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ABSTRACT

Since the year 2000, an international reform process has been underway to reduce the negative impacts of tax havens. This paper analyzes whether the reform period has favoured protected tax havens, i.e. havens with strong connections to the UK, the EU, the United States and China, relative to tax havens without such connections. Using a difference in difference approach, we show that portfolio investment in protected havens increased significantly more than in unprotected havens in the period 1997 to 2015. In other words, through their associated territories, some of the most powerful countries in the world seem to have cornered the market for tax haven services during the reform period. This may make further reform more difficult.

1. Introduction

There is an ongoing debate about the extent to which international institutions and reform processes disproportionately favour economically and politically powerful countries (Keohane, 1984; Krasner, 1991; Mearsheimer, 1994). Trade agreements under the World Trade Organization have reduced trade barriers for manufactured products, favouring the interests of industrialized countries, while liberalization has been much slower for agricultural sectors where developing countries have comparative advantage (Subramanian and Wei, 2007; Scott and Wilkinson, 2011; Muzaka and Bishop, 2015). Environmental accords such as the Paris Agreement have similarly been argued to favour developed countries, with less emphasis on the challenges and interests of poorer countries (Dimitrov, 2016). There is also a literature suggesting that wealthy economies use aid and their power in international organizations such as the World Bank and the IMF to influence voting in the United Nations (Kuziemko and Werker, 2006; Dreher et al., 2009a,b).

In this paper, we look at whether the international process to limit the negative impacts of tax havens conducted under the auspices of the OECD since the year 2000, has tended to privilege certain havens over others.[1] While countries and territories typically considered tax havens (alternatively termed secrecy jurisdictions) vary in their characteristics, they are on average too small to be considered influential in themselves (Dharmapala and Hines, 2009). However, several of them have powerful allies, being closely associated or constituent countries, territories or divisions of countries such as the UK, the EU, the US, and China. These havens arguably enjoy a measure of international protection and support that other havens do not.[2] The international process may privilege these protected havens in two ways; by creating rules that they may more easily meet, or rules that they may more easily flout without significant international repercussions given their degree of protection. The process has focused mainly on standards for transparency and tax information exchange, and incentives for actual (i.e. not only formal) adherence to the standards may be lower in havens under the protection of a powerful country.

The effectiveness of the OECD process against tax havens is debated (Johanneson and Zucman, 2014; Schjelderup, 2016; Seabrooke and Leonard, 2016). It may also be difficult to assess. In one sense, the existence of an international process of this kind means that all tax havens are treated units, whether willing participants in the process or not, and there are hence no untreated units to compare with. The effect of the process may, however, affect different tax havens differently, which is what we analyze. We use a difference in difference approach to look at whether portfolio investment increased more in protected tax havens than in unprotected ones in the period 1997 to 2015. While portfolio investment captures only part of total investment in tax havens, it has the advantage of data accessibility in a pre-reform year. We find that portfolio investment increased significantly more in protected tax havens in the period in question than in havens not closely associated with a big power. The reform period hence seems to have been favourable to tax havens with friends in high places. One possible explanation could be that protected havens more fully implement the principles laid down by the OECD, which leads to investor perceptions that these are more well-regulated jurisdictions. However, our results are basically unchanged when controlling for formal compliance with OECD principles by 2015, nor is formal compliance status significantly related to investment, which suggests that this is not the explanation. The possibility hence remains that investors increasingly see investment in protected tax havens as the safer way of escaping tax obligations elsewhere.

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[1] Based on the OECD (1998) report on harmful tax practices, the first practical steps of publishing a list of uncooperative tax havens and creating a Global Forum on Taxation were implemented in 2000, which we consider the start of the OECD process.

[2] For our classification of protected tax havens, see Table A1 in Appendix A.

The difference in difference methodology entails that results are not driven by time-invariant differences between tax havens, nor by general trends in portfolio investment. In terms of causal inference, the identifying assumption is that protected and unprotected tax havens would be on a common trend in the absence of international reform. This may or may not be the case, and since data on pre-reform investment is only available for one year, we cannot test this. Even at a descriptive level, however, the fact that protected havens have increased their share of tax haven investment from around 80 to around 90 per cent over the period 1997 to 2015 is noteworthy, and the implications thereof need to be understood. On the one hand, reduced competition in the supply of concealment services should increase the price and reduce the quantity of such services. On the other hand, rents from tax evasion services will go up, giving the dominant suppliers more of a stake in maintaining, and reducing their collective action challenges in expanding, the market for concealment services. In other words, political economy effects become important for assessing the overall implications of increasing market shares to protected tax havens.

Our analysis addresses the literature on endogenous institutions, and in particular the strategic imposition of rules and norms to undermine the competitiveness of rival jurisdictions or entities. The aforementioned studies of international institutions provide one example of this. A related point has been made for market competition, where large and powerful firms may lobby for regulations that rival firms incur larger costs in meeting (McWilliams et al., 2002). Moreover, sociological inquiry into the persistence of inequality has stressed how higher classes impose norms which require a certain educational or cultural background to master, effectively curtailing the social mobility of lower class individuals (Bourdieu and Passeron, 1977). A common underlying assumption in these perspectives, whether at country, firm or individual level, is that dominant entities have some form of advantage in meeting specific norms, which they then impose on others. Our analysis of protected entities adds a possible strategic interest resulting from an advantage in acting with impunity, in avoiding repercussions from not conforming to a norm imposed. The distinction may be important, as the norm in the first instance meets with substantially greater overall compliance than in the second instance, where the dominant entities do not comply.

We also contribute to an emerging literature on tax havens. Our distinction between protected and unprotected tax havens adds an important political economy, international relations dimension to the literature focusing on the definition and characterization of tax havens (Hines and Rice, 1994; Diamond and Diamond, 2002; Dharmapala and Hines, 2009). The finding of increasing concentration of investment in protected tax havens has implications for the literature on negative or positive economic consequences of tax havens for non-haven countries (Desai et al., 2006; Rose and Spiegel, 2007; Slemrod and Wilson, 2009; Hines, 2010; Andersen et al., 2013; Blanco and Rogers, 2014). Adding to the literature on the effectiveness of international initiatives in reducing the negative consequences of tax havens (Johannesen and Zucman, 2014), our results suggest that their effects may be highly heterogeneous depending on the relations of havens to powerful nations. Moreover, while some of these studies suggest that the pressure on tax havens has increased after the 2008 financial crisis, when the G20 got more involved in the international processes (ibid.), and following the scandals of the LuxLeaks, SwissLeaks and the Panama papers (Seabrooke and Leonard, 2016), our data does not suggest that the divergence between protected and unprotected tax haven investment changed at that particular juncture. Our results are consistent with the argument of Elsayyed and Konrad (2012) that tax haven reform gets increasingly difficult as the remaining havens enjoy higher rents from reduced competition, but suggests that this may be an even more intractable problem since the

remaining havens enjoy international protection and have both the incentives and the power to resist full reform.

The paper is structured as follows. Section two presents a brief conceptual framework. Our data and empirical strategy are discussed in section three. The main results are presented in section four, followed by robustness tests in section five. Section six discusses the implications of the results. Section seven concludes.

2. Conceptual framework

At the core of standard definitions of tax havens is a combination of low tax rates for foreign entities, and strict secrecy rules or practices which make it difficult for other jurisdictions to access information necessary for tax purposes (Schelderup, 2016). Which countries and territories qualify as tax havens is heavily debated, while a number of small islands and territories such as the Cayman Islands and the British Virgin Islands typically make the list, it has been argued that countries such as the Netherlands and the UK, or the US state of Delaware, should also be counted among them. The network analysis of Garcia-Bernardo et al. (2017) might provide some guidance here, in categorizing the UK and the Netherlands as conduits to sink tax havens such as the Cayman Islands, but this is not a debate we aim to settle here. We instead take the two lists of tax havens compiled in Hines (2010) and Johanneson and Zucman (2014) as our point of departure in defining our samples of tax havens.

While difficult to quantify precisely for obvious reasons, it is estimated that the role of tax havens in the world economy is substantial. Zucman (2013, 2014) suggests that at least 8 per cent of personal wealth is stashed in such jurisdictions, leading to a loss of tax revenue of 200 billion USD in non-haven countries annually, and that profit shifting by multinational corporations to such havens is substantial. Tax havens have been argued to impose a number of inefficiencies, including costs incurred by individuals and corporations seeking to evade taxes, increased enforcement costs for tax authorities, and higher costs in raising taxes for public goods (Slemrod and Wilson, 2009). Moreover, secrecy entails not just an opportunity to circumvent tax liability in non-haven countries, but also other types of legal liability, including criminal. While tax havens have also been argued to increase efficiency in the case where taxes would otherwise be designed in an inefficient manner (Hong and Smart, 2010), these forms of analyses rest on questionable assumptions, the core one perhaps being that non-haven countries need to be protected from their own tax setting inclinations, and that the existence of low tax jurisdictions for the wealthy are a good way of doing so.

The international process towards tax havens that has been overseen by the OECD since 2000 has recognized the negative externalities created by concealment services offered by tax havens. The reforms have concentrated on increasing transparency and information exchange, using various forms of pressure including the publication of lists denoting the level of compliance of havens with evolving standards, the latest of which includes automatic exchange of information between countries. The standards have their theoretical rationale in deterrence models of tax evasion (Allingham and Sandmo, 1972), where increased detection probabilities reduce evasion. The effectiveness of deterrence strategies are debated, and in models that incorporate norms against tax evasion (Andreoni et al., 1998) these strategies are either more effective if detection increases the stigma of norm violation or less effective if they undermine intrinsic norms against evasion. Important here is the question of whose norms matter. The use of tax havens as a means of evasion is predominantly for the wealthy and the extremely wealthy, Alstadsæter et al. (2017) estimate that 50 per cent of offshore wealth is owned by the richest 0.01 per cent, and that taking into account their offshore wealth this group evades 30 per cent of taxes as compared to 3 per cent for the general population they study. They

argue that this sharp increase in evasion with income is inconsistent with deterrence models alone, and suggest the explanation lies in a supply side of tax haven concealment services that finds it optimal to only target the very wealthy. However, as norms are usually understood relative to a reference group, a different explanation could be fundamentally different norms towards tax evasion among the very wealthy, which is in one sense consistent with findings that suggest the very wealthy are more conservative in areas that include views of taxation (Page et al., 2013).

However, even in a deterrence framework it should be pointed out that increased accessibility of information can, but need not necessarily lead to a corresponding increase in detection probabilities and punishment. Contrary to popular wisdom, information is not power, but requires and can direct power. The incentives of tax administrations in non-haven countries to go after tax evaders among the very wealthy depends on the relative power of this elite in domestic politics. In some countries these incentives will be strong, in others less so. While the political economy of non-haven countries is an important issue, this is not what we focus on here. Our analysis relates more to the question of the extent to which the information needed for deterrence will actually be forthcoming. While most jurisdictions are at present found to be largely of fully compliant with OECD standards, this formal compliance may not necessarily entail actual compliance, which tax havens have an incentive to resist. The history of international institutions is replete with examples of conventions that states ratify but fail to honour, for instance in the area of human rights. Non-haven states may have greater material interests in enforcing compliance with standards in the case of tax havens. However, the literature on sanctions suggest that their success depends on their relative costs to the sanctioning country and the sanctioned entity (Eaton and Engers, 1999). And this would seem to advantage tax havens which enjoy a measure of international protection through a close association with a powerful country.

If this is the case, we should see a shift in evasion activities to protected tax havens. We define protected tax havens as those jurisdictions that are in close association with the UK, the EU, the United States, and China. These include the overseas territories and crown dependencies of the UK, EU member states and countries that are constituent parts of EU states, countries with strong associations to the United States, and special administrative regions of China.[3] While a number of what we define as unprotected tax havens have other associations with these powers, for instance in terms of being members of the Commonwealth, we do not consider these weaker links as giving rise to international protection. While there are other powerful states in the world, the tax havens examined do not have similarly close ties to them. Moreover, while several of the unprotected havens have close associations, they are not to what we consider powerful countries.

We analyze whether the period of international reform towards tax havens has favoured protected havens over unprotected ones, using portfolio investment data from the IMF. This data has the advantage of being available in a pre-reform year. Admittedly, it is also incomplete. It does not include direct investment, defined as investment which gives more than a 10 per cent interest in a corporation. And if there is something that characterizes tax evasion activities through tax havens, it is their complexity, with investment successively channelled through different havens. Our data mainly captures the investment positions of non-haven countries held directly in our samples of tax havens, not the final destination. Given the traceability of investments to these first destinations, however, we would argue that for evasion purposes, investors would be particularly concerned about the compliance activities of these destinations.

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[3] See Table A1 in Appendix A for the list of protected and unprotected tax havens.

3. Data and empirical strategy

Our analysis is based on two samples of tax havens, corresponding to the lists of tax havens compiled by Hines (2010) and Johanneson and Zucman (2014). These lists are presented in Table A1 in Appendix A, and each consists of 52 countries or territories. However, the status of the Netherlands Antilles has undergone a change in the period we study from 1997 to 2015, being divided into Curacão and Sint Maarten. In our analysis, we treat the Netherlands Antilles as one unit, adding up the combined investment in the two countries. This reduces the two lists to 51 and 50 tax havens, respectively, as Curacão featured only in the list of Johanneson and Zucman (2014), likely due to the as yet unresolved status of Curacâo at the year of publication of Hines (2010). We run separate estimations for each of the two samples of tax havens.

Our dependent variable is portfolio investment in each tax haven country or territory.[4] This variable is calculated on the basis of data from the IMF Coordinated Portfolio Investment Survey (CPIS). This survey provides information on the portfolio investment assets of up to 86 reporting countries and territories broken down by 242 host economies, including all the smaller territories in the two tax haven lists.[5] The data are available annually for 1997, and 2001 through 2013, and bi-annually thereafter. For our main analysis, we use the data for 1997 and end of year 2015, and include only the investment of the 28 countries reporting portfolio investment to the CPIS in both 1997 and 2015.[6] The full list of these reporting economies can be found in Table A2 in Appendix A. We calculate portfolio investment as the sum of the assets these economies hold in each tax haven, and convert this to constant 2010 USD billion using GDP deflator data from the World Development Indicators. While the sample of 28 reporting countries on which our data is based is somewhat restrictive, these countries include most of the major developed country investors. In robustness tests, we show that we get similar results when using data from the years 2001 and 2015, calculating total investment to each tax haven on the basis of reported assets of the 63 countries reporting in both of these years. However, as data from 1997 predates the OECD process on tax havens, this is used in our main analysis, and the existence of this early data in the CPIS is a major advantage in using this data source. While portfolio investment does not capture all investment in tax havens, bilateral data on foreign direct investment is not available from that early on. The data set on bank deposits from the Bank of International Settlements used in Johanneson and Zucman (2014) covers only 14 tax havens and starts in 2003.

We conduct standard difference in difference estimation, as captured by equation 1. Our dependent variable y_{it} is portfolio investment in tax haven *i* in year *t*, where the included years are 1997 and 2015. We include tax haven fixed effects α_i and a time dummy λ_t for 2015. Our treatment variable D_{it} takes the value 0 in 1997 and 1 in 2015 for the protected tax havens, and 0 in both years for the unprotected havens. Our analysis considers all tax havens as treated by the OECD process, and the parameter ρ captures the difference in treatment effect between tax havens protected and unprotected by a major international power. In a sense, the treatment here can be viewed as having a protected status activated by the change in international institutions towards tax havens. The tax havens we consider protected are denoted in the full list of tax havens in Table A1 in Appendix A. These are the overseas territories and crown dependencies of the UK (Anguilla, Bermuda, the Cayman Islands, Gibraltar,

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[4] Portfolio investment is typically defined as investment that does not give a controlling interest in a corporation, in contrast to direct investment, which does, with the threshold set at 10 per cent of voting shares.
[5] For details on the data, please see http://data.imf.org/?sk=B981B4E3-4E58-467E-9B90-9DE0C3367363 (accessed 2 August 2017).
[6] The country coverage of the CPIS has expanded significantly since the 1997 survey, and of the 29 economies reporting their assets in 1997, data for only Ireland was missing in 2015 at the time of analysis.

Montserrat, the Turks and Caicos Islands, the British Virgin Islands, Guernsey, the Isle of Man, Jersey), EU member states (Austria, Belgium, Cyprus, Ireland, Luxembourg, Malta), countries that are constituent parts of EU states (Aruba and the Netherlands Antilles/Curacão/Sint Maarten are countries within the Kingdom of the Netherlands), countries with strong associations to the United States (the Marshall Islands and Micronesia are republics in association with the US, and the US Virgin Islands is an organized, unincorporated territory of the US), and special administrative regions of China (Hong Kong and Macao). In total, 20 of the 51 countries and territories in the Hines (2010) sample of tax havens, and 21 of the 50 in the Johanneson and Zucman (2014) list, are considered protected in our analyses. In all estimations, we use standard errors clustered at the country level.

$$y_{it} = \alpha_i + \lambda_t + \rho D_{it} + \beta X_{it} + \epsilon_{it} \qquad (1)$$

For our analysis to capture a causal effect on investment of protection in the face of reform, the identifying assumption is that protected and unprotected tax havens would have been on the same common trend in the absence of the change in international institutions. Since the CPIS offers only one year of data prior to the OECD process, we cannot test this. The group of unprotected tax havens include major jurisdictions like Switzerland and Singapore, so it is unlikely that the protected group had a greater capacity for expansion than the unprotected group. However, other changes may have occurred in the protected or unprotected group which may explain why one could have experienced a greater change in investment than the other. Since compliance with OECD standards was faster among protected tax havens, it is possible that investors increased their investment more in these havens for this reason, either due to perceived institutional efficiency in these havens, or for reputational reasons. In additional specifications, we include compliance status with OECD standards as of 2015 in our covariates X_{it}. Another possibility is that the LuxLeaks of 2014 or the SwissLeaks of 2015 may have had an effect on investment (the Panama Papers did not become public until 2016, i.e. after our period of analysis). In separate analyses conducted for the period before and after the 2008 financial crisis, we find significant results for the pre-crisis period, which suggests that these leaks cannot be the whole explanation. Moreover, if the LuxLeaks had a negative effect on investment in Luxembourg, this would mean that our results underestimate the effect of protection in the face of reform, since Luxembourg is one of the protected havens. To exclude the results being driven by negative effects of the SwissLeaks, we perform additional estimations where we drop Switzerland from the sample. It remains possible, of course, that some of the effect in the period after 2008 is due to investor perceptions that unprotected tax havens are more susceptible or vulnerable to these forms of leaks.

4. Main results
The main results from our difference in difference analysis is presented graphically in Figure 1 and formally in Table 1 (all in constant 2010 USD billion terms). As Figure 1 indicates, the increase in mean portfolio investment from 1997 to 2015 was substantially larger in the protected tax havens than in the unprotected ones. For the Hines (2010) sample of havens, investment in unprotected havens rose from about 7 billion USD to almost 30 billion USD, while the corresponding rise for protected havens was from 31 to 293 billion USD (all in constant 2010 USD terms). For the sample based on Johanneson and Zucman (2014), unprotected jurisdictions saw an increase from 9 to 36 billion USD, while the increase for protected ones was from 31 to 244 billion USD. These number also imply that the market share of the protected havens in total portfolio investment to tax havens increased by approximately 10 percentage points over the period, to almost 91 per cent in 2015 (87 per cent for the Johanneson and Zucman sample). The results in the first two columns of Table 1 show that the difference in portfolio investment over time is significant ($p < 0.055$ for the Hines sample, and $p < 0.089$ for the

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Johanneson and Zucman sample). The point estimate is somewhat larger for the Hines sample of tax havens, reflecting in particular the inclusion of Ireland in this sample but not in the Johanneson and Zucman sample, but in both cases the estimate is economically sizeable. The estimates suggest that the average protected tax havens increased its inward investment relative to the average unprotected havens by 187-239 billion USD over the 18 year period from 1997 to 2015, or approximately 10-13 billion per year.

Figure 1. Portfolio investment in protected and unprotected tax havens 1997 and 2015.
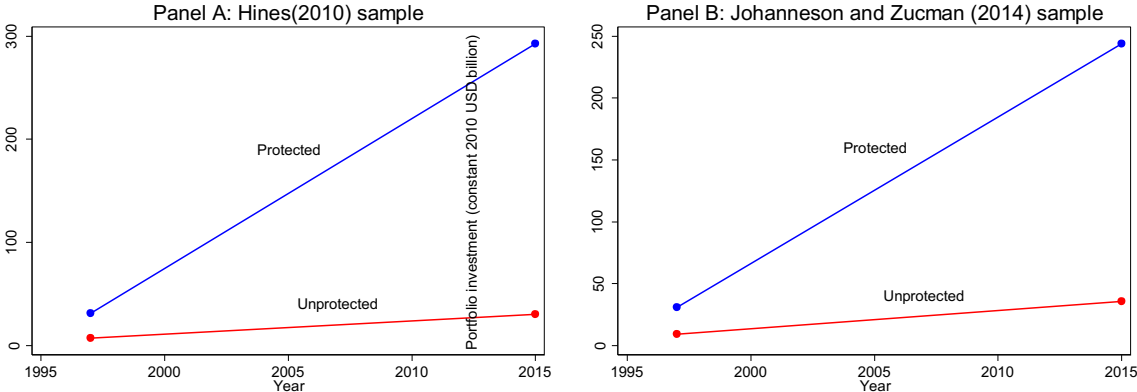

Table 1. Main results, difference in difference estimation 1997 to 2015.

	(1)	(2)	(3)	(4)
Tax haven sample	Hines (2010)	Johanneson and Zucman (2014)	Hines (2010)	Johanneson and Zucman (2014)
Dependent variable	Portfolio investment (constant 2010 USD billion)	Portfolio investment (constant 2010 USD billion)	Portfolio investment (constant 2010 USD billion)	Portfolio investment (constant 2010 USD billion)
Protected	238.855*	186.743*	207.252*	168.287*
	(121.48)	(107.79)	(106.75)	(96.86)
OECD compliant			83.024	63.144
			(57.68)	(54.02)
Constant	16.456	18.104	16.456	18.104
	(24.12)	(22.90)	(24.09)	(22.92)
Country fixed effects	Yes	Yes	Yes	Yes
Year dummies	Yes	Yes	Yes	Yes
r2	0.193	0.162	0.203	0.169
N	102	100	102	100
Countries	51	50	51	50

Note: Standard errors clustered at the country level in parentheses. *** indicates significance at the 1% level, ** at 5%, * at 10%.

At various stages over the reform period, the OECD has rated the compliance of tax havens with the standards created. As of October 2015, 29 of the 51 jurisdictions in the Hines (2010) sample were assessed as fully or largely compliant with OECD standards, as were 32 of the 50 jurisdictions in the Johanneson and Zucman (2014) sample (confer OECD (2015), p. 15). A protected haven was on average almost 40 per cent more likely to be compliant at this stage (p < 0.005) than an unprotected one, which raises the possibility that our results are driven by compliance.[7] In the last two columns of Table 1, we include a compliance variable which takes the value one for fully or largely compliant havens in 2015, and zero otherwise. This reduces the coefficient for protected havens only slightly, but also increases precision and in both samples the level of significance remains almost unchanged (p < 0.058 and p < 0.089 for the two samples, respectively). Compliance displays a positive correlation with portfolio investment, but not a statistically significant one. Including the protected haven variable actually

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[7] Results from a linear probability model, available on request.

proves important, as additional estimations where investment is simply regressed on compliance suggests a significantly positive effect of compliance in the Hines sample, which would be misleading.[8]

It has been suggested that the OECD process towards tax havens received an extra impetus after the 2008 financial crisis, when the G20 threw its weight behind the reforms (Johanneson and Zucman, 2014). In Table 2, we estimate equation (1) separately for the periods before and after 2008, for the Hines sample in the first two columns and the Johanneson and Zucman sample in the last two columns. The coefficients for the protected havens variable is not significantly different across periods, suggesting that in terms of increasing the dominance of the protected havens at least, the OECD process did not change around the 2008 crisis. The shift of investor money towards protected jurisdiction appears to have started in the early phase of reform. This result is somewhat stronger if we divide the data in the year 2009, after the general dip in economic activity and investment.[9]

Table 2. Separate difference-in-difference before and after 2008 financial crisis.

	(1)	(2)	(3)	(4)
Tax haven sample	*Hines (2010)*	*Hines (2010)*	*Johanneson and Zucman (2014)*	*Johanneson and Zucman (2014)*
Years	*1997-2008*	*2008-2015*	*1997-2008*	*2008-2015*
Dependent variable	*Portfolio investment (constant 2010 USD billion)*	*Portfolio investment (constant 2010 USD billion)*	*Portfolio investment (constant 2010 USD billion)*	*Portfolio investment (constant 2010 USD billion)*
Protected	127.109**	111.745*	103.546**	83.197
	(58.92)	(63.39)	(50.95)	(57.68)
Constant	16.456	75.090***	18.104	71.457***
	(11.67)	(12.61)	(10.81)	(12.27)
Country fixed effects	Yes	Yes	Yes	Yes
Year dummies	Yes	Yes	Yes	Yes
r2	0.214	0.169	0.196	0.131
N	102	102	100	100
Countries	51	51	50	50

*Note: Standard errors clustered at the country level in parentheses. *** indicates significance at the 1% level, ** at 5%, * at 10%.*

5. Robustness

Of the 28 reporting economies in the 1997 and 2015 IMF CPIS data on the basis of which our investment variable is calculated, a few are considered tax havens. This includes Bermuda and Singapore in the Hines (2010) sample, and additionally Austria, Belgium, Chile and Malaysia in the Johanneson and Zucman (2014) sample. To test whether our results hold for direct portfolio investment from non-haven countries to tax havens, we exclude the reported assets from these havens in the investment variable used for estimations in columns one and two in Table 3. The results change only marginally. While the results for the periods before and after the financial crisis in 2008 suggest otherwise, columns three and four in Table 3 assess whether our results could be driven by a negative impact on portfolio investment in Switzerland following the SwissLeaks of 2015. Taking Switzerland out of our two tax haven samples does not substantially alter results. The results in Table 3 also hold if we control for compliance with OECD standards.[10]

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[8] Results available on request.
[9] Results available on request.
[10] Results available on request.

Table 3. Robustness to excluding reported investment from tax havens, and excluding Switzerland from tax haven samples.

	(1)	(2)	(3)	(4)
Tax haven sample	Hines (2010)	Johanneson and Zucman (2014)	Hines (2010) ex Switzerland	Johanneson and Zucman (2014) ex Switzerland
Dependent variable	Portfolio investment (constant 2010 USD billion), reporting havens excluded	Portfolio investment (constant 2010 USD billion), reporting havens excluded	Portfolio investment (constant 2010 USD billion)	Portfolio investment (constant 2010 USD billion)
Protected	233.002*	173.398*	254.292**	203.151*
	(119.56)	(100.84)	(120.55)	(106.58)
Constant	16.186	16.147	13.325	14.944
	(23.75)	(21.44)	(24.14)	(22.86)
Country fixed effects	Yes	Yes	Yes	Yes
Year dummies	Yes	Yes	Yes	Yes
r2	0.190	0.160	0.197	0.166
N	102	100	100	98
Countries	51	50	50	49

Note: Standard errors clustered at the country level in parentheses. *** indicates significance at the 1% level, ** at 5%, * at 10%.

While the 1997 IMF CPIS includes investment reported by many of the major economies in the world, the number of reporting economies has increased substantially from 2001 onwards. In Table 4, we report results for total investment to the two samples of tax havens from 63 economies reporting to the CPIS in 2001 and 2015. This means that the first year of observation here is after the start of the OECD process. However, results are in line with what we have found earlier, with protected havens seeing a significantly greater increase in portfolio investment since 2001. The estimated difference is somewhat larger than in previous results, reflecting the addition of more reporting economies. As shown in the last two columns, results hold when controlling for compliance status in 2015, which is not significantly related to investment.

Table 4. Difference in difference 2001 to 2015, investment from expanded number of reporting economies.

	(1)	(2)	(3)	(4)
Tax haven sample	Hines (2010)	Johanneson and Zucman (2014)	Hines (2010)	Johanneson and Zucman (2014)
Dependent variable	Portfolio investment (constant 2010 USD billion)	Portfolio investment (constant 2010 USD billion)	Portfolio investment (constant 2010 USD billion)	Portfolio investment (constant 2010 USD billion)
Protected	285.326*	223.157*	247.584*	200.539*
	(143.07)	(126.06)	(125.76)	(113.30)
OECD compliant			99.155	77.386
			(67.74)	(62.92)
Constant	42.411	45.886*	42.411	45.886*
	(28.38)	(26.76)	(28.33)	(26.78)
Country fixed effects	Yes	Yes	Yes	Yes
Year dummies	Yes	Yes	Yes	Yes
r2	0.196	0.168	0.206	0.175
N	102	100	102	100
Countries	51	50	51	50

Note: Standard errors clustered at the country level in parentheses. *** indicates significance at the 1% level, ** at 5%, * at 10%.

6. Discussion

The above results do not inform us about whether OECD reforms have been successful in curtailing the use of tax havens, it is possible that total investment in tax havens would have been even greater in their absence. However, if the reforms have worked, they appear to have worked differently for protected and unprotected tax havens. The institutions in this area may hence have favoured havens associated with a major international power. Greater formal compliance among the protected havens by 2015 may suggest that the international standards has been shaped in a way that they have lower costs in meeting. However, the fact that controlling for formal compliance does not do much to alter

the estimated divergence in investment between protected and unprotected havens, suggests that this is unlikely to be the full explanation. If not reduced reputational risk due to formal compliance with international rules, the question then is what investors get from protected havens that they do not get from unprotected ones. One possibility is that investors perceive protected havens as more insulated from pressures to actually comply with the imposed standards, and hence as a safer place to conceal taxable income and assets. Of course, it is not obvious that it is in the interest of the international powers in question to facilitate this form of shirking in their associated havens. The EU, for instance, consists of a number of countries harmed by tax havens who may resist such strategies. However, dominant economies such as the Netherlands, and the UK, have financial sectors which serve as important conduits of flows to associated tax havens (Garcia-Bernardo et al., 2017), and clear material interests in protecting these havens.

On the other hand, it is possible that the increasing divergence in investment between protected and unprotected havens have little to do with the international reform process. If there are economies of scale in tax haven investment facilitation, the small advantage that protected havens had in 1997 could have been magnified into greater dominance by 2015. Tax havens for instance sometimes function as locations where investors pool investment to reduce risk, which could give rise to these forms of forces where some havens become more focal over time. However, if we look at individual jurisdictions, there was not that much of a difference in investment levels between unprotected Switzerland, and protected Luxembourg and Cayman Island in 1997, or between unprotected Panama and protected Jersey, which casts doubt on this explanation; clearly these unprotected havens seemed in as good a position to exploit economies of scale, and did not. The divergence can also be explained by changes in governance, investment technology, or connectedness to the world economy that may have been different for our two groups of tax havens. In testing for this, the lack of data on smaller territories in the tax haven sample prove restrictive, standard country level datasets are typically not comprehensive enough to include such jurisdictions.[11]

The increasing concentration of investment to protected tax havens nevertheless raises important questions for the current structure of the market for tax evasion or concealment services, and for future international reform. In their theoretical analysis of the welfare effects of limiting the number of tax havens, Slemrod and Wilson (2009) provides the following reason for why tax havens tend to be small countries: There is a limit to how much tax revenues a haven can divert from non-haven countries before non-haven countries take steps to shut it down. The benefits of this given level of concealment services is divided on the population of a haven, which means that smaller countries will see higher per capita benefits of becoming a haven than larger ones. Within this framework, we can view international reform as reducing the level of concealment services a tax haven can get away with. This would mean that the larger tax havens, which were close to indifferent to whether to be a haven, will choose to be havens no longer. In other words, in this framework, we would expect to see the OECD reform process lead to a greater reduction in concealment services among larger havens compared to smaller ones. However, what the Slemrod and Wilson (2009) framework does not consider is the possibility that the level of concealment services a country can get away with is greater for territories that are under the protection of powerful countries (which explains why tax havens tend not to be just any small country, but small countries with particular international associations), and that

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[11] Specifically, the World Bank Governance Indicators used in the cross-sectional analyses of Dharmapala and Hines (2009) are unavailable pre-2004 for 10 of the 20 protected tax havens in the Hines (2010) sample and 11 of the 21 protected havens in the Johanneson and Zucman (2014) sample. In particular, data is missing for UK overseas territories and crown dependencies, the constituent countries of the Netherlands, as well as the US Virgin Islands. Additional analyses incorporating these variables are hence not particularly meaningful.

international reform may have much less bite in reducing the feasible level of concealment services in protected havens. If the latter is the case, then we should expect to see reform reduce investment in unprotected havens relative to protected ones.

In Table 5, we add two measures of tax haven population size in order to explore these predictions empirically. In columns one and two, we add a variable taking a value equal to the 2015 population size in 2015, and zero in 1997. This can be viewed as an interaction between an international reform treatment dummy and population size, and its coefficient hence measures how changes in investment over the reform period varies with population size. In columns three and four, we include a simple small state dummy variable, which takes the value one in 2015 for territories with less than 250.000 inhabitants, and zero otherwise. Similarly, this can be viewed as an interaction between a reform treatment dummy and a dummy for small states.[12] The results support the prediction that the protected havens have gained. There is no indication that smaller tax havens have become more dominant.

Table 5. Estimates including population variables.

	(1)	(2)	(3)	(4)
Tax haven sample	*Hines (2010)*	*Johanneson and Zucman (2014)*	*Hines (2010)*	*Johanneson and Zucman (2014)*
Dependent variable	*Portfolio investment (constant 2010 USD billion)*	*Portfolio investment (constant 2010 USD billion)*	*Portfolio investment (constant 2010 USD billion)*	*Portfolio investment (constant 2010 USD billion)*
Protected	259.341**	191.253*	264.370**	199.437*
	(119.96)	(105.23)	(125.57)	(109.48)
Population 2015 (million)	27.745	3.251		
	(17.01)	(3.11)		
Small state dummy			-138.769	-84.953
			(105.38)	(94.37)
Constant	16.456	18.104	16.456	18.104
	(23.80)	(22.99)	(23.76)	(22.82)
Country fixed effects	Yes	Yes	Yes	Yes
Year dummies	Yes	Yes	Yes	Yes
r2	0.221	0.165	0.224	0.177
N	102	100	102	100
Countries	51	50	51	50

Note: Standard errors clustered at the country level in parentheses. *** indicates significance at the 1% level, ** at 5%, * at 10%.

Why is this important? In the model of Slemrod and Wilson (2009), concealment services offered by tax havens entail externalities for non-haven countries, in increasing their costs of tax policy enforcement and reducing revenues for supplying public goods. Partial reform which reduces the number of tax havens is shown to be beneficial to all countries, it increases the price of concealment services which benefits non-haven countries and the remaining tax havens, while the large tax havens which cease to be tax havens were close to indifferent on their tax haven status to begin with and also benefit through reduced diversion from higher concealment prices. Full reform, though, which eliminates all tax havens is deemed more difficult to accomplish, as the smaller tax havens will face an outright loss and resist this type of reform. However, if the countries that resist full reform are simply small, it seems odd to assume that they have the power to resist this kind of reform, larger non-haven countries should be able to simply push reforms through the international system. On the other hand, if reform tends to marginalize unprotected tax havens, full reform will be politically more difficult as the remaining havens are politically connected. In other words, our results suggest that further reform to address tax havens may be difficult to accomplish. In one particular sense, the increased dominance of protected havens may have the potential to make things worse. If the existing institutions merely

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[12] Here we use the cut-off for small states as defined by Kolstad and Wiig (forthcoming).

constrain unprotected havens, any resources the protected havens and their associated powers invest in increasing the demand for concealment services through other changes to the international system will bring returns that fall squarely on the protected havens, rather than being spread thinly among all havens. In other words, collective action problems in promoting tax evasion facilitation through tax havens will be reduced for countries powerful enough to exert significant influence on international institutions.

7. Concluding remarks

International institutions have been argued to favour the interests of powerful countries. Our analysis shows that tax havens closely associated with the UK, the EU, the US, and China have significantly increased their share of the market for tax haven investment over the period in which the OECD reform process to curtail the negative effects of tax havens has taken place. If related to the reform process, the relative increase in investment to protected havens likely reflect an ability to circumvent OECD standards at less risk of sanctions compared to unprotected havens. The conduct and actual compliance of these countries and territories merits further attention in future studies. But importantly, the increased concentration of tax haven investment to protected havens suggests that further international reform aimed at reducing negative externalities caused by tax havens may prove difficult, as the dominant havens have both the incentives and international backing to resist reform.

The analysis underscores the importance of understanding the political economy of international reform. This raises a number of challenging questions for further research. These include the interconnections between elites in non-haven countries and tax havens, and the facilitating role of tax advisors. In addition, in effectively addressing the role of tax havens in facilitating evasion of taxes and responsibility and in widening economic, political and social disparities between wealthy elites and the population at large, issues of power and accountability need to be emphasized. To move beyond measures that are well-intended but easily captured or circumvented, these types of questions need to take centre stage.

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Appendix A

Table A 1. List of protected and unprotected tax havens.

Tax haven (Hines, 2010)	Protector	Explanation	Tax haven (Johanneson and Zucman, 2014)	Protector	Explanation
Andorra			Andorra		
Anguilla	UK	Overseas territory of the UK	Anguilla	UK	Overseas territory of the UK
Antigua and Barbuda			Antigua and Barbuda		
Aruba	EU	Country within the Kingdom of the Netherlands	Aruba	EU	Country within the Kingdom of the Netherlands
Bahamas The			Austria	EU	EU member state
Bahrain Kingdom of			Bahamas The		
Barbados			Bahrain Kingdom of		
Belize			Barbados		
Bermuda	UK	Overseas territory of the UK	Belgium	EU	EU member state
Cayman Islands	UK	Overseas territory of the UK	Belize		
Cook Islands			Bermuda	UK	Overseas territory of the UK
Costa Rica			Cayman Islands	UK	Overseas territory of the UK
Cyprus	EU	EU member state	Chile		
Djibouti			Cook Islands		
Dominica			Costa Rica		
Gibraltar	UK	Overseas territory of the UK	Curacao	EU	Country within the Kingdom of the Netherlands
Grenada			Cyprus	EU	EU member state
Guernsey	UK	British Crown dependency	Dominica		
China PR Hong Kong	China	Special administrative region of the People's Republic of China	Gibraltar	UK	Overseas territory of the UK
Ireland	EU	EU member state	Grenada		
Isle of Man	UK	British Crown dependency	Guernsey	UK	British Crown dependency
Jersey	UK	British Crown dependency	China PR Hong Kong	China	Special administrative region of the People's Republic of China
Jordan			Isle of Man	UK	British Crown dependency
Lebanon			Jersey	UK	British Crown dependency
Liberia			Liberia		
Liechtenstein			Liechtenstein		
Luxembourg	EU	EU member state	Luxembourg	EU	EU member state
China PR Macao	China	Special administrative region of the People's Republic of China	China PR Macao	China	Special administrative region of the People's Republic of China
Maldives			Malaysia		
Malta	EU	EU member state	Malta	EU	EU member state
Marshall Islands Republic of	US	Presidential republic in free association with the US	Marshall Islands Republic of	US	Presidential republic in free association with the US
Mauritius			Monaco		
Micronesia Federated States of	US	Federal republic in free association with the US	Montserrat	UK	Overseas territory of the UK
Monaco			Nauru		
Montserrat	UK	Overseas territory of the UK	Netherlands Antilles	EU	Country within the Kingdom of the Netherlands
Nauru			Niue		
Netherlands Antilles	EU	Country within the Kingdom of the Netherlands	Panama		
Niue			St Kitts and Nevis		
Panama			St Lucia		
Samoa			St Vincent and the Grenadines		
San Marino			Samoa		
Seychelles			San Marino		
Singapore			Seychelles		
St Kitts and Nevis			Singapore		
St Lucia			Sint Maarten	EU	Country within the Kingdom of the Netherlands
Sint Maarten	EU	Country within the Kingdom of the Netherlands	Switzerland		
St Vincent and the Grenadines			Trinidad and Tobago		
Switzerland			Turks and Caicos Islands	UK	Overseas territory of the UK
Tonga			Uruguay		
Turks and Caicos Islands	UK	Overseas territory of the UK	US Virgin Islands	US	Organized, unincorporated territory of the US
Vanuatu			Vanuatu		
Virgin Islands British	UK	Overseas territory of the UK	Virgin Islands British	UK	Overseas territory of the UK

Table A 2. Reporting countries, main analysis.

Argentina	Japan
Australia	Korea, Republic of
Austria	Malaysia
Belgium	Netherlands
Bermuda	New Zealand
Canada	Norway
Chile	Portugal
Denmark	Singapore
Finland	Spain
France	Sweden
Iceland	Thailand
Indonesia	United Kingdom
Israel	United States
Italy	Venezuela, Republica Bolivariana de

Since the year 2000, an international reform process has been underway to reduce the negative impacts of tax havens. This paper analyzes whether the reform period has favoured protected tax havens, i.e. havens with strong connections to the UK, the EU, the United States and China, relative to tax havens without such connections. Using a difference in difference approach, we show that portfolio investment in protected havens increased significantly more than in unprotected havens in the period 1997 to 2015. In other words, through their associated territories, some of the most powerful countries in the world seem to have cornered the market for tax haven services during the reform period. This may make further reform more difficult.

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