The relationship between MNE tax haven use and FDI into developing economies characterized by capital flight

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The use of tax havens by multinationals is a pervasive activity in international business. However, we know little about the complementary relationship between tax haven use and foreign direct investment (FDI) in the developing world. Drawing on internalization theory, we develop a conceptual framework that explores this relationship and allows us to contribute to the literature on the determinants of tax haven use by developed-country multinationals. Using a large, firm-level data set, we test the model and find a strong positive association between tax haven use and FDI into countries characterized by low economic development and extreme levels of capital flight. This paper contributes to the literature by adding an important dimension to our understanding of the motives for which MNEs invest in tax havens and has important policy implications at both the domestic and the international level.

Keywords: capital flight, economic development, institutions, tax havens, wealth extraction

1. Introduction

Multinational enterprises (MNEs) from the developed world own different types of subsidiaries in increasingly complex networks across the globe. Some of the foreign host locations are characterized by light-touch regulation and secrecy, as well as low tax rates on financial capital. These so-called tax havens have received widespread media attention in recent years. In this paper, we explore the relationship between tax haven use and foreign direct investment (FDI) in developing countries, which are often characterized by weak institutions, market imperfections and a propensity for significant capital flight. This relationship is of critical importance because tax

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havens are increasingly being characterized as wealth extractors that undermine economic development and contribute to rising inequality in developed nations (Torslov, Wier and Zucman, 2018).

Recent research has begun to shed light on this phenomenon. Andersen et al. (2017) show that 15 per cent of the windfall gains in petroleum-producing countries with autocratic rulers is diverted to accounts in tax havens. A recent World Bank report (Andersen, Johannesen and Rijkers, 2020) shows that aid disbursements to highly aid-dependent countries are strongly associated with an increase in bank deposits to tax havens. Coupled with the disclosures in the Panama Papers, the Paradise Papers and the Luanda Leaks (Ndikumana, 2020), this research shows a clear pattern of abuse by elites in the developing world to amass wealth by using tax havens. Indeed, Ndikumana (2020) argues that capital flight has had a negative impact on the citizens of developing countries in Africa, depriving governments of the resources to invest in public services such as education, clean drinking water, health care, childcare services and sanitation systems.

The use of tax havens by the world's leading MNEs is not a new phenomenon. Tax havens serve as financial hubs that handle enormous amounts of capital and trade. In conjunction with the world's leading financial centres – London, New York, Frankfurt and Tokyo – they have become the nerve centres of global trading networks and a permanent feature of international business. A significant share of all MNEs own tax haven subsidiaries or, in some cases, are owned by parent MNEs that are registered in tax havens. These countries offer low tax rates or beneficial fiscal treatment of cross-border financial transactions, extensive bilateral investment and double taxation treaty networks, and access to international financial markets, which make them attractive to companies, large and small (UNCTAD, 2016). Enormous amounts of capital flow in and out of tax havens each year. The UNCTAD *World Investment Reports* of 2013 and 2016 report detailed FDI trends and amounts of investments to offshore financial centres by so-called special purpose entities, which are foreign subsidiaries created with the purpose of exploiting tax benefits in countries that offer low or zero corporate taxation. UNCTAD (2013, 2016) clearly shows how offshore financial centres account for an increasing share of global FDI flows emanating from important investor developed countries.

Zucman (2013) also finds significant flows and estimates that close to 40 per cent of the world's FDI is routed through tax havens. Almost exclusively, this type of investment is not used for productive economic activity in the tax haven location. Instead, it is held there to avoid corporate tax levied at higher rates in countries across an MNE's global network. Consequently, it deprives locations that create the economic value added of revenues that could be used to finance public investment, and it may increase taxes on less mobile forms of income, such as wages and salaries paid to workers.

Using panel data for a sample of MNEs from 19 developed economies, we find that MNEs that have subsidiaries in developing countries with a high degree of capital flight also have a much stronger propensity to own tax haven subsidiaries than other MNEs who have only conventional subsidiaries in developed economies. This suggests that when MNEs extend their networks to regions of the world characterized by weak institutions and a high degree of capital flight, this leads to more tax haven activity. For example, in one of our specifications, we show that developed-country MNEs that own a subsidiary in Africa are 5 per cent more likely to own a tax haven subsidiary in a highly secretive location.

This is an important finding and contributes to the literature both conceptually and empirically. First, our findings extend our conceptual understanding of how institutional voids affect developing countries. Buckley et al. (2015) apply internalization theory and the economic geography of FDI to tax havens and offshore financial centres with a particular emphasis on Chinese MNEs. They argue that capital market imperfections and poor institutional environments create significant transaction costs that can be alleviated by the use of tax havens. Our findings test this theory but extend the model to a specific phenomenon – countries that experience significant capital flight.

Our empirical contribution lies in the large panel data set that allows us to test the relationship between MNEs from 19 developed countries and their FDI locations around the world, including tax havens. This enables us to undertake a cross-country comparison that is rare in the literature on tax havens, which mostly focuses on single-country analysis. We also contribute to the literature by drawing out a number of policy recommendations based on our main empirical results.

The rest of the paper is set out as follows: in the second section we outline our conceptual framework and generate two testable hypotheses. In the third section we describe the firm-level data used in this study. The fourth section lays out the empirical methodology and in the fifth section we report our results. The sixth section concludes with a discussion of our findings and policy implications.

2. Conceptual framework and hypotheses

Our conceptual framework is illustrated in figure 1, which shows the complementary relationship between investing in tax havens and investing in overseas non-tax-haven subsidiaries. The framework draws on the traditional internalization theory (see Rugman, 1980, 2010) and combines with it insights from the work by Buckley et al. (2015), who apply internalization theory to offshore FDI with respect to Chinese capital flows. We build and extend the framework of Buckley et al. (2015), which uses a case-based empirical approach, by developing a conceptual framework

that enables us to generate testable hypotheses that can be estimated with firm-level data using panel data. The benefit of this larger-scale empirical analysis lies in capturing cross-country evidence for a set of heterogeneous developed-country MNEs that have subsidiary structures across the world.

The profit-shifting activity of MNEs is a complex process (Holtzblatt, Jermakowicz and Epstein, 2015; Pun, 2017). MNEs that choose to undertake this type of activity need to employ well-qualified legal advisors, accountants and tax experts to take advantage of hybrid mismatch opportunities that result from differences in tax codes across countries (Kemme, Parikh and Steigner, 2017; OECD, 2013). In general, tax avoidance schemes are not difficult for MNEs to set up but do carry risks. Nevertheless, a number of firms are willing to supply firms with these types of schemes, Panamanian law firm Mossack Fonseca being a famous example. Furthermore, many enablers of tax avoidance, such as the Big Four, are ready to meet the demands of MNEs to undertake this type of activity (see Jones, Temouri and Cobham, 2018; Sikka, 2015; Sikka and Willmott, 2010). This can be observed from the recent Panama Papers and Paradise Papers scandals, which generated widespread media attention across the world.

At present, countries across the world are signatories to more than 3,000 bilateral international tax treaties. Hence, the tax landscape is constantly changing (Kleist, 2018), and this complexity allows MNEs to use transfer pricing techniques to shift profits out of high-tax jurisdictions and into low-tax jurisdictions (Eden, 1998; Eden and Kudrle, 2005).[1] Some argue that the ability of MNEs to exploit differences in corporate tax rules across the jurisdictions in which they operate is a key competitive advantage over firms that choose not to take such extreme measures (Picciotto, 2018).

Abstracting from the complexity of the structures used to undertake international profit shifting, figure 1 shows a simple tax avoidance structure. This basic structure is useful because it can encompass the various motivations for MNEs to use tax haven subsidiaries. In order to simplify the theory, we subsume all of these factors under a simple construct: "profit shifting".

Figure 1 shows three boxes. In the first box is the parent MNE, which originates from a developed country. In the second box is the tax haven subsidiary, which is located in an offshore jurisdiction that fits the parent MNE's specific needs. The literature

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[1]   It is important to note that this type of activity is not necessarily illegal. In some circumstances, transfer pricing is needed in order to evaluate the performance of divisions across an MNE's corporate structure. But very often it is abused for tax and secrecy purposes, and many scholars and representatives of non-governmental organizations believe it does not play to the spirit and intention of the rules as they have been developed since the 1920s. Indeed, some scholars argue that it undermines the undoubted ability of capitalism to enhance living standards across the world (Palan, Murphy and Chavagneux, 2010; Shaxson, 2014).

suggests that MNEs do not choose a tax haven location in a vacuum (Dharmapala and Hines, 2009). Offshore locations differ in terms of geographical proximity and cultural ties to centres of large economic activity, quality of governance and institutions, and size of local populations, among other factors (Dharmapala and Hines, 2009). Nevertheless, one common aspect of tax haven locations is that they have institutions in place that protect the interests of investors. These include a stable political environment, a legal system that aligns with the interests of private property, privacy and high levels of secrecy for investors, light-touch regulation and low, often zero, rates of tax on corporate profits.

The third box includes the parent firm's set of conventional (non-tax-haven) subsidiaries. Any number of such subsidiaries could be included in this box, from any location across the world (except a tax haven). We assume that the parent has a significant degree of control over these subsidiaries, but it is not necessary to assume that they are fully owned.

Figure 1: Conceptual framework

Degree of market imperfection and institutional weakness
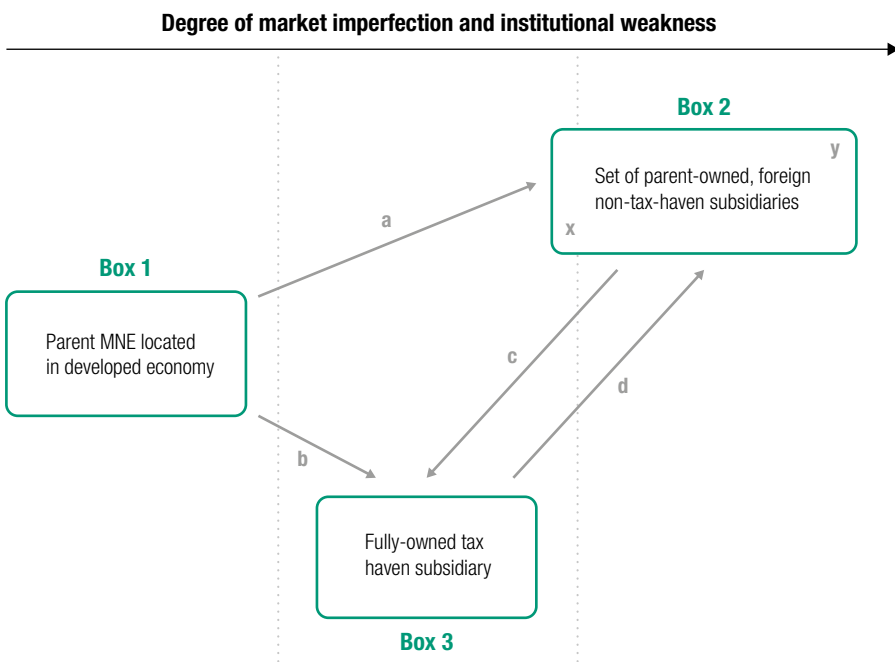
Key:
a: Real resource flows
b & d: Shadow resource flows
c: Profit shifting

The simple profit-shifting structure illustrated in figure 1 can be described as follows. The parent MNE sets up subsidiaries in foreign markets to mitigate transaction costs. This type of FDI is based on the four standard FDI motives (Dunning, 1980, 1988): (1) market-seeking; (2) resources-seeking; (3) efficiency-seeking; and (4) strategic asset-seeking. Hence, real resources flow back and forth from the subsidiaries to the parent; they could include knowledge transfers, intangible assets and capital goods. They are illustrated by capital flow a in figure 1, which is equal to the net flow of capital to and from the parent. At some stage in the MNE's life cycle, the MNE may choose to take advantage of the financial benefits of setting up a tax haven subsidiary. This could be prior to the conventional investment overseas or it could be at a later date. Once the tax haven subsidiary has been set up, flows that we call "shadow resource flows" can be shifted between the tax haven subsidiary and the conventional overseas subsidiaries. These flows can be seen in shadow resource flows b and d in figure 1. Furthermore (not shown in the figure), the returns from these flows may end up back in the parent firm's location of origin if the tax rules change, for example, through a repatriation tax holiday or a loosening of the domestic corporate tax rate (Bloink, 2011; Kyj and Romeo, 2015). An example of a shadow resource flow could be the use of an intangible asset such as intellectual property, such as a brand, patent or unique business process. Ownership of the intangible is registered in the tax haven, and the conventional subsidiary has to pay a royalty fee to use the intellectual property. Hence, profits are shifted from the conventional subsidiary in the high-tax location into the tax haven subsidiary in the low-tax location. This is shown by capital flow c in figure 1, which is equal to the sum of all the profit shifting from each of the conventional subsidiaries.[2]

So how does this simple profit-shifting structure relate to the key research question of this paper? The answer lies in the complementary relationship between use of tax haven subsidiaries and investment in overseas non-tax-haven subsidiaries that are owned in order to conduct conventional FDI. In figure 1, the arrow at the top of the figure shows the degree of market imperfection and institutional weakness as posited by Buckley et al. (2015). As we move to the right, this degree increases as market imperfections and institutional weakness increase, and MNEs become more likely to undertake FDI with a physical presence as opposed to running joint ventures, licensing or exporting (Puck, Holtbrugge and Mohr, 2009) and also more likely to use tax havens. For example, the domestic capital market in the host location may not be driven by market forces, as MNEs may receive privileged

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[2]　A classic example of this type of structure is that of Starbucks. In 2012 it was revealed that although Starbucks had sales worth £1.2 billion in the United Kingdom in the three years preceding 2012, the company paid zero corporate income tax, as they reported zero profits. This was made possible by using practices such as transfer pricing, by registering patents with a subsidiary in a low-tax jurisdiction outside of the United Kingdom and then paying royalty payments to it, and by paying interest on loans – basically through a robust profit-shifting structure (Campbell and Helleloid, 2016).

access through political connections or a business group that receives favourable access, or they may find it difficult to obtain bank loans because of complex and discriminatory regulations. Therefore, it is plausible to argue that the second box contains a continuum of (non-tax haven) foreign subsidiaries, controlled by the parent and ranked in terms of the degree of market imperfections relative to the MNE's home environment. For instance, a United Kingdom MNE may own a conventional overseas subsidiary in Poland, represented by position x in box 2, and a conventional overseas subsidiary in the Democratic Republic of the Congo, represented by position y at the far right side of box 2, where we assume that the degree of market imperfection and institutional weakness is such that $y > x$. MNEs are more likely to own tax havens if they have FDI in developing economies with significant market imperfections. This means that capital flows c and d between the conventional subsidiaries and the tax haven will be much stronger from location y than from location x[3]. This leads to our first hypothesis:

Hypothesis 1: *MNEs that control foreign subsidiaries in developing economies with weak institutions and greater market imperfections have a higher likelihood of owning a tax haven subsidiary relative to MNEs who control foreign subsidiaries only in developed economies.*

Hypothesis 1 is a direct test of the internalization theory as outlined by Buckley et al. (2015). In order to extend this theory, we specifically focus on an important phenomenon that often affects developing countries – capital flight. This is an extreme form of market imperfection and reflects the institutional weakness of the domestic economy. It often occurs in response to an economic event such as a negative economic shock, lower confidence in a country's ability to meet its debt obligations or a change in the tax and regulatory environment. Such events may lead to a depreciation in the value of a country's currency. In such environments, there is a strong incentive for foreign investors and corrupt government officials to withdraw their money from the country; and using a tax haven, with its associated light-touch regulation and secrecy, enables MNEs and individuals to do this quickly and secretly.

It is important to acknowledge that capital flight has many determinants and that it is not only about avoiding tax (see e.g. Alesina and Tabellini, 1989; Cuddington, 1986; Lensink, Hermes and Murinde, 2000; Pastor, 1990). However, in terms of the empirical evidence, Bolwijn, Casella and Rigo (2018) have examined the link between profit-shifting activities of MNEs and FDI, with a focus on the use of offshore financial centres. Their analysis confirms that tax avoidance, enabled by FDI through offshore hubs, is responsible for an estimated $100 billion in annual losses

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[3] This should be thought about in a relative sense with respect to the size of the market in question. For example, financial flow as a proportion of GDP.

for developing countries. Over recent decades, some of the weakest economies in the world – notably in sub-Saharan Africa – have experienced significant outflows of foreign capital into Western financial centres. Ndikumana and Boyce (2010; 2018) calculate capital flight for 30 sub-Saharan African countries from 1970 to 2015 and find that total capital flight amounted to $1.4 trillion over this period, far exceeding the stock of debt owed by these countries as of 2015 ($496.9 billion). They go on to point out that these countries lose more through capital flight than they receive in the form of foreign aid. Furthermore, they state that "promoting international cooperation to lift the veil of secrecy in offshore banking jurisdictions" (Ndikumana and Boyce, 2010: 478) would go a long way to curtail future capital flight. Hence, there seems to be a strong association between countries that experience significant capital flight and tax haven use. This observation leads to our second hypothesis:

Hypothesis 2: *The likelihood of owning a tax haven subsidiary increases if an MNE controls subsidiaries in developing countries associated with a significant degree of capital flight.*

3. Data

The primary source of data for this study is the ORBIS database published by Bureau van Dijk. ORBIS is a firm-level data set that contains published information on the accounts, financials, ownership and location of companies from all across the world. It also includes the number and location of all the subsidiaries owned by each firm. This is valuable as it allows us to map the operations of MNEs across the globe and to identify investments in locations classified as tax havens. The secrecy provisions in tax havens make it hard to trace subsidiaries or any companies incorporated there, not to mention their financial details. The geographical identification of subsidiaries provided by the data from ORBIS thus presents one of the best ways to shed light on this type of activity.

For the purpose of this study, the data set includes MNEs from the following 19 developed countries: Australia, Austria, Belgium, Canada, Denmark, France, Finland, Germany, Greece, Iceland, Italy, Japan, the Netherlands, New Zealand, Norway, Portugal, Sweden, the United Kingdom, and the United States. Table 1 shows the firm and country coverage. As can be seen, a large number of firms are included from Germany, Italy, France and Spain. An MNE is defined as a firm with at least a 50 per cent stake in a foreign enterprise. The data consist of an unbalanced panel for the years 2009 to 2017, and the data set consists of 149,244 observations across 34,047 MNEs.

Table 1. Distribution of MNEs by home country

Origin country	Number of parent MNEs
Australia	516
Austria	1,160
Belgium	1,680
Canada	105
Denmark	701
Germany	4,126
Greece	214
Finland	899
France	4,129
Iceland	43
Italy	7,960
Japan	1,867
Netherlands	863
New Zealand	27
Norway	420
Portugal	832
Spain	3,956
Sweden	1,316
United Kingdom	1,850
United States	1,383
Total	**34,047**

Source: ORBIS database.

Table 2 provides summary statistics for the variables used in our analysis. As can be seen, 12 per cent of the firms in our sample have a subsidiary in a "dot" tax haven, which includes only some of the small island economies, such as the Cayman Islands. In contrast, if we use a broader tax haven measure that includes the Big Seven, such as Hong Kong (China), then 35 per cent of the firms have a tax haven subsidiary. Other interesting statistics show that the average number of subsidiaries a firm has abroad is equal to 22.7. Furthermore, 30 per cent of the firms in the sample are classified as knowledge-intensive service providers and 5 per cent of the firms are in the high-technology manufacturing sector. In terms of firm financial statistics, the average turnover in natural logarithms is 11.42, which amounts to approximately $60 million. The descriptive statistics also show that approximately 14 per cent of the parent firms own a subsidiary in Africa and 21 per cent of the firms own a subsidiary in South America.

Table 2. Descriptive statistics

Variable	Observations	Mean	Standard deviation
Dot Tax Havens	149,244	0.123121	0.328577
Dot + EU NC	149,244	0.168369	0.374195
Dot + Big 7	149,244	0.341689	0.474277
Dot + EU NC + Big 7	149,244	0.35842	0.479538
Developed	149,244	0.82867	0.376799
Africa	149,244	0.146833	0.353941
East Asia	149,244	0.283911	0.450896
South and Central Asia	149,244	0.158519	0.365228
Europe	149,244	0.265572	0.441639
Middle East	149,244	0.052753	0.22354
North America	149,244	0.1296	0.335864
South America	149,244	0.211231	0.408184
Oceania	149,244	0.008724	0.092994
Capital Flight Top 10	149,244	0.390569	0.487879
Capital Flight Top 11-30	149,244	0.152917	0.359909
Capital Flight Top 31-50	149,244	0.211841	0.408614
Rest of Africa	149,244	0.074589	0.262728
Rest of the World	149,244	0.158894	0.365579
Above 10% GDP	149,244	0.136019	0.34281
5% to 10% GDP	149,244	0.289693	0.453622
2% to 5% GDP	149,244	0.370326	0.482894
Below 2% GDP	149,244	0.229704	0.420644
Knowledge-Intensive Services	149,244	0.309996	0.462493
Less-Knowledge-Intensive Services	149,244	0.252553	0.434478
High-Tech Manufacturing	149,244	0.052109	0.222248
Medium-High-Tech	149,244	0.158097	0.364833
Medium-Low-Tech	149,244	0.112681	0.316204
Low-Tech	149,244	0.114564	0.318496
Ln Intangible Fixed Assets	149,244	7.416115	3.645311
Ln Long-Term Debt	149,244	8.971327	2.875317
Ln Cash Flow	149,244	8.753994	2.415796
Ln Turnover	149,244	11.42334	2.269039
Number of Foreign Subsidiaries	149,244	22.70761	70.9598

Source: see Sections 3.1 – 3.3

3.1 Dependent variable

Defining which countries are classified as tax havens is not straightforward. In their book *Tax Havens: How Globalization Really Works*, Palan et al. (2010, p. 8) define tax havens as "places or countries that have sufficient autonomy to write their own tax, finance, and other laws and regulations. They all take advantage of this autonomy to create legislation designed to assist non-resident persons or corporations to avoid the regulatory obligations imposed on them in the places where those non-resident people or corporations undertake the substance of their economic transaction."

Tax havens are, first and foremost, legal entities – countries, cities or states – that have the authority to make their own laws, specifically tax laws. These entities thus have legal control or jurisdiction over certain geographical areas that they use to offer individuals and corporations incentives for investment. The incentives come in a number of forms, the most significant of which are low tax rates on mobile capital and the provision of secrecy (Palan et al., 2010).

The literature so far has focused much more attention on the low tax rates set by these jurisdictions and perhaps overlooked the secrecy provisions that tax havens can provide. Researchers who have taken a conservative approach in terms of defining tax havens include Hines and Rice (1994) and Desai, Foley and Hines (2006b), who identify "dot tax havens" as geographically small and isolated, often small island economies that thrive as financial hubs with little indigenous population or industry, such as the Cayman Islands, Andorra, Monaco and Seychelles. These stand in contrast to the Big Seven havens, which are identified as Hong Kong (China), Ireland, Switzerland, Liberia, Lebanon, Singapore and Panama. The Big Seven all have populations in excess of two million inhabitants and significant indigenous economic activity. In this paper we take advantage of both of these definitions. Furthermore, we also use the European Union (EU) blacklist of non-cooperative jurisdictions (European Council, 2917; 2019). Table 3 outlines which countries are classified as tax havens across these three categorizations. The dot tax havens are taken from Jones and Temouri (2016), which has greater coverage than Hines and Rice (1994); the EU non-cooperative jurisdictions are from the EU and the Big Seven are from Hines and Rice (1994).

Once a tax haven location is defined, it is then possible to determine whether an MNE owns a tax haven subsidiary by using the ownership information in ORBIS. Hence, we are able to construct our dependent variable, which equals 1 if a firm owns a tax haven subsidiary and 0 otherwise. We create three tax haven measures to ensure robustness across each specification. The first measure equals 1 if a firm owns a subsidiary in a dot tax haven and 0 otherwise. This is therefore the narrowest definition. The other definitions become much broader in terms of coverage. The second tax haven measure equals 1 if a firm owns a dot tax haven

subsidiary and owns a subsidiary from the EU blacklist and 0 otherwise. The third measure combines all three categories; it equals 1 if a firm owns a subsidiary in a dot tax haven, an EU-blacklisted haven or one of the Big Seven and 0 otherwise.

Table 3. Tax haven definitions		
Jones and Temouri (2016), dot tax havens	EU, non-cooperative jurisdictions	Hines and Rice (1994), Big 7
Andorra	Bahrain	Hong Kong (China)
Anguilla	Barbados	Ireland
Antigua	Belize	Lebanon
Barbados	Grenada	Liberia
Bahrain	Guam	Panama
Bermuda	Macao (China)	Singapore
Bahamas	Marshall Islands	Switzerland
Belize	Mongolia	
British Virgin Islands	Namibia	
Cayman Islands	Palau	
Cook Islands	Panama	
Cyprus	Saint Lucia	
Isle of Man	Samoa	
Jersey	Trinidad & Tobago	
Gibraltar	Tunisia	
Grenada	United Arab Emirates	
Guernsey		
Liechtenstein		
Luxembourg		
Macao (China)		
Malta		
Monaco		
Netherlands Antilles		
Saint Kitts and Nevis		
Saint Lucia		
Saint Vincent		
Seychelles		
Turks and Caicos Islands		

3.2 Independent variables

In order to test our two hypotheses, we created a set of dummy variables. First, we had to identify the location of non-tax haven subsidiaries in order to create regional dummies. ORBIS provides the ownership information needed to do this. Consequently, we can create a dummy variable that equals 1 if a firm has a subsidiary in the developed world and 0 if it does not. Table 2 shows that 82 per cent of parent MNEs own a subsidiary in the developed world. This is not surprising because our sample consists of parent firms from the developed world. In a similar way, we also created dummies for Africa, East Asia, South and Central Asia, Europe, the Middle East, North America, South America and Oceania. It is important to note that these dummies are not mutually exclusive. In order to classify countries as developed or developing, we used the United Nations *World Economic Situation and Prospects* (WESP) report for 2014 (United Nations, 2014). The 2014 WESP country classifications reflect the basic economic conditions in a country and serve as a reliable marker of development for the time period used in this research. Table 4 identifies which region each country belongs to.

To test for capital flight, we used data from Global Financial Integrity (GFI), a non-profit Washington, DC-based research and advisory organization working on the analysis of illicit financial flows. GFI releases data as well as periodic reports for what it regards as "illicit financial flows" from the developing world. This paper makes use of the data from two GFI reports: *Illicit Financial Flows from Developing Countries: 2004–2013* (Kar and Spanjers, 2015) and *Illicit Financial Flows to and from Developing Countries: 2005–2014* (Global Financial Integrity, 2014). Their calculations put the total unrecorded capital flight from the developing world over the 10-year period (2004–2013) at roughly $7.8 trillion. This paper uses the GFI data to form a ranking of average annual unreported capital flight from developing countries. The countries are then divided into three groups: (1) "extreme capital flight" includes the top 10 countries by average amount of capital flight; (2) "large capital flight" refers to the next 20 countries by average amount of capital flight; and (3) "medium capital flight" refers to the next 20 countries by average amount of capital flight. We then created a set of dummy variables for each of the three categories. These are shown in table 5.

Last, as a final robustness check, we also created four dummy variables for capital flight as a percentage of GDP: (1) capital flight greater than 10 per cent of GDP; (2) capital flight between 5 and 10 per cent of GDP; (3) capital flight between 2 and 5 per cent of GDP; and (4) capital flight below 2 per cent of GDP. It is important to note that these dummies are calculated for countries that are not developed countries. For a detailed list of countries in each category, see table 6.

Table 4. Regional distribution table

Developed countries[1]		Africa		East Asia	South and Central Asia	Middle East	Europe	North America	South America	Oceania
Australia	Italy	Algeria	Liberia	Brunei	Afghanistan	Iran	Albania	Aruba	Argentina	Fiji
Austria	Japan	Angola	Libya	Cambodia	Armenia	Iraq	Belarus	Costa Rica	Bolivia (Plurinational State of)	Kiribati
Belgium	Korea, Rep. of	Benin	Madagascar	China	Azerbaijan	Jordan	Bosnia	Cuba	Brazil	Marshall Islands
Canada	Netherlands	Botswana	Malawi	Hong Kong (China)	Bangladesh	Kuwait	Bulgaria	Curaçao	Colombia	Micronesia
Chile	New Zealand	Burkina Faso	Mali	Indonesia	Bhutan	Lebanon	Croatia	Dominica	Ecuador	Nauru
Czechia	Norway	Burundi	Mauritania	Korea, Dem. Rep. of	Georgia	Oman	Cyprus	Dominican Republic	Guyana	Palau
Denmark	Poland	Cabo Verde	Mauritius	Laos	India	Qatar	Latvia	El Salvador	Paraguay	Papua New Guinea
Estonia	Portugal	Cameroon	Morocco	Malaysia	Kazakhstan	Saudi Arabia	Lithuania	Guatemala	Peru	Samoa
Finland	Slovakia	Central African Rep.	Mozambique	Mongolia	Kyrgyzstan	State of Palestine	Macedonia	Haiti	Suriname	Solomon Islands
France	Slovenia	Chad	Namibia	Myanmar	Maldives	Syria	Moldova	Honduras	Uruguay	Tonga
Germany	Spain	Comoros	Niger	Philippines	Nepal	United Arab Emirates	Montenegro	Jamaica	Venezuela (Bolivarian Rep. of)	Tuvalu

Table 4. Regional distribution table (Concluded)

Developed countries[1]		Africa		East Asia	South and Central Asia	Middle East	Europe	North America	South America	Oceania
Greece	Sweden	Congo, Dem. Rep. of	Nigeria	Singapore	Pakistan	Yemen	Romania	Martinique		Vanuatu
Hungary	Switzerland	Congo, Rep. of	Rwanda	Taiwan Province of China	Sri Lanka		Russia	Mexico		
Iceland	Turkey	Côte d'Ivoire	Sao Tome and Principe	Thailand	Tajikistan		San Marino	Montserrat		
Ireland	United Kingdom	Djibouti	Senegal	Timor-Leste	Turkmenistan		Serbia	Nicaragua		
Israel	United States	Egypt	Seychelles	Viet Nam	Uzbekistan		Ukraine	Panama		
		Equatorial Guinea	Sierra Leone					Trinidad		
		Eritrea	Somalia							
		Eswatini	South Africa							
		Ethiopia	South Sudan							
		Gabon	Sudan							
		The Gambia	Tanzania							
		Ghana	Togo							
		Guinea-Bissau	Tunisia							
		Guinea	Uganda							
		Kenya	Zambia							
		Lesotho	Zimbabwe							

[1] Countries listed in this column are members of the Organisation for Economic Co-operation and Development (OECD).

Table 5. List of countries by unrecorded capital outflows (Top 50)

Extreme capital flight (Top 10)	Large capital flight (Top 11-30)	Medium capital flight (Top 31-50)
China	Kazakhstan	Oman
Russian Federation	Turkey	Peru
Mexico	Venezuela, Bolivarian Rep. of	Morocco
India	Ukraine	Serbia
Malaysia	Costa Rica	Egypt
Brazil	Iraq	Paraguay
South Africa	Azerbaijan	Trinidad and Tobago
Thailand	Viet Nam	Romania
Indonesia	Philippines	Nicaragua
Nigeria	Poland	Zambia
	Belarus	Saudi Arabia
	Aruba	Kuwait
	Argentina	Ecuador
	Iran, Islamic Rep. of	Ethiopia
	Hungary	Bulgaria
	Bangladesh	Côte d'Ivoire
	Brunei Darussalam	Togo
	Syria	Guatemala
	Qatar	Equatorial Guinea
	Honduras	Sri Lanka

Source: Global Financial Integrity.

Table 6. Capital flight as a percentage of GDP by country

Above 10%	5%–10%	2%–5%	Below 2%
Armenia	Bangladesh	Benin	Afghanistan
Aruba	Bulgaria	Bhutan	Albania
Azerbaijan	Burkina Faso	Bolivia	Algeria
Belarus	Croatia	Burundi	Angola
Botswana	El Salvador	Cabo Verde	Argentina
Brunei Darussalam	Ethiopia	Cameroon	Bosnia & Herzegovina
Cambodia	Fiji	China	Brazil
Chad	Guatemala	Dominican Rep.	Central African Rep.

Table 6. Capital flight as a percentage of GDP by country (Concluded)

Above 10%	5%–10%	2%–5%	Below 2%
Comoros	Guinea	Ecuador	Colombia
Congo-Brazzaville	Guinea-Bissau	Egypt	Congo-Kinshasa
Costa Rica	Iraq	Gabon	Dominica
Côte d'Ivoire	Jordan	Haiti	Eritrea
Djibouti	Lebanon	Hungary	Ghana
Equatorial Guinea	Macedonia	India	Iran
Georgia	Madagascar	Indonesia	Kenya
The Gambia	Maldives	Jamaica	Libya
Guyana	Mali	Kiribati	Mauritania
Honduras	Mauritius	Kuwait	Myanmar
Kazakhstan	Mexico	Kyrgyzstan	Pakistan
Laos	Montenegro	Mongolia	Saudi Arabia
Lesotho	Nigeria	Morocco	Tajikistan
Liberia	Oman	Mozambique	Tanzania
Malawi	Panama	Nepal	Timor-Leste
Malaysia	Papua New Guinea	Niger	Turkmenistan
Moldova	Philippines	Peru	Yemen
Namibia	Russia	Qatar	
Nicaragua	Rwanda	Romania	
Paraguay	Sao Tome	Sri Lanka	
Samoa	Senegal	Sudan	
Serbia	South Africa	Tonga	
Sierra Leone	Thailand	Tunisia	
Solomon Islands	Ukraine	Turkey	
Suriname	Venezuela	Uganda	
Swaziland	Vietnam	Uruguay	
Syria		Zimbabwe	
Togo			
Trinidad and Tobago			
Vanuatu			
Zambia			

Source: Global Financial Integrity.

3.3 Control variables

The literature identifies a number of variables that can explain the determinants of tax haven use. Taylor, Richardson and Taplin (2015) use data on 200 Australian firms. They find that intangible assets, withholding taxes and the degree of multinationality have significant explanatory power. Graham and Tucker (2006) relate firm size and profitability to the use of tax havens. Desai, Foley and Hines (2006a) focus on United States MNEs and find that firms with large research and development operations are more likely to use tax haven affiliates whereas intrafirm trade exhibits a positive relationship with tax haven usage.

With these studies as guidelines, the yearly financial accounts provided by ORBIS provide us with these control variables, such as turnover and the number of foreign subsidiaries, to capture firm size and internationalization. We also control for intangible fixed assets and long-term debt. It is important to point out that these data are for the parent MNE only and not the foreign subsidiaries. We also use the NACE two-digit industry codes to create broad sector-level fixed effects, in order to capture the effect of industry and technology-intensity differences. The categories are based on a definition from Eurostat and are as follows: high-technology manufacturing, medium-high-technology manufacturing, medium-low-technology manufacturing, low-technology manufacturing, knowledge-intensive services and less-knowledge-intensive services.

4. Empirical method

The empirical model used in this paper adapts the model used by Jones and Temouri (2016), who investigate the determinants of tax haven FDI. Thus, the data lend themselves to an econometric analysis using a probit model, which is consistent with studies undertaken in the literature. For this study we used a number of variants of the following model to test our hypotheses:

$$\text{TAX HAVEN}_{itc} = \beta_0 + \Omega\, \text{FSA}_{itc} + \beta_j \sum_{j=1}^{9} \text{REGION}_{itc} + \delta_1 \text{FLIGHT}_{itc} + S_k + P_t + \varepsilon_{itc} \quad (1)$$

where subscript i represents each individual MNE, t represents the year, c represents the parent MNE's country of incorporation and k represents sectors. The dependent variable TAX HAVEN refers to the dependent variable that takes the value of 1 if an MNE owns a subsidiary located in a tax haven and 0 otherwise. The vector FSA contains firm-specific variables that are typically found in the literature (see Graham and Tucker, 2006; Jones and Temouri, 2016). These include turnover, to account for firm size; intangible fixed assets, as these can be manipulated by transfer pricing in order to shift profits; the number of non-tax haven subsidiaries owned by the developed-country MNE, to control for the degree of internationalization; the MNE's

long-term debt, given the ability of firms to use thin capitalization to manipulate profits; and cash flow, as a short-term performance measure.

In order to test our hypotheses, we include variables called **REGION** and **FLIGHT**. The $j = 9$ **REGION** variables are set up as follows: when $j = 1$ the dummy variable is called "Developed". It equals 1 if a parent MNE has control of a subsidiary in the developed world (not including a domestic subsidiary) and 0 otherwise. When $j = 2$, the dummy variable is called Africa. This equals 1 if a parent MNE has control of a subsidiary in Africa and 0 otherwise. This continues for $j = 3, 4, 5, 6, 7, 8$ and 9. The other locations are East Asia, South and Central Asia, Rest of Europe, Middle East, North America, South America and Oceania. It is important to note that the dummy variables are not mutually exclusive.

The variable **FLIGHT** is a measure of capital flight and this is operationalized in two ways. First, we rank countries in terms of the volume of capital flight. We then create three dummy variables as outlined above and shown in tables 5 and 6. Capital Flight Top 10 is a dummy that equals 1 if the firm owns a subsidiary abroad that is in the top 10 countries in terms of capital flight and 0 otherwise. Capital Flight Top 11-30 is a dummy that equals 1 if the firm owns a subsidiary abroad that is in the 11-30 ranking in terms of capital flight and 0 otherwise. Capital Flight Top 31-50 is a dummy that equals 1 if the firm owns a subsidiary abroad that is in the 31-50 ranking in terms of capital flight and 0 otherwise. Countries outside the top 50 are in the base category to measure against. For the second approach, developing countries are classified by ranking unrecorded capital outflows as a percentage of their GDP. Dummy variables record the presence of subsidiaries in countries where unrecorded capital outflows account for (1) above 10 per cent of GDP; (2) between 5 and 10 per cent of GDP; (3) between 2 and 5 per cent of GDP; and (4) below 2 per cent of GDP.

5. Results

Our empirical results (marginal effects) are shown in tables 7, 8 and 9. Each table has three columns within it corresponding to different tax haven dependent variables, starting with the narrowest definition of a tax haven and finishing with the broadest definition. Table 7 investigates hypothesis 1, whereas tables 8 and 9 investigate the impact of capital flight and hence test hypothesis 2.

Hypothesis 1 predicts that parent firms that own subsidiaries in the developing world have a greater propensity to use tax havens. This is operationalized by including dummy variables for a specific region where a parent owns subsidiaries. As can be seen for each tax haven measure in columns 1 to 3 of table 7, parent firms that own a subsidiary in a developed country are much less likely to own a tax

haven subsidiary than those that do not own a subsidiary in a developed country. The magnitude of this effect gets larger as the tax haven measure shifts from the narrow definition to the broad definition. Hence, this represents the first part of the evidence that MNEs that own subsidiaries only in the developed world are less likely to use tax havens.

The other regional dummies are of even greater interest and specifically test hypothesis 1. The dummy variable for Africa is positive and significant. Using the narrowest definition of a tax haven, it would appear that parent firms that own a subsidiary in Africa have a 5.3 per cent greater probability of using a tax haven than do firms that do not own a tax haven subsidiary. Interestingly, the magnitude increases to 11.4 per cent when the measure for tax havens includes the jurisdictions blacklisted by the EU but falls when using the broadest measure of tax havens in column 3. This suggests that the ownership of subsidiaries in Africa is strongly correlated with the most secretive tax haven locations – the dot tax havens and the tax havens identified by the EU as being the most non-cooperative in terms of transparency.

Similar evidence can be seen for the other regional dummy variables for developing countries, but the magnitude of the effect across the tax haven measures is not quite as large as for Africa. One exception to this is the ownership of subsidiaries in Oceania. However, this can perhaps be explained as an outlier, as subsidiary ownership in this region constitutes a very small part of the sample and these locations themselves are tiny island economies, arguably working as auxiliaries to neighbouring havens. In summary, therefore, our results indicate quite strong support for hypothesis 1 in that it appears that subsidiary ownership in developing countries, which are characterized by market imperfections and weaker institutions, is strongly correlated with the ownership of tax haven subsidiaries.

Table 7. Developed versus developing countries

Variable	(1) Dot tax havens	(2) Dot + EU non-cooperative	(3) Dot + EU non-cooperative + Big 7
Developed	-0.0462***	-0.0985***	-0.214***
	(0.00272)	(0.00356)	(0.00399)
Africa	0.0526***	0.114***	0.0283***
	(0.00266)	(0.00384)	(0.00612)
East Asia	0.00660***	0.0153***	0.160***
	(0.00189)	(0.00258)	(0.00478)
South and Central Asia	0.0165***	0.0335***	0.101***
	(0.00248)	(0.00341)	(0.00573)

Variable	(1) Dot tax havens	(2) Dot + EU non- cooperative	(3) Dot + EU non- cooperative + Big 7
Table 7. Developed versus developing countries (Concluded)			
Rest of Europe	0.0297***	0.0307***	-0.0667***
	(0.00191)	(0.00251)	(0.00511)
Middle East	0.0464***	0.186***	0.0673***
	(0.00439)	(0.0118)	(0.0183)
North America	0.00955***	0.0520***	-0.0199***
	(0.00251)	(0.00380)	(0.00666)
South America	-0.00208	0.0240***	-0.0166***
	(0.00198)	(0.00281)	(0.00499)
Oceania	0.134***	0.177***	0.167***
	(0.0142)	(0.0230)	(0.0361)
Log Intangible Fixed Assets	0.00599***	0.00715***	0.0150***
	(0.000366)	(0.000469)	(0.000738)
Log Long-Term Debt	0.00537***	0.00605***	-0.00350***
	(0.000427)	(0.000545)	(0.000820)
Log Cash Flow	0.0134***	0.0126***	0.0253***
	(0.000758)	(0.000976)	(0.00155)
Log Turnover	-0.00639***	-0.00620***	0.0148***
	(0.000739)	(0.000982)	(0.00163)
Foreign Subsidiaries	0.000900***	0.00179***	0.0145***
	(2.99e-05)	(7.91e-05)	(0.000500)
Sector Dummies	Yes	Yes	Yes
Time Dummies	Yes	Yes	Yes
Log Pseudo-Likelihood	-38498.267	-46785.146	-66734.513
Wald chi²	18103.43	19009.21	20606.02
Prob > chi²	0.0000	0.0000	0.0000
Pseudo R²	0.3086	0.3084	0.3147
Observations	149,244	149,244	149,244

Note: Each column reports the marginal effects from a set of probit regressions. The dependent variable is whether a firm owns a subsidiary in a tax haven, based on three definitions. Period dummies, the constant and the fixed effect coefficients are not reported for brevity. Total long-term debt, turnover, free cash flow and intangible assets are entered as their natural logarithms. Robust standard errors in parenthesis.

*** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$.

Hypothesis 2 focuses on capital flight as an important determinant of tax haven use, the argument being that developed-country MNEs that own tax haven subsidiaries in developing countries and that are characterized by significant capital flight are much more likely to use tax havens. The results for this prediction are shown in tables 8 and 9, which use capital flight measures based on the absolute value of capital flight and as a percentage of GDP.

The developed-country dummy across each specification in columns 4 to 9 is again negative and significant, mirroring the results reported in table 7. In contrast, the dummies for capital flight (using the two methods) are positive and provide strong support for hypothesis 2. What is also interesting is that stronger results are obtained when using the broader measure of tax haven use. This suggests that parent firms that own subsidiaries in countries with a high degree of capital flight are also likely to own tax haven subsidiaries in the most secretive locations as well as the bigger tax haven locations. This is consistent with the argument that financial flows are channelled throughout the financial system and into and out of the most secretive dot tax havens and in turn channelled to the bigger financial centres.

Last, it is important to discuss the control variables used in each model. For each specification, the coefficient on tax haven use is strongly correlated with the ownership of intangible assets, consistent with the literature (Taylor et al., 2015). There is also significant evidence that firms that own more foreign subsidiaries, which proxies for the degree of internationalization, are also much more likely to own tax haven subsidiaries. Furthermore, firms that have a healthy cash flow are also much more likely to use tax havens, which means that tax haven use appears to be correlated with firm performance, especially in the short term. The results for turnover show that turnover is a positive predictor of tax haven use for the broader tax haven measure but a negative predictor for the narrower tax haven measure. This flips around for results obtained for long-term debt, such that more indebtedness correlates positively for MNEs who own subsidiaries in some of the most secretive tax haven locations.

Table 8. Unrecorded capital outflows (absolute)

Variable	(5) Dot tax havens	(6) Dot + EU non-cooperative	(7) Dot + EU non-cooperative + Big 7
Developed	-0.0437***	-0.0915***	-0.220***
	(0.00273)	(0.00367)	(0.00397)
Capital Flight Top 10	0.00258	0.0131***	0.0501***
	(0.00172)	(0.00235)	(0.00432)
Capital Flight Top 11-30	0.0190***	0.0689***	0.0558***
	(0.00253)	(0.00372)	(0.00555)
Capital Flight Top 31-50	0.0422***	0.0458***	-0.0777***
	(0.00221)	(0.00274)	(0.00498)
Rest of Africa	0.0568***	0.138***	-0.00436
	(0.00369)	(0.00678)	(0.00964)
Rest of World	0.0163***	0.0517***	0.0390***
	(0.00239)	(0.00345)	(0.00590)
Log Intangible Fixed Assets	0.00660***	0.00840***	0.0153***
	(0.000370)	(0.000473)	(0.000734)
Log Long-Term Debt	0.00520***	0.00616***	-0.00449***
	(0.000428)	(0.000545)	(0.000808)
Log Cash Flow	0.0137***	0.0133***	0.0266***
	(0.000765)	(0.000984)	(0.00154)
Log Turnover	-0.00615***	-0.00674***	0.0176***
	(0.000749)	(0.000987)	(0.00163)
Foreign Subsidiaries	0.000978***	0.00200***	0.0152***
	(3.19e-05)	(8.50e-05)	(0.000432)
Sector Dummies	Yes	Yes	Yes
Time Dummies	Yes	Yes	Yes
Log Pseudo-Likelihood	-38753.666	-47242.826	-67488.619
Wald chi²	17488.32	18505.21	19307.05
Prob > chi²	0.0000	0.0000	0.0000
Pseudo R²	0.3040	0.3017	0.3070
Observations	149,244	149,244	149,244

Note: Each column reports the marginal effects from a set of probit regressions. The dependent variable is whether a firm owns a subsidiary in a tax haven, based on three definitions. Period dummies, the constant and the fixed effect coefficients are not reported for brevity. Total long-term debt, turnover, free cash flow and intangible assets are entered as their natural logarithms. Robust standard errors in parenthesis.
*** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$.

Table 9. Unrecorded capital outflows (GDP, per cent)

Variable	(8) Dot tax havens	(9) Dot + EU non-cooperative	(10) Dot + EU non-cooperative + Big 7
Developed	-0.0456***	-0.0966***	-0.200***
	(0.00276)	(0.00361)	(0.00426)
Above 10% GDP	0.0280***	0.0511***	0.130***
	(0.00271)	(0.00375)	(0.00620)
5% to 10% GDP	0.0236***	0.0390***	-0.00154
	(0.00196)	(0.00261)	(0.00168)
2% to 5% GDP	0.0205***	0.0370***	0.104***
	(0.00180)	(0.00237)	(0.00423)
Below 2%	0.00890***	0.0452***	-0.0230***
	(0.00193)	(0.00272)	(0.00487)
Log Intangible Fixed Assets	0.00647***	0.00796***	0.0162***
	(0.000369)	(0.000468)	(0.000737)
Log Long-Term Debt	0.00534***	0.00590***	-0.00467***
	(0.000428)	(0.000540)	(0.000820)
Log Cash Flow	0.0129***	0.0121***	0.0276***
	(0.000759)	(0.000964)	(0.00155)
Log Turnover	-0.00702***	-0.00729***	0.0169***
	(0.000741)	(0.000968)	(0.00164)
Foreign Subsidiaries	0.00107***	0.00212***	0.0137***
	(3.17e-05)	(8.32e-05)	(0.000516)
Sector Dummies	Yes	Yes	Yes
Time Dummies	Yes	Yes	Yes
Sector Dummies	-38990.868	-47684.474	-67297.497
Time Dummies	16880.33	18719.83	21200.32
Log Pseudo-Likelihood	0.0000	0.0000	0.0000
Wald chi²	0.2998	0.2951	0.3089
Prob > chi²	149,244	149,244	149,244
Pseudo R²	0.3040	0.3017	0.3070
Observations	149,244	149,244	149,244

Note: Each column reports the marginal effects from a set of probit regressions. The dependent variable is whether a firm owns a subsidiary in a tax haven, based on three definitions. Period dummies, the constant and the fixed effect coefficients are not reported for brevity. Total long-term debt, turnover, free cash flow and intangible assets are entered as their natural logarithms. Robust standard errors in parenthesis.
*** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$.

6. Concluding remarks and policy implications

In this research we have learned that tax haven use is strongly correlated with developed-country MNEs owning subsidiaries in developing countries, often characterized by significant market imperfections and weak institutions. Furthermore, we showed that this relationship also holds for developed-country MNEs that own subsidiaries in locations that are characterized by significant capital flight. This is a particular type of market imperfection that has a significant impact on the developing world, as it removes wealth and income that could be used to finance public expenditure targeted at the poorest members of society.

Our findings build upon the literature that investigates tax haven use (see review by Cooper and Nguyen, 2020) and directly tests the theoretical insights of Buckley et al. (2015) with respect to market imperfections, institutions and economic geography. Furthermore, our findings add insights to the literature that estimates the volume of profit shifting by MNEs (Cobham, Janský and Meinzer, 2015; Zucman, 2015; Zucman, Fagan and Piketty, 2016) and adds to our understanding of the complementary relationship between tax haven uses and investments into developing countries.

It is important to point out some weaknesses in our analysis that future research could address. First, our data set does not allow us to consider the actual financial flows that go into and out of tax havens. The ORBIS database only allows us to determine whether a developed-country MNE owns a subsidiary in a particular location. Very often the accounting data for these subsidiaries are incomplete and missing. If there were open and transparent financial reporting, country by country, then it would be possible to account for the degree of profit shifting into and out of tax havens and researchers could begin to understand the degree of asset ownership booked into tax havens. Recent evidence by Faccio and FitzGerald (2018) is important in showing a case-based study analysis of Vodafone, the first large MNE to voluntarily publish country-by-country data. Using Vodafone's data, they show the tax impact of a move to formulary apportionment on a global basis versus the EU's Common Consolidated Corporate Tax Base proposal.

Second, it is important to note that tax avoidance and capital flight are both products of a weak institutional environment (Cuddington, 1986; Lensink et al., 2000). Indeed, capital flight is not motivated only by tax considerations (Alesina and Tabellini, 1989; Pastor, 1990). Future research could consider in greater detail other confounding factors that drive capital flight and tax avoidance in order to shed additional light on this important phenomenon.

In terms of policy, this research has a number of implications. First, developing countries must strengthen their rules with respect to beneficial ownership of companies, trusts, partnerships and foundations. Being better able to understand

who ultimately owns or has legal control of companies within their jurisdictions allows much greater oversight by the public and provides incentives to representatives to hold these companies and their owners to better account. It also enables better oversight and monitoring compliance and will enable countries to enact legislation to mitigate the degree of profit shifting that lowers the revenue losses. For example, it may better enable local content laws that make it possible for mineral rights to flow to indigenous groups. This would go some way to stop capital from being withdrawn from these countries. Indeed, policies such as these would help reinforce the power of development aid to boost economic development in these regions.

Nevertheless, domestic policy is not sufficient to stop the profit shifting and wealth extraction out of developing countries. The international system of corporate taxation is in a state of flux. The old system based on the arms-length principle is in much need of reform. The rules were designed at a time when the role of the MNE in the world economy was much less important than it is today. Furthermore, the pervasiveness of digital MNEs and their ability to sell goods and services in markets without having a physical presence means that profit shifting is becoming even more pervasive. Casella and Formenti (2018) show evidence for this trend when they report that MNEs in more digital industries have less conventional FDI than less digitally-oriented MNEs and instead have higher incentives to invest in subsidiaries with fiscal and financial motives.

The OECD's 2012 Base Erosion and Profit Shifting (BEPS) initiative has had some success with respect to acknowledging this issue and has emphasized much greater transparency with respect to country-by-country reporting, but it is essential that the international community work together to reform international taxation (for data and methodological issues with implementing BEPS, see Bradbury, Hanappi and Moore, 2018). Sadly, at the time of writing this paper, implementation of these reforms appears unlikely as the United States has withdrawn from the OECD/G20 Inclusive Framework on BEPS. This framework brought together 135 countries and jurisdictions to collaborate on the 15 Actions that resulted from the BEPS initiative. It puts significant emphasis on trying to ensure that profits are taxed where economic activity and value creation occurs. Indeed, this may eventually lead to a system of unitary taxation and formulary apportionment that could go a long way towards eradicating profit shifting and mitigating the impact of tax havens. However, recently the United States and the EU Commission decided to depart from the OECD BEPS process. The use of digital sales taxes, enacted unilaterally by many countries, is undermining the multilateral framework, and it appears that developing countries are being marginalized from the process. Hence, it would appear that there is a long way to go in terms of reforming the international system of corporate taxation and eliminating the harmful tax practices that affect developing countries.

References

Alesina, A., and Tabellini, G. (1989). External debt, capital flight and political risk. *Journal of International Economics*, 27(3-4), 199-220.

Andersen, J. J., Johannesen, N., Dreyer Lassen, D., and Paltseva, E. (2017). Petro rents, political institutions, and hidden wealth: Evidence from offshore bank accounts. *Journal of the European Economic Association*, 15(4), 818–860.

Andersen, J., Johannesen, N., and Rijkers, B. (2020). *Elite capture of foreign aid: Evidence from offshore bank accounts*. Policy Research Working Paper 9150. Development Research Group, World Bank Group. http://documents.worldbank.org/curated/en/493201582052636710/Elite-Capture-of-Foreign-Aid-Evidence-from-Offshore-Bank-Accounts.

Bolwijn, R., Casella, B., and Rigo, D. (2018). An FDI-driven approach to measuring the scale and economic impact of BEPS. *Transnational Corporations*, *25*(2), 107-143.

Bilicka, K., and Fuest, C. (2014). With which countries do tax havens share information? *International Tax and Public Finance*, 21(2), 175–197.

Bloink, R. (2011). Is United States corporate tax policy outsourcing America? A critical analysis of the proposed tax holiday for trapped CFC earnings. *Villanova Law Review*, 56(5), 833. https://digitalcommons.law.villanova.edu/vlr/vol56/iss5/3.

Bradbury, D., Hanappi, T., and Moore, A. (2018). Estimating the fiscal effects of base erosion and profit shifting: data availability and analytical issues. *Transnational Corporations Journal*, 25(2).

Buckley, P. J., Doh, J. P., and Benischke, M. H. (2017). Towards a renaissance in international business research? Big questions, grand challenges, and the future of IB scholarship. *Journal of International Business Studies*, 48(9), 1045-1064.

Buckley, P. J., Sutherland, D., Voss, H., and El-Gohari, A. (2015). The economic geography of offshore incorporation in tax havens and offshore financial centres: The case of Chinese MNEs. *Journal of Economic Geography*, 15(1), 103–128.

Campbell, K., and Helleloid, D. (2016). Educational case: Starbucks: Social responsibility and tax avoidance. *Journal of Accounting Education*, 37, 38–60.

Casella, B., and Formenti, L. (2018). FDI in the digital economy: a shift to asset-light international footprints. *Transnational Corporations*, 25(1), 101-130.

Cobham, A., Janský, P., and Meinzer, M. (2015). The financial secrecy index: Shedding new light on the geography of secrecy. *Economic Geography*, 91(3), 281-303.

Cooper, M., and Nguyen, Q. T. (2020). Multinational enterprises and corporate tax planning: A review of literature and suggestions for a future research agenda. *International Business Review*, 101692.

Cuddington, J. T. (1986). *Capital flight: Estimates, issues, and explanations* (Vol. 58). Princeton, NJ: International Finance Section, Department of Economics, Princeton University.

de Oliveira Concer, R., and Turolla, F. A. (2013). Internalisation theory and the internationalisation decision by Brazilian firms. *Revista Alcance*, 20(3), 294–308.

Desai, M., Foley, C., and Hines, J. (2006a). The demand for tax haven operations. *Journal of Public Economics*, 90, 513–531.

Desai, M., Foley, C., and Hines, J. (2006b). Do tax havens divert economic activity? *Economics Letters*, 90(2), 219–224.

Dharmapala, D., and Hines, J. (2009). Which countries become tax havens? *Journal of Public Economics*, 93, 1058–1068.

Dunning, J. H. (1980). Toward an eclectic theory of international production: Some empirical tests. *Journal of International Business Studies*, 11(1), 9–31.

Dunning, J. H. (1988). The eclectic paradigm of international production: A restatement and some possible extensions. *Journal of International Business Studies*, 19(1), 1–32.

Eden, L. (1998). *Taxing Multinationals: Transfer Pricing and Corporate Income Taxation in North America*. Toronto: University of Toronto Press.

Eden, L., and Kudrle, R. (2005). Tax havens: Renegade states in the international tax regime? *Law & Policy*, 27(1), 100–127.

European Council, 2017. *The EU List of Non-Cooperative Jurisdictions for Tax Purposes*. Brussels.

European Council, 2019. *The EU List of Non-Cooperative Jurisdictions for Tax Purposes*. Brussels.

Faccio, T., and FitzGerald, E. V. (2018). Sharing the corporate tax base: equitable taxing of multinationals and the choice of formulary apportionment. *Transnational Corporations Journal*, 25(2).

Global Financial Integrity. (2016). Illicit financial flows to and from developing countries: 2005–2014. http://www.gfintegrity.org/wp-content/uploads/2017/05/GFI-IFF-Report-2017_final.pdf.

Graham, J., and Tucker, A. (2006). Tax shelters and corporate debt policy. *Journal of Financial Economics*, 81(3), 563–594.

Helman, C. (2017). What America's biggest companies pay in taxes. *Forbes*, April 18. https://www.forbes.com/sites/christopherhelman/2017/04/18/what-americas-biggest-companies-pay-in-taxes/#73924b852f51.

Hines, J., and Rice, E. (1994). Fiscal paradise: Foreign tax havens and American business. *Quarterly Journal of Economics*, 109(1), 149–182.

Holtzblatt, M., Jermakowicz, E., and Epstein, B. (2015). Tax havens: Methods and tactics for corporate profit shifting. *International Tax Journal*, 41(1), 33–44.

Hymer, S. (1960). *The International Operations of National Firms: A Study of Direct Foreign Investment*. Cambridge: MIT Press.

Jones, C., and Temouri, Y. (2016). The determinants of tax haven FDI. *Journal of World Business*, 51(2), 237–250.

Jones, C., Temouri, Y., and Cobham, A. (2018). Tax haven networks and the role of the Big 4 accountancy firms. *Journal of World Business*, 53(2), 177–193.

Kar, D., and Spanjers, J. (2015). Illicit financial flows from developing countries: 2004–2013. Global Financial Integrity. https://www.gfintegrity.org/report/illicit-financial-flows-from-developing-countries-2004-2013/.

Kemme, D. M., Parikh, B., and Steigner, T. (2017). Tax havens, tax evasion and tax information exchange agreements in the OECD. *European Financial Management*, 23(3), 519–542.

Kleist, D. (2018). The multilateral convention to implement tax treaty related measures to prevent BEPS – Some thoughts on complexity and uncertainty. *Nordic Tax Journal*, (1), 31–48.

Kudrle, R. T. (2008). The OECD's harmful tax competition initiative and the tax havens: From bombshell to damp squib. *Global Economy Journal*, 8(1), 1850128.

Kyj, L. S., and Romeo, G. C. (2015). Microsoft's foreign earnings: Tax strategy. *Issues in Accounting Education*, 30(4), 297–310.

Lensink, R., Hermes, N., and Murinde, V. (2000). Capital flight and political risk. *Journal of International Money and Finance*, 19(1), 73-92.

Moudatsou, A., and Kyrkilis, D. (2011). FDI and economic growth: Causality for the EU and ASEAN. *Journal of Economic Integration*, 26(3): 554–577.

Ndikumana, L. (2020). Op-ed: Financial secrecy and capital flight is crippling Africa. *Daily Maverick*. https://www.dailymaverick.co.za/article/2020-02-18-financial-secrecy-and-capital-flight-is-crippling-africa.

Ndikumana, L. O., and Boyce, J. K. (2010). Measurement of capital flight: Methodology and results for sub-Saharan African countries. *African Development Review*, 22(4), 471–481.

Ndikumana, L. and Boyce, J. K. (2018). Capital flight from Africa, updated methodology and new estimates. Research Report, Political Economy Research Institute, University of Massachusetts at Amherst.

OECD (Organisation for Economic Cooperation and Development (2013). Addressing base erosion and profit shifting. http://www.oecd-ilibrary.org/.

Oxelheim, L., Randøy, T., and Stonehill, A. (2001). On the treatment of finance-specific factors within the OLI paradigm. *International Business Review*, 10(4), 381–398.

Palan, R., Murphy, R., and Chavagneux, C. (2010). *Tax Havens: How Globalization Really Works*. New York: Cornell University Press.

Pastor Jr., M. (1990). Capital flight from Latin America. *World Development*, 18(1), 1-18.

Picciotto, S., 2018. International tax, regulatory arbitrage and the growth of transnational corporations. *Transnational Corporations*, *25*(3), pp. 27-53.

Puck, J. F., Holtbrugge, D., and Mohr, A. T. (2009). Beyond entry mode choice: Explaining the conversion of joint ventures into wholly owned subsidiaries in the People's Republic of China. *Journal of International Business Studies*, 40(3), 388–404.

Pun, G. (2017). Base erosion and profit shifting: How corporations use transfer pricing to avoid taxation. *Boston College International and Comparative Law Review*, 40(2), 287–314.

Rugman, A. M. (1980). Internalization theory and corporate international finance. *California Management Review*, 23(2), 73–79.

Rugman, A. M. (2010). Reconciling internalization theory and the eclectic paradigm. *Multinational Business Review*, 18(2), 1–12.

Shaxson, N. (2014). IMF: Tax havens cause poverty, particularly in developing countries. Taxjustice.net. https://www.taxjustice.net/2014/06/25/imf-tax-havens-cause-poverty-particularly-developing-countries/.

Sikka, P. (2015). No accounting for tax avoidance. *Political Quarterly*, 86(3), 427–433.

Sikka, P., and Willmott, H. (2010). The dark side of transfer pricing: Its role in tax avoidance and wealth retentiveness. *Critical Perspectives on Accounting*, 21, 342–356.

Taylor, G., Richardson, G., and Taplin, R. (2015). Determinants of tax haven utilization: Evidence from Australian firms. *Accounting & Finance*, 55(2), 545–574.

Tørsløv, T. R., Wier, L. S., and Zucman, G. (2018). The missing profits of nations (No. w24701). National Bureau of Economic Research.

UNCTAD (2013). *World Investment Report 2013. Global Value Chains: Investment and Trade for Development.* New York and Geneva: United Nations.

UNCTAD (2016). *World Investment Report 2016. Investor Nationality: Policy Challenges*. New York and Geneva: United Nations.

United Nations. (2014). Country classification. http://www.un.org/en/development/desa/policy/wesp/wesp_current/2014wesp_country_classification.pdf.

Zucman, G., Fagan, T. L., and Piketty, T. (2016). *The Hidden Wealth of Nations: the Scourge of Tax Havens*. Chicago: University of Chicago Press.

Zucman, G. (2013). The missing wealth of nations: Are Europe and the U.S. net debtors or net creditors? *Quarterly Journal of Economics*, 128(3), 1321-1364.

Zucman, G. (2015). *The Hidden Wealth of Nations.* Chicago: University of Chicago Press.