

Tax treaty shopping: structural determinants of Foreign Direct Investment routed through the Netherlands

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Abstract Many multinationals divert Foreign Direct Investment (FDI) through conduit countries that have a favourable tax treaty network, to avoid host country withholding taxes. This is referred to as tax treaty shopping. The Netherlands is the world's largest conduit country; in 2009, multinationals held approximately € 1,600 billion of FDI via the Netherlands. This paper uses micro data from Dutch Special Purpose Entities to analyse geographical patterns and structural determinants of FDI diversion. Regression analysis confirms that tax treaties are a key determinant of FDI routed through the Netherlands. The effect of tax treaties on FDI diversion partly arises from the reduction of dividend withholding tax rates, which provides strong evidence for tax treaty shopping.

Keywords Treaty shopping, Tax treaties, Foreign direct investment, Withholding tax, Special purpose entities

JEL Classification G32, H25, H32

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1 Introduction

Tax treaty shopping is a particular form of tax avoidance by multinational corporations. It involves the diversion of Foreign Direct Investment (FDI) through a third country to achieve reduction of withholding taxes under favourable tax treaties (Kingson 1981). Most countries levy withholding taxes on outgoing dividends and interest payments to foreign affiliates. Tax treaties reduce or eliminate these withholding taxes on a bilateral basis, thus providing an advantage to foreign investors from the partner country. When multinationals engage in treaty shopping, they may obtain benefits that a host country would otherwise not provide to them.

This article analyses how tax treaties and other structural determinants influence the diversion of FDI. Only a few other articles have analysed treaty shopping before, using micro data from a single home or host country (Collins and Shackelford 1998; Weichenrieder and Mintz 2008). This article contributes to existing literature by presenting the first empirical analysis of worldwide FDI routed through a specific third country. It is also the first article that uses micro data from Dutch Special Purpose Entities (SPEs). The results provide strong evidence for tax treaty shopping via the Netherlands, which is relevant for international tax policies. The findings have major implications for further research on tax treaties and other research using bilateral FDI data as well.

The structure of this article is as follows. Section 2 provides background on treaty shopping and discusses related research. Next, Section 3 describes the Dutch micro data and geographical patterns of FDI routed through the Netherlands. Section 4 uses regression analysis to identify determinants of FDI diversion. Section 5 presents conclusions, policy implications and a discussion of limitations to this study.

2 Background on treaty shopping and FDI diversion

In theory, the main purpose of tax treaties is to remove tax barriers to international economic activity. Tax treaties prevent double taxation by allocating taxing rights between the host country, where the income arises, and the home country, where the beneficiary of the income resides. This provides legal certainty to foreign investors. Withholding tax reductions limit the taxing rights of the host country and are a core element of tax treaties.

In practice, many countries have also adopted unilateral measures to prevent double taxation, such as a tax credit or exemption for income that has been taxed abroad. Where such unilateral measures exist, tax treaties merely confirm these. Some argue that treaties may still signal that the host country is committed to international investment rules (Barthel et al. 2010a). This is especially relevant for developing countries. However, the reputation of a country's tax administration may be more important than the number of treaties in place and the value of legal certainty should not be exaggerated (Thuronyi 2010). Some treaties also serve specific purposes other than attracting FDI (Pistone 2010). Nonetheless, tax treaties do offer benefits to foreign investors. An example is a

reduced withholding tax on dividends paid to a parent in a country that exempts these dividends from tax. In this case, the withholding tax cannot be recovered by the company and the reduced rate is a real benefit.

Tax treaties themselves do not provide a formal definition of treaty shopping. However, Article 22 of the 2006 US model treaty, on anti-treaty shopping provisions, provides an implicit description: ‘*residents of third countries [...] benefiting from what is intended to be a reciprocal agreement between two countries*’. For the purpose of this article, tax treaty shopping is defined more specifically as the diversion of FDI through an intermediate country to achieve reduction of withholding taxes under favourable tax treaties (Kingson 1981). To this effect, a tax treaty must exist between the host and intermediate country (Kandev 2009; OECD 1986). Diverted FDI is defined as FDI into an intermediate country that is then reinvested as FDI in another country.¹ The investment may pass through various entities in the intermediate country and undergo transformations, for example from an intra-group loan into an equity investment. This definition excludes investments that entities in the intermediate country finance by issuing bonds or obtaining other external funding themselves.

Tax treaty shopping has received substantial attention in legal analyses since the early 1980s. Many of these focus on the use of Dutch conduit entities and on attempts of the US to limit tax avoidance via conduit structures. They generally regard the Netherlands as a key intermediate country, mainly due to its extensive and favourable tax treaty network (Avi-Yonah 2009; Dolan and Walsh Weil 1995; Kingson 1981; Wacker 1993).

Certain clauses in tax treaties can inhibit treaty shopping. One type, limitation of benefits (LOB), specifies detailed objective criteria that an investor must meet to qualify for treaty benefits. These criteria exclude conduit entities. Before 2007, the only Dutch tax treaty with LOB was the Netherlands-US treaty. A second type, a main purpose test, is subjective and denies treaty benefits if an investment relation is established or maintained mainly for the purpose of securing these benefits. This clause is more common, but may be difficult to apply, because the host country tax authority would need to assess the operations of foreign entities to determine their purpose. Before 2007, a main purpose test was included in 11 Dutch tax treaties. Since 2007, the Netherlands includes a main purpose test or LOB in new and amended tax treaties more often.

Host countries generally disapprove of treaty shopping, because it breaches the principle of reciprocity and treaty benefits are not intended for investors from third countries (Kandev 2009; Lee 2009; OECD 1986). This raises the question why many countries, including most Dutch treaty partners, conclude treaties without anti-treaty shopping provisions. Legal cases illustrate that these countries, too, find treaty shopping abusive. Examples are the *Prévost* case in Canada, involving a Dutch conduit (Kandev 2009), and the *Andolan* case in India, involving a Mauritian conduit (Baistrocchi 2008). However, these cases do confirm that a tax treaty allows treaty shopping unless it contains explicit countermeasures.

To date, there exist only a few empirical economic studies on treaty shopping. Collins and Shackelford (1998) examine the effect of withholding and home country taxes on cross border payments between foreign affiliates of US firms. They find that internal dividend and interest flows are structured in such a way as to mitigate taxes and conclude that the results are consistent with treaty shopping. A key difference with this study is that Collins and Shackelford use income flow data instead of data on diverted capital stock. The different methodologies make the results difficult to compare. Weichenrieder and Mintz (2008) provide the only direct evidence of treaty shopping so far. They show that higher bilateral withholding taxes to and from Germany substantially increase the

¹ Between the ultimate home and host countries, FDI may be diverted several times.

probability that outward and inward FDI is diverted via a third country. A key difference with this study is that Weichenrieder and Mintz analyse the probability that multinationals use a conduit entity rather than the proportion of diverted FDI stock.

Other studies have analysed the effect of tax treaties on bilateral FDI without accounting for the possibility of treaty shopping. All these studies use gravity models with dummy variables for the existence of a tax treaties. Some cover a broad range of home and host countries, using bilateral FDI data from the OECD or UNCTAD. Blonigen and Davies (2008) and Egger et al. (2006) find negative effects of new tax treaties on FDI, whereas Coupé et al. (2008) find no significant effects. Barthel et al. (2010b), who use a dataset with extended coverage of developing countries, find positive effects, as does Siegman (2007). Thus, results regarding the effect of tax treaties on bilateral FDI have been mixed.

If tax treaties increase bilateral FDI, this may to some extent result from treaty shopping (Thuronyi 2010). The diversion of inward FDI from non-treaty countries through treaty countries affects the apparent origin of investments. The UK Office for National Statistics calls this the '*Netherlands effect*', although it occurs for other countries as well (Wilkie 2010). FDI diversion via a treaty country leads to overestimation of the effect of the treaty on bilateral FDI originating from that country itself. Furthermore, after a host country concludes additional treaties, new investments might no longer be diverted. This increases the apparent effect of new treaties. However, changes in investment route do not affect total inward FDI from all countries combined. Only Neumayer (2007) has analysed the effect of tax and investment treaties on total FDI. He finds that tax treaties increase FDI to middle income countries, but not to low income countries. Most studies are not robust to treaty shopping, though, which makes empirical results on treaty shopping highly relevant.

For the analysis of FDI diversion, it is important to distinguish conduit entities from so-called base companies and mixing companies. The last two are used by multinationals from home countries that tax the income of foreign subsidiaries, such as the US. The tax on this income is usually offset by a tax credit equal to the tax already paid abroad and thus arises only if the foreign tax rate is lower. Furthermore, the tax is normally deferred until the income is repatriated in the form of dividends. If a multinational invests abroad via a base company in an intermediate country, it can reinvest the income of subsidiaries via the base company and avoid the home country tax (Desai et al. 2003). A multinational can also use an intermediate holding to mix dividends from low-tax and high-tax countries. This allows to offset taxes paid in different countries against each other when the dividends are paid onwards to the ultimate parent, which may not be possible if the ultimate parent holds the subsidiaries directly (Dolan and Walsh Weil 1995).²

Thus, dividend conduits aim to avoid withholding taxes levied by host countries, whereas base and mixing companies take withholding taxes into account as well but primarily aim to avoid home country taxes. Base and mixing companies are established in countries that exempt foreign dividend income and have a favourable treaty network, such as the Netherlands. They can be difficult to distinguish from conduits, because they involve similar holding structures.

Analogous to tax treaties, bilateral investment treaties can also be a reason for FDI diversion.³ Investment treaties enhance protection of foreign investors in developing or emerging countries against expropriation and unfavourable policy changes (Fortanier and Van Tulder 2007). The Netherlands has a relatively large network of almost 100 investment treaties and these contain a broad

² The UK and Japan recently switched from credit to exemption systems for foreign dividend income, but many structures set up in response to past tax rules are still in place.

³ Investment treaties can also be an important secondary consideration when fiscal reasons are the main driver for FDI diversion and various conduit countries offer similar tax benefits.

definition of investors that facilitates treaty shopping. As of June 2011, out of approximately 400 claims under investment treaties worldwide, at least 29 cases involved Dutch intermediate holdings with a foreign parent or controlling shareholder that sought protection through a Dutch investment treaty (Van Os and Knottnerus 2011).

On the basis of the literature discussed above, some potential determinants of FDI diversion can be identified. First, normal FDI is largely explained by gravity factors and this may also apply to diverted FDI. To put it differently, FDI diversion through the Netherlands may partly follow the same pattern as normal FDI to and from the Netherlands, regardless of treaty benefits. Second, due to tax treaty shopping, one would expect that FDI diversion is higher via tax treaty routes that reduce withholding taxes. In addition, home country taxation of foreign dividend income probably increases FDI diversion because of deferral and mixing strategies. Third, one might expect that FDI diversion is higher via investment treaty routes. Fourth, due to signalling effects, a high number of tax and investment treaties may reduce the need for protection under a specific bilateral treaty and therefore reduce FDI diversion. These potential determinants form the basis for the empirical analysis in this article.

3 Description of FDI routed through the Netherlands⁴

3.1 Dutch conduit entities

Before presenting the analysis of treaty shopping, this section describes the Dutch micro data and geographical patterns of FDI routed through the Netherlands.

The Netherlands is the world's largest conduit country for FDI. At the end of 2009, FDI diverted via the Netherlands amounted to approximately € 1,600 billion.⁵ This corresponds to 13% of global inward FDI stock. US micro data show that the Netherlands hosts more intermediate holdings for outward investments of large US firms than any other country (Desai et al. 2003). In addition, German micro data show that the Netherlands ranks first in number of intermediate holdings, and second in value of pass-through investment stock, for FDI to and from Germany (Weichenrieder and Mintz 2008).

This article uses Dutch micro data on conduit entities. These entities are identified by the central bank (DNB). By definition, they hold mainly financial or intangible assets and most or all of their assets and liabilities are foreign.⁶ Usually they do not conduct real business activities. At the end of 2009, there were approximately 11,500 such entities (DNB 2009; 2010). The central bank collects detailed survey data on annual investment positions and monthly transactions of some 1,000 entities that account for approximately 90% of total conduit entity assets. Participation to the surveys is obligatory under Dutch law. The analysis mainly uses micro data from 2006 and 2007.

⁴ Access to the anonymised micro data used for this research was obtained from De Nederlandsche Bank in cooperation with Statistics Netherlands, subject to DNB's disclosure policies, see <http://www.dnb.nl/en/statistics/statistische-microdata/index.jsp>. The interpretation of the data is solely the responsibility of the author.

⁵ Calculated as € 1,918 bn of conduit entity FDI assets minus € 327 bn of securities issued to finance FDI; the latter follows from € 435 bn of total securities issued by conduit entities minus €108 of debt securities issued to finance portfolio assets. This is consistent with the reported € 1,650 bn of conduit entity FDI liabilities. Source: DNB, <http://statistics.dnb.nl>, tables 9.1, 12.10 and 12.14 (accessed 19 Sep 2011).

⁶ For conduit entities with the same ultimate parent, these criteria apply to the cluster as a whole.

3.2 Parent companies and home countries

Data on ultimate parents of conduit entities were not available from the central bank and were obtained from the REACH database of Bureau van Dijk.⁷ Some entities belong to the same ultimate parent. Within these clusters, balance sheets are consolidated as much as possible by netting out Dutch intra-group equity and loan positions. Each cluster or individual conduit entity not belonging to a cluster will be referred to as a Special Purpose Entity (SPE), in line with OECD terminology (OECD 2008). After removing some 100 SPEs that hold portfolio investments only, the dataset has approximately 525 to 575 SPEs per month.

Table 1 shows the main individual origin countries for all SPEs in the dataset. The top seven countries are the same for direct and ultimate parents and include the largest economies. They also include the Netherlands Antilles and Luxembourg, two other countries with many intermediate holdings.⁸ It is remarkable that over 40% of US ultimate parents hold their Dutch SPEs indirectly via another country. This figure is consistent with Desai et al. (2003). The average proportion for all Dutch SPEs is approximately 25%.

Table 1 Geographical distribution of parent companies of Dutch SPEs

	Direct parents	Ultimate parents
United States	10%	17%
United Kingdom	13%	13%
Netherlands Antilles	9%	7%
Luxembourg	9%	6%
France	5%	6%
Germany	7%	5%
Japan	6%	5%
Other countries	40%	41%
Number of SPEs	822	680

Note: the table includes all SPEs in any of the reporting populations from April 2003 to December 2007 for which ownership data were available.

3.3 Destinations of diverted FDI

To analyse diverted FDI stocks, the SPE data require additional processing. Approximately 50 SPEs, representing 10% of total assets, belong to a banking group. In international investment statistics, cross border loans between SPEs and foreign banks are always regarded as external loans, even if the counterparty is affiliated. Yet due to the nature of SPE operations, most of these loans are probably intra-group. All loans between banking group SPEs and foreign banks are therefore reclassified as intra-group loans.⁹ Furthermore, the assets of some SPEs are substantially larger than total liabilities plus equity. To make both sides of the balance sheet match, a liability item with unknown origin is created where necessary.

⁷ This is a commercial database that integrates data from national company registers. Ultimate parents are defined as companies that own an SPE through shareholdings of more than 50% at each step in the ownership chain and that are not known to be majority owned by another company.

⁸ The large share of direct parents in the Netherlands Antilles is partly due to historical reasons. The number of ultimate parents in these countries is overstated due to incomplete ownership data.

⁹ Also in contrast to investment statistics, capital or loans provided by Dutch SPEs to their foreign parents are counted as positive assets, because this describes SPE positions in the most useful way.

The description of geographical patterns distinguishes seven country groups on the basis of tax, economic and political criteria. The classification also takes into account the amount of detail that is allowed by confidentiality requirements. Table 2 presents a description of the different country groups, which are mutually exclusive.

Table 2 Country groups for the description of geographical patterns

Country group	Description
(1) Developing without treaty	38 low and 67 middle income countries that do not have a tax treaty with the Netherlands
(2) Developing with treaty	11 low and 25 middle income countries (other than the emerging economies below) that have a tax treaty with the Netherlands. These countries are probably most vulnerable to treaty shopping, because they have limited capacity to implement anti-avoidance measures and a relatively weak position in tax treaty negotiations (Pistone 2010), which are highly complex (Thuronyi 2010).
(3) BRICSM	The six major emerging economies Brazil, Russia, India, China, South Africa and Mexico. All six have a tax treaty with the Netherlands and receive substantial FDI via Dutch SPEs. In contrast to developing countries, they can implement advanced anti-avoidance measures and negotiate tax treaties with high income countries on an equal basis.
(4) EU	All EU-27 countries except Luxembourg, Belgium, Ireland, and the Netherlands itself. Within the EU, no withholding taxes apply on cross border transactions with affiliated entities, except in a few host countries with transitory arrangements.
(5) Other high income	30 non-EU high income countries, including the US, Japan, Hong Kong, and Singapore. 17 of these had a tax treaty with the Netherlands. Hong Kong signed one in 2010; as of 2007, it was the only high income territory outside the Dutch tax treaty network where Dutch SPEs had substantial positions.
(6) Tax haven islands	The eight tax havens that are no OECD members where liabilities of Dutch SPEs are largest. These are the Netherlands Antilles ^{a)} , Aruba, Bermuda, British Virgin Islands, Cayman Islands, Guernsey, Jersey, and Puerto Rico. ^{b)} They are high income countries with some degree of autonomy, belonging to the Kingdom of the Netherlands, the UK, and the US. All have zero corporate tax regimes. ^{c)} Only the Netherlands Antilles and Aruba have tax treaties with the Netherlands. Tax treaties of the UK and the US do not extend to their tax haven dependencies.
(7) OECD tax havens	The four OECD member countries Luxembourg, Ireland, Belgium and Switzerland, which can also be regarded as tax havens for multinationals because of their special tax regimes. ^{d)} In contrast to tax haven islands, these four countries have many tax treaties.

Notes: a) In 2007, the Netherlands Antilles consisted of Curaçao, where most financing companies are located, and four smaller islands. In 2010, Curaçao became a separate jurisdiction and inherited the Netherlands Antilles' tax treaty. b) In 2007, Cyprus fell just outside this group, while investments from Cyprus via Dutch SPEs were strongly increasing. c) Bermuda and Cayman Islands do not levy corporate income tax. Puerto Rico exempted US manufacturing companies (see Grubert and Slemrod 1998); it phased out this regime by 2006 and introduced special tax allowances instead. In 2007, the other five island havens exempted international financing companies. d) Belgium has a notional interest deduction scheme resulting in low tax rates for equity-funded corporations that lend to affiliates. In Switzerland, some cantons offer a low-tax environment. For special tax characteristics of Ireland and Luxembourg, see Mutti and Grubert (2009).

Table 3 shows some tax system characteristics of the seven country groups. Note that non-EU high income countries on average have a relatively low number of tax treaties, but this is because the group includes minor countries with no tax treaties at all, such as Equatorial Guinea, Gibraltar, and the Bahamas. The data on average withholding taxes¹⁰ (WHT) confirm that the standard rates for dividend

¹⁰ WHT data based on 170 countries for which data were available. Most countries and tax treaties define various

(div.) and interest (int.) payments are substantially higher than the rates for payments to the Netherlands.

Table 3 Tax system characteristics and inward FDI positions (in € bn)

Country group	Country average (unweighted)					Total for country group		
	Number of tax treaties	div. WHT (no treaty)	div. WHT to NL	int. WHT (no treaty)	int. WHT to NL	Total inward FDI	Inward FDI via Dutch SPEs	Share via Dutch SPEs
(1) Developing without treaty	6	11%	11%	14%	14%	309	19	6%
(2) Developing with treaty	37	11%	5%	14%	7%	582	53	9%
(3) BRICSM	63	4%	3%	16%	9%	929	54	6%
(4) EU ^{a) b)}	64	12%	0%	11%	2%	3,420	710	21%
(5) Other high income ^{a)}	27	12%	4%	11%	7%	3,322	243	7%
(6) Tax haven islands	1	3%	3%	6%	6%	91 ^{c)}	103	n.a. ^{c)}
(7) OECD tax havens	66	24%	0%	9%	0%	831 ^{d)}	351	42% ^{e)}
All countries ^{b)}	23	11%	7%	13%	10%	9,481	1,533	16%

Notes: Tax treaty and withholding tax data as of end 2007, average of end-2006 and end-2007 for total inward FDI, and SPE positions as of 30 June 2007; a) excluding tax havens; b) excluding the Netherlands; c) total inward FDI excluding Jersey, Guernsey, and Puerto Rico because data are unavailable; d) € 1,501 bn if Luxembourg SPEs are included; e) 23% if Luxembourg SPEs are included.

The last columns show total inward FDI stocks for each country group and investments held via Dutch SPEs. In absolute terms, the EU is by far the largest destination of Dutch SPEs investments. However, diverted FDI in developing countries is also substantial, over € 70 billion in total. It accounts for 9% of all inward FDI for Dutch treaty partners and 6% for other developing countries. The relatively small difference between these shares is remarkable, because the tax advantages that can be obtained in the absence of a tax treaty are more limited. SPE investments in the second country group may still benefit from relatively generous unilateral tax relief or protection under investment treaties, though. Dutch SPE investments in BRICSM countries are relatively modest, partly due to the well-known use of other conduit countries, notably Hong Kong for China and Mauritius for India.

3.4 Origin and destination combinations

For further analysis, an origin and destination matrix is generated for each SPE by proportionally attributing the various country group destinations to the country group origins. Next, all matrices are added up to a total matrix for all SPEs combined. The general methodology for constructing origin and destination matrices is described in Annex 7 to the OECD Benchmark Definition on FDI (OECD 2008).¹¹

rates. This study uses the maximum rate for large non-financial parent companies that hold a controlling stake in the host country entity, are not owned by a government, and are not subject to anti-avoidance provisions or based in a tax haven. Furthermore, for normal host countries, it disregards special rates for companies operating in a particular zone or industry. For tax haven host countries, in contrast, it uses the special rates for international financing companies, if applicable.

¹¹ Some SPEs have negative balance sheet positions. These reflect a negative valuation of investments on the assets side or negative net worth reported as negative equity on the liabilities side, for example. The matrix calculations include rules to prevent attribution of positive assets to negative liabilities (as a negative proportion) and vice versa.

Table 4 presents an origin and destination matrix for Dutch SPEs as of 30 June 2007. The destination dimension includes FDI assets only and distinguishes the seven country groups mentioned above. The origin dimension includes all types of financing, thus also securities, liabilities to domestic non-SPE affiliates, and obligations to non-affiliated companies. On the origin side, all developing and emerging economies are combined into a single group for confidentiality reasons. Furthermore, there are two additional categories: the Netherlands itself, in case of domestic non-SPE affiliates or shares issued in the Netherlands; and capital of unknown origin, as explained in the previous section. Various cells have been merged for confidentiality reasons.

Table 4 Origins and destinations of Dutch SPEs investments, as of 30 June 2007 (in € bn)

		Direct origin of capital							Total
		(1)-(3)	(4)	(5)	(6)	(7)	NL	Un-known	
Destination	(1) Developing without treaty	32	11		4	3		85	19
	(2) Developing with treaty		32			7	1		53
	(3) BRICSM		23	4	17				54
	(4) EU		386	77	28	151	36		710
	(5) Other high income		142		86				243
	(6) Tax haven islands		180		231				103
	(7) OECD tax havens								351
	Total		32	636	220	120	344		96

The matrix shows that the EU is by far the largest origin of investments via Dutch SPEs. OECD member tax havens are also a large source of SPE funding, partly because of debt securities issued by SPEs listed in Luxembourg and Switzerland. Developing and emerging economies are mostly net FDI importers and a relatively minor origin of Dutch SPE financing. SPE liabilities to and direct investments in non-EU countries that do not have a tax treaty with the Netherlands are only 5-10% of the total. The main origins and destinations of this kind are British tax haven islands, Puerto Rico, Hong Kong, and some developing countries. On the liability side, these positions consist partly of loans from tax haven affiliates. The Netherlands does not impose a withholding tax on interest payments, so these loans do not require a tax treaty to reduce withholding taxes. On the asset side, SPE investments in non-treaty countries could be motivated by unilateral tax relief or investment protection, as explained above.

Approximately a quarter of the SPE investments are intra-EU. At present, there are no withholding taxes inside the EU that SPE structures may help to avoid. However, historical reasons may play a role and some companies may find it convenient to use a single structure for investments inside and outside the EU. Finally, a substantial share of investments is routed from tax havens via Dutch SPEs into other tax havens. This suggests that some Dutch SPEs are part of SPE chains and serve other purposes than tax treaty shopping.

4 Empirical analysis of treaty shopping

4.1 Empirical specification

The previous section showed that the main origins and destinations of SPE investments are countries that have a tax treaty with the Netherlands. This section analyses if treaty shopping is a reason for that geographical pattern, by identifying structural determinants of FDI diversion. Using regression analysis, at the level of country pairs, it tests which variables influence the proportion of bilateral FDI stock that is diverted through the Netherlands.

On the basis of existing literature, various potential determinants were identified: gravity factors, tax variables, investment treaties, and variables reflecting the general treatment of foreign investors. The analysis uses two alternative types of tax variables: general tax system indicators and more detailed measures modelling the benefits of specific tax strategies.

The general tax indicators are dummy variables for the existence of a Dutch tax treaty route, for a direct tax treaty between the home and host country, and for the taxation (non-exemption) of foreign profits by the home country. One would expect that a Dutch treaty route increases FDI diversion because of potential treaty benefits, whereas a direct treaty decreases it because the reduction of withholding taxes under a direct treaty lowers the potential benefits of FDI diversion. Furthermore, non-exemption of foreign profits might increase FDI diversion due to potential dividend deferral and mixing benefits.

The strategy-specific tax benefits reflect the reduction of the total tax on income generated in the host country, taking into account bilateral withholding taxes and the home and host country tax systems. The analysis focuses on distributed profits, because almost 80% of diverted FDI consists of equity investments.¹² Regressions with strategy-specific variables include a measure for dividend conduit benefits and for either base or mixing company benefits.¹³ These variables distinguish Dutch tax treaties that provide large withholding tax reductions from others that provide smaller reductions or none at all. It is expected that all strategy-specific benefits increase FDI diversion.

All regressions include separate gravity variables for the home and host country. It is expected that stronger gravity factors are associated with higher FDI diversion. Furthermore, the regressions include two investment treaty dummies. Similar to the general tax variables, it is expected that a Dutch investment treaty route increases FDI diversion and a direct investment treaty decreases it. The regressions use the host country's total numbers of tax and investment treaties as proxies for its general commitment to protect investors. If treaties have a signalling role, one would expect a negative effect on FDI diversion.

The analysis controls for two alternative reasons for FDI diversion. First, firms from outside Europe may establish European headquarters in the Netherlands and these headquarters may also qualify as SPEs. Second, investors may use a conduit country to reduce exposure to corruption in home or host countries.¹⁴ It is expected that the possibility of European headquarters and higher corruption in the home or host country increase FDI diversion.

Treaty shopping benefits probably have a decreasing marginal effect on the share of diverted FDI. The reason is that most large multinationals, which account for a substantial share of total FDI,

¹² Avoidance of capital gains tax on the potential future sale of a foreign subsidiary can also be a reason for diversion of equity investments.

¹³ If both measures would be included simultaneously, the effect for country pairs where the host country has the lowest tax rate would be modelled largely independently from pairs where the home country has the highest rate. This would not provide useful information about overall tax strategies.

¹⁴ This is especially relevant for joint ventures between companies from different countries.

may divert investments even if this yields only a small reduction in effective tax rates, because they can obtain large absolute gains. Some large multinationals may face specific barriers, though, such as historical internal ownership structures or minority shareholders that make it costly to restructure existing operations. Others may prefer less complex holding structures or may simply be more focussed on maximizing operational rather than fiscal performance. Therefore some multinationals may only divert investments if treaty shopping reduces effective tax rates by a much larger amount. To model decreasing marginal effects, most regressions use the square root of the diverted FDI share as the dependent variable. This simple transformation substantially enhances the model fit.

The empirical analysis uses tobit estimation because the share of diverted FDI is zero for approximately 9% of observations.¹⁵ All regressions are estimated with robust standard errors.

4.2 Regression variables

Table 5 provides descriptive statistics for the regression variables. By default, the regressions use data from 2007. The dependent variable, the share of FDI from an origin country to a destination country diverted via the Netherlands, is calculated as follows. First, diverted FDI is obtained from an origin and destination matrix with FDI assets and liabilities that distinguishes all individual countries and territories.¹⁶ This matrix excludes assets financed with external debt or other non-FDI funding. Next, the diverted FDI stock is divided by the sum of the diverted and the non-diverted bilateral FDI stock. The latter is obtained from the OECD Statistics database, using inward FDI data if available.

The home country gravity variable is calculated as the ratio of non-diverted home country FDI in the Netherlands to total home country outward FDI stock. The host country gravity variable is the ratio of non-diverted FDI from the Netherlands to total host country inward FDI stock.¹⁷ By default, data on total inward and outward FDI stocks are taken from UNCTAD statistics. However, for a few countries, UNCTAD severely underestimates total FDI stocks, so the sum of bilateral FDI stocks reported by OECD partner countries is used instead.¹⁸

The general tax system dummies are defined as follows. The Dutch tax treaties dummy takes the value one for pairs of countries that both have a tax treaty with the Netherlands and the direct tax treaty dummy for pairs that have a tax treaty with each other. If two countries are EU members, this is regarded as equivalent to having a tax treaty between them. The non-exemption dummy takes the value one if the home country does not exempt foreign dividend income for at least 95%. The investment treaty dummies are defined in the same way as the tax treaty dummies.

Note that a Dutch tax treaty route does not exist for only 20% of country pairs. The majority of these observations, 14% of all country pairs, concern developing host countries. Similarly, only 28% of country pairs does not have a direct tax treaty and almost half of these observations also involves a developing host country. The correlation between the Dutch and direct tax treaty dummies is less than 0.5, though, so the full data set contains sufficient variation to analyse the effect of treaty routes. Annex 2 provides a correlation matrix.

¹⁵ The main results of OLS regressions are not materially different, though.

¹⁶ As far as possible, these matrices attribute equity assets to equity liabilities and loan assets to loan liabilities to reflect SPE structures more accurately. Most SPEs have one main origin country for each type of liabilities.

¹⁷ Most regressions use the square roots of these shares to match the transformation of the dependent variable.

¹⁸ Examples are total outward FDI stocks of Bermuda and the Netherlands Antilles as of end-2007, for which UNCTAD reports € 0.1 billion and € 0.7 billion, respectively, whereas the sum of bilateral inward FDI stocks reported by OECD partner countries is € 14 billion and € 68 billion, respectively.

Table 5 Descriptive statistics for regression variables

Variable	Mean	Sd ^{a)}	Min.	Max.	Unit of measurement	Underlying sources
<i>Dependent variable</i>						
Diverted FDI share	0.11	0.23	0.000	1.000	Ratio of FDI stocks	DNB, OECD
Diverted FDI share (root)	0.20	0.26	0.000	1.000	(Ratio of FDI stocks) ^½	DNB, OECD
<i>Gravity variables</i>						
Home gravity variable (root)	0.17	0.12	0.000	0.997	(Ratio of FDI stocks) ^½	OECD, UNCTAD
Host gravity variable (root)	0.18	0.09	0.000	0.498	(Ratio of FDI stocks) ^½	OECD, UNCTAD
<i>General tax variables</i>						
Dutch tax treaties dummy	0.80	0.41	0	1	Dummy	Dutch government
Direct tax treaty dummy	0.72	0.45	0	1	Dummy	IBFD
Non-exemption dummy	0.52	0.50	0	1	Dummy	E&Y, Deloitte, PwC, national sources
Developing host x Dutch tax treaties	0.15	0.36	0	1	<i>See interacted variables</i>	
Developing host x direct tax treaty	0.17	0.37	0	1	<i>See interacted variables</i>	
<i>Strategy-specific tax variables</i>						
Dividend conduit benefit	0	5	-25	20	%-point change in tax on distributed profit ^{b)}	E&Y, Deloitte, PwC, national sources
Base company benefit	3	6	-18	35	%-point change in tax on distributed profit ^{b)}	E&Y, Deloitte, PwC, national sources
Mixing company benefit	2	3	0	8	%-point change in tax on distributed profit ^{b)}	E&Y, Deloitte, PwC, national sources
Developing host x dividend conduit benefit	0	3	-25	12	<i>See interacted variables</i>	
Developing host x base company benefit	0	3	-18	27	<i>See interacted variables</i>	
<i>Investment treaty variables</i>						
Dutch inv. treaties dummy	0.54	0.50	0	1	Dummy	UNCTAD, Dutch government
Direct inv. treaty dummy	0.60	0.49	0	1	Dummy	UNCTAD
<i>Other control variables</i>						
European HQ dummy	0.20	0.40	0	1	Dummy	-
Developing host dummy	0.29	0.45	0	1	Dummy	World Bank
Home corruption	3.1	2.0	0.0	8.0	CPI score (reversed scale, 0-9)	Transparency International
Host corruption	4.5	2.3	0.6	8.6	CPI score (reversed scale, 0-9)	Transparency International
Host tax treaties	0.54	0.28	0	1.08	No. of treaties / 100	IBFD
Host inv. treaties	0.46	0.30	0	1.14	No. of treaties / 100	UNCTAD

Note: data for end of 2007; the statistics are shown for the observations in the baseline regression. n = 1730 for mixing company benefit, n = 1742 for other strategy-specific tax variables, and n = 1757 for all other variables. ^{a)} Standard deviation; ^{b)} see Annex 1.

The calculation of strategy-specific tax benefits involves tax data from all individual home and host countries as well as data on dividend withholding tax rates from Dutch tax treaties and over 1,200 tax treaties between home and host countries.¹⁹ International tax data were obtained from annual corporate

¹⁹ For the selection of applicable tax rates, see note 10.

tax surveys, overviews of withholding tax rates, and country profiles by Ernst & Young, Deloitte and PwC. A few data gaps were filled using national sources, mainly official websites from national tax authorities and ministries of finance, and original texts of tax treaties.

The dividend conduit benefit is defined as the total tax on profits generated in the host country that are distributed directly to the home country, minus the total tax that arises if the profits are distributed to the home country via a Dutch intermediate holding. The calculation takes into account the treatment of foreign profits in the home country. The benefit can be positive if a Dutch SPE reduces withholding taxes.²⁰ It can be negative if the Dutch route increases withholding taxes, even if the host and home country both have a tax treaty with the Netherlands. The average benefit is near zero, mainly because withholding tax reductions for observations with a Dutch treaty route are offset by compounded withholding taxes for observations without a Dutch treaty route,

The base company benefit is calculated in a similar manner, assuming a profit is distributed to a Dutch intermediate holding only and not onwards to the home country.²¹ This benefit reflects the payoff of a deferral strategy. The mixing company benefit is defined as half of the absolute difference between the home and host country tax rates.²² This benefit reflects the payoff of mixing dividends from low-tax and high-tax sources: it increases if the home and host country tax rates are further apart and is always positive. For home countries that exempt foreign dividend income, the base and mixing company benefits are set to zero. Annex 1 contains the formulas for the strategy-specific tax benefits.

The possibility of European headquarters (HQ) is captured by a dummy variable.²³ Corruption is measured using the Transparency International Corruption Perception Index (CPI) for 2007, which reflects perception of corruption by foreign investors.²⁴ Finally, the regression variables include a dummy identifying developing host countries (excluding BRICSM) and interactions between this dummy and tax variables, to test whether FDI into developing countries is more likely to be diverted via Dutch SPEs.

The analysis focuses on diversion of FDI via the Netherlands directly into normal economies. Therefore it excludes tax haven host countries and round-tripping observations with the same home and host country. It also excludes observations with total FDI below EUR 10 million. For such small positions, the diverted FDI share is relatively sensitive to potentially relevant non-reporting SPEs and to inaccuracies resulting from the proportional attribution of assets to liabilities. The baseline specification includes 100 home countries and 146 host countries. It covers a combined € 563 billion

²⁰ For example, consider a host country with 20% WHT on dividends paid to non-treaty countries, which include the home country. The Netherlands has a tax treaty with the host country, which reduces this 20% rate to 10%, and also with the home country, which reduces the standard Dutch dividend WHT from 15% to 5%. This reduces total WHT from 20% to $1-(1-0.10)(1-0.05) = 14.5\%$.

²¹ The base company benefit may also capture structures involving a Dutch cooperative or a direct US parent that uses so-called tick-the-box regulations to create hybrid entities. Such structures can avoid Dutch WHT and home country taxation even if profits are distributed upwards.

²² This is an approximation only, which disregards WHT and assumes that a multinational repatriates equal pre-tax profits from host countries with lower and higher tax rates than the home country. Half of the benefit is attributed to each type of host country.

²³ Europe is defined here as all EU countries plus Norway, Iceland, Switzerland, Croatia, Bosnia-Herzegovina, Serbia and Montenegro, Albania, and Macedonia.

²⁴ The 2007 CPI covers 179 countries, but none of the eight major tax haven islands. For these jurisdictions, corruption is set to zero, because it is very unlikely that protection against corruption is a reason to divert tax haven investments through the Netherlands.

of diverted FDI stocks²⁵ and € 6,237 billion of non-diverted FDI stocks, representing roughly 75% of global FDI stocks.

4.3 Results for general tax variables

Table 6 shows the results of regressions with general tax variables. In the baseline specification, the home and host country gravity factors are positive and highly significant, as expected. This confirms that in part, FDI diverted via the Netherlands simply follows the same pattern as regular FDI and this need not be related to treaty benefits. If an additional 10% of a home country's total outward FDI stock is invested in the Netherlands, then the share of the country's FDI to other destinations that is routed through the Netherlands is, on average, also approximately 10 percentage points higher.²⁶ This is a large effect, compared to the mean diverted FDI share of 11%. The host country gravity effect is slightly smaller.

Tax treaty effects are also significant and have the expected signs. On average, the existence of a Dutch treaty route is associated with approximately 6 percentage points more bilateral FDI being held via the Netherlands, whereas a direct bilateral tax treaty is associated with 3 percentage points less. Compared to the mean diverted FDI share of 11%, these effects are substantial as well. The tax treaty effects are additional to gravity effects and it is difficult to think of another explanation than tax treaty shopping. The effect of foreign income taxation by the home country, indicated by the non-exemption dummy, is insignificant.

The bilateral investment treaty effects are significant and also have the expected signs. The effects are similar in size to the tax treaty effects. This suggests that investment treaty shopping is another reason for investment diversion. An alternative explanation could be that FDI diversion is mainly driven by tax planning and the resulting structures also benefit from investment protection, or the other way around. However, there is only some 50% overlap between the Dutch tax and investment treaty networks. Therefore it is likely that tax treaties and investment treaties are both determinants of FDI diversion.

The results indicate that avoidance of home or host country corruption does not play a significant role. Furthermore, FDI diversion is not significantly reduced if host countries have more treaties. This finding does not support the idea that treaties have a signalling role.

The second regression tests whether FDI diversion via the Netherlands can be explained by European headquarters of non-European firms. The coefficient of the European headquarters dummy is significant, but negative, so this does not help to explain investment via Dutch SPEs.

²⁵ At the end of 2007, total FDI diverted via Dutch SPEs was approximately € 1,400 billion. The observations in the dataset add up to € 864 billion, or roughly 60% of the total, because they exclude FDI assets attributed to unknown liabilities, round-tripping FDI, and smaller SPEs. Total diverted FDI included in the regressions is further reduced to € 563 billion, because FDI into tax havens is disregarded, for € 110 billion of diverted FDI corresponding data on non-diverted FDI are unavailable, and tax or control variables are missing for some minor countries.

²⁶ All estimated effects reported in the text are evaluated at mean values of the regression variables, taking into account the tobit estimation method and the transformation of the dependent variable. The effects refer to the expected share of diverted FDI unconditional on this expected share being greater than zero. The difference with conditional effects is not substantial.

Table 6 Overall effect of tax treaties on FDI diversion

	(1)	(2)	(3)	(4)
Home gravity variable	0.65*** (0.07)	0.66*** (0.07)	0.86*** (0.10)	0.86*** (0.10)
Host gravity variable	0.50*** (0.10)	0.51*** (0.10)	0.39*** (0.13)	0.43*** (0.13)
Dutch tax treaties dummy	0.07*** (0.03)	0.07*** (0.03)	0.05 (0.03)	-0.02 (0.05)
Direct tax treaty dummy	-0.04** (0.02)	-0.05** (0.02)	-0.05** (0.03)	-0.02 (0.04)
Non-exemption dummy	0.01 (0.02)	0.01 (0.02)	0.02 (0.02)	0.02 (0.02)
Developing host x Dutch tax treaties	-	-	-	0.12** (0.06)
Developing host x direct tax treaty	-	-	-	-0.13*** (0.05)
Dutch inv. treaties dummy	0.07*** (0.02)	0.06*** (0.02)	0.09*** (0.02)	0.08*** (0.02)
Direct inv. treaty dummy	-0.05** (0.02)	-0.05** (0.02)	-0.01 (0.03)	-0.01 (0.03)
European HQ dummy	-	-0.05*** (0.02)	-	-
Developing host dummy	-	-	-	0.04 (0.05)
Home corruption	-0.004 (0.004)	-0.002 (0.004)	-0.001 (0.006)	-0.001 (0.005)
Host corruption	-0.003 (0.003)	-0.004 (0.003)	-0.009* (0.005)	-0.014** (0.006)
Host tax treaties	-0.01 (0.04)	0.01 (0.05)	0.10 (0.07)	0.13* (0.07)
Host inv. treaties	0.01 (0.04)	0.03 (0.03)	0.06 (0.05)	-0.07 (0.05)
Constant	-0.02 (0.03)	-0.02 (0.03)	-0.05 (0.04)	-0.04 (0.05)
Observations	1757	1757	987	987
Adjusted R ²	0.11	0.11	0.12	0.13

Notes: Dependent variable is the share of bilateral FDI stock diverted via the Netherlands. All specifications use tobit estimation. Robust standard errors are in parentheses. * denotes $p < 0.10$; ** $p < 0.05$; *** $p < 0.01$.

The third regression excludes FDI via the Netherlands into the EU altogether. FDI in the EU accounts for a large number of observations but may follow different patterns, especially in the case of intra-EU investments, due to the high degree of economic integration. In this specification, the Dutch tax treaties coefficient becomes insignificant. That may suggest the significant effect in the first regression is due to tax treaties between the Netherlands and home countries that increase FDI diversion from non-EU countries into the EU. However, the large FDI diversion within the EU, which showed up in the description of origins and destinations, also influences the results. For non-EU host countries, FDI diversion still depends on the existence of a direct tax treaty between the home and host country. For

investment treaties, the effect of a direct treaty becomes insignificant, but the diversion still depends on Dutch treaties. Thus, for FDI in non-EU countries, the results seem only partially consistent with treaty shopping. The next section will discuss this finding in more detail.

The fourth regression uses the same observations and analyses whether the effects of tax treaties differs between developing host countries and other non-EU host countries. The general effects of tax treaties on FDI diversion are now insignificant. Thus, the mere existence of tax treaties does not affect the routes of investment in non-EU high-income and BRICSM countries. In contrast, the interaction variables show significant effects of tax treaties on FDI in developing countries. These effects have the expected signs, consistent with tax treaty shopping, and are relatively large. The effect of a Dutch tax treaty route is therefore not limited to EU host countries.

So far, the regressions show that FDI diversion depends on three types of structural determinants. First, gravity effects confirm that FDI diversion partly follows the same pattern as FDI in general. This suggests that a Dutch investment route offers some generic benefits, regardless of tax or investment treaties. Second, tax treaties have an additional effect on FDI diversion, except for FDI in non-EU high-income and BRICSM countries. For other host countries, a Dutch treaty route increases diversion, while a direct treaty with the home country reduces it. This provides some evidence of treaty shopping. Third, investment treaties have a similar effect. This provides some evidence of investment treaty shopping as well.

Other potential determinants included in the regressions do not help to explain the pattern of FDI diversion. The limited role of European headquarters is consistent with the finding of Weichenrieder and Mintz (2008) that Dutch SPEs also hold large American and Asian investments. The insignificance of the home country tax system is unexpected and not in line with other studies. Weichenrieder and Mintz (2008) find that companies from countries that do not exempt foreign profits are more likely to invest in Germany via a third country, for example. The most likely explanation is that the analysis does not properly reflect tax strategies of Dutch SPEs with a direct parent in a tax haven or in a country that exempts foreign dividend income and an ultimate parent in a country that does not.

Four alternative specifications, presented in Annex 3, confirm that the effects of tax treaties on FDI diversion are sufficiently robust. First, apparent gravity effects may result from other factors and in that case the gravity variables could distort the analysis. In a specification without gravity effects, though, tax determinants are similar. Second, a specification with home country fixed effects captures relevant characteristics of home countries that may accidentally have been omitted from the regressions. The tax treaty effects are not affected. The third specification includes host country fixed effects instead, capturing differences in domestic anti-avoidance rules. This reduces the significance, but not the size, of the estimated effect of a Dutch tax treaty route. The fourth specification uses a linear dependent variable, without the transformation to model decreasing marginal effects. The corresponding model fit is much lower, but otherwise the results are similar.

4.4 Results for strategy-specific tax variables

The next series of regressions uses strategy-specific tax variables to test whether the effect of tax treaties is related to reduced withholding taxes. Table 7 shows the regression results. In the first specification, gravity forces are similar to above and the coefficients for corruption and numbers of treaties are again insignificant. The dividend conduit benefit has a significantly positive effect. On average, a 10 percentage points reduction in total taxes on distributed profits is associated with an additional 3% of bilateral FDI being diverted via the Netherlands, again over and above the diversion explained by gravity forces. Considering that a 10 percentage point reduction is twice the standard

deviation and the mean diverted FDI share is 11%, the effect is not large but it is material. Thus, reduced dividend withholding taxes are a structural determinant of FDI diversion, which provides strong evidence for tax treaty shopping.

Table 7 Effect of strategy-specific tax benefits on FDI diversion

	(1)	(2)	(3)	(4)	(5)	(6)
Home gravity variable	0.65*** (0.07)	0.66*** (0.07)	0.64*** (0.07)	0.66*** (0.07)	0.84*** (0.10)	0.85*** (0.10)
Host gravity variable	0.49*** (0.10)	0.50*** (0.10)	0.46*** (0.10)	0.50*** (0.10)	0.35** (0.14)	0.39*** (0.14)
Dividend conduit benefit	0.38** (0.16)	0.32** (0.16)	0.33** (0.17)	0.37** (0.16)	0.65*** (0.22)	0.37 (0.31)
Base company benefit	-0.14 (0.13)	-	-0.15 (0.13)	-0.06 (0.12)	-0.14 (0.20)	-0.01 (0.22)
Mixing company benefit	-	0.27 (0.23)	-	-	-	-
Dutch tax treaties dummy	-	-	0.06** (0.02)	-	-	-
Direct tax treaty dummy	-	-	-0.04* (0.02)	-	-	-
Developing host x dividend benefit	-	-	-	-	-	0.60 (0.45)
Developing host x base benefit	-	-	-	-	-	-0.25 (0.42)
Dutch inv. treaties dummy	0.06*** (0.02)	0.06*** (0.02)	0.06*** (0.02)	0.06*** (0.02)	0.08*** (0.02)	0.08*** (0.02)
Direct inv. treaty dummy	-0.06*** (0.02)	-0.06*** (0.02)	-0.05** (0.02)	-0.06*** (0.02)	-0.03 (0.03)	-0.03 (0.03)
European HQ dummy	-	-	-	-0.05** (0.02)	-	-
Developing host dummy	-	-	-	-	-	0.05* (0.03)
Home corruption	-0.002 (0.004)	-0.002 (0.004)	-0.001 (0.004)	0.000 (0.004)	0.002 (0.006)	0.004 (0.006)
Host corruption	-0.002 (0.003)	-0.002 (0.003)	-0.002 (0.003)	-0.003 (0.003)	-0.008 (0.005)	-0.012** (0.006)
Host tax treaties	0.00 (0.04)	0.00 (0.04)	0.00 (0.04)	0.01 (0.04)	0.09 (0.05)	0.11* (0.06)
Host inv. treaties	0.02 (0.04)	0.02 (0.04)	0.03 (0.04)	0.04 (0.04)	0.03 (0.05)	-0.04 (0.05)
Constant	0.00 (0.03)	-0.01 (0.03)	0.00 (0.04)	0.00 (0.03)	-0.02 (0.04)	-0.04 (0.04)
Observations	1727	1715	1727	1727	957	957
Adjusted R ²	0.11	0.11	0.11	0.11	0.13	0.13

Notes: Dependent variable is the share of bilateral FDI stock diverted via the Netherlands. All specifications use tobit estimation. All specifications use tobit estimation. Robust standard errors are in parentheses. * denotes $p < 0.10$; ** $p < 0.05$; *** $p < 0.01$.

The effect of the base company benefit is insignificant, whereas a positive effect was expected. This suggests that deferral of home country taxation is not a main determinant of FDI diversion, at least not in addition to structures that also yield a dividend conduit benefit. It is possible that such structures are also used to defer home country taxation, though, because reduced withholding taxes between the Netherlands and the home country do not imply that multinationals always distribute subsidiary profits up to the ultimate parent.

The second regression includes the benefit of a mixing company instead of a base company. The corresponding effect is positive but also insignificant. Thus, although anecdotal evidence indicates that some SPE structures were established specifically to achieve mixing of foreign tax credits, this motive is not a major determinant of FDI diversion. Further specifications are shown with the base company benefit only, but estimations with the mixing company benefit instead yield the same results.

The third regression adds tax treaty dummies, which hardly affects the result for the dividend conduit benefit. This confirms that the reduction of dividend withholding taxes is a key determinant of FDI diversion, even after controlling for legal certainty and other general provisions provided by tax treaties. However, the Dutch tax treaties dummy is significant too. Thus, apart from reduced dividend withholding taxes, tax treaties provide further benefits that induce FDI diversion. These benefits may result from legal certainty, but also from tax sparing clauses or reduced interest withholding taxes, for example. The fourth regression adds the European headquarters dummy. Similar to the previous regression series, it does not have the expected sign, which indicates that FDI diversion via the Netherlands is not driven by European headquarters of non-European firms.

The fifth regression limits observations again to non-EU host countries. For these host countries, the dividend conduit benefit has a larger effect on FDI diversion. On average, a 10 percentage points reduction in taxes on distributed profits is associated with an additional 5% of bilateral FDI being diverted via the Netherlands. This contrasts with the results for general tax variables, where the overall effect of Dutch tax treaties became insignificant after dropping EU host countries. However, these contrasting findings can be explained by the large FDI diversion within the EU. In the regressions with general tax variables, it increases the effect of a Dutch tax treaty route, because such a route exists for all intra-EU observations. By contrast, in the regressions with strategy-specific tax variables, it reduces the effect of dividend conduit benefits, because there are no such benefits within the EU and yet FDI diversion is large. The sixth regression tests again whether the effect of tax benefits on FDI diversion differs between developing host countries and other non-EU host countries. Using strategy-specific measures for tax benefits, no significant difference is found.

The regressions with strategy-specific tax variables confirm the three types of structural determinants identified above: gravity effects, tax treaties, and investment treaties. In particular, they show that bilateral withholding tax reductions are a key determinant of FDI diversion via Dutch SPEs. This result is in line with other studies (Collins and Shackelford 1998; Weichenrieder and Mintz 2008).

The last two regressions show that dividend conduit benefits significantly increase FDI diversion into all non-EU host countries. By contrast, the regressions with dummy variables in the previous section show that tax treaties significantly influence FDI diversion into developing countries, but not into BRICSM countries and high income countries outside the EU. This paradox might be explained by the fact that Dutch tax treaties with developing countries often generate a dividend conduit benefit, because these treaties specify relatively low dividend withholding taxes. Dutch tax treaties with non-EU high income and BRICSM countries generate such a benefit less often, because half of these countries have no dividend withholding taxes and Dutch treaty rates are closer to treaty rates agreed with other partners. Thus, when differences in standard withholding tax rates and treaty

characteristics are taken into account, the effect of tax treaties becomes similar and significant for all non-EU host countries.

Contrary to expectations, the analysis does not provide evidence that specific strategies to avoid home country taxation have an additional effect on FDI diversion. Other studies, such as Desai et al. (2003), do find that base company benefits increase the use of SPEs. However, as mentioned in the previous section, this may be explained by Dutch SPE whose direct and ultimate parents are located in different countries.

Four alternative specifications, presented in Annex 3, confirm that the overall effect of dividend conduit benefits on FDI diversion is sufficiently robust. The specifications are the same as for the regressions with general tax variables. Including home country fixed effects or using a linear dependent variable reduces the size and significance of the dividend conduit benefit effect, but it remains significant at the 10% level. In the other two specifications, findings for the dividend conduit are similar to above. Surprisingly, the specification without gravity variables shows a significant effect of the base company benefit, but the negative sign suggests that this variable does not capture deferral strategies properly.

5 Conclusions, policy implications, and discussion

This article analysed structural determinants of FDI diversion via the Netherlands. It shows that FDI diversion is higher if the home and host country both have a tax treaty with the Netherlands, and lower if there exists a direct treaty between the home and host country. Furthermore, the article shows that diversion of investments is partly driven by specific corporate structures that reduce the total tax on distributed foreign profits by taking advantage of reduced withholding taxes under Dutch tax treaties. It can therefore be concluded that FDI diversion partly results from tax treaty shopping. On average, the possibility to avoid dividend withholding tax causes a few percent of bilateral FDI stock to be routed through the Netherlands rather than being held directly from the origin country. This effect is not large, yet it is material and may also occur for some non-Dutch treaty routes. Although this article focuses on tax treaties, it provides some evidence of investment treaty shopping via Dutch SPEs as well.

The results imply that apparent positive effects of tax and investment treaties on inward FDI can to some extent be attributed to treaty shopping. This has major implications for further research on foreign investment using bilateral FDI data, because FDI diversion changes the immediate destination of outward FDI and the immediate origin of inward FDI.

It is difficult to assess the social costs and benefits of tax treaty shopping, because the results do not show how FDI diversion influences the overall amount of investment between ultimate origin and destination countries. Social benefits include higher after-tax returns for investors and potentially higher investment, which in turn may generate additional economic activity and tax revenues. Social costs include lower tax revenues at a given level of investment and implementation costs of tax planning. There are also indirect effects. A lower dividend withholding tax creates an incentive for a subsidiary to pay out higher dividends and reinvest less or repay less debt, for example. This reduces future investments and limits the tax base in the host country over time.

The results have policy implications for non-EU countries as well as for the Netherlands (Weyzig and Van Dijk 2009). To keep better control over policy outcomes, non-EU countries may prefer unilateral measures to attract FDI instead of reducing withholding taxes on a bilateral basis. If countries suspect significant diversion of inward FDI via an existing treaty, they could renegotiate the treaty and include anti-avoidance provisions, but this process would be costly. It would be more

efficient if the Netherlands were to take unilateral measures against treaty shopping. In principle, such measures could be effective even if other countries do not take similar measures, because the Netherlands is by far the largest conduit country for FDI.

Some limitations to this study should be noted, although it is unlikely that these affect the main results. First, there are various limitations to the micro data. For example, some SPEs report larger assets than liabilities and the data do not cover smaller SPEs that may still be significant for particular destination countries. Second, longer ownership chains distort the estimation of home country tax effects. Third, the analysis uses normal withholding tax rates and disregards preferential regimes, but for some countries special tax concessions may reduce the additional benefits of a tax treaty. Fourth, the regressions disregard qualitative differences between tax treaties, for example with regard to limitation of benefits and tax sparing clauses. Fifth, the analysis could not take into account what tax treaties and regulations were in place at the time an investment was made or how FDI diversion evolves over time. These last two limitations are probably the most important ones.

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Annex 1: Calculation of tax benefits

Dividend conduit benefit If the home country exempts foreign dividend income:

$$\begin{aligned} \text{Benefit} = & (1 - (1 - STR_{host})(1 - WHT_{host-home})) \\ & - (1 - (1 - STR_{host})(1 - WHT_{host-NL-home})) \end{aligned}$$

and if the home country does not exempt foreign dividend income, but provides a tax credit:

$$\begin{aligned} \text{Benefit} = & \max \left[STR_{home}, (1 - (1 - STR_{host})(1 - WHT_{host-home})) \right] \\ & - \max \left[STR_{home}, (1 - (1 - STR_{host})(1 - WHT_{host-NL-home})) \right] \end{aligned}$$

with STR denoting the statutory tax rate on corporate income and

$$WHT_{host-NL-home} = 1 - (1 - WHT_{host-NL})(1 - WHT_{NL-home}).$$

Base company benefit If the home country exempts foreign dividend income: $\text{Benefit} = 0$;

if the home country does not exempt foreign dividend income, but provides a tax credit:

$$\begin{aligned} \text{Benefit} = & \max \left[STR_{home}, (1 - (1 - STR_{host})(1 - WHT_{host-home})) \right] \\ & - (1 - (1 - STR_{host})(1 - WHT_{host-NL})) \end{aligned}$$

Mixing company benefit If the home country exempts foreign dividend income: $\text{Benefit} = 0$;

if the home country does not exempt foreign dividend income, but provides a tax credit:

$$\text{Benefit} = \frac{1}{2} |STR_{home} - STR_{host}|.$$

Annex 2: Correlation matrix

Table 8 Correlation matrix of the main regression variables

	Diverted FDI	Home gravity	Host gravity	Dutch tax treaties	Direct tax treaties	Non- exempt.	Dividend conduit	Base company	Dutch inv. treaties	Direct inv. treaties	Develop. host	Home corrupt.	Host corrupt.	Host tax treaties	Host inv. treaties
Diverted FDI	1.000														
Home gravity	0.277	1.000													
Host gravity	0.137	-0.065	1.000												
Dutch tax treaties	0.050	-0.035	0.300	1.000											
Direct tax treaties	-0.088	-0.121	0.114	0.474	1.000										
Non-exemption	-0.062	-0.266	0.026	-0.034	0.023	1.000									
Dividend conduit	0.077	0.041	0.072	0.104	-0.080	0.017	1.000								
Base company	-0.065	-0.219	-0.010	0.027	-0.033	0.477	0.304	1.000							
Dutch inv. treaties	0.018	-0.097	0.073	0.193	0.313	-0.056	-0.087	-0.101	1.000						
Direct inv. treaties	-0.094	-0.106	-0.002	0.140	0.393	-0.011	-0.132	-0.055	0.579	1.000					
Developing host	-0.023	0.054	-0.418	-0.408	-0.195	0.028	-0.117	-0.130	0.043	0.088	1.000				
Home corruption	-0.085	-0.408	0.146	0.040	0.119	0.430	-0.109	0.266	0.281	0.245	-0.083	1.000			
Host corruption	-0.056	0.011	-0.290	-0.205	-0.054	0.036	-0.030	-0.019	0.163	0.241	0.618	-0.055	1.000		
Host tax treaties	0.054	-0.091	0.522	0.565	0.364	0.013	0.090	0.062	0.148	0.100	-0.551	0.192	-0.407	1.000	
Host inv. treaties	0.060	-0.079	0.508	0.347	0.238	0.034	-0.012	0.023	0.260	0.233	-0.255	0.191	-0.143	0.759	1.000

Notes: n = 1715.

Annex 3: Results of robustness checks

Table 9 presents the results of robustness checks for the regressions with tax treaty dummies. The results are briefly discussed in the main text. The first regression omits gravity variables. The second regression includes home country fixed effects and the third regression includes host country fixed effects. The fourth regression uses a linear dependent variable. Table 10 presents the same robustness checks for the regressions with strategy-specific tax variables. These are also discussed in the main text. The use of data for 2006 instead of 2007 (not shown) does not affect the results for general and strategy-specific tax variables.

Table 9 Robustness checks for overall effect of tax treaties on FDI diversion

	(1)	(2)	(3)	(4)
Home gravity variable	-	-	0.62*** (0.06)	0.88*** (0.13)
Host gravity variable	-	0.51*** (0.08)	-	0.57** (0.23)
Dutch tax treaties dummy	0.08*** (0.03)	0.06*** (0.02)	0.06* (0.04)	0.06** (0.02)
Direct tax treaty dummy	-0.06*** (0.02)	-0.06*** (0.02)	-0.06*** (0.02)	-0.05** (0.02)
Non-exemption dummy	0.00 (0.02)	-	0.01 (0.02)	-0.01 (0.01)
Dutch inv. treaties dummy	0.07*** (0.02)	0.02 (0.02)	0.07*** (0.02)	0.05*** (0.02)
Direct inv. treaty dummy	-0.05** (0.02)	-0.04*** (0.02)	-0.03* (0.02)	-0.04** (0.02)
Home corruption	-0.017*** (0.004)	-	-0.001 (0.004)	0.003 (0.004)
Host corruption	-0.007* (0.003)	0.002 (0.003)	-	0.000 (0.003)
Host tax treaties	0.00 (0.05)	-0.01 (0.04)	-	0.02 (0.04)
Host inv. treaties	0.07* (0.04)	0.08* (0.03)	-	0.00 (0.04)
Home fixed effects	-	Yes	-	-
Host fixed effects	-	-	Yes	-
Constant	0.20 (0.03)	0.04 (0.08)	-0.09 (0.20)	0.03 (0.03)
Observations	1802	1757	1757	1781
Adjusted R ²	0.04	-.	-.	0.05
Likelihood ratio	-	800.3	601.2	-

Notes: All specifications use tobit estimation. Standard errors are in parentheses; for specifications 1 and 4 these are robust standard errors. Specifications 2 and 3 use normal tobit estimation with country dummies; the corresponding likelihood ratios have 94 and 117 degrees of freedom, respectively. * denotes $p < 0.10$; ** $p < 0.05$; *** $p < 0.01$.

Table 10 Robustness checks for effect of strategy-specific tax benefits on FDI diversion

	(1)	(2)	(3)	(4)
Home gravity variable	-	-	0.64*** (0.06)	0.88*** (0.13)
Host gravity variable	-	0.51*** (0.08)	-	0.59*** (0.23)
Dividend conduit benefit	0.49*** (0.17)	0.27* (0.15)	0.37** (0.17)	0.26* (0.15)
Base company benefit	-0.37*** (0.13)	-0.10 (0.14)	-0.07 (0.14)	-0.21* (0.11)
Dutch inv. treaties dummy	0.06*** (0.02)	-0.02 (0.02)	0.06*** (0.02)	0.05** (0.02)
Direct inv. treaty dummy	-0.06*** (0.02)	-0.05*** (0.02)	-0.05*** (0.02)	-0.04** (0.02)
Home corruption	-0.014*** (0.004)	-	0.001 (0.004)	0.004 (0.003)
Host corruption	-0.005 (0.003)	0.002 (0.003)	-	0.001 (0.003)
Host tax treaties	0.01 (0.04)	-0.01 (0.04)	-	-0.02 (0.04)
Host inv. treaties	0.08** (0.04)	0.08** (0.03)	-	-0.01 (0.03)
Home fixed effects	-	Yes	-	-
Host fixed effects	-	-	Yes	-
Constant	0.23*** (0.03)	0.05 (0.08)	-0.02 (0.04)	0.04* (0.02)
Observations	1772	1814	1766	1751
Adjusted R ²	0.04	-	-	0.05
Likelihood ratio	-	811.8	593.7	-

Notes: All specifications use tobit estimation. Standard errors are in parentheses; for specifications 1 and 4 these are robust standard errors. Specifications 2 and 3 use normal tobit estimation with country dummies; the corresponding likelihood ratios have 106 and 118 degrees of freedom, respectively. * denotes $p < 0.10$; ** $p < 0.05$; *** $p < 0.01$.