*, 2006; Egger *et al*, 2008).

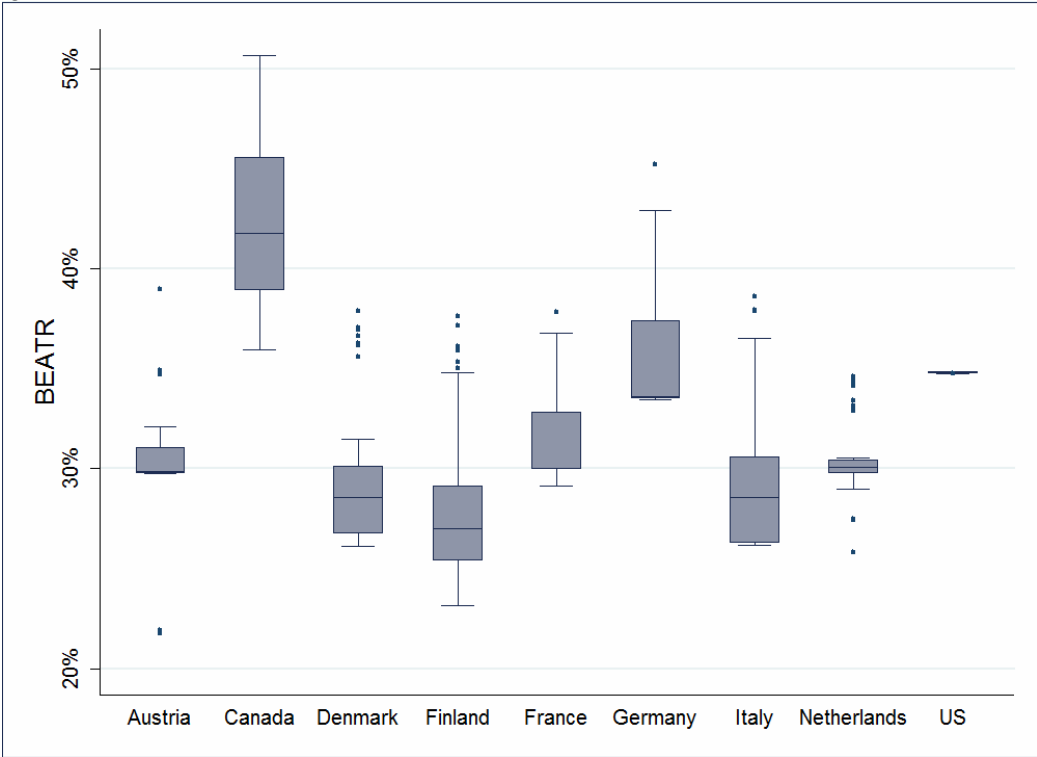
² The median value of each box plot (i.e., of all the values encompassed for each horizontal axis value) is depicted by the middle horizontal line that divides the box into 2 parts, which are equal if the median is the same as the mean. The lower hinge of the box represents the 25th percentile and the upper hinge the 75th percentile. The whiskers connect the box with a lower adjacent line representing the 10th percentile and an upper adjacent line representing the 90th percentile. Dots stand for outlier values.

Nonetheless, previous studies calculating the BEATR of OECD countries for the 1990s and the beginning of the 2000s found a convergence (i.e. a variance decline through the years) attributed to the efforts to harmonize tax rates (Hajkova *et al*, 2006).

The results in this dissertation clearly deny the predicted convergence for the period going from 2002 to 2007. Instead, the sample OECD countries show a growing variance in the BEATRs faced by foreign investors patent in the increasingly stretched boxes. It should be noted, however, that most studies vary policy factors only and keep constant the exogenous factors such as host country real interest rate and inflation in order to isolate effects of tax policy on FDI, as recommended by Yoo (2003). In this dissertation country-specific values of non-tax-related variables, such as real interest rate and inflation, are used to account for the real conditions faced by foreign investors in the host country. Under this assumption, the research question is extended to whether or not taxes are relevant for attracting FDI under the real economic conditions.

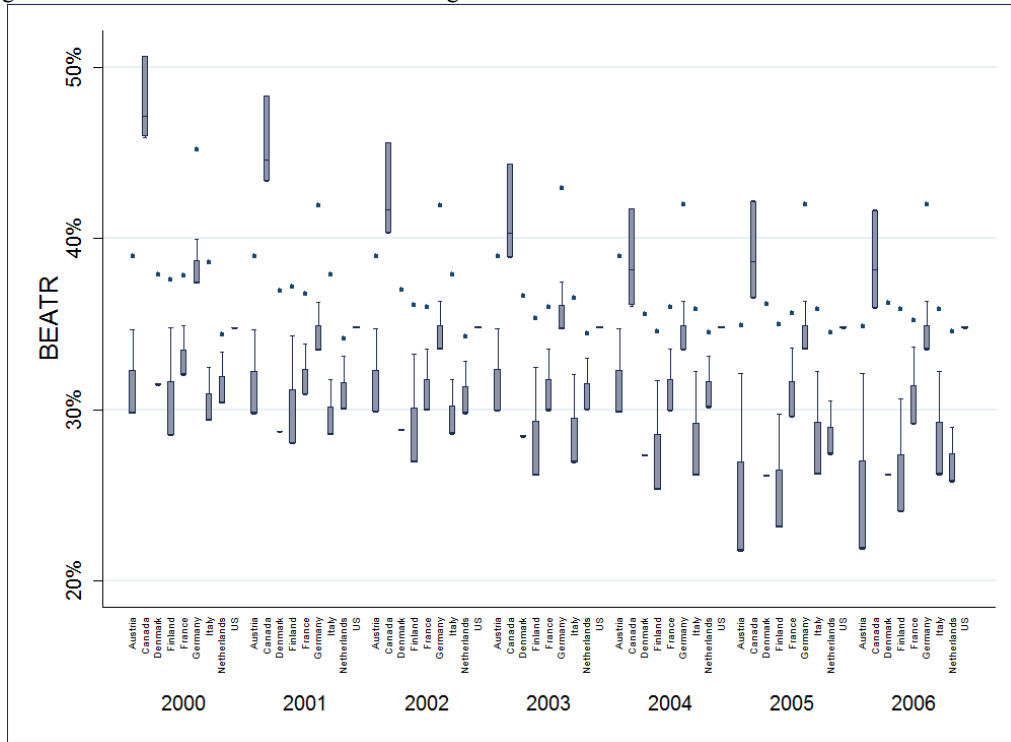
The variance in the box-plot for each year may be further explained by the variability among BEATRs for the 9 countries analysed. The following box-plots explore these variations.

Figure 5: Variation of BEATRs across countries.



Source: Own elaboration (2010) using STATA.

Figure 6: Variation in the BEATR across foreign investors from 2000 to 2007.



Source: Own elaboration (2010) using STATA.

Results indicate huge differences among the countries analyzed, accentuated with time. Austria presents the highest variation in taxation burden for different foreign investors through the 8 years inspected, oppositely to the US, which steadily maintains the same values of around 36% for the home countries analyzed. Concerning the median values, Canada shows the highest tax values while Finland shows the lowest.

3.1.3 Other independent variables

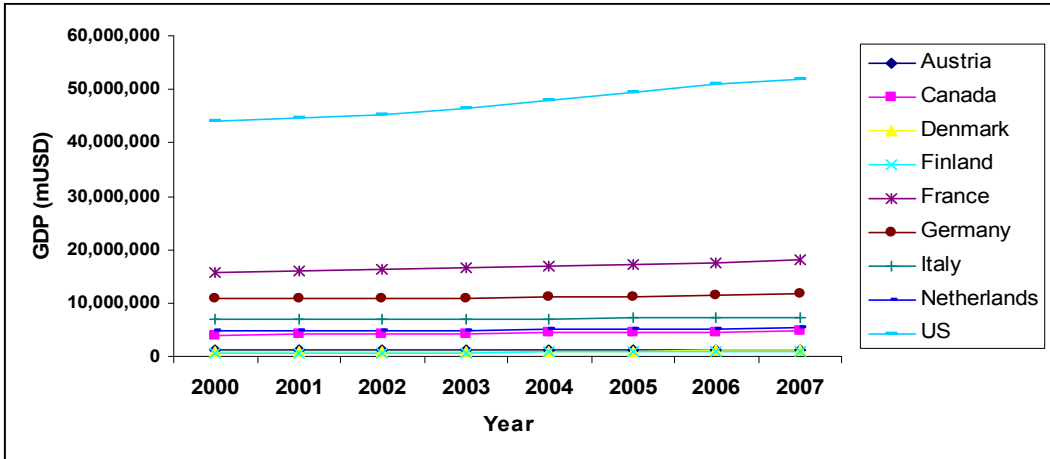
The choice of other variables for the present research follows the Markusen and Maskus (2002) view that OLI factors should be considered together in order to estimate effects on MNEs' location decisions. These factors include gravity factors such as market size and proximity, firm-specific economies of scale such as labour costs and variables covering economic openness, which are seldom covered together in one empirical study (Hajkova *et al*, 2006). In general, control variables are chosen for explaining FDI with different motivations, as described in Chapter 1.

Finally, the bilateral nature of the measures used for FDI and taxes is explored by using dummy variables for the taxation systems in the home countries, for the existence of

border between countries and also for a novelty of this study that deserves being highlighted: tax policy symmetry between host and home country.

Gross Domestic Product (hostgdp and homegdp), real GDP at market prices, is the sum of gross value added by all producers in the economy plus income from product taxes and minus subsidies not included in the value of the products (World Bank, 2010). Host country GDP serves as a proxy for the size of demand to be served by MNEs' affiliates while home country GDP is a proxy for the size of the pool of potential investors (Bénassy-Quéré *et al*, 2005a and 2005b). If FDI is mostly market seeking, the host country's market size should exert a clear positive effect on FDI (Egger *et al*, 2008).

Figure 7: Total GDP evolution for selected countries.



Source: Own elaboration (2010) based on World Bank's World Development Indicators , 2010.

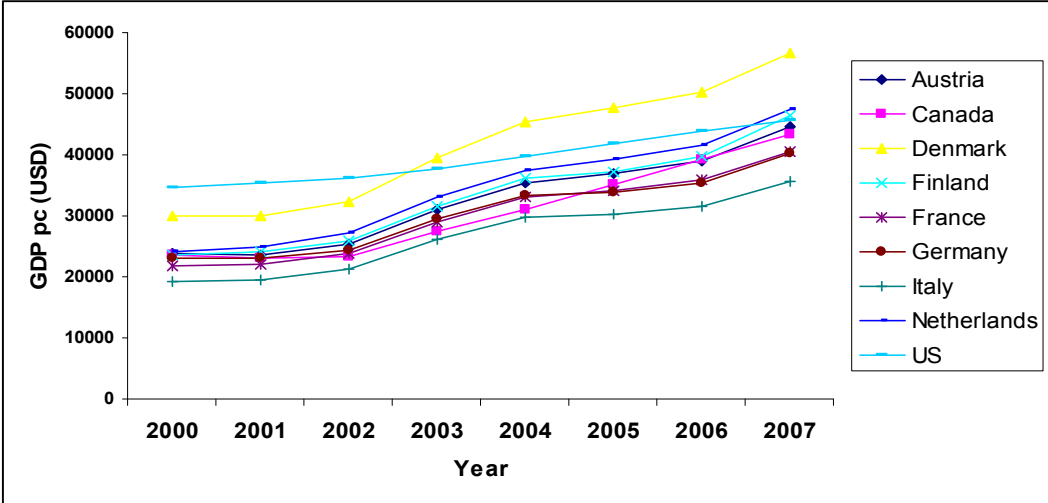
Data shows that the US stands out as an outlier with a huge market demand and pool of potential investors. This information agrees with the previous indication that the US is simultaneously the biggest source and attractor of FDI among the selected countries.

Total population (hostpop and homepop) is another market size variable that should have the same effect in FDI as *GDP* and shall be used for robustness purposes.

Gross Domestic Product Per Capita (hostgdppc and homegdppc) at current market prices is the GDP divided by the mid-year population. The GDP per capita in the home country stands for the capital abundance for investors and thus should have a positive effect on outward FDI. The host country GDP is often source of discussion and suggests ambiguous effects on FDI. Many authors (see Bénassy-Quéré *et al*, 2005a ; Bellak *et al*, 2009b) state that this indicator encompasses many host country location factors both

with potential negative effect on efficiency-seeking FDI (such as wage costs) and positive (such as favourable infrastructure endowment).

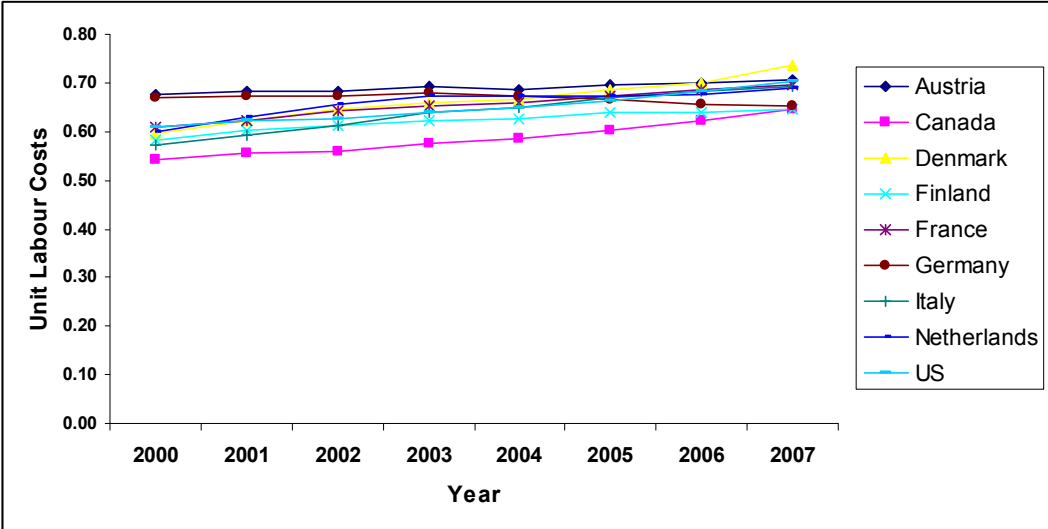
Figure 8: GDP per capita evolution for selected countries.



Source: Own elaboration (2010) based on World Bank’s World Development Indicators, 2010.

Unit Labour Costs (ulc) are the total labour costs per real output, i.e, they measure the average labour costs per unit of output. This variable is basically a link between productivity and the cost of labour (OECD, 2010) and helps determine to which extent FDI is efficiency driven (Bellak *et al*, 2009a). Since higher labour costs represent higher production costs, it is expected to have a negative sign.

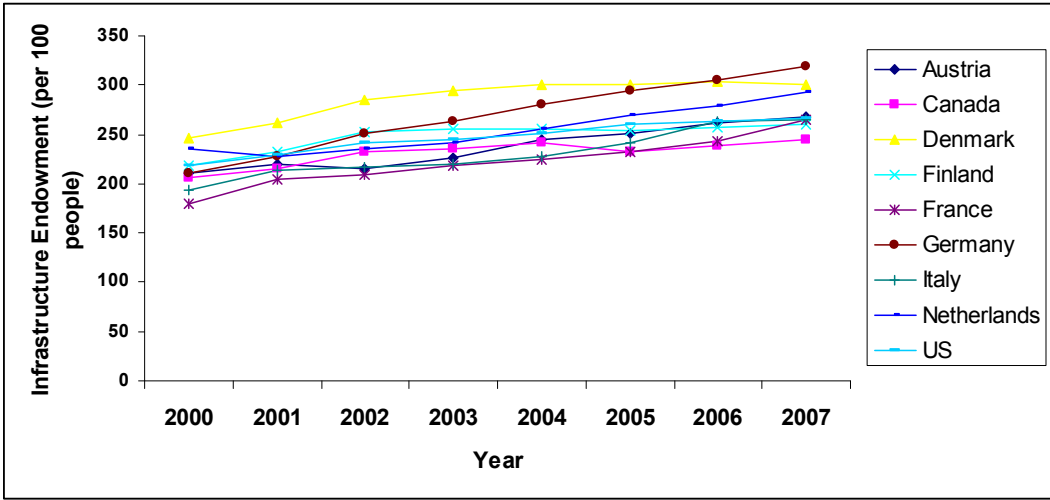
Figure 9: Unit labour costs in selected countries.



Source: Own elaboration (2010) based on OECD statistics, 2010.

Compound communications' infrastructure endowment (infra) is the sum of internet users plus telephone lines plus mobile and fixed phone subscribers per 100 people. This variable is an extension of labour productivity and is chosen in line with the latest studies that find telecommunications' infrastructure a more significant (positive) FDI determinant than other types of infrastructure, such as roads and electricity (see Mollick *et al*, 2006 and Bellak *et al*, 2009a).

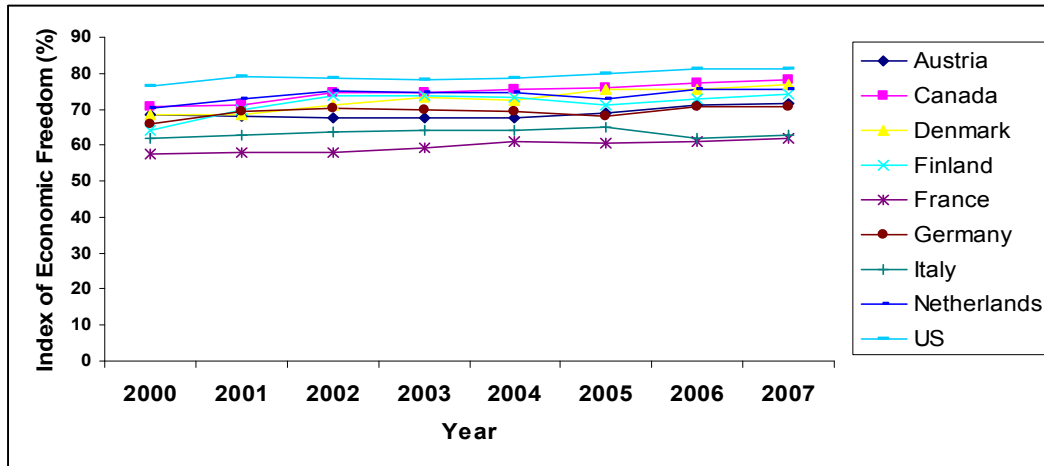
Figure 10: Compound infrastructure endowment for selected countries.



Source: Own calculation (2010) based on World Bank's World Development Indicators, 2010.

Index of Economic Freedom (efree) is the right of every individual to control his own labour and property and it is measured based on the rate (0-100) given to ten components: Business, trade, fiscal, monetary, investment, financial and labour freedom; government spending, property rights and freedom from corruption (The Heritage Foundation, 2010). Institutional measures have been widely used in research, ranging from political stability indexes (Park, 2003; Bellak *et al*, 2009b), corruption indexes (Egger and Winner, 2006) and other indirect measures of economic freedom such number of privatizations (Bellak *et al*, 2009b). In this dissertation a proxy is used that accounts for many of these aspects and since economic freedom means higher quality of legal institutions and less risk on economic transaction, it is expected that *efree* exerts a positive effect on FDI (Egger and Winner, 2004).

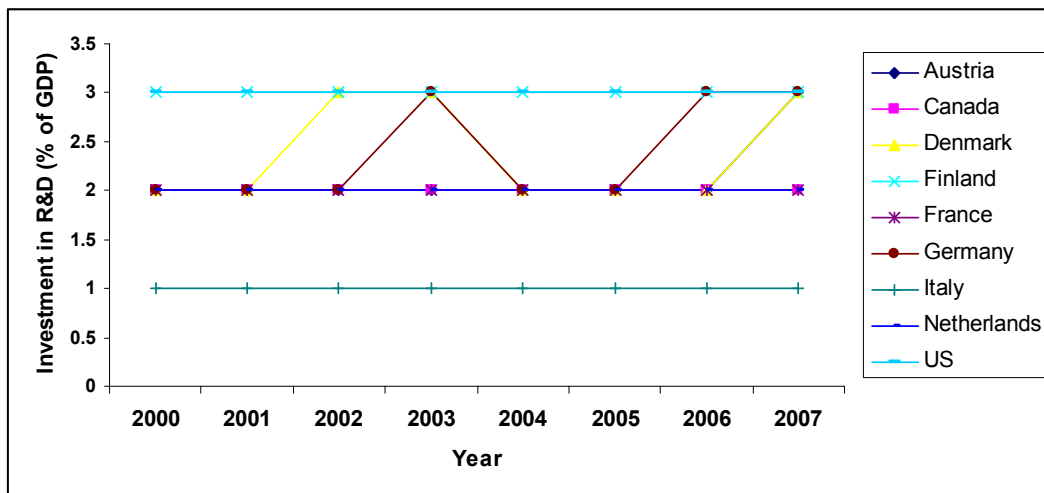
Figure 11: Index of economic freedom for selected countries.



Source: Own elaboration (2010) based on The Heritage Foundation, 2010.

Research & Development expenditures as percentage of GDP (rd) are current capital expenditures, public and private, on creative work that are used systematically to increase knowledge and its use in new applications (World Bank, 2010). R&D expenditure is considered a good proxy for the level of a country's intangible assets described in the OLI paradigm (Bloningen, 2005). This variable is expected to have a positive effect on FDI since an additional investment in R&D in the host country should increase productivity without additional costs (Bloningen, 2005; Bellak *et al*, 2009a). Recent studies such as Guimón (2008) indicate that FDI is increasingly compounded by R&D activities, reinforcing the prediction.

Figure 12: Investment in R&D of selected countries.



Source: Own elaboration (2010) based on World Bank's World Development Indicators, 2010.

Bilateral Distance (dist) is the distance in kilometres between the capital cities of home and host country using the calculator <http://www.geobytes.com/citydistancetool.htm>. A majority of studies revealed a negative sign of distance on FDI. First, new affiliates from market-seeking MNEs usually depend on the headquarters for starting up; second, trade flows between affiliates and headquarters are usually high for efficiency-seeking MNEs (Bellak *et al*, 2009b). However, distance may encourage FDI due to an internalization advantage. Based on previous findings, in this research it is considered that the negative aspects of distance outweigh the positive (Bellak and Leibrecht, 2009).

Existence of border between host and home country (border) is a dummy variable set to “1” when host and home countries have a common border. It is an extension to *dist* and intends to capture a possible non-linearity in distances (Bénassy-Quéré and Lahrèche-Révil, 2005). A common border may indicate cultural proximity and easier access to the host market and thus a positive sign is expected (Bellak and Leibrecht, 2009).

Existence of exemption system in the home country for dividend and interest (exdiv and exint) is a dummy variable set to “1” every time the home country of the investor exempts foreign affiliates from home taxes. The use of this variable follows the previous theoretical reasoning that although retained earnings are not sensitive to home country taxes, transfers of capital between parent and subsidiary are. This means that when the home country has an exemption system, MNEs are more likely to have an overall sensitivity to host taxes whereas a credit system may turn host taxes inconsequential (Bloningen, 2005). Since exemption systems enhance the FDI outflows to low tax countries, it is expected a positive sign of these variables at the cost of BEATR significance (Bénassy-Quéré and Lahrèche-Révil, 2005). However, since data used for taxation systems is set constant for whole period of analysis (see Appendix1), it happens that all countries studied use credit system for foreign interest income and all countries except the US use exemption system to treat dividend income. For this reason, it is of no use exploring the impact of these variables in the present study.

Symmetry of taxation policy between host and home country (sym) is a dummy variable set to “1” when host and home country have the same tax burden if every non-tax related variable in the calculation of the BEATR is set constant, including valuation and depreciation methods, inflation and real interest rate (see appendixes 1 and 2). Considering the notation T_{Hhj} , meaning the BEATR cleared from non-tax related

variables applied in host country H to a firm from home country h in period j , then

$$sym = \begin{cases} 0 & \text{if } |T_{Abj} - T_{Baj}| > 0 \\ 1 & \text{if } |T_{Abj} - T_{Baj}| = 0 \end{cases}. \text{ The purpose of introducing this new variable is to find a}$$

relationship between FDI and the parity between home and host country tax policies. Although this concept was not tested in other works (thus being a contribution and a novelty of this dissertation) it is expected that countries between which there is a high FDI flow, tax policies will tend to be harmonized. There are 16 observations where symmetry is found, representing around 6% of the total

Approximate symmetry of taxation between host and home country (symapp) is a dummy chosen using the same rationale as (*sym*) but setting the value “1” if the gap between host and home countries taxes towards each other in a certain period is equal or less than one percentage point. It is mathematically defined as

$$symapp = \begin{cases} 0 & \text{if } |T_{Abj} - T_{Baj}| > 1 \\ 1 & \text{if } |T_{Abj} - T_{Baj}| \leq 1 \end{cases}. \text{ Since it was found that it is highly improbable that}$$

perfect symmetry occurs, this variable was created in order to extend the symmetry impact analysis to country pairs with small variations between BEATRs. 88 country present these conditions, representing 17.5% of total pairs.

Squared difference between host and home country tax (deltatax2) is intended to capture the negative effects of asymmetrical behaviour between home and host taxation.

It is easily defined as $deltatax2 = (T_{Abj} - T_{Baj})^2$. Contrarily to *sym* and *symapp*, this variable should have a negative impact on bilateral FDI inward stocks.

3.2 Empirical Specifications

3.2.1 Model and descriptive statistics

The analysis of the effects of taxation in FDI is based on a one year lagged augmented panel-gravity model which basically regresses the logarithm of FDI bilateral stocks on several explanatory variables. The basic assumption is that the most important factors for trade are dimension of countries and proximity to each other (Bénassy-Quéré and Lahrière-Révil, 2005) and this model has been successfully applied to explaining FDI flows and stocks (see Bloningen, 2005) such as in Egger *et al* (2008) and Hajkova *et al*,

(2006). Gravity models use the gravitational force as analogy to explain economic phenomena such as trade flows (Reinert, 2010). This type of model is estimated using natural logarithms of the dependent variable and core explanatory variables. The core variables include GDP of home and host countries, distance between countries (see Bloningen, 2005; Bénassy-Quéré *et al*, 2005) and a location specific factor of main interest: taxes (see Bénassy-Quéré and Lahrière-Révil, 2005). The core model is further augmented with other independent variables represented in equation (1) as X_{njt} for variables varying across country pair and time, Y_{nj} for location factors varying over country pair, Z_{nt} for location factors varying over host country and time and W_{jt} for location factors varying over home country and time. Bun and Klassen (2002) also recommend that these models should use the lagged form of explanatory variables as followed, for example, by Bellak *et al* (2009a) and Egger *et al* (2008) to capture the market dynamics and eliminate possible endogeneity bias.

$$\ln fdi_1_{njt} = \alpha_1 beatr_{njt} + \alpha_2 \ln hostgdp_{nt} + \alpha_3 \ln homegdp_{jt} + \alpha_4 \ln dist_{nj} + \alpha_5 X_{njt} + \alpha_6 Y_{nj} + \alpha_7 Z_{nt} + \alpha_8 W_{jt} + \alpha_{nj} + \lambda_t + e_{njt} \quad (1)$$

All gravity variables are used in natural logarithms while the remaining variables are set either in levels or logs. Simple algebra may show that the interpretation of the coefficients α is different in the two cases. They represent *elasticity* for variables in logs and *semi-elasticity* for the level variables. While the first indicates the percentage change in the dependent variable due to a 1% change in the explanatory variable, the latter stands for the percentage change in the dependent variable due to a one unit increase in the explanatory variable.

In equation (1) α_{nj} accounts for specific country-pair effects capturing all unobserved time invariant influences on inward FDI, λ_t represents fixed-time effects reflecting time specific shocks specific to all countries and e_{jnt} is the remainder error term. The following table describes the variables included in the model.

Table 10: Description of proxies used in equation (1).

Type	Proxy	Description	Expected Sign	Source
Dependent variable	$\ln fdi_1_{njt}$ ³	Bilateral FDI inward stocks in logs one year ahead of independent variables.		Source OECD database (2010)

Explanatory variable of main interest	$beatr_{jnt}$	Bilateral effective tax rates as proxy of real tax burden on MNEs.	(-)	Own calculation based on Yoo, (2003) and Devereux and Griffith (1999, 2003) with raw data taken from World Bank WDI (2010), OECD Statistics (2010) and Yoo (2003).
Standard Gravity variables	$\ln hostgdp_{nt}$	Gross domestic product of host country in logs.	(+)	World Bank WDI (2010).
	$\ln hom etgdp_{jt}$	Gross domestic product of home country in logs.	(+)	
	$\ln dist_{nj}$	Distance in km between home and host countries' capitals.	(-)	http://www.geobytes.com/citydistanceool.htm
X_{njt}	sym_{njt}	Symmetry in tax policy between host and home country.	(+)	Calculation (2010) based on own BEATR calculations.
	$symapp_{njt}$	Approximate symmetry in tax policy between host and home country.	(+)	
	$deltatax2_{njt}$	Squared difference in tax between host and home country.	(-)	
Y_{nj}	$border_{nj}$	Existence of common border between host and home country.	(+)	
Z_{nt}	rd_{nj}	R&D expenditure of host country and percentage of GDP.	(+)	World Bank WDI (2010).
	$efree_{nt}$	Overall index of economic freedom.	(+)	The Heritage Foundation (2010)
	$\ln inf ra_{nt}$	Communications Infrastructure endowment in logs.	(+)	Own calculation: Internet users + mobile and fixed phone subscribers + telephone lines (per 100 people) taken from World Bank WDI (2010).
	ulc_{nt}	Unit labour costs	(-)	OECD statistics (2010).
	$\ln hostgdppc_{nt}$	Host country GDP per capita in logs.	(?)	World Bank WDI (2010).
	$\ln hostpop_{nt}$	Total population of host country in logs.	(+)	
W_{jt}	$\ln hom epop_{nt}$	Total population of home country in logs.	(+)	World Bank WDI (2010).
	$\ln hom etgdppc_{nt}$	Home country GDP per capita in logs.	(?)	

Source: Own elaboration (2010).

Using FDI in logs requires special handling of negative values. As there are only 5 negative FDI values³, 1% of all observations (504), these values are considered zero in the final vector of the transformed variable without being need to drop observations.

³ This may occur due to the accounting practice, i.e., between the begin and end of a period, FDI stocks change by the additional investment minus divestment and other transactions between the parent and affiliate (Bellak, 1998). This may lead to negative book values in the accounting sheet.

Table 11: Summary of all variables used in the research.

Variable		Mean	Std. Dev.	Min	Max	Observations
lnfdi_1	overall	8.5327	2.1383	0.0000	12.5930	N = 504
	between		2.0148	3.3965	12.1930	n = 72
	within		0.7493	3.2223	11.4091	T = 7
beatr	overall	0.3225	0.0540	0.2175	0.5067	N = 504
	between		0.0506	0.2604	0.4495	n = 72
	within		0.0195	0.2644	0.3861	T = 7
lnhostgdp	overall	15.3647	1.3131	13.4460	17.7442	N = 504
	between		1.3204	13.5204	17.6629	n = 72
	within		0.0387	15.2902	15.4621	T = 7
lnhomegdp	overall	15.3647	1.3131	13.4460	17.7442	N = 504
	between		1.3204	13.5204	17.6629	n = 72
	within		0.0387	15.2902	15.4621	T = 7
lndist	overall	7.6594	1.0328	5.8693	9.0757	N = 504
	between		1.0390	5.8693	9.0757	n = 72
	within		0.0000	7.6594	7.6594	T = 7
sym	overall	0.0198	0.1396	0.0000	1.0000	N = 504
	between		0.0498	0.0000	0.1429	n = 72
	within		0.1305	-0.1230	0.8770	T = 7
symapp	overall	0.1746	0.3800	0.0000	1.0000	N = 504
	between		0.2517	0.0000	0.8571	n = 72
	within		0.2860	-0.6825	1.0317	T = 7
deltatax2	overall	35.6944	46.3502	0.0000	256.0000	N = 504
	between		38.7110	1.7143	165.0000	n = 72
	within		25.8394	-33.7341	166.2659	T = 7
border	overall	0.1944	0.3962	0.0000	1.0000	N = 504
	between		0.3985	0.0000	1.0000	n = 72
	within		0.0000	0.1944	0.1944	T = 7
rd	overall	2.1746	0.6059	1.0000	3.0000	N = 504
	between		0.5705	1.0000	3.0000	n = 72
	within		0.2132	1.8889	2.8889	T = 7
efree	overall	70.0270	5.8824	57.4000	81.2000	N = 504
	between		5.5808	59.3000	78.8429	n = 72
	within		1.9567	63.0984	73.4270	T = 7
lninfra	overall	5.4873	0.1136	5.1874	5.7203	N = 504
	between		0.0799	5.3691	5.6482	n = 72
	within		0.0812	5.2789	5.6501	T = 7
ulc	overall	0.6425	0.0389	0.5422	0.7010	N = 504
	between		0.0301	0.5774	0.6877	n = 72
	within		0.0248	0.5845	0.6924	T = 7
lnhostgppc	overall	10.3329	0.2328	9.8663	10.8271	N = 504
	between		0.1364	10.1243	10.5575	n = 72
	within		0.1893	10.0586	10.6554	T = 7
lnhomegppc	overall	10.3329	0.2328	9.8663	10.8271	N = 504
	between		0.1364	10.1243	10.5575	n = 72
	within		0.1893	10.0586	10.6554	T = 7
lnhostpop	overall	17.1385	1.2977	15.4596	19.5138	N = 504
	between		1.3055	15.4674	19.4864	n = 72
	within		0.0123	17.1091	17.1684	T = 7
lnhomepop	overall	17.1385	1.2977	15.4596	19.5138	N = 504
	between		1.3055	15.4674	19.4864	n = 72
	within		0.0123	17.1091	17.1684	T = 7

Source: Own elaboration (2010) using STATA.

The descriptive statistics presented in Table 11 are the summary of the variables introduced in the previous section. The lagged form leads to a loss of one year of observations. Hence, FDI data report to the period of 2001 to 2007 while explanatory variables report to the period of 2000 to 2006, i.e., a period of 7 years.

There are 72 distinct host/home country pairs. Variation over time or a given group is called *within* variation while variation across groups is called *between* variation (Cameron and Triverdi, 2009). From the table above it is fair enough to state that there is bigger *between* variation.

Table 12: Correlation matrix of all variables.

Variables	beatr	lnhost gdp	lnhome gdp	lndist	sym	symapp	delta tax2	border	rd	efree	lninfra	ulc	lnhost gdppc	lnhome gdppc	lnhost pop	lnhome pop
beatr	1.0000															
lnhostgdp	0.3300	1.0000														
lnhomegdp	0.1131	-0.1242	1.0000													
lndist	0.5919	0.2331	0.2331	1.0000												
sym	0.1212	0.0107	0.0107	0.0414	1.0000											
symapp	0.0086	0.0483	0.0483	-0.0744	0.3093	1.0000										
deltatax2	-0.0925	-0.1918	-0.1918	-0.1781	-0.1078	-0.3475	1.0000									
border	-0.0762	0.1254	0.1254	-0.4831	0.0739	0.0117	0.1169	1.0000								
rd	0.0548	-0.0200	0.0029	0.1714	-0.0881	-0.0722	0.1114	-0.1169	1.0000							
efree	0.1872	0.0076	0.0057	0.2993	-0.0849	-0.0748	-0.0286	-0.1369	0.5404	1.0000						
lninfra	-0.2503	-0.2219	0.0470	-0.1033	-0.1110	-0.1083	0.1539	-0.0103	0.3211	0.4894	1.0000					
ulc	-0.4454	0.0133	0.0143	-0.2817	-0.0559	0.0079	-0.0230	0.1333	-0.0212	-0.0163	0.4587	1.0000				
lnhostgdppc	-0.2412	-0.0018	0.0234	0.0725	-0.1042	-0.1018	0.0200	-0.0816	0.3806	0.5538	0.7644	0.5107	1.0000			
lnhomegdppc	-0.1517	0.0234	-0.0018	0.0725	-0.1042	-0.1018	0.0200	-0.0816	-0.0304	0.1201	0.4627	0.4023	0.5809	1.0000		
lnhostpop	0.3849	0.9716	-0.1212	0.2789	0.0218	0.0368	-0.1627	0.1412	-0.0303	0.0289	-0.2329	-0.0410	-0.0506	0.0136	1.0000	
lnhomepop	0.1467	-0.1212	0.9716	0.2789	0.0218	0.0368	-0.1627	0.1412	0.0040	-0.0015	0.0352	0.0102	0.0136	-0.0506	-0.1249	1.0000

Source: Own elaboration (2010) using STATA.

Table 12 shows correlations between all variables. As expected, host and country GDP *per capita* present the highest correlations with other explanatory variables suggesting that these might have several endogenous location factors. Yet, no correlation is above 0.8, the common threshold for accepting that there is no multicollinearity between factors (Bellak and Leibrecht, 2009). Exceptions are host and home country populations that may be considered substitutes for host and home country GDP.

3.2.2 Estimation procedures

To test the robustness of the gravity model chosen for this analysis, the first regression is the simple Pooled OLS with only core gravity variables. The subsequent estimation procedure is the basic general-to-specific approach, starting with the most general model and progressively testing down until only statically significant variables are included (at 10% level). This procedure reduces the probability of omitted variable bias and tests the robustness of tax semi-elasticity (in line with Bellak and Leibrecht (2009) and Bellak *et al* (2009a)). Country-pair specific effects might be fixed (correlated with explanatory variables) or random (not correlated with explanatory variables). In the present study these effects are considered random in the preferred models. First the Hausman-tests do not reject the null hypothesis that the individual effects are random in the first two (preferred models); the first test compares random and fixed effects estimators assuming that there is no serial correlation or heteroscedasticity, the second is the regression based Hausman-test based on cluster robust standard errors (Woolridge, 2002; Cameron and Triverdi, 2009). Second, random effects allow estimating the impact of time fixed variables such as $border_{nj}$ and $\ln dist_{nj}$. Finally, our main concern is the decision of MNEs between different host countries and the country-pair effects are efficiently explored by the random estimator. For convenience, the variables $\ln hostgdppc_m$ and $\ln hom etgdppc_m$ are dropped in the first five models to avoid endogeneity with home and host country location factors such as infrastructure, R&D expenditures, labour costs and the taxation systems. In the last three models these variables take the place of $\ln hostgdp_m$ and $\ln hom etgdp_j$ in order to compare the explanatory power of introducing alternative gravity variables in the preferred model.

3.3 Results and Discussion

Table 13 shows the results obtained for the eight models used which are further divided into four categories as follows. The core gravity model is M0 and includes only gravity specific variables such as host and home country size and distance between countries. The general models M1.1 to M1.3 include gravity specific variables and all location factors differing in the type of symmetry-related variable. The preferred model, M2, includes gravity specific variables and all significant (at least at 10% level) location

factors. Finally, there are variations to the preferred model that test other proxies for host and home country size like GDP *per capita*, population or a combination of both. As expected, all core gravity variables are strongly significant in the first five models, corroborating theoretical beliefs that market size and distance (i.e. transaction and transportation costs) are basic explanations for FDI (Bloningen, 2005). Alone, gravity variables account for a high R-squared of 0.633, thus constituting a solid framework for the subsequent augmented models. Plus, the elasticity of distance on FDI is negative as expected and close to the unity in absolute value in the first model what corresponds to usual findings in gravity models (Bénassy-Quéré and Lahréche-Rèvil, 2005).

As stated previously, in the M1.1 to M1.3 and M2 models the Hausman tests indicate that the random effects estimator should be used and results show that these models present high overall explanatory power and robust Wald tests in line or above the gravity models used by Bellak *et al* (2009b), Bellak and Leibrecht (2009) and Bénassy-Quéré and Lahréche-Rèvil (2005).

Models M2' and M2'' reject the random effects estimator and thus a fixed effects estimator is used. Even if the robustness of these models is confirmed by the F-test, the explanatory power of the models is significantly lower with most variables being insignificant. This suggests that, as expected, replacing GDP with GDP *per capita* probably introduces mixed effects and reduces the explanatory power of the preferred model. Better results are obtained with M2''', where GDP is replaced only by population. This result restates the confidence on the gravity model since it is possible to have similar results to M2 (preferred model) using gravity variables other than GDP. Despite the similarity between M2 and M2''' in terms of elasticities and semi-elasticities, the previous model presents higher R-squared and therefore remains the preferred one.

Table 13: Summary of empirical results obtained for the eight models.

Variables	Core Gravity	General / Symmetry Effects			Preferred	Variations to Preferred		
	M0	M1.1	M1.2	M1.3	M2	M2'	M2''	M2'''
beatr		-4.065** (2.065)	-3.908* (2.100)	-4.053** (2.052)	-4.193** (1.951)	-4.780* (2.740)	-5.905** (2.712)	-5.649*** (2.042)
Inhostgdp	1.076*** (0.110)	1.117*** (0.122)	1.119*** (0.122)	1.121*** (0.122)	1.179*** (0.114)			
Inhomegdp	1.012*** (0.0928)	0.964*** (0.0970)	0.968*** (0.0976)	0.969*** (0.0977)	1.020*** (0.0963)			
Indist	-0.711*** (0.122)	-0.494** (0.191)	-0.507*** (0.184)	-0.497*** (0.187)	-0.641*** (0.148)	dropped (0)	dropped (0)	-0.357*** (0.0839)
sym		0.00466 (0.131)						
symapp			-0.125 (0.129)					
deltatax2				0.000517 (0.00125)				
border		0.475 (0.361)	0.459 (0.353)	0.462 (0.357)				
rd		-0.0160 (0.0921)	-0.0150 (0.0920)	-0.190 (0.0904)				
efree		0.0271 (0.0180)	0.0273 (0.0176)	0.0286* (0.0171)	0.0325** (0.0163)	0.0177 (0.0234)	0.0230 (0.0249)	0.0343* (0.0177)
Ininfra		2.362*** (0.433)	2.342*** (0.436)	2.316*** (0.433)	2.598*** (0.458)	0.919 (0.699)	0.488 (0.827)	2.901*** (0.460)
ulc		1.885 (2.279)	1.938 (2.315)	1.948 (2.313)				
Inhostgdppc						0.927* (0.539)	0.684 (0.586)	
Inhomegdppc						0.430 (0.488)	0.976 (0.606)	
Inhostpop							-10.73 (5.895)	1.219*** (0.131)
Inhomepop							6.940* (5.773)	0.979*** (0.107)
cons	-18.09*** (2.382)	-34.48*** (3.454)	-34.44*** (3.446)	-34.49*** (3.462)	-35.53*** (3.708)	-10.23*** (3.828)	54.44 (94.40)	-40.17*** (4.197)
N	504	504	504	504	504	504	504	504
r2	0.633					0.307	0.317	
r2_o		0.662	0.661	0.661	0.658	0.00970	0.0322	0.587
r2_b		0.714	0.713	0.714	0.710	0.00740	0.0387	0.629
r2_w		0.287	0.290	0.288	0.285	0.307	0.317	0.283
F	57.28***					22.59***	20.45***	
Wald (Chi2)		7284.46***	7285.17***	7294.40***	7126.6***			5003.6***
Hausman(Chi2)		9.16	7.45	7.15	8.50	19.60***	12.52*	11.90**
Hausman(F)		1.07	0.91	0.86	1.21	2.61**	3.24***	1.46
pvalue	0.00317					0.00379	0.000508	
ll	-844.9					-476.6	-473.0	

Standard errors in parentheses
* p<0.10, ** p<0.05, *** p<0.01

Source: Own calculation (2010) based on STATA.

Concerning the effects of taxes on FDI, the results show that the latter are at least partially explained by the first, with significant results in all models from M1.1 to M2'''. This confirms the robustness of the BEATR as explanatory of inward FDI. The semi-elasticities drawn are similar to those of other studies using augmented panel-gravity lagged models using the BEATR as explanatory variable of inward investment. In practice, table 13 indicates that 1 percentage point increase in the tax burden should decrease investment between 3.9%-5.9%. This is in line with the findings from Hajkova

et al (2006) of 3.52%-5.38%, using a OECD sample and Bellak and Leibrecht (2009) of 4.27%-4.29%, using a CEEC sample and De Mooij and Ederveen's (2008) meta results of 5.9%. Actually, a higher tax elasticity was obtained when the proxy for infrastructure endowment was dropped, meaning that controlling for infrastructure reduces the explanatory power of taxes as derived by Bellak *et al* (2009a). Nonetheless, since there is loss of significance in the core gravity variables in this model, this version of M2 was only ran for robustness purposes and does not figure in table 13.

Focusing on results from M1.1 to M2, there are other results should be addressed in this analysis. According to what was predicted, both the level of openness and free access to labour and markets and the communications' infrastructure endowment create a positive effect on FDI. In fact, the latter is highly significant through all models and presents a high elasticity ranging between 2.4-2.6.

Other results diverge from the first expectations. Symmetry variables show no relevant effect on FDI inward stocks which suggests that parity in tax policy between home and host country has no effect on investment. However, it should be noted that the approximate symmetry variable *symapp* reduces both the semi-elasticity and explanatory power of the BEATR, indicating that this latter measure might be decomposed into other tax features. Labour costs prove insignificant when compared to the robust positive elasticity of communications' infrastructure. Even though major studies have found communication's infrastructure a significant factor in attracting FDI, Bellak *et al* (2009b) indicate that these would be more relevant in CEECs whereas reduction of labour costs (through reduction of non-wage labour costs) would be more relevant for efficiency-seeking in more developed OECD countries. Moreover, the existence of common border and R&D expenditure seem insignificant determinants of FDI for the countries studied. In the first case it is possibly due to the bigger explanatory power of the gravity factor *distance* and in the second case due to the similarity in the R&D figures between countries and over the years.

Chapter 4 – Conclusions and Policy Implications

This chapter is an assessment of this dissertation concerning the achievement of the objectives proposed. It is evaluated how the results adhere to theoretical beliefs and agree with previous empirical studies and how clearly the results answer the research question. At the end, shortcomings of the present work are pointed out along with suggestions for future development in the same area.

The aim of this research was to test whether or not taxes significantly affect the amount of FDI that MNEs allocate to foreign locations. The results presented and discussed in the previous chapter indicate with a high degree of certainty that high taxes negatively affect FDI. In agreement with the theoretical background, specifically with the OLI framework, it was also acknowledged that host and home market characteristics are positively related to FDI while distance, which accounts for potential information costs, is negatively related. In line with previous empirical works it is also found that specific location factors such as infrastructure endowment and overall economic freedom also prove to be important FDI determinants. However, previous hypotheses and results showing that labour costs would be relevant for MNEs decisions are not corroborated in this research. This might indicate that the motivations underlying FDI are shifting from Resource-Seeking and Efficiency-Seeking to predominantly Market-Seeking or to other motivations such as escaping restrictive legal barriers in the home country.

Concerning taxes, the results induce two main conclusions. First the derived tax semi-elasticities are fairly robust across the preferred specifications and show an absolute value in line with the most recent works covering data until the beginning of the 2000s. This indicates that the role of taxes derived using the appropriate measures (BEATR) is steadily an important tool for policy makers to attract FDI despite the pressures to reduce tax competition and harmonize tax policies. Second, the issue overlooked in previous works relatively to tax symmetry between home and host country does not seem to affect the amount of FDI but, depending on the symmetry variable, may affect the BEATR, reducing its explanatory power. This result might suggest that MNEs decisions have little to do with the institutional relationship between countries, that DTTs have not been successfully promoting FDI growth or simply that a new streamline of work is required to decompose tax effects into detail-variables such as

symmetry. In this case, the results obtained through the novel approach introduced open an important door towards providing policy makers with more precise vision of the tools that they might have in hands, such as approximating tax measures with partner countries in order to create a synergy for increasing FDI.

While this study is an important step towards answering the proposed research question, there are some aspects that should be enhanced in further studies. First, the use of aggregated FDI data does not allow exploring important features of both taxes and FDI such as the as the impact of taxes on different components of FDI or the estimation of the BEATR according to real firm level activity. Second, the lack of available data concerning countries' tax codes has disabled the possibility of controlling for the effects of different taxation systems on the MNEs sensitivity to taxes, an issue not resolved in recent literature.

Appendix 1: Estimation of the Tax Burden

In order to fully understand the calculation of the tax measure used in this work, it is first explained the methodology and assumptions for the EATR and, following, the respective extension to international investment: the BEATR.

Calculation of the EATR - Domestic Investment

The general expression of the EATR according to Devereux and Griffith (2003) comes as:

$$EATR = \frac{R^* - R}{\frac{p}{1+r}}, \quad (1)$$

where R^* represents the net present value (NPV) of the investment to the shareholder in absence of taxation and independently on how the investment is financed. DG, 2003 derive this parcel as:

$$R^* = \frac{p-r}{1+r}, \quad (2)$$

Being p the real financial return r the real interest rate. In this paper, for the calculation of p it is used the recommended economic rent of 20% ($p=30\%$) used in Devereux and Griffith (1999, 2003) and also in Egger et al (2008) in agreement with the European Commission (2001). This means that a certain company undertakes an investment with the same rate of return despite the different host countries, in other words, investments are assumed to be equally profitable Yoo (2003). Concerning r , it is used the host country real long-term interest rates taken from OECD online statistics (2010), from 2000 to 2009. As stated in Chapter 3 most authors use a fixed rate of return on alternative investments of 5% (Römisch and Leibrecht, 2006; Egger et al 2008). Their purpose is to compare measures of tax burden that consider all mutually exclusive projects with the same potential profitability and the same opportunity cost on investment to single out tax burden effects (Yoo, 2003 and DG, 2003).

In (1) R represents the NPV of the post-tax economic rent and it is assumed in the main literature (for example Yoo, 2003 and OECD, 1991) to be composed by NPV attributable to investment financed by retained earnings R^{RE} , where the return from

investment is distributed as a dividend, and additional cost of raising external finance F :

$$R = R^{RE} + F, \quad (3)$$

DG (1999, 2003) details the parcels into:

$$R^{RE} = -\gamma(1-A) + \frac{\gamma}{1+\rho} \{(1+\pi)(p+\delta)(1-\tau) + (1+\pi)(1-\delta)(1-A)\}. \quad (4)$$

The NPV of external finance may have three components:

$$F^{RE} = 0, \text{ finance raised through retained earnings} \quad (5)$$

$$F^N = \frac{-\rho(1-\gamma)}{(1+\rho)}(1-\phi\tau), \text{ finance raised through new equity} \quad (6)$$

$$F^D = \frac{\gamma(1-\phi\tau)}{(1+\rho)}\{\rho - i(1-\tau)\}, \text{ finance raised through debt} \quad (7)$$

weighed according to OECD (1991) cited in Yoo (2003) as 55% for retained earnings, 10% for new equity and 35% for debt.

The variable A denotes the net present value of depreciation allowances on a unitary investment made and depends on the depreciation method in the host country, which may be Declining Balance (DB), Straight Line (SL) or a combination of both and the equations come from Yoo (2003):

$$A_{DB} = \frac{\tau\phi(1+\rho)}{\phi+\rho} \text{ and} \quad (8)$$

$$A_{SL} = \frac{\tau\phi(1+\rho)}{\rho} \left(1 - \frac{1}{(1+\rho)^N}\right) \quad (9)$$

N denotes the number of years for which depreciation can be claimed. In some studies such as Egger et al (2008), the most generous scheme is used in the presence of both. In this paper, if there is a switch from DB to SL after M years, the following equation is used (see Yoo, 2003):

$$A_B = A_{DB} \left[1 - \frac{(1-\phi)^M}{(1+\rho)^M}\right] + A_{SL} \left(\frac{1}{(1+\rho)^M}\right) \quad (10)$$

Furthermore, from the country tax codes, the depreciation schemes vary across the type of asset. For weighing purposes throughout this paper it is assumed that investment is made in three types of assets: 28% investment made in buildings, 50% in plant and machinery (P&M) and 22% in inventory, as recommended by OECD (1991) and Yoo

(2003). Where the NPV is based on the lifetime of the asset and no value is mentioned in the tax code, it is assumed that plant and machinery last for 8 years and buildings for 25 years (DG, 1999).

The following table describes the remaining input variables and parameters, their sources and simplifications where applicable.

Table 14: Description of variables and parameters used in equations from (1) to (10).

Variable	Description	Proxy	Source/Obs.
γ	Shareholder's net income of a unit increase of the dividends.	$\gamma = 1^1$	Main studies consider personal taxes negligible due to its irrelevance to FDI (Yoo, 2003).
ρ	Shareholder's nominal discount rate.	$\rho = i$	
π	Inflation	Consumer price index as proxy	OECD online database (2009) from 2000-2007.
δ	Economic depreciation rate	12.25% for P&M, 3.61% for buildings and 0% for inventories	OECD (1991) cited in Yoo (2003)
τ	Statutory tax rate	Corporate Income Tax on distributed profits.	Source OECD (2010) from 2000-2009, following the general assumption of absence of split-rate ¹
i	Nominal interest rate	$i = \pi + r$	Fisher identity
ϕ	Allowance rates for tax purposes	2001 data for OECD countries taken from Yoo (2003).	It is assumed that depreciation methods along with other characteristics (see calculation of BEATR) are relatively unchangeable over time (DG, 1999) and due to lack of available data this assumption is extended to allowance rates (It is fairly reasonable since, for example Yoo (2003) exemplifies "A" with fixed ϕ of 10%.

Source: Own Elaboration based on DG (1999, 2003), Yoo (2003) and Römisch and Leibrecht (2006).

The results are obtained using the assumptions outlined in Table13:

¹According to Römisch and Leibrecht (2006), in the absence of personal taxes and given the existence of a split-rate system, i.e., the host country applies different corporate taxes to retained earnings and distributed profits, then $\gamma = 1/(1-c) = (1-\tau^D)/(1-\tau^{RE})$, where c is the net withholding tax rate imposed on cash dividends paid by the firm to the shareholder. In the absence of this split-rate system comes logically $\gamma = 1$ and $\tau^{RE} = \tau^D = \tau$.

Table 15: EATR for OECD countries from 2000 to 2009.

year/country	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009
Australia	31.4%	27.6%	28.0%	28.1%	28.2%	28.1%	27.8%	28.2%	27.6%	28.4%
Austria	27.8%	27.7%	27.9%	28.0%	27.8%	20.3%	20.5%	20.3%	20.1%	20.7%
Belgium	28.2%	28.2%	28.3%	23.9%	23.8%	23.7%	23.8%	23.8%	23.6%	24.0%
Canada	34.2%	32.6%	30.6%	28.8%	27.7%	27.6%	27.4%	27.4%	25.4%	25.6%
Czech Republic	24.6%	24.4%	25.1%	25.5%	22.4%	20.9%	19.1%	19.0%	15.8%	16.2%
Denmark	25.9%	24.4%	24.3%	24.4%	24.6%	22.8%	22.8%	20.3%	20.0%	20.4%
Finland	23.4%	23.5%	23.7%	23.9%	24.0%	21.4%	21.2%	21.0%	20.6%	21.5%
France	30.4%	29.3%	28.4%	28.4%	28.4%	28.1%	27.7%	27.7%	27.4%	28.1%
Germany	35.2%	31.4%	31.5%	32.7%	31.5%	31.5%	31.5%	31.3%	24.1%	24.6%
Greece	28.5%	28.4%	28.4%	28.4%	28.5%	25.9%	23.5%	20.2%	19.9%	20.5%
Hungary	12.9%	13.1%	13.9%	14.0%	11.9%	12.6%	13.6%	15.0%	15.4%	15.7%
Iceland	23.9%	23.6%	13.9%	14.5%	14.3%	14.1%	13.6%	13.9%	9.9%	10.0%
Ireland	18.7%	15.5%	12.3%	9.6%	9.9%	9.8%	9.5%	9.3%	9.5%	11.2%
Italy	27.6%	26.8%	26.9%	25.3%	24.7%	24.7%	24.7%	24.7%	20.2%	20.8%
Japan	33.7%	33.7%	33.7%	33.5%	32.4%	32.4%	32.3%	32.4%	32.0%	32.7%
Korea	24.5%	24.0%	23.5%	23.2%	23.2%	21.7%	21.8%	21.7%	21.1%	19.0%
Luxembourg	29.9%	30.1%	24.4%	24.4%	24.3%	24.3%	24.2%	24.3%	24.0%	23.3%
Mexico	28.5%	29.1%	29.3%	28.5%	27.6%	25.1%	24.3%	23.4%	23.2%	23.2%
Netherlands	28.1%	27.6%	27.4%	27.7%	28.0%	25.4%	24.0%	20.5%	20.3%	20.6%
New Zealand	27.7%	27.7%	27.7%	27.8%	27.7%	27.6%	27.5%	27.7%	24.8%	25.2%
Norway	23.8%	23.8%	24.0%	23.9%	24.1%	24.0%	23.9%	24.1%	23.6%	23.9%
Poland	24.0%	23.1%	23.7%	23.0%	15.7%	15.9%	16.0%	15.9%	15.6%	15.6%
Portugal	28.0%	27.6%	26.0%	26.1%	21.9%	21.9%	21.7%	21.0%	21.0%	21.9%
Slovak Republic	23.5%	24.4%	21.5%	20.6%	15.5%	16.2%	16.0%	16.2%	16.0%	16.4%
Spain	28.4%	28.3%	28.5%	28.5%	28.5%	28.4%	28.4%	26.4%	24.0%	25.0%
Sweden	16.7%	16.7%	16.7%	16.7%	16.6%	16.6%	16.7%	16.7%	16.7%	15.6%
Switzerland	20.0%	20.0%	19.8%	19.6%	19.5%	19.4%	17.2%	17.3%	16.7%	17.4%
Turkey	13.0%	13.1%	14.9%	18.1%	24.0%	21.8%	13.5%	13.8%	13.3%	14.4%
United Kingdom	24.7%	24.6%	24.6%	24.6%	24.6%	24.4%	24.4%	24.4%	22.4%	22.7%
United States	27.5%	27.5%	27.6%	27.6%	27.5%	27.5%	27.5%	27.5%	27.4%	27.6%
Total average	25.8%	25.3%	24.5%	24.3%	23.6%	22.8%	22.2%	21.8%	20.7%	21.1%

Source: Own calculations (2010).

The values of EATR are in line with major studies and show the downward trend in taxes until 2009, when the increase in the average values of the EATR is due to the worldwide inflation decline in the post 2008 subprime crisis.

Calculation of the BEATR - International Investment

Following DG (2003), the EATR for international investment, i.e, the Bilateral Effective Average Tax Rate (BEATR) is given by:

$$BEATR = \frac{R_n^* - R_n}{E(1 + \pi_n) p_n / (1 + i)} \quad (3.11)$$

For this purpose, the indices “n” and “j” refer, respectively, to host and home country features in relation to the investor company and, following the same reasoning, the NPV generated by the perturbation of the subsidiary’s capital stock takes the form of:

$$R_n = R_n^{RE} + F_j + F_n \quad (12)$$

F_j stands for the NPV associated with cash of parent firm financing and F_n is associated with finance of the subsidiary. These parcels are derived in the same paper as follows:

$$F_j^{RE} = 0, \text{ parent finances by retained earnings} \quad (13)$$

$$F_j^N = \frac{-\rho(1-\gamma_j)(1-\tau_n\phi_n)}{1+\rho}, \text{ parent finances by new equity} \quad (14)$$

$$F_j^D = \frac{\gamma_j(1-\tau_n\phi_n)(\rho-i(1-\tau_j))}{1+\rho}, \text{ subsidiary finances by debt} \quad (15)$$

$$F_n^{RE} = 0, \text{ subsidiary finances by retained earnings} \quad (16)$$

$$F_n^N = \frac{\gamma_n\sigma_{jn}}{(1+\rho)}(1-\tau_n\phi_n)[E-(1+\rho)], \text{ subsidiary finances by new equity} \quad (17)$$

$$F_n^D = \frac{\gamma_n(1-\phi_n\tau_n)}{(1+\rho)}\{\sigma_{jn}[E(1+i(1-\tau_n))-(1+\rho)]-E\omega_{jn}\}, \quad (18)$$

if the subsidiary finances by debt.

Seemingly, the economic rent generated by a perturbation in the capital stock financed by retained earnings comes:

$$R_n^{RE} = \gamma_n(1-\sigma_{jn})\left\{- (1-A_n) + \frac{E(1+\pi_n)\{(p_n-\delta)(1-\tau_n) + (1-\delta)(1-A_n)\}}{1+\rho}\right\} \quad (19)$$

As in the referred main studies using bilateral measures of taxation, this dissertation considers 7 ways of investment with weights given by OECD (1991) cited in Yoo (2003): 55% for retained earnings, 10% for new equity and 35% for debt concerning parent company source of finance and 33% for each of the same parcels relative to source of subsidiary finance.

FDI is subject to an additional layer of taxation associated with the cross-border payment of dividends and interest income repatriated by the subsidiary in the host country to the parent in the home country. The additional variables are described in Yoo (2003) as the total tax due on the repatriation of the unit dividends from the subsidiary to the parent σ and the total tax due on interest payments from the subsidiary to the parent ω , where:

$$\sigma_{jn} = \begin{cases} c_n - exemption \\ \max\left\{\frac{\tau_j - \tau_n}{1 - \tau_n}, c_n\right\} - credit\ with\ limitation \\ \tau_j(1 - c_n) + c_n - deduction \end{cases} \quad (20)$$

and,

$$\omega = \begin{cases} \varpi_n - \tau_n - exemption \\ \max\{\tau_j, \varpi_n\} - \tau_n - credit\ with\ limitation \\ \tau_j(1 - \varpi_n) + \varpi_n - \tau_n - deduction \end{cases} \quad (21)$$

Where *Exemption*, *Credit* and *Deduction* refer to how the countries treat foreign source income – Taxation Systems as described in Chapter 1. Furthermore, while depreciation allowances are adequately taken into account for machinery and buildings, inventories should modify R_n^{RE} in order to reflect the situation that any increase in the value of inventories due to inflation is taxed under FIFO method in compliance with OECD (1991) and EC (2001) as cited in Yoo (2003):

$$R_n^{RE} = \frac{\gamma_j(1 - \sigma_{jn})}{(1 + \rho)} \times \frac{\tau_n \pi_n}{(1 - \tau_n)(1 + \pi_n)} \quad (22)$$

Table 16: Description of the new variables and parameters introduced in equations from (11) to (22).

Variable	Description	Proxy	Source/Obs.
E	Real exchange rate	$E=1$	All values of FDI in US dollars. The exchange rate is normalized at unity in period t (DG, 2003)
C_n	Host country withholding tax levied on dividends	Bilateral values taken from 2001 in Yoo (2003)	In this dissertation the values obtained for 2001 are set constant from 2000 to 2009. According to DG (1999), these elements from the tax code remain relatively unchanged over time.
ϖ_n	Host country withholding tax levied on interest income		
Taxation systems	Host country treatment of foreign source income (dividends and interest)	Information concerning the OECD countries tax code available for 2001 in Yoo (2003) concerning interest/dividend and machinery/buildings/inventories	
Depreciation Methods	How allowances can be claimed against tax		
Valuation Methods	Method firms are allowed to value inventory		

Source: Own Elaboration based on DG (1999, 2003), Yoo (2003) and Römisch and Leibrecht (2006).

Using the assumptions asserted in tables 13 and 15 and the following values were obtained for the BEATR:

Table 17: BEATR for OECD countries from 2000 to 2009

Country	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009
Australia	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Austria	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Belgium	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Canada	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Chile	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Czech Republic	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Denmark	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Egypt	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
France	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Germany	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Greece	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
India	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Indonesia	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Italy	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Japan	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Korea	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Luxembourg	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Malaysia	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Mexico	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Netherlands	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
New Zealand	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Norway	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Poland	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Portugal	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Saudi Arabia	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Spain	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Sweden	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Switzerland	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Taiwan	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Thailand	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
United Kingdom	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
United States	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000

Source: Own calculations (2010).

References

Amerighi, O. and G. de Feo (2009), “Is Competition for FDI Bad for Regional Welfare?”, Working Papers, N° 680, Dipartimento Scienze Economiche Università di Bologna.

Auerbach, A. J. (2006), “Why Have Corporate Tax Revenues Declined? Another Look”, Working Paper, N° 1785, Prepared for the CESifo Workshop “The Future of Capital Income Taxation”.

Becker, J. and C. Fuest (2009), “Optimal Tax Policy when Firms are Internationally Mobile”, Working Paper, N° 907, Oxford University Centre for Business Taxation.

Bellak, C. (1998), “The Measurement of Foreign Direct Investment: A Critical Review”, The International Trade Journal, Vol. 12, N° 2, pp. 227-257.

Bellak, C and M. Leibrecht (2005), “Do Low Corporate Income Tax Rates Attract FDI? Evidence from Eight Central – and East European Countries”, Research Paper Series: Globalization, Productivity and Technology, N° 43, The University of Nottingham.

Bellak, C. and M. Leibrecht (2009), “Do Low Corporate Income Tax Rates Affect FDI? – Evidence from Central and Eastern European Countries”, Applied Economics, Vol. 41, pp. 2691-2703.

Bellak, C., M. Leibrecht and R. Römisch (2005), “New Evidence on the Tax Burden of MNC Activities in Central – and East European New Member States”, Discussion Paper N° 2, Wirtschafts Universität Wien.

Bellak, C., M. Leibrecht and R. Römisch (2007), “On the Appropriate Measure of Tax Burden on Foreign Direct Investment to the CEEs”, Applied Economic Letters, N° 14, pp. 603-606.

Bellak, C., M. Leibrecht and J. P. Damijan (2009), “Infrastructure Endowment and Corporate Income Taxes as Determinants of Foreign Direct Investment in Central and Eastern European Countries”, *The World Economy*, 2009, pp. 267-290.

Bellak, C., M. Leibrecht and R. Stehrer (2009), “The Role of Public Policy in Closing Foreign Direct Investment Gaps: An Empirical Analysis”, *Empirica*, N° 37, pp. 19-46.

Bénassy-Quéré, A. and A. Lahrière-Révil (2005), “Corporate Taxation and FDI Within the EU25”, <http://www.economieinternationale.fr/anglaisgraph/communications/pdf/2005/16170305/Lahreche-Benassy.pdf>, accessed on 04-08-2010.

Bénassy-Quéré, A., M. Coupet and T. Mayer (2005), “Institutional Determinants of Foreign Direct Investment”, Working Paper, N° 5, Centre D’Études Prospectives et D’Informations Internationales (CEPII).

Bénassy-Quéré, A., N. Goyalraja and A. Trannoy (2005) “Tax Competition and Public Input”, Working Paper, N° 8, Centre D’Études Prospectives et D’Informations Internationales (CEPII).

Beugelsdijk, S., J. Hennart, A. Slangen and R. Smeets (2010), “Why and How FDI Stocks Are a Biased Measure of MNE Affiliate Activity”, *Journal of International Business Studies*, <http://www.cpb.nl/nl/org/homepages/rsm/jibs201029a.pdf>, accessed on 09-08-2010.

Billington, N. (1999), “The Location of Foreign Direct Investment: An Empirical Analysis”, *Applied Economics*, N° 31, pp. 65-76.

Blomström, M. and H. Persson (1983), "Foreign Investment and Spillover Efficiency in an Underdeveloped Economy: Evidence from the Mexican Manufacturing Industry", *World Development*, Vol. 11, pp. 493-501.

Bloningen, B. A. (2005), "A Review of the Empirical Literature on FDI Determinants", *Atlantic Economic Journal*, N° 33, pp. 383-403.

Buckley, P. J. (2004), "Regional Integration and Foreign direct Investment in a Globalised World Economy", in *European Union and Race for Foreign Direct Investment in Europe*, P. N. Ghauri, *International Business and Management Series*, pp.35-58, The Netherlands.

Buckley, P. J., P. N. Devinney, J. J. Louviere (2006), "Do Managers Behave the Way Theory Suggests? A Choice Theoretic Examination of Foreign Direct Investment Location Decision Making", [http://www2.agsm.edu.au/agsm/web.nsf/AttachmentsByTitle/TD_FDI/\\$FILE/FDI.pdf](http://www2.agsm.edu.au/agsm/web.nsf/AttachmentsByTitle/TD_FDI/$FILE/FDI.pdf), accessed on 04-07-2010.

Bun, M. J. and J. G. Klaassen (2002), "The Importance of Dynamics in Panel Gravity Models of Trade", *Discussion Paper*, N° 18, Universiteit Van Amsterdam (UVA) *Econometrics*.

Cameron, A. C. and P. K. Triverdi (2009), *Microeconometrics Using Stata, Texas: A Stata Press Publication*.

Caves, R. E. (1974), "Multinational Firms, Competition and Productivity in Host Country Markets", *Vol. 41*, N° 162, pp. 176-193.

Chudnovsky, D and A. López (2000), "Policy Competition for Foreign Direct Investment: The Global and Regional Dimensions", *Report paper*, N° 5, *Latin American Trade Network (LATN)*.

Davies, R. B. and J. Voget (2008), "Tax Competition in Expanding European Union", http://www.tcd.ie/Political_Science/postgraduate/seminar_docs/DaviesVoget09.pdf, accessed on 25-07-2010.

De Mooij, R.A. and S. Ederveen (2001), “Taxation and Foreign Direct Investment: A Synthesis of Empirical Research”, Discussion Papers, N° 3, CPB Netherlands Bureau for Economic Policy Analysis.

De Mooij, R.A. and S. Ederveen (2005), “Explaining the Variation in Empirical Estimates of Tax Elasticities of Foreign Direct Investment”, Discussion Papers, N° 05-108/3, Tinbergen Institute.

De Mooij, R.A. and S. Ederveen (2008), “Corporate Tax Elasticities A Reader’s Guide to Empirical Findings”, Working Papers, N° 0822, Oxford University Centre for Business Taxation.

Devereux, M. P. (2006), “The Impact of Taxation on the Location of Capital, Firms and Profit: A Survey of Empirical Evidence”, Working Papers, N° 0702, Oxford University Centre for Business Taxation.

Deveureux, M. P. and R. Griffith (1999), “The Taxation of Discrete Investment Choices”, Working Paper, N° 98/16, Institute for Fiscal Studies.

Devereux, M. P., R Griffith and A. Klemm (2002), “Corporate Income Tax Reforms and International Tax Competition”, *Economic Policy*, October, pp. 451-494.

Devereux, M. P., B. Lockwood and M. Redoano (2002), “Is There a Race to the Bottom in Corporate Taxes? An Overview of Recent Research”, http://www2.warwick.ac.uk/fac/soc/csgr/research/keytopic/race/Lockwood_Overview_May03.pdf/, accessed on 25-07-2010.

Devereux, M. P. and R. Griffith (2003), “Evaluating Tax Policy for Location Decisions”, *International Tax and Public Finance*, N°10, pp. 107-126.

Diaw, M. K. and J. Gorter (2002), "The remedy may be worse than the disease: A critical account of the Code of Conduct", Discussion Papers, N° 5, CPB Netherlands Bureau for Economic Policy Analysis.

Dunning, J. H. (1977), "Trade, Location of Economic Activity and the MNE: A Search for an Eclectic Approach", in *The International Allocation of Economic Activity*, B. Ohlin, P. Hesselborn and M. Wijkman (editors), Holmes and Meier, Vol ..., pp. ..., London.

Dunning, J. H. (1993), *Multinational Enterprises and the Global Economy*, Reading: Addison-Wesley.

Dunning, J. H. (2001), "The Eclectic (OLI) Paradigm of International Production: Past, Present and Future", *International Journal of the Economics of Business*, Vol. 8, N° 2, pp. 173-190.

Dunning, J. H. and S. Lundan (2008), *Multinational Enterprises and the Global Economy*, Cheltenham: Edward Elgar.

Egger, P. and H. Winner (2004), "Economic Freedom and Taxation: Is there a Trade-Off in the Locational Competition Between Countries?", *Public Choice*, N° 118, pp. 271-288.

Egger, P. and H. Winner (2006), "How Corruption Influences Foreign Direct Investment A Panel Data Study", *University of Chicago Press*, Vol. 54, N° 2, pp. 459-486.

Egger, P., S. Loretz, M. Pfaffermayr and H. Winner (2008), "Bilateral Effective Tax Rates and Foreign Direct Investment", *Int Tax Public Finance*, 2009, N° 16, pp. 822-849.

Elschner, C. and W. Vanborren (2009), “Corporate Effective Tax Rates in an Enlarged European Union”, Taxation Papers, N° 14, Office for the Official Publications of the European Communities.

Ernst & Young (2010), “Waking Up to the New Economy”, EY 2010 European Attractiveness Survey, [http://www.ey.com/Publication/vwLUAssets/Attractiveness_survey_2010_EU/\\$FILE/Attractiveness_survey_2010_EU.pdf](http://www.ey.com/Publication/vwLUAssets/Attractiveness_survey_2010_EU/$FILE/Attractiveness_survey_2010_EU.pdf), accessed on 06-06-2010.

Fletcher, K. (2002), Tax Incentives in Cambodia, Lao PDR, and Vietnam, Hanoi: IMF Conference on FDI: Opportunities and Challenges for Cambodia, Lao PDR, and Vietnam.

Franco, C. (2009), “Exports and FDI Motivations: Empirical Evidence from US Foreign Subsidiaries”, EAPE European Association for Evolutionary Political Economy, submitted on 9/15/2009.

Friedman, J. (2003), “The Decline of Corporate Income Tax Revenues”, Center on Budget and Policy Priorities, <http://centeronbudget.org/files/10-16-03tax.pdf>, accessed on 25-07-2010.

Friedman, J., D. A. Gerlowski and J. Silberman (1996), “Foreign Direct Investment: The Factors Affecting Foreign Branch Plants in the United States”, Global Finance Journal, Vol. 7, N° 2, pp. 209-222.

IBFD (2010), Global Corporate Tax HandBook, Amsterdam: IBFD.

Globerman, S. (1979), “Foreign Direct Investment and ‘Spillover’ Efficiency Benefits in Canadian Manufacturing Industries”, Canadian Journal of Economics, Vol. 12, N° 1, pp. 42-56.

Gordon, R. and J. D. Wilson (1986), "An Examination of Multijurisdictional Corporate Income Taxation Under Formula Apportionment", *Econometrica*, Vol. 54, N° 6, pp. 1357-1373.

Görg, H. and D. Greenaway (2003), "Much Ado About Nothing? Do Domestic Firms Really Benefit From Foreign Direct Investment?", Discussion Papers, N° 944, Institute for the Study of Labour.

Gorter, J. and R. A. de Mooij (2001), "Capital Income Taxation in the European Union: Trends and Trade-Offs", Special Publications, N° 30, CPB Netherlands Bureau for Economic Policy Analysis.

Gorter, J. and A. Parikh (2003), "How Sensitive is FDI to Differences in Corporate Income Taxation Within the EU?", *De Economist*, Vol. 151, N° 2, pp. 193-204.

Grčić, B. and Z. Babić, "The Determinants of FDI: Evaluation of Transition Countries Attractiveness for Foreign Investors", *Enterprise in Transition*, 5th Conference, Session 1.4, pp. 1166-1176.

Grubert, H. and J. Mutti (2000), "Do Taxes Influence Where U.S. Corporations Invest?", *National Tax Journal*, Vol. 53, N° 4, pp. 825-839.

Gurtner, B. and J. Christensen (2008), "Race to the Bottom: Incentives for New Investment?", Tax Justice Network, http://www.taxjustice.net/cms/upload/pdf/Bruno-John_0810_Tax_Comp.pdf, accessed on 25-07-2010.

Guimón, J. (2008), "Government Strategies to Attract R&D-Intensive FDI", OECD Global Forum on International Investment VII, Section 2.1 – International Investment and Innovation, <http://www.oecd.org/dataoecd/45/4/40310856.pdf>, accessed on 04-08-2010.

Hajkova, D., G. Nicoletti, L. Vartia and K. Yoo (2006), "Taxation and Business Environment as Drivers of Foreign Direct Investment in OECD Countries", *Economic Studies*, N° 43, OECD Economic Department.

Hansson, Å. and K. Olofsdotter (2008), "Foreign Direct Investment in Europe: Tax Competition and Agglomeration Economies", Lund University – Sweden, <http://www.etsg.org/ETSG2008/Papers/Olofsdotter.pdf>, accessed on 25-07-2010.

Hartman, G. (1984), "Tax Policy and Foreign Direct Investment in the United States", *National Tax Journal*, Vol. 38, N° 4, pp. 475-487.

Hines, J. R., Jr. (1996), "Altered States: Taxes and the Location of Foreign Direct Investment in America", *The American Economic Review*, Vol. 86, N° 5, pp. 1076-1094.

Hines, J. R., Jr. (1999), "Lessons from Behavioral Responses to International Taxation", *National Tax Journal*, Vol. 54, pp. 305-323.

Hines, J. R. Jr. and E. M. Rice (1994), "Fiscal Paradise: foreign Tax Havens and American Business", *The Quarterly Journal of Economics*, Feb 94, pp. 149-182.

Horstmann, I. J. and J. R. Markusen (1987), "Firm Specific Assets and the Gains from Foreign Direct Investment", *Economica*, Vol. 56, pp. 41-48.

Hubert, F. and N. Pain (2001), "Inward Investment and Technical Progress in the United Kingdom Manufacturing Sector" *Scottish Journal of Political Economy*, Vol. 48, N°.2, pp. 134-147.

Hymer, S. (1968), "The Large Multinational 'Corporation'", in *Multinational Corporations*, M. Casson (editors), Edward Elgar, pp. 6-31, Hants.

Jajry, I. (2009), "Foreign Direct Investment and Economic Growth: Co integration Techniques", *The IUP Journal of Managerial Economics*, Vol. 7, N° 3&4, pp. 8-18.

Karkinsky, T. and N. Riedel (2009), "Corporate Taxation and the Choice of Patente Location Within Multinational Firms", Working Papers, N° 0931, Oxford University Centre for Business Taxation.

letto-Gillies, G. (2005), *Transnational Corporations and International Production: Concepts, Theories and Effects*, London: Edward Elgar.

Markusen, J. R. and K. E. Maskus (2002), "Discriminating Among Alternative Theories of the Multinational Enterprise", *Review of International Economics*, Vol. 10, N° 4, pp. 694-707.

Mold, A. (2003), "The Impact of Single Market Programme on the Location Determinants of US Manufacturing Affiliates: An Econometric Analysis", *JCMS*, Vol. 41, N° 1, pp. 37-62.

Mollick, A. V., R. Ramos-Duran and S. Silva-Ochoa (2006), "Infrastructure and FDI Inflows into Mexico: A Panel Data Approach", *Global Economy Journal*, Vol. 6, Issue 1, Article 6.

Moore, P. J. and F. P. Ruane (2005), "Taxation and the Financial Structure of Foreign Direct Investment", IIS Discussion Paper N° 88, Institute for International Integration Studies.

Moran, T. H. (1999), *Foreign Direct Investment and Development: The New Policy Agenda for Developing Countries and Economies in Transition*, Washington: Institute for International Economics.

Morriset, J. (2003), “Using Tax Incentives to Attract foreign Direct Investment”, The World Bank Group: Private Sector and Infrastructure Network, Note N° 253, February 2003.

Morisset, J. and N. Pirnia (2001) “How Tax Policy and Incentives Affect Foreign Direct Investment: A Review”, in *Using Tax Incentives to Compete for Foreign Investment: Are They worth the Costs?*, Wells, L. T. Jr. et al, Foreign Investment Advisory Service, Occasional Paper, N° 15, pp. 69-105.

Mytelka, L.K. (2000), “Locational tournaments for FDI: inward investment into Europe in a global world”, in *The Globalization of Multinational Enterprise Activity and Economic Development*, N. Hood and Young, S. (Editors), Macmillan, pp. 278–302, London.

Nnadozie, E. (2000), “What Determines US Investment in African Countries”, <http://www.csae.ox.ac.uk/conferences/2000-OiA/pdfpapers/nnadozie.PDF>, accessed on 04-07-2010.

Oates, W. E. (2002), “Fiscal and Regulatory Competition: Theory and Evidence”, *Perspektiven der Wirtschaftspolitik*, Vol. 3, N°4, pp. 377-390.

OECD (1996), *Benchmark Definition of Foreign Direct Investment*, Third Edition, Paris: OECD Publications.

OECD (2003), *Checklist for Foreign Direct Investment Incentive Policies*, Paris: OECD Publications.

OECD (2006), *European Union Foreign Direct Investment Yearbook*, Luxemburg: Office for The Official Publications of the European Communities.

OECD. Stat Extracts (2010), <http://stats.oecd.org/Index.aspx>, accessed on 01-05-2010.

Oxelheim, L. and P. N. Ghauri (2004), "The Race for FDI in the European Union", in European Union and Race for Foreign Direct Investment in Europe, P. N. Ghauri (Editor), International Business and Management Series, pp. 3-34, The Netherlands.

Park, K. H (2003), "Patterns and Strategies of Foreign Direct Investment: The Case of Japanese Firms", Applied Economics, N° 35, pp. 1739-1746.

Raudonen, S. (2008), "The Impact of Corporate Taxation on Foreign Direct Investment: A Survey", Working Papers, N° 182, Tallinn School of Economics and Business Administration.

Reinert, K. (2010), "Gravity Models", http://press.princeton.edu/chapters/reinert/19article_reinert_gravity.pdf, accessed on 17-09-2010.

Römisch, R. and M. Leibrecht (2006), "An Alternative Formulation of the Devereux-Griffith Effective Average Tax Rates for International Investment", Working Papers, N° 39, WIIW.

Root, F. R. and A. A. Ahmed (1978), "The Influence of Policy Instruments on Manufacturing Direct Foreign Investment in Developing Countries", Journal of International Business Studies, N° 9, pp. 81-93.

Ruane, F. and A. Ügur (2002), "Foreign Direct Investment and Productivity Spillovers in Irish Manufacturing Industry: Evidence from Firm Level Panel Data", Trinity Economic Papers 02/06, Trinity College Dublin.

Saunders, R. (1982), "The Determinants of Industry Variation of Foreign Ownership in Canadian Manufacturing", The Canadian Journal of Economics, Vol. 15, N° 1, pp. 19-22.

Schön, W. (2003), *Tax Competition in Europe*, The Netherlands: International Bureau of Fiscal Documentation.

Shamsuddin, A. F. M. (1994), “Economic Determinants of Foreign Direct Investment in Less Developed Countries”, *The Pakistan Development Review*, Vol. 33, N° 1, pp. 41-51.

Slemrod, J. (1990), “Optimal Taxation and Optimal Tax Systems”, *Journal of Economic Perspectives*, Vol. 4, N°1, pp. 157-178.

Slemrod, J. (1990), “Tax Effects on Foreign Direct Investment in the United States: Evidence from Cross-Country Comparison”, in *Taxation in the Global Economy*, A. Razin and J. Slemrod (editors), pp. 79-122, Chicago.

Tavares, A. T. and S. Young (2005), “FDI and Multinationals: Patterns, Impacts and Policies”, *International Journal of the Economics of Business*, Vol. 12, N° 1, pp. 3-16.

The Heritage Foundation (2010), *Index of Economic Freedom*, <http://www.heritage.org/index/>, accessed on 15-05-2010.

UNCTAD (2000), *Tax Incentives and Foreign Direct Investment: A Global Survey*, ASIT Advisory studies, N° 16, Geneva: UN.

UNCTAD (2009), *World Investment Report: Transnational Corporations, Agricultural Production and Development*, New York: UN.

Vernon, R. (1966), “International Investment and International Trade in The Product Cycle”, *The Quarterly Journal of Economics*, Vol. 80, N° 2, pp. 190-207.

Vlahinić-Dizdarević, N. and M. Biljan-August (2005), “FDI Performance and Determinants in South-Eastern European Countries: Evidence from Cross Country Data”, *Enterprise in Transition*, 6th Conference, pp. 1363-1377.

Wei, S. Z. C. and Z. Zhu (2007), “A Revisit to the Outward FDI Determinants: Further Evidence from Count Panel Data Models with Fixed Effects”, *Applied Economic Letters*, Vol. 12, pp. 809-812.

Wilson, J. D. (1999), “Theories of Tax Competition”, *National Tax Journal*, Vol. 52, N° 2, pp. 269-304.

Woolridge, J. M. (2002), *Econometric Analysis of Cross Section and Panel Data*, Cambridge, MA: MIT Press.

World Bank (2010), *World Development Indicators*, <http://data.worldbank.org/data-catalog>, accessed on 01-05-2010.

Yao, Y. and X. Zhang (2008), “Race to the Top and Race to the Bottom: Tax Competition in Rural China”, Discussion Paper, N° 799, International Food Policy Research Institute.

Yoo, K. (2003), “Corporate Taxation of Foreign Direct Investment Income 1991-2001”, Working Papers, N° 365, OECD Economics Department.

