

Foreign direct investment and corporate income taxation under legal uncertainty*

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Abstract

This paper analyzes the effects of legal uncertainty on foreign direct investment (FDI) in developed and developing economies. Legal uncertainty is modeled considering different aspects: the application of double tax agreements, the different types of legal systems existing and the level of corruption. The final effect of legal uncertainty on FDI is not clear in the literature. Whilst we would suppose that the existence of a double tax agreement should encourage foreign direct investment, the literature is surprisingly inconclusive and more often than not finds a negative or insignificant relationship. The impact of different legal systems on FDI is not straightforward in the various empirical results. As far as corruption is concerned most empirical findings underline a negative effect of corruption on FDI.

We explain these different stylized facts by taking legal uncertainty into account. We will study a general equilibrium model of foreign investors who consider investing in a profitable developed or developing market. In such a context uncertainty arises due to the application of double tax agreements, due to different legislation in act and to corruption's issues. The entry decision will be undertaken strategically, taking the behavior of other market participants into account. Depending on the industry structure, firms may decide to enter until economic rents are zero in the low tax scenario. Companies that compete with each other may underbid each other, speculating that legal uncertainty resolves in their favor. This

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will lead to a race to the bottom between foreign direct investors and harmful competition. The analysis of the impact of corporate income taxation on FDI has been done thus considering the complexity of the context where foreign investors have to act due to legal uncertainty issues. It can result for example that a double tax agreement with a high degree of legal uncertainty can be worse for the host company (and the involved firms) than a fully implemented agreement or no agreement at all.

1. Related Literature

1.1. Foreign direct investments and their determinants

Foreign direct investment (henceforth FDI) has become an important source of private external finance for developed and especially for developing countries. Essentially, there are three motives for FDI. First, there is FDI related to the availability of location-bound resources or assets (“resource/asset-seeking” i.e. raw materials; low-cost unskilled labor; skilled labor; technological, innovative; physical infrastructure). Second, there are FDI related to the size of markets for goods and services (“market-seeking” i.e. market size and per capita income; market growth; access to regional and global markets; country-specific consumer preferences; structure of markets). Third, there are FDI related to cost advantages in production (“efficiency seeking” i.e. cost of resources and assets listed above adjusted for labor productivity; other input costs, such as transport and communication costs to/from and within host economy and other intermediate products; membership of a regional integration agreement conducive to the establishment of regional corporate networks).

The increasing globalization and liberalization of the world economy has forced firms to seek new markets, new resources and new assets. Within this new economic environment the traditional motives related to FDI development above mentioned (market-seeking, resource-seeking, and efficiency-seeking) have not disappeared, however they are being incorporated into firms' broader competitive-enhancing strategies. Nowadays transnational corporations looking to invest take for granted the presence of state-of-the-art FDI frameworks and a range of business facilitation measures, and increasingly seek a combination of cost reduction, larger markets, and “created” assets that can help them to maintain a competitive edge (communications infrastructure, marketing networks, technology, and innovative capacity i.e. critical for enabling firms to maintain their competitiveness in a rapidly changing world).

While FDI represents investment in production facilities, its significance for developing countries is much greater than for developed countries. Different groups of developing countries have contributed with a different degree to the spread of FDI. Not only can FDI add to investment and

capital formation, but, perhaps more important, it is also a means of transferring production technology, skills, innovative capacity, and organizational and managerial practices between locations, as well as of accessing international marketing networks. The first to benefit are enterprises that are part of transnational systems (consisting of parent firms and affiliates) or that are directly linked to such systems through nonequity arrangements. But these assets can also be transferred to domestic firms and the wider economies of host countries if the environment is conducive. The greater the supply and distribution links between foreign affiliates and domestic firms, and the stronger the capabilities of domestic firms to capture spillovers (that is, indirect effects) from the presence of and competition from foreign firms, the more likely it is that the attributes of FDI that enhance productivity and competitiveness will spread. In these respects, beyond inducing transnational corporations to locate their activities in a particular country, policies and fiscal strategies matter.

Globalization has led to an increase in the level of FDI directed to developing countries. In this context the above mentioned changes of firms' strategies is no longer the only determinant of the relative change in the importance of the traditional motives that impact FDI. Nowadays the main concern for firms to invest in developing countries is the assurance to find a good environment for FDI in terms of: political and social stability and the presence of rules and laws that assure legal certainty in carry on the business.

More specifically we can distinguish five basic principles, which can be considered fundamental components of a macro-legal environment for FDI in developing countries. The first is the publicity of the rule of law, which enables all concerned parties to have access to the laws they have to abide. The second is the clarity and certainty of the legal framework, which allows such parties to understand which laws are applicable to their situation and what their specific meaning is. The third is predictability in the application of the rule of law, which reduces the risks linked to changing interpretation, implementation or enforcement of the laws. The fourth is stability of the legal, political and policy frameworks, which provides investors assurances that the local government will not unilaterally and unfavorably change the basic conditions underlying their investment decisions. Finally, there is fairness, in particular the possibility of legal recourse and due process, with access to independent judiciary and dispute settlement mechanism.

1.2. Legal uncertainty

An analysis of the effect of corporate income taxation on FDI can not be done without considering the overall impact that legal uncertainty has on this relationship. In order to reach a beneficial environment for FDI, harmonization (same legal systems) and clarity of law inside these countries is a prerequisite. The need for this harmonization derives in part from the costs of legal diversity and the legal uncertainty that

possibly results from it for particular groups. Broadly, “legal certainty” would imply dynamic and efficient substantive laws clearly stating the rights, obligations, and liabilities of all business parties, rule-based business transactions, procedural law providing prompt and inexpensive means to the courts, an institutional framework that supports business development and sustainability, strict adherence to the principles of ‘rule of law’ and ‘supremacy of the law’, and an efficient and independent judiciary. Legal uncertainty on the other hands always occurs when individual actors are uncertain of the effects of the provisions of the dominant legal system on the results of their actions.

The term “legal uncertainty” covers both “subjective” and “objective” aspects. The term “subjective legal uncertainty” refers here to the subjective assessment of marginal costs and marginal utility, which differs from individual to individual. Subjective legal uncertainty can also be referred to as “uncertainty as to what the law is”. In case of complete legal uncertainty it is irrational to want to improve an individual knowledge of the law due to the considerable information and transaction costs. In fact with increasing marginal costs of acquiring information and the diminishing marginal utility of additional legal knowledge, individual economic subjects will only spend on information and transactions until marginal costs and marginal utility are equal. In this context ignorance beyond this will remain in existence and then that decisions will continue to be taken under uncertainty.

The term “objective legal uncertainty” describes an objective legal reality that has to be accepted to an equal extent by all parties involved. It occurs where statutory regulations for certain sets of facts are either non-existent or do not form a reliable and sure basis for decisions. There are three areas of “objective legal uncertainty”. First, absence of law applies to areas for which there are (as yet) no statutory rules and regulations, i.e. areas not subject to national sovereignty, such as the seabed, space, the environment and legal areas which have not yet been determined, such as in some transformation and developing countries. Second, legal instability occurs where regulations are unstable over and beyond consumption or investment periods, because amendments to statutes are frequent and unforeseeable, so that even experts are not clear about the current legal position and the continuance of subjective claims. Third, denial of justice is understood to be the obstruction or prevention of the enforcement of legal rights by state authorities or employees. In the following we will assume a very broad meaning for legal uncertainty, one which includes all the aspects here referred to.

There is a debate whether “legal certainty” decreases over time. The supporters of this view claim that this is a legal specific and natural event mainly due to the fact that rules and principles of law become more and more uncertain in content and in application as legal systems are biased in favor of explaining those rules and principles. The increasing uncertainty of the “rule” means that the rule becomes vague, inapplicable, ambiguous and remote. This can be manifested in two ways. First, rules may become more uncertain “on the books” namely the

court's decision becomes a part of the meaning of the rule, so that the rule becomes more complex as it is become both a statute and a judicial decision. The second way rules may become more uncertain is in their application. The above described is however an intrinsic aspects of any legal systems that can also indirectly impact the degree of uncertainty in transnational investments.

Legal uncertainty in a very broad meaning generates transaction costs which obviously are higher in international transactions than in domestic trade. The costs of collecting information due to the lack of knowledge of foreign statutes prevent international purchases or leads to the necessity of more expensive information collection. There are costs of legal disputes, which are much greater in the event of international legal disputes than in the case of a domestic legal dispute (Freyhold, Gessner, Vial and Wagner, 1995). There are costs of setting incentives for pushing through legal claims. This includes private attempts to speed up approval procedures and legal procedures. As is known, "beneficial charges", that apply in particular in developing countries, and include bribes or pay-offs, represent an important cost factor for multinational corporations. Part of this is probably the result of having to deal with legal uncertainty or legal instability and, sometimes also corruption issues (Wei, 1997). Finally, there are other transaction costs, in particular due the difficulties involved in complaining about goods, in making warranty claims and in exchanging goods. The associated costs in case of international transactions, including travel expenses, time spent (opportunity costs), and annoyance (negative utility), are high, in particular if law suits are the consequence.

1.4. The role of legal systems

The legal system is one of the most important institutions of a society. Among the various definitions of institution we will refer to the following one: "institutions" are formal and informal mechanisms, which control social interaction in some form or other and in this way shape restrictions for individual behaviour so that negotiation and coordination costs are reduced (North, 1994).

Legal uncertainty due to different legal systems in act can represent an investment risk for both domestic and foreign investors. For domestic investors it is not only the actual existence of institutions as being important but also their stability. For foreign investors the legal uncertainty can be caused not only by imperfect national legal systems, but also by the different natures of legal systems in the international context.

Moreover as far as transnational economic integration and FDI are concerned, law is a fundamental instrument. There are high costs involved in cross-border business due to different legal systems within a global or a regional area. These costs are, on the one hand, occurring through the collection of information about the respective national regulations, and, on the other hand, are due to the uncertainty of

individual cross-border transactions that increase the number of legal provisions and processes that could be faced.

More in details different legal systems may imply:

- Additional costs for acquiring the information needed to write a particular contract in other legal areas.
- Higher costs for litigating issues under various contracts governed by different legal regimes.
- Costs of instability due to the fact that several contracts are subject to subsequent changes in the law.
- Diversity in judicial administration across the different countries.

These high costs are the main reason why there are strong forces that push for harmonization of law within the European Union and beyond. The sustainers of this harmonization assume that legal diversity causes transaction costs and lowers economic trade and welfare, in particular by creating legal uncertainty. It is argued that legal diversity increases the transaction costs of cross-border contracting and discourages consumers and small entrepreneurs from engaging in such transactions. Consumers as well as producers tend to refrain from contracts in foreign legal systems (thus having a negative impact on the level of FDI) if the costs of information (about the law, about administrative procedures, about competent legal advice) and/or the costs of enforcement (by way of litigation or alternative forms of dispute resolution) seem too high or unpredictable. This unpredictability or uncertainty about the costs of cross-border transactions may arise from the diversity in the formal legal system or diversity in judicial administration across the individual member countries.

In general empirical research on the effect of legal uncertainty on economic trade and growth suffers from the difficulty of measuring correctly the degree of legal uncertainty. Most studies model legal uncertainty using factors such as political instability, juridical incredibility, a lack of civil liberty or the degree of corruption. All these studies concentrate on explaining cross-country variations in growth due to differences in legal uncertainty within a country in worldwide samples or only for developing economies.

Written law is the first observable characteristics of formal institutions used in empirical research in order to measure the quality of legal institutions. For example, it has been discovered that formal legal protections for investors correlate with the size and depth of capital markets and hence with investment levels (La Porta et al., 1999). This approach has some limitations due to the fact that cannot capture the role of informal institutions and cannot take into account possible interdependencies with formal institutions.

Another approach uses proxy variables that measure the quality of institutions indirectly (Barro, 1991). The quality of this approach clearly depends on the quality of the proxy chosen.

Surveys of country risk experts or foreign and domestic investors are normally used as a third approach in the empirical literature on the impact of legal uncertainty or institutions on economic growth. These surveys cover a series of questions about the business environment. However, also this third approach is subject to criticism. Some authors note that the survey data used in this approach raises at least two relevant difficulties (Rodrik, 2004). First the survey data is highly subjective and may depend upon other aspects than the actual institutional environment. Second this kind of data gives no policy guidelines because the results say nothing about which institutional model is superior but just that it is important to make investors feel safe.

There are recent studies that explicitly analyze the effects of cross-border legal uncertainty taking into consideration mainly two variables (Turrini and van Ypersele, 2006). The first variable is an index of legal similarity; the other is a dummy variable equal to 1 if a pair of countries shares the same origin of their legal system and to 0 otherwise. The estimation of a standard gravity equation augmented by one of these two variables show that trade flows are higher by about 65 per cent if a pair of countries has identical legal procedures or, respectively, by 47 per cent if a pair of countries shares common origins for their legal systems. These results are in line with other results (den Butter and Mosch, 2003) that find for a sample of 25 OECD countries that a pair of countries with a similar legal system trades about 46 to 84 percent more with each other than countries with a different legal system. Hence on average from these studies it seems that a country pair with a similar legal system trades almost 50 percent more with each other. Other studies use firm-level data (del Gatto et al., 2006) to simulate that a 5 per cent reduction in international trade barriers (induced by legal harmonization) results in a 2.13% increase in productivity due to a more competitive environment.

Another study considers from a theoretical point of view the issue whether legal harmonization could be an appropriate solution to the problem of the high macroeconomic costs of legal uncertainty (Wagner, 2009). In this paper legal uncertainty is regarded as a non-tariff trade barrier. However the author does not suggest that full harmonization is necessary, because also harmonization itself generates substantial costs. These costs include: direct costs for developing new bureaucracies or demolishing old structures; costs arising from a loss of the advantages of system competition (the advantages being an adaptation to the variety of preferences, efficiency advantages of regulative competition, and the minimization of “rent-seeking” costs caused by bureaucrats/politicians). However in the paper it is also claimed that, from the point of view of the economy as a whole, welfare gains could be realized through more harmonization.

In the light of the above considerations the paper suggests to adopt a step-by-step approach that would also allow the correction of errors at an early stage. At first is suggested to start with harmonization of contract law for international (transborder) transactions that would give individuals time to get acquainted with the new regime and to evaluate it.

The background of the experience gathered through this first stage should make it possible to turn to a more comprehensive harmonization at a later stage if this then is assessed as being desirable. However the author also warns that a legal harmonization only makes sense if it is accompanied by a thorough reform of the system of civil justice and a harmonization of procedural law. The paper concludes that: “a full harmonization (at first sight) may seem to be an adequate instrument for reducing the costs of cross-border legal uncertainty; however, full harmonization itself tends to imply high economic costs, so that it is not generally recommendable. Nevertheless, a gradual (partial) harmonization process could, in some circumstances, be beneficial” (Wagner, 2009).

1.4. Tax treaties and double tax agreements

Economists have long been concerned about the effect of taxation on foreign direct investment (FDI). Many studies have examined whether and to what extent FDI responds to tax incentives, finding that actually firms do indeed respond to a variety of tax policies and that this can result in an inefficient allocation of investment across countries. As governments use their tax policies to affect the rates of return on capital, provide public goods, or simply capture part of the profits that would otherwise be repatriated to other countries, this can allocate investment away from its most productive use.

One potential method of eliminating this inefficiency is a bilateral tax treaty on FDI. These treaties adjust the tax environment for investment between treaty partners by specifying the applicable tax base, the withholding taxes that can be applied, and other measures affecting the taxation of FDI. Worldwide, over 2,000 of these treaties are in force and they govern the taxation of the large majority of FDI (Radaelli, 1997). Tax treaties should also provide certainty and protection regarding the level of taxation on investments abroad which may, for instance, be valued by business when deciding on the location of a regional headquarters.

Double tax agreements (or double tax treaties, henceforth DTT) are made in order to avoid double taxation and prevent fiscal evasion with respect to taxes on income. But their wider function is to try to facilitate investment, trade, movement of technology, and movement of personnel between countries. The double tax agreements reduce or eliminate double taxation caused by the overlapping taxing jurisdictions because treaty partners agree to limit taxing rights over various types of income. These tax agreements also agree on methods of reducing double taxation where both countries have a right to tax and moreover generally include an exchange of information facility in order to prevent fiscal evasion. The two tax administrations can also use the mutual agreement procedures to develop a common interpretation and resolve differences of application of the tax treaty.

Double taxation occurs if a multinational company (henceforth MNC) pays tax on the same corporate income earned from economic activity in

a foreign country twice: once to the tax authorities of the foreign country, which is host to the economic activity, and once to the tax authorities of the home country, in which the company is domiciled.

Double taxation has to be avoided, through double tax agreements, as it could represent an obstacle or barrier to foreign investment, thus distorting the efficient allocation of scarce financial resources across countries of the world. Yet, DTTs can also reduce FDI in as much as they reduce tax avoidance, tax evasion and other more or less legal tax-saving strategies such as transfer pricing by multinational companies (Blonigen and Davies, 2002). The 2003 Revision to the Commentary to the treaty model of the OECD explicitly mentions prevention of tax avoidance as an objective of DTTs (Arnold, 2004).

More in detail, the theory claims that tax treaties play four major roles, two of which are likely to increase FDI and two of which tend to reduce it (Blonigen and Davies, 2004). Tax agreements increase FDI as they standardize tax definitions and jurisdictions. Janeba (1996) theoretically shows that such coordination can reduce the double taxation of affiliate income. Tax treaties affect the taxation of multinational enterprises by lowering withholding taxes and increasing tax certainty. In particular, Edmiston, Mudd, and Valev (2003) find that uncertainty over tax policy is a significant barrier to FDI. Thus, if a tax treaty reduces the likelihood of a host nation unilaterally changing its tax policy, this added certainty would increase FDI.

The combination of these two roles of treaties increases the expected value of after-tax returns from FDI leading one to expect that the introduction of a tax treaty should increase FDI. These above mentioned FDI-increasing aspects of treaties are however at least partially offset by the following two FDI-reducing roles of treaties, due to the increased enforcement of transfer pricing regulation. This occurs by the introduction of additional regulations on the calculation of internal prices, establishing guidelines for resolving disputes between taxation authorities, and encouraging the exchange of information between authorities. The establishment of anti-treaty shopping provisions inhibits the ability to direct profits through low-tax treaty partners in order to minimize tax payments. Since these increase the taxation of affiliate income in a given host, they would lead one to anticipate that a tax treaty might reduce FDI.

Despite the large and increasing number of DTTs concluded, there exists little evidence on the question whether they increase FDI or not. This is surprising given that the question is of great importance especially to developing countries that invest time and other scarce resources to negotiate, conclude, sign and ratify a lot of DTTs. If no increase in FDI can be expected, then the effort spent concluding DTTs would be wasted and the costs imposed would fail to be recovered. In their aim to increase FDI inflows, developing countries have resorted to bilateral treaties to signal their commitment to stable, correct practices and offer favorable treatment to foreign investors. By signing DTTs, developing countries

provide foreign investors with security and stability as regards the issue of taxation in addition to the relief from double taxation. By signing bilateral investment treaties (BITs), developing countries commit to granting certain relative standards such as national treatment (foreign investors may not be treated any worse than national investors, but may be treated better and, in fact, often are) and most-favored nation treatment (privileges granted to one foreign investor must be granted to all foreign investors). They also agree to guarantee certain absolute standards of treatment such as fair and equitable treatment for foreign investors in accordance with international standards after the investment has taken place. BITs typically ban discriminatory treatment against foreign investors and include guarantees of compensation for expropriated property or funds, and free transfer and repatriation of capital and profits. Further, the BIT parties agree to submit to binding dispute settlement should a dispute concerning these provisions arise (UNCTAD, 1998).

There are two model treaties for DTTs available, which are regularly updated and on which treaty partners can base their treaty if they wish to do so: one from the OECD, the other one from the United Nations. The OECD model treaty clearly favors residence taxation, which benefits developed countries since it is mainly developed country investors who invest in developing countries, not the other way around and residence taxation favors countries with net positive foreign asset positions. The UN model treaty, on the other hand, provides more room for source-based taxation, which is more beneficial to developing countries for the same reason. Critics argue, however, that the UN model treaty is not sufficiently different from the OECD model treaty and is still biased against developing country interests (Figuerola, 1992). Also, the vast majority of DTTs are based on the OECD model (Arnold, Sasseville and Zolt, 2002).

The rising importance of FDI in the world economy has increased the attention of researchers into policies that governments use to influence multinational enterprises. Among these policies certainly taxation is one of the most interesting and recent objects of great attention.

There is a growing literature on the effects of tax treaties on FDI. Theory general claims that, in line with the OECD's (1997) model treaty, treaties are intended to increase FDI. However the empirical literature generally finds no evidence for the theoretical hypothesis: researchers find in general an insignificant or a weakly negative effect of treaty formation on FDI (Louie and Rousslang, 2007; Millimet and Kumas, 2007). This result is often interpreted suggesting that the FDI increasing aspects of treaties, such as tax certainty or withholding tax reductions are balanced with negative effects as mentioned above, yielding a zero net effect of treaties on multinational enterprises.

Blonigen and Davies (2002) represent the first attempts to estimate the impact of tax treaties on FDI. Respectively using panel data on OECD FDI (where FDI is measured as stocks) and US FDI (where FDI is

measured as stocks or sales), these papers find that after controlling for country fixed effects there is either a small negative or insignificant effect of treaty formation on FDI. In details using OECD data they find that new treaty activity (during the 1983-1992 period) suggests strong negative impacts on FDI. While they find a positive correlation in the case of much older treaties, they cannot weight this evidence very heavily as they cannot observe FDI activity before these treaties were in place. These results are consistent with previous work by Blonigen and Davies (2002) using only US data. Thus, in conjunction with this earlier work, the results cast doubt upon the FDI promotion rationale for treaty formation, which stands in contrast to the conventional wisdom among many economists and lawyers. The authors suggest that one possible reason for the non-promotion effect of treaties on FDI activity is that treaties reduce firms' abilities to evade taxes through transfer pricing or treaty shopping. An additional possibility for non-promotion of FDI activity by new treaties is that treaties may increase investment uncertainty, at least in the short run. Since a new treaty has yet to be tested in the courts of the partner countries, it may actually increase the perceived risk of investment between treaty partners until the legal interpretation of the treaty has been resolved. Thus, in the short run, the treaty may lead to a reduction in FDI activity. Over the long run, however, this uncertainty will be resolved, clearing the way for the treaty to promote investment. However, when the authors include the new treaty dummy variable with a lag of one year (or even two years) after the treaty was enacted; they get similar negative and statistically significant effects of new treaties on FDI activity. This would argue that the uncertainty issue is not behind the effects they find unless it takes many years to resolve such uncertainty.

Egger, Larch, Pfaffermayr, and Winner (2006), who control for the endogenous selection of which treaties are actually formed, find that treaties significantly reduce FDI stocks. Davies, Norbäck and Tekin-Koru (2007) expand the research on this by utilizing affiliate-level data from Swedish-owned multinationals from 1965 to 1998. In line with earlier studies, they find no significant effect from treaty formation on the level of affiliate sales.

An important study from Neumayer (2006) finds, against all the results so far mentioned, robust empirical evidence that DDTs increase FDI to developing countries. However when the author splits developing countries into low-income and middle-income countries, he found that DDTs are effective in the group of middle income countries.

1.5. Corruption

Corruption has always been considered an important determinant of foreign direct investment. Corruption can take manifold forms. One possible street for corruption works through the legal system. Corrupt officials and judges may decide against the law or at least postpone the judicial process, which has a cost to foreign investors. As the degree of potential corruption in the legal system is unknown, corruption may

cause legal uncertainty. For this reason, we will consider apart from differences in legal systems and double tax agreements also the role of corruption as an explanatory variable for corruption.

The direction of the effect of corruption on foreign direct investment is unclear in the literature (Al-Sadig, 2009). The reason may be that foreign investors may use corruption to facilitate their investment, thus circumventing bad institutions. This argument has been recently made by Delios et al (2005). Cross section regressions typically support the view that corruption is bad for FDI, but this may be due to an omitted variable bias, as countries that attract little FDI for different reasons may also be the most corrupt. When controlling for country fixed effects in a panel, Al- Sadig (2009) finds that corruption has no impact at all on FDI.

Caetano and Caleiro (2005) split the countries in two samples, high corruption and low corruption countries, and find that the effect of corruption on FDI is negative only for high corruption countries.

In a similar spirit, Hakkala et al (2005) divide foreign direct investments into horizontal and vertical investments. Horizontal investments are typically market seeking investment, and may be done in many markets at the same time. Vertical investments typically are done along the value chain of the firm in order to outsource and reduce production costs. They find that only horizontal FDI is deterred by corruption, whereas vertical FDI is not. One explanation may be the significance of resources which necessitate investments in particular countries, corrupt or not.

In conclusion, corruption may influence FDI negatively in highly corrupt countries for horizontal foreign direct investments.

This paper proceeds as follows. In the next section, we sketch a model of foreign direct investment with a corporate income tax and legal uncertainty. Thereafter, we will briefly describe the data used. In particular, we will explain how we use different legal systems, double tax agreements, and corruption as proxies for legal uncertainty. Chapter four then gives the empirical results before concluding.

2. The Model

We assume that a large number of firms compete in their home market under perfect competition. This implies that there are no economic profits in the domestic market. These firms, however, consider the possibility to enter the market in a developing economy. We assume that in the developing economy, these companies would operate under imperfect competition, and would thus earn an economic rent. In particular, we assume that there is monopolistic competition in the foreign market. Entry into the foreign market is not without cost, which will assume the form of fixed costs F . Firms produce their good with variable unit cost c . These costs can either be the cost of production in the domestic market including shipping, or the cost of producing abroad. Given monopolistic competition, the firm will have an influence on price

setting. Profits are given by revenues minus variable costs, minus fixed costs and taxes, resulting in

$$\pi_i = p_i x_i - c x_i - (1 + r)F_i - T_i. \quad (1)$$

These firms have some money k_i to invest, which they could invest in the home market at the market interest rate r , or in a developing economy abroad. Annual fixed costs are proportional to the size of the foreign market fY , which we can interpret as the cost to set up the foreign affiliate. In addition to own funds k_i , the firm can resort on bank credit to finance start-up costs abroad. In order to ensure themselves against default risk, banks will only debt finance a share $1 - \theta$ of total start-up costs and request equity finance of θfY , implying a credit constraint of $d_i \leq k_i(1 - \theta)/\theta$.

Both the country of origin and the host country consider to tax accounting profits. Note that interest on debt is tax deductible, interest on equity is not. The above credit constraint ensures that firms use equity nonetheless. For simplicity, we assume that there are no other taxes. We assume that the developing country taxes corporate income at a rate t^* on gross corporate profits, which include return on equity capital, $T_i^* = t^*(\pi_i + r\theta fY + T_i)$. The home country taxes corporate income at a rate t , where the tax base is already reduced by foreign taxes, $T_i' = t(\pi_i + r\theta fY + T_i - T_i^*)$.

There is uncertainty about taxation, so that t and t^* are random variables, for several reasons. First, countries may change tax policy between investment and revenues, which creates uncertainty. Second, tax laws may be subject to interpretation, in particular in the presence of double tax agreements, where it may be uncertain whether a business is taxed at home, abroad, or not at all. Foreign CIT reduces profits and hence the domestic tax base. This implies that taxation equals

$$T_i = \frac{\tau}{1-\tau} (\pi_i + r\theta fY) \quad (2)$$

where the ad valorem tax τ equals $\tau = t + t^* - tt^*$. Substituting taxation (2) and the financing constraint into profits (1) yields after some rearrangement an expression for net profits,

$$\pi_i = (1 - \tau)(p_i x_i - c x_i) - [(1 - \tau)(1 + r) + \tau\theta]fY. \quad (3)$$

Foreigners demand domestic products according to a CES utility function,

$$X = \left[\sum_{i=1}^n x_i^{\frac{\varepsilon-1}{\varepsilon}} \right]^{\frac{\varepsilon}{\varepsilon-1}}, \quad (4)$$

and are willing to spend a total of Y on these products, yielding the following budget constraint

$$\sum_{i=1}^n p_i x_i \leq Y. \quad (5)$$

Maximizing utility (4) subject to the budget constraint, we arrive after some manipulation at a demand function for individual products,

$$x_i = p_i^{-\varepsilon} X^{1-\varepsilon} Y^\varepsilon, \quad (6)$$

where ε is price elasticity of demand. An increase in the price will reduce demand for a particular product, but given imperfect competition, the reduction in demand is finite. In order to eliminate utility X from the above equation, we take both sides to the power of $\varepsilon/(1 - \varepsilon)$ and sum over all varieties n . After some rearrangement we arrive at a utility based price index,

$$P = \left[\sum_{i=1}^n p_i^{1-\varepsilon} \right]^{\frac{1}{1-\varepsilon}} = \frac{Y}{X}, \quad (7)$$

which allows us to eliminate the utility aggregate X from the demand function (6) and substitute it with the price index.

$$x_i = p_i^{-\varepsilon} P^{\varepsilon-1} Y. \quad (8)$$

We find that an increase in the price relative to the price index (p_i/P) will reduce demand with elasticity ε , whereas an increase in real income (Y/P) will increase demand proportionally. Without loss of generality, we will normalize the utility based price index to unity, $P = 1$.

Firms will maximize expected net profits (3) subject to the demand function (8), resulting in the well-known Amoroso-Robinson mark-up pricing rule,

$$p_i = \frac{\varepsilon}{\varepsilon-1} c. \quad (9)$$

Given identical prices for all firms, the price index (7) is declining in the number of available products. This implies that relative prices increase and demand for each firm declines. Thus products are strategic complements. Demand (8) is constant across all varieties, increasing in aggregate demand (Y) and decreasing in the number of available product varieties,

$$x_i = \frac{\varepsilon-1}{\varepsilon} \frac{Y}{cn}. \quad (10)$$

Note that taxation does not enter in the intensive margin, and firms choose prices and quantities independently of prices. Substituting demand (10) and prices (9) into profits (3), we can derive expected profits,

$$E[\pi_i] = E[1 - \tau] \left[\frac{Y}{\varepsilon n} - (1 + r - r\theta)fY \right] - r\theta fY. \quad (11)$$

Expectations over taxation matter for profits and for the entry decision. Again, we observe that debt finance $(1 - \theta)r fY$ is tax deductible, whereas equity finance is not, and therefore exhibits the full negative impact on expected profits. We obviously find that running profits $Y/(\varepsilon n)$ are subject

to taxation. Most importantly, we find that an increase in n reduces *ceteris paribus* expected net profits.

Before continuing, it is interesting to note three special cases. First, in the absence of taxation, $\tau = 0$, we find that entry will occur until the number of firms $n = 1/(\varepsilon f(1+r))$. Clearly, an increase in fixed costs and an increase in substitutability between products ε will reduce profit margins and entry. Second, in case of pure debt finance $\theta = 0$, we again find that entry will occur until the number of firms $n = 1/(\varepsilon f(1+r))$. Complete debt finance therefore eliminates the externality of equity taxation. Finally, in the case of pure equity finance $\theta = 1$, we obtain entry until $n = E[1-\tau]/(\varepsilon f(1+r))$, which is strictly less than under debt finance and in absence of taxation.

Substituting foreign and domestic taxes into expected profits (11), we obtain,

$$E[\pi_i] = [(1 - E(t))(1 - E(t^*)) + \frac{\rho_{t,t^*}}{\sigma_t \sigma_{t^*}}] \left[\frac{Y}{\varepsilon n} - (1 + r - r\theta)rfY \right] - \theta rfY. \quad (12)$$

An increase in the standard deviation σ of either foreign or domestic taxes unambiguously reduces expected profits. The standard deviation is of course a measure of legal uncertainty. An increase in legal uncertainty has a negative effect on expected profits. As this will reduce entry as we will show below, it will also reduce foreign direct investment, which depends linearly on entry.

An increase in the correlation ρ between the two tax rates by contrast exhibits a positive effect on expected profits. Corporate income taxes are obviously correlated. The theory of tax competition teaches us that taxes converge to zero, implying a positive correlation between the two taxes. Yardstick competition models by contrast postulate that taxes mimic taxes of neighbors, which again leads to a positive correlation.

Double tax agreements will influence the above condition on two dimensions. First, they assign taxing rights to one or the other country, thus eliminating double taxation (but also double non taxation), captured by the first term in square parenthesis $(1-E(t))(1-E(t^*))$. Second, they impact on the correlation between the two tax rates. Double tax agreements try to set one of the two tax rates equal to zero. However, given legal uncertainty, this is never achieved with precision, so that the correlation will decline, but not fall to zero. A lower correlation, just like less uncertainty about the individual tax rates represented by the standard deviations, will thus reduce profits. This may explain the weak correlation between foreign direct investment and double tax agreements.

Firms will enter the foreign market as long as expected profits are nonnegative. The number of firms will reach

$$n = \left[\frac{\theta \varepsilon r f}{E[1 - \tau]} + (1 + r - \theta r) \varepsilon r f \right]^{-1}. \quad (13)$$

Substituting the number of firms in equilibrium (13) into realized profits (3), we obtain

$$\pi_i = [E(\tau) - \tau] \frac{\theta r f Y}{E[1 - \tau]}. \quad (14)$$

If actually taxes are less than expected taxes, the firm will incur a profit, otherwise a loss. Once again, our findings depend crucially on the non-deductibility of equity finance. A corporate income tax that would allow for the deduction of equity, such as the ACE, would eliminate the effect of uncertainty on corporate profits. The bigger the share of equity finance, the more pronounced will the variability of profits be. Note that the elasticity of substitution does not influence this equation, as the negative effect of an increase in substitutability is exactly offset by the reduction in the number of firms that enter the market.

We find that expected gross profits correspond to the first term, $\theta r f Y E(\tau) / E[1 - \tau]$, whereas actual corporate income taxes equal $\theta r f Y \tau / E[1 - \tau]$. As firms will make a loss in case of actually taxes exceeding expected taxes (13), they may consider default as an option. In this case, firms would forgo tax payments, but would have to write off capital investment. Firms will default when tax liabilities exceed equity capital, or

$$\frac{\tau \theta r f Y}{E[1 - \tau]} > \theta r f Y. \quad (15)$$

Rearranging terms, we find that firms will default if interest rates and cumulated tax rates are high,

$$\tau + E(\tau) > 1. \quad (16)$$

With default an additional option, the distribution of profits (13) is truncated, leading to entry beyond the free entry condition (12) formulated above. In particular, a firm may enter when expected profits are already zero, speculate on low taxation, either through low tax rates or through loopholes in double tax agreements, and default otherwise. This will lead to additional entry, which will render expected profits negative for all market participants.

Clearly banks who give easy credit are the other losers in this game. Note however, that the equity requirement does not influence the default decision at all, so that banks have no handle to prevent the issue, apart from refusing credit all together.

3. The Data

We will study the implications of the above model in an international panel. We will use the stock of foreign direct investment from one country to another as our dependent variable. We will rely on OECD data and use FDI stocks from OECD countries invested in other OECD countries and virtual all the countries of the world in 2006. With data restrictions implied by other series described below, we arrive at a sample of 26

investor countries and 125 countries where investments have taken place.

We will use GDP and population data for the same year for all those countries from the same source. Statutory corporate income tax rates come from KPMG world taxation report. We use the CIA world factbook to identify latitude and longitude of each country and compute the distance between two countries with the Haversine formula, which takes account of the spherical shape of earth to compute the distance between two points starting from latitude and longitude coordinates in radian notation,

$$d = \text{arc cos}[\sin(\text{lat}) \sin(\text{lat}^*) + \cos(\text{lat}) \cos(\text{lat}^*) \cos(\text{long}^* - \text{long})] * 6371 ,$$

where 6371 km is the earth radius.

We use two indicators for legal uncertainty. First, we look at double tax agreements, which we have taken from the IBFD database, which has registered 2489 tax treaties between 186 countries. Second, we analyze legal traditions. We assume that countries with similar legal traditions find it easier to understand each other, and this should reduce legal uncertainty. We use the Juriglobe data from the University of Ottawa database (<http://www.juriglobe.ca/>) to identify the legal system of a country. This database contains five distinct legal traditions, common law, civil law, customary law, muslim law and jewish law, and allows for several legal traditions within one country, e.g. a former colony that had customary law, gets influenced by e.g. civil law through its colonial power and then turns towards muslim law. The degree of mutual understanding will be higher if both countries have only one identical legal system. We will use an interaction term between legal systems to identify common legal traditions. In order to ensure that we are not measuring corruption instead, we will also include the corruption index for transparency international.

Legal uncertainty per se is not our main concern, however. We have found that legal uncertainty matters for investment decisions through its impact on expectations over taxation. For this reason, we will interact our measures of legal uncertainty with the statutory corporate income tax.

4. Evidence

Apart from our dependent variable, the stock of foreign direct investment by country of origin and country of destination in 2006 according to OECD data, we have 4 panel data series, namely, the existence of a tax treaty between these countries, the distance between these two countries, and whether they share a common law or civil law tradition. Unfortunately for our estimation, none of the countries of origin had a muslim, jewish or customary law tradition. We also have eight data series that only vary with the country of destination. These variables are the

corporate income tax rate, gross domestic product, population, and five dummy variables for the five legal systems. Finally, we have series that vary only with the country of source, namely the statutory corporate income tax and gross domestic product. All series except for dummies and ratios are transformed logarithmically.

A natural starting point was to see whether corporate income taxes have an influence on foreign direct investment. This is shown in column A of table 1 below. We obtain the surprising result that an increase in corporate income taxes drives foreign direct investment. Obviously, this may be due to the fact that bigger economies attract more FDI but also have higher tax rates. We therefore control for GDP in the second estimation, presented in column B of table 1. The statutory corporate income tax rate now has a negative sign and GDP has a positive impact. A one percent increase in GDP will lead to a one percent increase in FDI, whereas a 1 percent decrease in the statutory corporate income tax leads to a 2.45% increase in FDI. We then also include GDP of source country, as bigger countries may manage to invest more, and indeed find a unit elasticity here, too. Column D then includes the ratio of corporate income tax rate between the destination and the source country. An increase in this ratio, either due to a reduction in the destination country statutory corporate income tax rate or due to an increase in the source country statutory corporate income tax rate reduces FDI.

Table 1: Panel estimation. Dependent: bilateral FDI stock 2006 (in logs)

	A	B	C	D
Constant	1.87 (8.33)	-21.59 (-30.44)	-49.58 (-43.09)	-48.38 (-38.06)
Corporate income tax rate (destination country)	4.23 (5.319)	-2.45 (-3.49)	-2.44 (-3.96)	-1.07 (-1.21)
GDP (destination country)		1.01 (34.35)	1.01 (38.92)	1.01 (38.94)
GDP (source country)			1.04 (28.99)	0.99 (24.21)
CIT ratio (destination/source)				-0.38 (-2.22)
R²	0.9	29.2	44.8	44.9

Notes: t-statistics in parenthesis.

Eliminating destination CIT as it is statistically insignificant, we find that a unit decrease in the CIT ratio increases FDI by $\frac{1}{2}$ percent, as shown in column E of table 2. We then add population of the destination country. Given that we are using logs, we can interpret this by stating that both the absolute size of destination country, measured by its GDP, as well as

the richness of the country, measured by GDP per capita, matters for foreign direct investment. We find that in addition to GDP itself, also GDP per capita would have a positive impact on FDI. However, the inclusion of GDP per capita breaks the unit elasticity of destination GDP and FDI, as confirmed by coefficient tests. This may be due to the fact that big poor countries attract less FDI, or rich small countries more. Next, we add geographical distance and find that countries attract less FDI when they are distant from countries of origin.

Table 2: Panel estimation. Dependent: bilateral FDI stock 2006 (in logs)

	E	F	G
Constant	-47.90 (-39.63)	-47.84 (-39.99)	-45.81 (-37.63)
GDP (destination country)	1.01 (39.46)	1.18 (35.52)	1.11 (32.68)
GDP (source country)	0.97 (25.37)	0.99 (26.05)	1.03 (27.01)
CIT ratio (destination/source)	-0.52 (-4.37)	-0.38 (-3.15)	-0.29 (-2.46)
Population		-0.31 (-8.00)	-0.24 (-6.25)
Geographic distance			-0.30 (-7.36)
R²	44.9	46.1	47.0

Notes: t-statistics in parenthesis.

We will now look at three different institutional variables that measure of legal uncertainty, corruption in the destination country, the difference in the legal system, and the existence of a tax treaty. Table H and I give the results, first with population included, and then without (as population turns out insignificant). All variables have the expected sign. GDP in both the destination and source country increases bilateral FDI, whereas an increase in the statutory corporate income tax ratio reduces FDI. We find that low corruption is good for foreign direct investment, a different legal system is an impediment to FDI, but the existence of a tax treaty is favorable for FDI. In that respect, an institutional setting that reduces legal uncertainty appears to be good for FDI.

Table 3: Panel estimation. Dependent: bilateral FDI stock 2006 (in logs)

	H	I	J
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Constant	-44.07 (-35.46)	-44.37 (-36.12)	-43.82 (-35.23)
GDP (destination country)	0.76 (13.00)	0.84 (29.72)	0.83 (29.21)
GDP (source country)	1.02 (27.06)	1.02 (27.08)	1.01 (26.77)
CIT ratio (destination/source)	-0.24 (-2.06)	-0.22 (-1.91)	-0.34 (-2.70)
Population	0.10 (1.56)		
Geographic distance	-0.23 (-5.73)	-0.23 (-5.59)	-0.23 (-5.61)
(low) Corruption index	0.26 (6.96)	0.21 (9.33)	0.22 (9.60)
Treaty	0.60 (6.21)	0.71 (6.32)	0.59 (6.19)
Different legal system	-0.45 (-4.36)	-0.43 (-4.24)	-1.31 (-3.86)
Interaction: Different legal system and CIT (destination country)			3.23 (2.71)
R²	48.9	48.9	49.0
Notes: t-statistics in parenthesis.			

In the theoretical part, we have argued that legal uncertainty may actually lead to excess entry into foreign markets, as tax speculators may hope for low or no taxation, and otherwise consider default. Clearly, the speculative gain is bigger if the destination country has a higher corporate income tax. We will try to identify this speculative motive with an interaction effect. In column J of table 3, we interact the different legal system with the statutory corporate income tax rate of the destination country. We find that the interaction term is positive and highly significant. This is clear evidence that speculative entry exists. As an increase in the corporate income tax has an effect on both the corporate income tax ratio and the interaction effect, a straightforward interpretation of tax policy is not possible. However, when looking at the means of the variables, we find that the positive effect prevails for countries with different legal systems. In order to attract foreign FDI from countries with a different legal tradition, it may actually be preferable to have high and uncertain tax rates.

Table 4: Panel estimation. Dependent: bilateral FDI stock 2006 (in logs)

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Constant	-43.70 (-33.70)	-43.52 (-34.78)	-43.40 (-33.36)	-43.10 (-34.14)
GDP (destination country)	0.83 (28.72)	0.82 (28.92)	0.82 (28.48)	0.82 (28.57)
GDP (source country)	1.01 (26.45)	1.01 (26.60)	1.01 (26.30)	1.00 (26.37)
CIT ratio (destination/source)	-0.31 (-2.41)	-0.34 (-2.89)	-0.39 (-2.91)	-0.43 (-3.48)
Geographic distance	-0.24 (-5.76)	-0.24 (-5.89)	-0.23 (-5.70)	-0.24 (-5.91)
(low) Corruption index	0.21 (9.39)	0.21 (9.43)	0.22 (9.62)	0.22 (9.65)
Treaty	0.16 (0.53)		0.29 (0.96)	
Interaction: Treaty and CIT (destination country)	1.69 (1.62)	2.21 (6.51)	1.16 (1.09)	2.12 (6.21)
Different legal system	-0.43 (-4.22)	-0.43 (-4.22)	-1.24 (-3.57)	-1.18 (-3.45)
Interaction: Different legal system and CIT (destination country)			2.95 (2.43)	2.75 (2.30)
R²	49.0	49.0	49.0	49.1

Notes: t-statistics in parenthesis.

Table 4 repeats this exercise with an interaction variable between the corporate income tax rate and the existence of a tax treaty. We find that neither the treaty variable itself nor the interaction term are statistically significant and therefore drop the treaty variable in column L, implying that treaties themselves have no impact on FDI. The interaction effect then turns out positive and statistically significant. This implies that speculative entry occurs also when treaties add a layer of complexity to the domestic and foreign legal system and thus increase legal uncertainty.

Introducing treaties will have a positive effect on FDI if corporate income tax rates are higher. As opposed to different legal systems, an increase in the corporate income tax rate in the presence of a treaty will have a negative impact on FDI.

In the last two columns of table 4, we present both interaction terms together, once again eliminating the statistically insignificant treaty dummy. The elasticities that we have measured before remain more or less the same. Both interaction terms indicate the impact of legal uncertainty on foreign direct investment through corporate income taxation.

Summary

This paper has analyzed the effects of legal uncertainty in the application of double tax agreements on foreign direct investment in developing economies. The literature is surprisingly inconclusive and more often than not finds a negative or insignificant relationship. We explain this stylized fact by taking legal uncertainty into account. We have studied a general equilibrium model of foreign investors who consider investing in a profitable developing market. Uncertainty arises due to uncertainty about the application of tax treaties. The entry decision will be undertaken strategically, taking the behavior of other market participants into account. Depending on the industry structure, firms may decide to enter until economic rents are zero in the low tax scenario. Companies that compete with each other may underbid each other, speculating that legal uncertainty resolves in their favor. This will lead to a race to the bottom between foreign direct investors and harmful competition. A double tax agreement with a high degree of legal uncertainty can therefore be worse for the host company (and the involved firms) than a fully implemented agreement or no agreement at all.

We have then tested these findings empirically in an international panel. We use the stock of foreign direct investment from one country to another as our dependent variable. The explanatory variables are the ratio of the statutory corporate income tax rates between the source and destination country, the existence of a tax treaty, and the common legal traditions, in addition to some control variables, in particular GDP in the source and destination country, corruption and geographic distance.

We find that legal uncertainty matters in explaining foreign direct investment. An increase in the ratio of the statutory corporate income tax rate of the destination relative to the source country exhibits a traditionally negative and significant effect on foreign direct investment. Filtered through institutional variables, we find that the interaction variable between the statutory corporate income tax rate and the tax treaty dummy and the statutory corporate income tax rate interacted with a different legal systems dummy both exhibit a positive impact on foreign direct investment. Both results point to the direction of a positive but detrimental impact of legal uncertainty on foreign direct investment through tax rates.

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