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#### Multinationals and services imports from havens: when policies stand in the way of tax planning

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#### Abstract

We study the extensive and intensive margins of services imports by multinational groups from tax havens, and investigate to what extent those imports may have profit shifting motives. Drawing on rich data covering the universe of multinational groups with a presence in Portugal, we show that in a high-tax country where policies strongly discourage transactions with tax havens, multinational groups do not have an excess propensity to import intra-group from those countries. For the havens directly targeted by the policies, there is even a negative excess propensity to do so. This notwithstanding, we document the existence of an excessive value of intra-group imports from a set of targeted havens.

JEL: F23, H26, F14, K34 Keywords: multinational groups, profit shifting, services imports, tax havens, tax law.

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#### 1. Introduction

Multinational groups have been at the center stage of the international tax policy agenda in recent years because of their cross-border activities that shift profits from high-tax to low-tax countries – a phenomenon commonly denominated *profit shifting*. While shifted profits are not observable, they are estimated to be massive (e.g. Crivelli *et al.*, 2016; Guvenen *et al.*, 2022; Tørsløv *et al.*, 2022). At the global level, Tørsløv *et al.* (2022) estimate that 35% of multinational profits were shifted to tax havens in 2015. Large values of shifted profits impact meaningfully the amount of tax revenues available for governments in high-tax countries. This makes profit shifting a particularly topical issue not only for policymakers but also for the media and the general public.

The economics and accounting literature has provided ample evidence on specific routes multinationals use to shift profits.<sup>1</sup> This notwithstanding, for one of those routes empirical evidence remains comparably scarce: the use of intra-group services trade. The mechanism multinationals may use to shift profits through this route is relatively straightforward. As multinationals do not find it desirable that their profits generated by operations in high-tax countries are taxed at those high rates, they may artificially reduce those profits by increasing their costs. This may be achieved by paying fees for services – for example consulting services – provided by a firm of the same group. If this latter firm is located in a tax haven with a zero or a very low corporate tax rate, this import transaction conveniently reduces profits booked in the high-tax country and increases those located in the tax haven, reducing the overall tax bill of the group. Anecdotal examples of the use of this route show up regularly in the news.<sup>2</sup>

In the limit, the services described in the previous paragraph may be completely fictitious, having no purpose other than profit shifting. As services are not tangible and are harder to observe than goods, those fictitious imports may be substantially easier to perform than in the case of goods. Alternatively, those services may be genuine and have economic meaning, but they may be over-priced to inflate the value of the transactions. While tax authorities require that transactions of goods and services between related parties are valued at their market price – the arm's length principle – such principle may be harder to enforce in services since these are

<sup>1.</sup> For literature reviews, see for example Dharmapala (2014), Riedel (2018) and Beer *et al.* (2020). Specific routes include: i) intra-group loans (e.g. Buettner and Wamser, 2013; Egger *et al.*, 2010); ii) using the variation in the withholding rates in bilateral tax treaties, channeling cross-border payments through countries with the lowest tax rates (e.g. Weichenrieder *et al.*, 2008; Weyzig, 2013); iii) strategic location of intellectual property in low-tax countries (e.g. Dischinger and Riedel, 2011; Karkinsky and Riedel, 2012; Griffith *et al.*, 2014); iv) manipulation of international transfer prices of goods (e.g. Clausing, 2003; Cristea and Nguyen, 2016; Davies *et al.*, 2018).

<sup>2.</sup> For example, Reuters (Bergin and Bousso, 2020) reported that Shell and other oil major companies shift profits to the Bahamas, Switzerland, Bermuda, the UK Channel Islands, and Ireland by using thinly staffed affiliates that collect enormous amounts of money in over-priced intra-group insurance services.

often highly differentiated, making comparable market prices hard to determine. For this reason, existing estimates of profit shifting done through mispricing of intragroup goods trade are considered to be just "the tip of the iceberg" (Davies *et al.*, 2018).

If multinationals consistently import intra-group services from tax havens that they would not import if it were not for profit shifting purposes, this should have systematic implications for services import data. In particular, one should observe an abnormally large propensity to import intra-group from tax havens. Moreover, if the value of those transactions is inflated, this should have implications for the intensive margin of those imports: their value should be abnormally large. In this paper, we investigate whether that is the case. Namely, we study the extensive and intensive margins of services imports by multinational groups from tax havens, and assess to what extent they are excessive and may have profit shifting motives.

Disaggregated data about services trade with tax havens which includes information about whether those transactions are performed by multinationals is typically not available. Therefore, we focus on the case of one high-tax country (Portugal) for which we were able to obtain such information. Specifically, we build on comprehensive administrative datasets made available by Banco de Portugal to analyze the extensive and intensive margins of intra-group services imports from tax havens to Portugal, and investigate to what extent those imports may have profit shifting motives. The richness and comprehensiveness of those datasets make them particularly suitable for our analysis. As there is neither a minimum threshold for a firm of the enterprise group to be reported, nor a specific value above which services imports are reported, we are able to have a comprehensive picture of multinational groups with a presence in Portugal and of their services imports.

Moreover, arguably Portugal is an interesting country to study profit shifting. On the one hand, incentives to shift profits from Portugal are particularly high since the country stands in the top 3 of OECD countries with the highest corporate income tax (CIT) top statutory rate (e.g. Braz *et al.*, 2022). On the other hand, policies in place to counteract international tax planning through the use of tax havens are particularly discouraging, including, inter alia, a penalty tax on transactions with havens that may be as high as 55% (section 2). It is therefore interesting to assess to what extent profit shifting through what may be one of the most important routes to shift profits (Tørsløv *et al.*, 2022) occurs when economic incentives are high but strong discouraging policies stand on the way of tax planning.

The paper contributes to the existing body of knowledge in two ways. The first is by showing that it is not the case that in all high-tax countries multinational groups do have a systematic excess propensity to import intra-group services from tax havens. Namely, in a country with policies that strongly discourage transactions with tax havens, we do not find evidence of such an excess propensity. Instead, multinational groups even systematically avoid importing intra-group services from tax havens targeted by Portuguese anti-tax planning policies relative to other countries. Those findings contrast with the results of Hebous and Johannesen (2021), which to our knowledge is the only existing paper studying the use of intragroup services imports as a systematic route for profit shifting. The authors analyze the extensive margin of intra-group imports from havens by German multinationals and document instead a positive excess propensity. We see our results as a valuable complement to their findings. In particular, the sharp distinction between the results advises for caution in generalizing the authors' finding to other countries and/or periods (Tørsløv *et al.*, 2022), and suggests that anti-tax planning policies may play a role in driving cross-country heterogeneity.

The second important contribution of this paper is the systematic analysis of the intensive margin of intra-group services imports from havens, which is not explored by Hebous and Johannesen (2021). We show that it is not only the case that there are only a few (large) groups engaging on intra-group imports from havens, but also the value of those imports is highly concentrated on a small share of them. Moreover, using a Poisson pseudo-maximum-likelihood estimator and controlling for a possible genuine specialization of havens in services, we show that the value of imports from a set of tax havens is abnormally large. Given the strong penalizations that would apply to those transactions if the discouraging anti-tax planning policies were in force, it is likely that those groups are benefiting from exceptions to the policies, for example through agreements concluded in advance with the tax authority. We provide illustrative evidence consistent with this interpretation. Those few large groups may be the ones that are willing to incur the cost of obtaining those exemptions. In that case, the exceptions may give them a competitive edge and possibly (further) distort competition (Martin et al., 2020). While the normative aspects of such distortions go beyond the scope of this paper, the evidence we present in this paper informs that debate.

The paper is organized as follows. Section 2 describes the Portuguese corporate tax system and the policies that aim at restraining international tax planning using transactions with tax havens. Section 3 describes the datasets used throughout the paper. Section 4 studies the extensive margin of intra-group services imports from tax havens, and section 5 extends the analysis to the intensive margin. Section 6 concludes.

#### 2. Institutional background

In this section, we provide a brief overview of the Portuguese corporate tax system and of the key policies designed to fight corporate tax planning using tax havens.<sup>3</sup>

Portugal stands out as one of the OECD countries with the highest CIT top statutory rate (e.g. Braz *et al.*, 2022). In 2014-2018, this rate was equal to 31.5%. Since 2004, the Government defines a blacklist of jurisdictions considered for legal

<sup>3.</sup> For a detailed overview of the Portuguese tax system, see for example Schellekens *et al.* (2014) and Braz *et al.* (2022).

and tax purposes as tax havens which has been relatively stable over time.<sup>4</sup> The blacklist was created as a tool to fight international tax planning and comprises more than 80 jurisdictions (Table A.1). Taking into account the difficulties in defining a tax haven, a number of different criteria are assessed to include a jurisdiction in the list. These may include i) the nonexistence of a tax that is similar to the Portuguese CIT or, if it does exist, the applicable rate is lower than 60% of the general CIT rate in Portugal; ii) the rules by which taxable income is calculated are substantially different from international standards; iii) the existence of special regimes or tax benefits that substantially reduce taxation; and iv) the applicable legislation and administrative practices do not allow for an effective information exchange when it comes to tax matters. The Portuguese official blacklist is often criticized by firms in Portugal (e.g. Jornal Económico, 2021) as most countries do not have their own official list and even among those that do the Portuguese list is particularly extensive. For example, the EU list of non-cooperative jurisdictions established in 2017 has 9 jurisdictions (in 2022).

Several policies to discourage taxpayers from using tax havens to avoid taxation are linked to the definition of tax haven of the official blacklist. We detail four of those policies which are relevant for services transactions within firms of the same group and for their potential impact in the location of profits.

The first policy is the non-deductibility of payments made to entities located in blacklisted jurisdictions.<sup>5</sup> In general, a Portuguese corporation is allowed to deduct royalties, interest, service fees and other expenses paid to related parties abroad if complying with the Portuguese transfer pricing rules. Those rules follow the OECD guidelines and consequently adopt the arm's length principle. However, the possibility to deduct expenses does not apply to payments made or due to entities in blacklisted jurisdictions, which are considered non-deductible for tax purposes. The rule applies even if the intra-group payments are made indirectly to those jurisdictions. Moreover, it also applies in transactions with non-blacklisted countries that are not part of the European Economic Area if their statutory tax rate is lower than 60% of the Portuguese one.

The second policy is the existence of penalty tax ("autonomous taxation") which can be either equal to 35% or 55% and that applies to payments made to blacklisted jurisdictions (on top of the non-deductibility).<sup>6</sup> These rates have a 10 percentage points surcharge if the taxpayer incurs tax losses in the same fiscal year. Autonomous taxes are one distinctive feature of the Portuguese tax system, which consist of taxes that are levied on an extensive set of corporate expenses, irrespective of profitability. Among others (e.g. bonus to managers or purchases of vehicles), those expenses include payments to jurisdictions that are part of the official blacklist. This penalty tax is higher than the general withholding tax rate

<sup>4.</sup> Article 63-D of the General Tax Law.

<sup>5.</sup> Article 23-A of the CIT Code.

<sup>6.</sup> Article 88 of the CIT Code.

that may apply in transactions with non-blacklisted jurisdictions, which is equal to 25%. It is also substantially higher than the low or zero withholding tax rates that often result from tax treaties or exemptions to some service categories.

Both the non-deductibility of expenses and autonomous taxation apply automatically to transactions with blacklisted jurisdictions. This notwithstanding, firms may choose to provide information to the tax authority to prove that the payment concerns a genuine transaction without an abnormal character and is not of an excessive amount. If the tax authority concludes that those conditions are met, firms are allowed to deduct the expense and autonomous taxation does not apply. Anecdotal evidence suggests that this evidence has to be very detailed and extensive to be accepted by the tax authority. For example, for consulting services the tax authority may require, inter alia, information about who are the specific persons involved, their hourly wage rate and professional experience, and evidence on meetings and travel expenses. Advance agreements providing legal certainty and assurance in relation to the tax impact of cross-border transactions are possible.<sup>7</sup> Bilateral or multilateral agreements can only be concluded with jurisdictions that signed a tax treaty with Portugal.

The third relevant policy we list is the Controlled Foreign Company (CFC) regime.<sup>8</sup> Under this regime, profits of a foreign subsidiary located in a blacklisted jurisdiction are immediately imputed to the Portuguese taxpayer in proportion to its holdings, irrespective of whether they are distributed or not.<sup>9</sup> Upon distribution of profits, a deduction is available for previously imputed income. The CFC rule only applies if the activities of the subsidiary do not meet certain conditions that aim at guaranteeing that it is not purely set with tax-planning purposes.

Finally, the fourth policy is the taxation of dividends received from subsidiaries located in blacklisted countries, which do not benefit from the existing participation exemption regime.<sup>10</sup> Under that regime, profits and reserves distributed to a Portuguese parent company are exempt from domestic taxation provided that the company holds directly or indirectly at least 10% of the share capital or voting rights of the subsidiary and for at least one year. However, this exemption never applies to blacklisted jurisdictions.

<sup>7.</sup> Article 138 of the CIT Code.

<sup>8.</sup> Article 66 of the CIT Code.

<sup>9.</sup> The rule also applies to profits of subsidiaries located in non-blacklisted countries that are not part of the European Economic Area if their statutory tax rate is lower than 60% of the Portuguese one. For the rule to apply, the resident firm must have a participation of at least 25% (or 10% if 50% of the foreign firm is hold by Portuguese residents.)

<sup>10.</sup> Article 51 of the CIT Code.

#### 3. Data

To investigate profit shifting through services imports from tax havens, we combine three confidential datasets provided by Banco de Portugal that comprise firmlevel data on services imports, the structure of enterprise groups, as well as firm characteristics and financial accounts. We merge the resulting dataset with information on country-level characteristics. A detailed description of the firm-level datasets and of the country-level variables is provided below. The period of analysis is 2014-2018, which is the period for which all the firm-level datasets are available.

#### 3.1. Firm-level data

Confidential firm-level data on services imports was provided by the Statistics Department of Banco de Portugal.<sup>11</sup> These data are collected monthly to compile the services account of the Portuguese balance of payments. Since there is only a non-reporting threshold on the annual value of all external operations of a firm, no specific threshold is imposed on the international transactions of services. Data for travel and tourism flows are not available.

Data are aggregated at the annual level, and all values are expressed in euros. For each import transaction, we observe the firm identifier, the service category, the partner country and the year. The service category is defined according to the Extended Balance of Payments Services (EBOPS) 2010 classification. At the most disaggregated level, there are 47 service categories available, detailed in Table A.2.

Confidential information about which firms belong to multinational enterprise groups and in which locations is the group present comes from the Enterprise Groups Database (Banco de Portugal Microdata Research Laboratory (BPLIM), 2019). This database identifies the resident and non-resident entities related through direct and indirect participations in equity capital to firms operating in Portugal. Relative to information from Foreign Direct Investment statistics commonly used in the literature (e.g. Hebous and Johannesen, 2021), it has the advantage that there is no minimum threshold of assets, participation or voting rights for a firm of the enterprise group to be reported. The database is constructed using the information on related parties and other participations reported through Informação Empresarial Simplificada (IES, Simplified Corporate Information). IES is a collaboration between the Portuguese Ministry of Finance, the Portuguese Ministry of Justice, Statistics Portugal and Banco de Portugal and constitutes the system through which firms report annually mandatory information to the tax administration and statistical authorities. Among other fields, reporting firms are required to provide the VAT number or the Legal Entity Identifier of the firms to which they are related through direct and indirect participations in equity

<sup>11.</sup> For a more detailed description of the dataset and for descriptive statistics, see Amador *et al.* (2019).

capital, their country, their sector of activity, the percentage of equity capital, and the percentage of voting rights. Moreover, they have to identify their ultimate controlling entity, which is the company that ultimately controls all the other entities in the enterprise group. This entity is not directly or indirectly controlled by any other company.

The reported information is subject to a quality control that cross checks the data with information provided in annual reports and relies on direct contact with the group to correct inconsistencies and guarantee that the enterprise group (the set of firms that have the same ultimate controlling entity together with the ultimate controlling entity) is complete. While the dataset includes information about national and multinational enterprise groups, we focus on the latter. We observe 34,929 multinational groups-year, which cover 123,434 firms-year. The geographical distribution of the firms that belong to those groups is presented in Table A.3.

We match the Enterprise Groups Database with the firm-level dataset on international services imports. For each group-year, we compute the total value of imports by the resident firms that integrate the group, disaggregated by country of origin and type of service. To proxy intra-group trade, we use the location of firms of the same group, as in Hebous and Johannesen (2021), Cristea and Nguyen (2016) and Vicard (2015). Under this caveat, henceforth we use the expression intra-group imports as imports from countries where an enterprise of the same group is located.

Finally, to learn more about the firms that integrate multinational groups and that operate in Portugal, we rely on economic and financial information for those firms available in the Central Balance Sheet database (Banco de Portugal Microdata Research Laboratory (BPLIM), 2020). The database includes annual data on balance sheet and profit and loss accounts items, as well as other characteristics of the firm such as the number of employees and the main sector of economic activity.

#### 3.2. Country-level data

To classify countries as tax havens, our starting point is the list of havens proposed by Hines Jr and Rice (1994), which is widely used in the literature. In that list, a location is considered a tax haven if it has low corporate tax rates, banking and business secrecy, advance communication facilities and self-promotion as an offshore financial center (Hines Jr and Rice, 1994, Appendix 1 p. 175). We updated that list with modifications that reflect changes in the political status of the Netherlands Antilles, classified as a tax haven.<sup>12</sup> Moreover, as in Tørsløv *et al.* 

<sup>12.</sup> The Netherlands Antilles was dissolved in 2010 and divided into Bonaire, Sint Eustatius and Saba, Curaçao and Sint Maarten (Dutch part). We consider those three separate jurisdictions as tax havens.

(2022), we update this list with three additional jurisdictions: the Netherlands, Belgium and Puerto Rico.

Using this procedure, the following countries are classified as tax havens in our baseline analyses: Andorra, Anguilla, Antigua and Barbuda, the Bahamas, Bahrain, Barbados, Belgium, Belize, Bermuda, Bonaire, Sint Eustatius and Saba, the Cayman Islands, the Cook Islands, Curaçao, Cyprus, Dominica, Gibraltar, Grenada, Guernsey, Hong Kong, Ireland, Isle of Man, Jersey, Jordan, Lebanon, Liberia, Liechtenstein, Luxembourg, Macao, Maldives, Malta, the Marshall Islands, Monaco, Montserrat, the Netherlands, Panama, Puerto Rico, Saint Kitts and Nevis, Saint Lucia, Saint Martin (French part), Saint Vincent and the Grenadines, Singapore, Sint Maarten (Dutch part), Switzerland, the Turks and Caicos Islands, Vanuatu and Virgin Islands (British).

As there is no commonly accepted definition of tax haven, we also consider in our analyses alternative lists widely used in the literature, namely the original list by Hines Jr and Rice (1994), and those by OECD (2000), Dyreng and Lindsey (2009) and Hines Jr (2010), and the Portuguese blacklist (section 2). Moreover, we probe the robustness of our results to removing one tax haven at a time from the different lists that we consider.

To characterize countries, we proxy income with annual GDP from the World Bank World Development Indicators. Distance between Lisbon (Portugal's most populated city) and the most populated city of each country and information about whether countries have a shared language with Portugal come from the CEPII gravity database (Head *et al.*, 2010).

#### 4. The extensive margin of multinationals' services imports from havens

In this section, we present a comprehensive analysis of the extensive margin of services imports of multinational groups from tax havens. Do most multinational groups import intra-group services from those countries, or only a few do so? What are the characteristics of those that do? Is the propensity to import intra-group services from havens excessive even if we consider a possible genuine specialization of those jurisdictions in services? We benefit from the richness of our dataset to shed light on these questions.

#### 4.1. Characterization of groups importing intra-group services from havens

We start by assessing whether importing intra-group services from tax havens is a common practice among multinational groups. Figure 1 presents the distribution of multinational groups(-year) in the sample distinguishing between (i) groups importing intra-group services from tax havens, (ii) other groups present in havens, and (iii) groups not present in havens. We consider that the group imports the service to Portugal if any of the firms of the group does so.



Figure 1: Distribution of multinational groups-year

Figure 1 shows that importing intra-group services directly from tax havens is not a common practice among multinational groups. First, this is because not all multinational groups are present in tax havens: only 28% of them do so. Second, among those groups, only a small fraction imports intra-group services from those jurisdictions. As a result, in total only 4% of the groups import intra-group services from tax havens, amounting to 1499 groups(-year) in the 2014-2018 period, or 300 groups on average every year. This is a modest percentage, especially given that we are considering a relatively comprehensive list of countries as tax havens, as detailed in Section 3.2.

The next natural question is then what are the type of groups that are engaged on those intra-group imports. We characterize them along two dimensions: the size of their operations in Portugal, measured in terms of turnover and number of employees, and how extensive their foreign presence is. As an illustration, Figure 2 shows the distribution of the logarithm of turnover for the three categories of groups considered before. The distribution for the groups that import intra-group services from tax havens (groups i) is shifted to the right. This graphical evidence is confirmed when we estimate a probit model (Table 1, columns 1-4). The dependent variable is a dummy variable equal to 1 if group g imports intra-group services from tax havens at year t, and 0 otherwise. The independent variables are *Employees* and/or *Turnover*, the number of employees and the turnover value of the group in Portugal at year t (both inverse hyperbolic sine transformed), respectively, and time and sector dummies. We consider two alternative samples. Panel a) includes all multinational groups, while panel b) only includes those that are present in havens. The table reports marginal effects.

The positive and significant coefficients of the variables *Employees* and *Turnover* indicate that the probability of importing intra-group services from tax havens is higher for larger groups, both in the sample of all groups and in the



Figure 2: Distribution of turnover, by type of multinational group-year Note: Only groups that have a strictly positive turnover are included in the sample.

sample of those that are present in tax havens. As a result, the groups that import intra-group services from tax havens account for a non-negligible share of total turnover and employment in Portugal, despite their small overall weight in the population of multinational groups. Namely, the firms that comprise those groups account for 43% of total turnover and 33% of the total number of employees over the sample period.

As for the extent of the geographical footprint of the groups, the variables  $N^{\varrho}$  havens and  $N^{\varrho}$  non-havens in Table 1 are the inverse hyperbolic sine transformation of the number of haven and non-haven countries where the group is present, respectively. As would be expected, the number of haven countries where the group is present is positively associated with a higher probability of importing intra-group services from tax havens, both in the universe of multinational groups and in the sample of those that are present in havens. As for the number of non-haven countries, the coefficient is only statistically significant for the sample of groups present in havens.

Overall, our findings indicate that importing intra-group services from tax havens is not a widespread activity across multinational groups. In fact, we show that only a small fraction of groups do it. The groups that conduct those imports tend to be the larger ones, both in terms of the size of their operations in Portugal, and in terms of the extensiveness of their geographical footprint.

	(1)	(2)	(3)	(4)	(5)	(6)
Turnover	0.005***		0.006***		$0.001^{***}$	$0.001^{***}$
	(0.000)		(0.000)		(0.000)	(0.000)
Employees		0.013 <sup>***</sup> (0.001)		0.015 <sup>***</sup> (0.001)		
$N^{o}$ havens					0.012*** (0.002)	0.010 <sup>***</sup> (0.003)
$N^{o}$ non-havens					0.000 (0.000)	0.000 (0.000)
Year dummies	Yes	Yes	Yes	Yes	Yes	Yes
Sector dummies	No	No	Yes	Yes	No	Yes
No. of observations	34929	34929	32323	32323	34929	32323
Pseudo R2	0.125	0.135	0.137	0.135	0.480	0.492
	-					

Standard errors in parentheses

\* p < 0.10, \*\* p < 0.05, \*\*\* p < 0.01

(a) All multinational groups

	(1)	(2)	(3)	(4)	(5)	(6)
Turnover	0.018***		0.023***		0.017***	0.022***
	(0.001)		(0.001)		(0.001)	(0.001)
Employees		0.052***		0.059***		
		(0.002)		(0.003)		
$N^{\mathrm{o}}$ havens					0.192 <sup>***</sup> (0.029)	0.205 <sup>***</sup> (0.037)
$N^{\mathrm{o}}$ non-havens					0.022*** (0.008)	0.018* (0.010)
Year dummies	Yes	Yes	Yes	Yes	Yes	Yes
Sector dummies	No	No	Yes	Yes	No	Yes
No. of observations	9758	9758	8591	8591	9758	8591
Pseudo R2	0.221	0.235	0.218	0.220	0.249	0.244

Standard errors in parentheses

\* p < 0.10, \*\* p < 0.05, \*\*\* p < 0.01

(b) Multinational groups present in tax havens

#### Table 1. Probability of importing intra-group services from tax havens

Notes: The table reports estimated marginal effects from a probit model. The dependent variable is a dummy variable equal to 1 if group g imports intra-group services from tax havens at year t, and 0 otherwise. The variables *Employees*, *Turnover*,  $N^{o}$  havens and  $N^{o}$  non-havens are the inverse hyperbolic sine transformation of the number of employees of group g at year t, turnover value of group g at year t, and number of haven and non-haven countries where group g is present at year t, respectively. Sector proxy: sector for which the total turnover of the firms of the group operating in Portugal is higher (industry, construction or services). Standard errors are clustered at the group level.

#### 4.2. Is there an excess propensity to import intra-group from tax havens?

In the previous subsection, we showed that only a few groups import intra-group services from havens, and that those groups tend to be the largest ones. We now develop a formal analysis that aims at understanding whether such a low probability of importing is what could be expected given those countries' characteristics, or instead if it is nonetheless excessive and therefore possible indicative of profit shifting motives. To that end, we adapt the identification strategy of Hebous and Johannesen (2021) to our setting and we estimate the following linear probability model:

$$Import_{gsct} = \alpha_1 Intra_{gct} + \alpha_2 TaxHaven_c + \alpha_3 Intra_{gct} TaxHaven_c + \beta X_{ct} + \mu_{gst} + \varepsilon_{gsct}.$$
(1)

The dependent variable is  $Import_{gsct}$ , a dummy variable equal to 1 if the multinational group g imports service s from country c to Portugal at year t, and 0 otherwise. As before, we consider that the group imports the service to Portugal if any of the firms of the group does so.  $Intra_{gct}$  is a dummy variable equal to 1 if the multinational group g is present in country c at time t. In our baseline specification,  $TaxHaven_c$  is a dummy variable that takes the value 1 if country c is in the list of countries described in section 3.2.  $X_{ct}$  is a vector of standard gravity controls: GDP, distance and dummy variables equal to 1 if the country shares a language with Portugal or is contiguous to Portugal (only Spain), and 0 otherwise. The term  $\mu_{gst}$  is a comprehensive set of group-service-time fixed effects. Finally,  $\varepsilon_{gsct}$  is a disturbance term. Group-service-time triplets are included in the sample if the group imports the respective service from at least one foreign country in that year. Standard errors are clustered at the country level, which corresponds to the most aggregate right-hand-side variable.

In this specification,  $\alpha_1$  captures how a group's propensity to import differs between a non-haven where the group is present and a similar non-haven where it is not.  $\alpha_2$  captures how a group's propensity to import differs between similar havens and non-havens where the group is not present. Since extra-group trade cannot have profit shifting motives, this coefficient should capture a possible genuine specialization of havens in services. The main coefficient of interest is  $\alpha_3$ . It expresses how the propensity to import from havens where the group is present differs from the propensity to import from non-havens where it is also present over and above what can be explained by a genuine specialization of havens in services. If  $\alpha_3 > 0$ , such excess propensity to import intra-group from tax havens can be attributed to profit shifting under the identifying assumption that, in a counterfactual state of the world without profit shifting, the probability of importing intragroup havens and non-havens would only differ to the same extent as the probability of importing from third parties in havens and non-havens. As  $X_{ct}$  may not control for all relevant country characteristics, we also estimate a version of equation (1) with country-year fixed effects, dropping the haven dummy and the set of country-year controls:

#### $Import_{qsct} = \alpha_1 Intra_{qct} + \alpha_2 Intra_{qct} TaxHaven_c + \mu_{qst} + \gamma_{ct} + \varepsilon_{qsct}.$ (2)

Analogously, the main coefficient of interest is  $\alpha_2$ , which captures the excess propensity to import intra-group from tax havens.

Overall, our identification strategy explores the heterogeneous choices that groups make in different countries as to whether being present there and as to whether importing services from there. As in Hebous and Johannesen (2021), this strategy benefits from the fact that extra-group imports convey information about a possible genuine specialization of havens in services, that can help identifying intra-group imports driven by profit shifting.

The results from the estimation of equations (1) and (2) are presented in the first two columns of Table 3. In the remaining columns, we divided our sample into services that may more likely be used for profit shifting (higher-risk) and other services (lower-risk). The former include insurance, financial, intellectual property, communication and other business services (categories SF-SJ of Table A.2). Alternatively, Table A.4 presents similar results obtained when we split the sample into 10 different aggregate service categories.

	All services	All services	Higher-risk	Higher-risk	Lower-risk	Lower-risk
Intra	0.247***	0.200***	0.265***	0.216***	0.194***	0.151***
	(0.039)	(0.030)	(0.041)	(0.032)	(0.034)	(0.027)
Haven	0 011**		0.010**		0 011**	
пачеп	(0.011)		(0.010)		0.011	
	(0.004)		(0.004)		(0.005)	
Haven * Intra	-0.075	-0.066*	-0.083	-0.070*	-0.054	-0.056
	(0.055)	(0.037)	(0.055)	(0.038)	(0.056)	(0.035)
	, , , , , , , , , , , , , , , , , , ,	, , , , , , , , , , , , , , , , , , ,	<b>,</b>	( )	, , , , , , , , , , , , , , , , , , ,	( )
GDP(In)	0.006***		0.006***		0.007***	
	(0.001)		(0.001)		(0.001)	
Distance(In)	0 014***		0 012***		0.015***	
Distance(III)	-0.014		-0.013		-0.015	
	(0.004)		(0.004)		(0.004)	
Comm. language	0.002		0.002		0.003	
0.0	(0.005)		(0.004)		(0.005)	
	( )		( )		( )	
Contiguity	0.357***		0.336***		0.424***	
	(0.028)		(0.028)		(0.026)	
Crown comiles wear FE	Vee	Vee	Vez	Vec	Vec	Vez
Group-service-year FE	res	res	res	res	res	res
Country-year FE	No	Yes	No	Yes	No	Yes
No. of observations	7065431	9081264	5422045	6969296	1643386	2111968
Adjusted R2	0.203	0.244	0.199	0.245	0.216	0.247

Standard errors in parentheses

\* p < 0.10, \*\* p < 0.05, \*\*\* p < 0.01

#### Table 3. Imports of services - extensive margin

Notes: The table reports estimated coefficients from a linear probability model. The dependent variable is a dummy variable equal to 1 if the multinational group g imports service s from country c to Portugal at year t, and 0 otherwise. *Intra* is a dummy variable equal to 1 if the multinational group g is present in country c at time t. *Haven* is a dummy variable that takes the value 1 if country c is in the tax havens list described in section 3.2. *GDP(In)* is the logarithm of annual GDP of country c, *Distance(In)* is the logarithm of the distance between Lisbon and the most populated city of country c, *Comm. language* is a dummy variable equal to 1 if country c is shares an official or primary language with Portugal, and *Contiguity* is a dummy variable equal to 1 if country c is Spain. Standard errors are clustered at the country level. Higher-risk services: services in the categories SF, SG, SH, SI and SJ of the EBOPS 2010 classification (Table A.2). Lower-risk services: remaining service categories.

The coefficients on the gravity controls are in general as expected, with imports being more likely from a country that is larger, closer, or shares a border. Moreover, we always find a positive and statistically significant coefficient on the  $Intra_{gct}$  dummy, indicating a higher propensity to import from a non-haven where the group is present than from a similar non-haven where the group is not present.

The coefficients of the tax haven dummy are positive and significant, capturing a genuine specialization of havens in services trade. This notwithstanding, there is no evidence of an excess propensity to import from related parties in havens either on high-risk services or in low-risk ones. Instead, the coefficient of  $Intra_{gct}TaxHaven_c$  is negative in all specifications, being marginally statistically significant in the specifications with country fixed effects for all services and for the subset of higher-risk services. When we use alternative lists of havens widely used in the literature (Hines Jr and Rice, 1994; OECD, 2000; Dyreng and Lindsey, 2009; Hines Jr, 2010), we do not find evidence of an excess propensity to import intra-group from havens either (Table 4). Instead, we obtain a highly significant negative excess propensity, both for higher-risk and lower-risk services (Table A.5).

	HR1994	OECD2000	DL2009	H2010
Intra	0.198***	0.188***	0.201***	0.199***
	(0.028)	(0.026)	(0.028)	(0.028)
Haven * Intra	-0.099***	-0.163***	-0.106***	-0.101***
	(0.035)	(0.030)	(0.034)	(0.034)
Group-service-year FE	Yes	Yes	Yes	Yes
Country-year FE	Yes	Yes	Yes	Yes
No. of observations	9081264	9081264	9081264	9081264
Adjusted R2	0.244	0.244	0.244	0.244
Chandand annana in manan				

Standard errors in parentheses

\* p < 0.10, \*\* p < 0.05, \*\*\* p < 0.01

Table 4. Imports of services, different classifications of tax havens – extensive margin

Notes: The table reports estimated coefficients from a linear probability model. The dependent variable and *Intra* are defined in Table 3. *Haven* is a dummy variable that takes the value 1 if the country is a tax haven, and 0 otherwise. The classification of a country as a tax haven differs across columns: HR1994 – Hines Jr and Rice (1994); OECD2000 – OECD (2000); DL2009 – Dyreng and Lindsey (2009); H2010 – Hines Jr (2010). Standard errors are clustered at the country level.

Overall, our estimates suggest that there are no systematic abnormal intragroup imports from tax havens at the extensive margin that could be explained by profit shifting practices. Instead, for most lists of tax havens we find evidence that multinationals avoid engaging in intra-group imports from those countries relative to other countries. Moreover, we find that the negative excess propensity to import intra-group from havens is largest (in absolute terms) when we consider the havens list from OECD (2000). This list is the shortest that we consider and the only one that only includes countries that are blacklisted by the Portuguese Government. As highly discouraging anti-tax planning policies apply to transactions with blacklisted countries (section 2), those policies may play a role in explaining the negative propensity to import intra-group from havens relative to other countries. In fact, policies such as the CFC regime, the impossibility to deduct expenses for tax purposes and autonomous taxation of those expenses that can be as high as 55% unless the firm undergoes a process of proving that the transaction is genuine, not of abnormal character and correctly priced, may not only reduce the economic incentives to make intra-group transactions with tax havens relative to other countries, but also turn those incentives negative. Simultaneously, blacklisting may also discourage intra-group transactions with havens via a stigma effect.

To provide illustrative evidence on the extent to which blacklisting and the associated policies may discourage transactions with havens we consider again the baseline comprehensive list of havens described in section 3.2 and we explore how the propensity to import intra-group is different when we separate between blacklisted havens and other havens. Among the blacklisted havens, we also distinguish between those with which Portugal has concluded a tax treaty, and those with which it has not. The reason to make this latter distinction is that if a tax treaty exists, double taxation can be avoided and there is the possibility of concluding advance bilateral or multilateral agreements with the tax authority (section 2). These agreements give firms legal certainty and assurance in relation to the tax impact of their cross-border transactions by establishing in advance the arm's length pricing to be applied, while avoiding, at the same time, double taxation. This means that if during the negotiation of the agreement firms can prove to the tax authority that transactions are genuine, not of abnormal character and not overpriced under the agreed arm's length pricing, they may obtain certainty that they will not be penalized despite the fact that their counterpart is located in a blacklisted country. As a result, while advance agreements have an initial fixed cost (pecuniary and nonpecuniary, for example in terms of preparation and presentation of information), they may achieve a substantial reduction of uncertainty and compliance costs. As a result of these benefits, multinational groups may be less likely to avoid engaging in intra-group imports from blacklisted havens with which Portugal has signed a tax treaty than with other blacklisted havens.

To explore this cross-haven heterogeneity we estimate the following model:

$$Import_{gsct} = \omega_1 Intra_{gct} + \omega_2 Intra_{gct} BlackHavenNT_{ct} + \\ + \omega_3 Intra_{gct} BlackHavenT_{ct} + \omega_4 Intra_{gct} OtherHaven_{ct} + \\ + \mu_{gst} + \gamma_{ct} + \varepsilon_{gsct}.$$
(3)

 $BlackHavenNT_{ct}$  is a dummy variable equal to 1 for blacklisted havens with which Portugal has not concluded a tax treaty, and 0 for other countries.  $BlackHavenT_{ct}$  is equal to 1 for blacklisted havens with which Portugal has concluded a tax treaty, and 0 otherwise.  $OtherHaven_{ct}$  is a dummy variable equal to 1 for havens that are not blacklisted, and 0 otherwise. This simple regression does not aim at capturing causality, but rather providing suggestive evidence of whether blacklisting and the policies associated to the blacklist may or not play a possible role in driving a negative excess propensity to import intra-group from havens.

The results are presented in Table 5. There is a sizable and highly significant negative excess propensity to import intra-group from blacklisted havens, somewhat larger (in absolute terms) for those havens with which Portugal has not signed a tax treaty. For havens not blacklisted, such propensity is smaller and not statistically significant. This pattern is consistent with the different degree of disincentives provided by the Portuguese anti-tax planning policies to different types of havens. A second key result is that the strong negative propensity to import intra-group from blacklisted havens relative to non-havens is not accompanied by a positive excess propensity to import from the other havens. Therefore, there is no evidence that multinational groups are systematically using services imports from havens not targeted by Portuguese policies (e.g. the Netherlands or Switzerland) to shift profits to those locations or to use them as an intermediate location before they reach blacklisted havens.

	All services	Higher-risk	Lower-risk
Intra	0.200***	0.216***	0.151***
	(0.030)	(0.032)	(0.027)
BlackHavenNT * Intra	-0.196***	-0.203***	-0.170***
	(0.034)	(0.035)	(0.031)
BlackHavenT * Intra	-0.114***	-0.112***	-0.114***
	(0.039)	(0.041)	(0.029)
OtherHaven * Intra	-0.053	-0.059	-0.041
	(0.037)	(0.039)	(0.035)
	. ,	. ,	. ,
Group-service-year FE	Yes	Yes	Yes
Country-year FE	Yes	Yes	Yes
No. of observations	9081264	6969296	2111968
Adjusted R2	0.244	0.245	0.247
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Standard errors in parentheses

\* p < 0.10, \*\* p < 0.05, \*\*\* p < 0.01

## Table 5. Imports of services, distinction between havens differently targeted by Portuguese policies – extensive margin

Notes: The table reports estimated coefficients from a linear probability model. The dependent variable and *Intra* are defined in Table 3. *BlackHavenNT* is a dummy variable equal to 1 for the tax havens (baseline list described in section 3.2) that are in the Portuguese blacklist and with which Portugal has not concluded a tax treaty, and 0 for other countries. *BlackHavenT* is a dummy variable equal to 1 for the tax havens that are in the Portuguese blacklist and with which Portugal has concluded a tax treaty, and 0 for other countries. *OtherHaven* is a dummy variable equal to 1 for the remaining havens, and 0 otherwise. Standard errors are clustered at the country level. Higher-risk and lower-risk services are defined in Table 3.

All in all, we do not find evidence that multinationals have an excess propensity to import intra-group services from tax havens. Instead, in a high-tax country that has specific policies to discourage transactions with tax havens, we even find a strong negative propensity to import intra-group services from havens targeted by those policies relative to other countries. These findings are distinct from those obtained by Hebous and Johannesen (2021) for German multinationals, which reveal a systematic excessive propensity to import intra-group from havens consistent with profit shifting. The results are not directly comparable given inter alia the likely different support of the distribution of firms in Portugal and our focus on a more recent period. Nevertheless, the sharp distinction advises for caution in generalizing the authors' findings to other countries and/or periods, and our illustrative evidence on the role of anti-tax planning policies suggests that they may play a role in driving cross-country heterogeneity.<sup>13</sup> Therefore, we see our results as a valuable complement to the evidence presented in the later paper.

#### 5. The intensive margin of multinationals' services imports from havens

#### 5.1. Potential tax loss for the Government and gains for multinationals

We now explore the intensive margin of intra-group services imports of multinationals from tax havens. The distribution of those imports across aggregate service categories is depicted on Figure A.1. A large share of those imports refer to intellectual property services, one service category that is commonly associated to profit shifting strategies by multinational groups as the intra-group transfer pricing process for those payments if often highly nontransparent (e.g. Karkinsky and Riedel, 2012; Dischinger and Riedel, 2011; Griffith *et al.*, 2014; Juranek *et al.*, 2018). The second largest category is "other business services", which comprise research and development, professional and management consulting, technical and trade-related and other business services not included elsewhere.

The first question we address is how large are intra-group services imports from tax havens. We consider two perspectives: (i) how large are they in terms of what could be the magnitude of tax revenues lost by the Government; and (ii) how large are they in terms of how meaningful could be the tax gains for the multinational groups involved in those transactions.

For the first perspective, and to derive an upper bound on the possible tax revenue lost by the Government, we make the extreme assumption that all intragroup imports from tax havens are purely fictitious imports that only serve the

<sup>13.</sup> Hebous and Johannesen (2021) refer that in the case of Germany and in the time period considered in their analyses there were no policies other than the German transfer pricing rules that could be effective in the context of profit shifting through services trade. Moreover, they refer that even those rules could possibly be easily circumvented given the intangible nature of services. This differs substantially from the set of policies in place in Portugal (section 2).

purpose of shifting profits. In that extreme and unrealistic scenario, they would shift approximately  $\notin$ 357 million of corporate tax base out of Portugal per year. Assuming that those profits would be taxed at a tax rate of 31.5% (the top statutory CIT rate in Portugal), that loss of tax base would correspond to a yearly revenue loss of around  $\notin$ 112 million. Such value corresponds to 0.2% of the yearly average tax revenue in Portugal over 2014-2018, and 1.9% of the yearly average CIT revenue. That is, as found by Hebous and Johannesen (2021) for Germany, the tax revenue lost through this specific profit shifting route is at most relatively modest.

While at the aggregate country level the tax revenue may be at most relatively modest, tax savings for specific groups may be large as we showed that those intragroup services imports are conducted by only a few groups. Moreover, even among those few groups, imports are highly concentrated on a handful of them (Figure 3). For example, in 2018 (the most recent year of our sample) 20% of the groups were responsible for 93% of the overall intra-group services imports from havens; 5% of the groups were responsible for 71% of those imports. A high concentration also holds in other years of the sample.



Figure 3: Concentration of intra-group services imports from tax havens Note: Concentration in 2018 (most recent year of the sample).

To obtain an upper bound for the potential tax savings of individual groups, we make again the extreme assumption that all intra-group imports only serve the purpose of shifting profits to tax havens. We compute for each group the sum of intra-group imports of services from tax havens, again for the most recent year of our sample. In the first column of Table 6, we present the median value of those imports for groups in the different quartiles of the distribution of imports. On the first quartile, the median value is slightly above 1200 Eur. On the last quartile, it equals almost 1.3 million Eur.

	Imports (Eur)	Imports/expenses	EBT/(EBT+imports)
Quartile 1	1,222.55	.0001	.9982
Quartile 2	24,417.08	.0024	.9792
Quartile 3	124,808.56	.0142	.8323
Quartile 4	1,260,848.20	.0315	.6223

Table 6. Intra-group imports of services from tax havens – median value for groups in different import quartiles

Notes: Values for the year 2018 (the most recent year of the sample). First column – median value of intra-group services imports from havens (in euros). Second column – median value of the ratio  $\frac{imports}{expenses}$  where *imports* stands for the group's intra-group imports from havens and *expenses* stands for the group's total expenses, proxied by the sum of total expenses of the firms of the group operating in Portugal. Third column – median value of the ratio  $\frac{EBT}{EBT+imports}$ , where *EBT* stands for the group operating in Portugal. Third column, proxied using the sum of the earnings before taxes of the group, proxied using the sum of the earnings before taxes of the group, with strictly positive expenses (EBT).

To illustrate how meaningful those flows may be for the multinational groups, we compare them with the total expenses of the group and with the earnings before taxes (EBT). The second column of Table 6 shows that intra-group services imports from havens in general constitute a relatively small share of the groups' total expenses. The median value for the set of groups that conduct more of those imports in value terms (quartile 4) is equal to 3%. This notwithstanding, in an extreme scenario where those imports fully represented shifted profits, they would translate into large tax savings. For example, the median value of the ratio  $\frac{EBT}{EBT+imports}$  is close to 60% for groups in quartile 4, i.e., in that extreme scenario the median reduction in taxable earnings would be close to 40%. As a result, while intra-group services imports from havens represent only at most a modest share of corporate tax revenue at the economy level, this does not imply that they cannot represent considerable tax savings for specific groups.

#### 5.2. Is the value of intra-group imports from havens excessive?

The results for the extensive margin showed that multinational groups are not systematically more likely to import services from firms within the group present in tax havens, than they do from intra-group firms located in other countries, when controlling for a genuine specialization of havens in services. Instead, we provided evidence that they are less likely to do so in the case of havens targeted by the Portuguese anti-tax planning policies. This notwithstanding, some groups import large values of intra-group services from tax havens. We now aim at bringing together the extensive and intensive margin of services imports and formally investigating whether the value of intra-group services from havens is abnormally large.

We estimate a model similar to the one for the extensive margin of services imports, except that now the dependent variable is the the value of imports of

service *s* by multinational group *g* from country *c* at year *t*. To deal with the fact that in many cases the value of imports is equal to zero we use a Poisson pseudo-maximum-likelihood (PPML) estimator (Silva and Tenreyro, 2006, 2011; Correia *et al.*, 2020). We interpret the coefficient of the interaction  $Intra_{gct}TaxHaven_c$  as a measure of excess intra-group imports from tax havens, that is the value of imports that is over and above the one that can be explained by a genuine specialization of havens in services. This analysis complements the one that studies exclusively the extensive margin presented in section 4.2.

The estimation results are presented in Table 7. In our baseline list, as well as in the lists of Hines Jr and Rice (1994), Dyreng and Lindsey (2009) and Hines Jr (2010), the interaction term is negative, as in the extensive margin analysis. However, when we consider the list of tax havens by OECD (2000) we obtain a positive, large and statistically significant coefficient, both for higher-risk and lower-risk services (Table A.7). These results suggest that for the subset of multinational groups that we consider, there is a systematic abnormally large value of intra-group imports of services from that specific set of tax havens.

	baseline	HR1994	OECD2000	DL2009	H2010
Intra	2.377***	2.252***	2.174***	2.255***	2.253***
	(0.248)	(0.220)	(0.190)	(0.221)	(0.220)
Haven * Intra	-0.905***	-0.620**	1.843***	-0.615**	-0.620**
	(0.248)	(0.271)	(0.294)	(0.268)	(0.271)
Group-service-year FE	Yes	Yes	Yes	Yes	Yes
Country-year FE	Yes	Yes	Yes	Yes	Yes
No. of observations	7762579	7762579	7762579	7762579	7762579
Pseudo R2	0.814	0.813	0.813	0.813	0.813

Standard errors in parentheses

\* p < 0.10, \*\* p < 0.05, \*\*\* p < 0.01

#### Table 7. Value of services imports

Notes: The table reports estimated coefficients from a Poisson pseudo-maximum-likelihood model. The dependent variable is the value of imports of service s by the multinational group g from country c at year t. Intra is defined in Table 3. Haven is a dummy variable that takes the value 1 if the country is a tax haven, and 0 otherwise. The classification of a country as a tax haven differs across columns: baseline – classification detailed in section 3.2; HR1994 – Hines Jr and Rice (1994); OECD2000 – OECD (2000); DL2009 – Dyreng and Lindsey (2009); H2010 – Hines Jr (2010). Standard errors are clustered at the country level.

Two aspects about the OECD's list are worth mentioning. First, the OECD's list is the one with the fewest number of havens. A haven in that list is characterized by no or only nominal taxes on income from geographically mobile financial and other service activities and by offering or being perceived as offering itself as a place where non-residents can escape taxes in their country of residence. Therefore, countries such as Switzerland, Singapore, Malta, Luxembourg or Ireland, which are considered as havens in the remaining lists, do not appear. Second, all the havens from the OECD's list also appear in the Portuguese blacklist, and therefore are precisely those for which policies are stricter given the concerns of the Portuguese tax authority with their use for tax planning purposes.

The combination of these results with those for the extensive margin offers interesting insights and highlights the importance of not restricting the attention to the extensive margin. In section 4.2, we have shown that multinational groups systematically avoid importing intra-group services from havens blacklisted by the Portuguese Government relative to other countries. This notwithstanding, our results in this section show that there is an excessive value of intra-group imports from the havens of the OECD's list, which are all blacklisted. Therefore, while groups systematically avoid engaging on intra-group imports from those countries and only a few groups do it, the value of their imports is excessive. In fact, when we drop the zeros from our sample and estimate a regression similar to the one above, but with the dependent variable being the logarithm of the value of imports, we obtain again evidence of a large and significant excessive value of intra-group imports from havens of the OECD's list (Table A.9).

Given the high disincentives that the anti-tax planning policies provide, it is likely that the few large groups that still import large and excessive values of services from blacklisted countries that are part of OECD (2000)'s list are benefiting from exceptions to anti-tax planning policies. Namely, those large groups may be potentially more willing to incur the cost of obtaining exceptions set forth by the Portuguese CIT law, by preparing detailed documentation for the tax authority, bringing disputes to court when the tax authority does not provide those exceptions, or negotiating advance agreements. In that case, those exceptions and agreements may give them a competitive edge and possibly (further) distort competition (Martin *et al.*, 2020). While the normative aspects of such distortions go beyond the scope of this paper, the evidence we present informs that debate.

We do not observe the tax treatment given to the transactions, and therefore we cannot know if the multinational groups conducting transactions with blacklisted havens are subject to the policies described in section 2 or benefiting from the above-mentioned exceptions. This notwithstanding, when we explore the heterogeneity of our results across havens differently targeted by Portuguese policies (Table 8) we only find an excessive value of imports from blacklisted havens with which Portugal has signed a tax treaty. Since bilateral and multilateral advance agreements can only be concluded in transactions with those countries, this evidence is suggestive that the excessive import value that we observe from blacklisted havens may be shaped by imports conducted under those agreements.

#### 6. Conclusions

Drawing on datasets covering the universe of multinational groups with a presence in Portugal, this paper studies the intensive and extensive margins of intra-group

	All services	Higher-risk	Lower-risk
Intra	2.377***	2.232***	2.850***
	(0.248)	(0.267)	(0.331)
BlackHavenNT * Intra	-3.243***	-2.928***	-4.086***
	(1.029)	(1.091)	(1.474)
BlackHavenT * Intra	$1.418^{***}$	1.330***	1.263***
	(0.330)	(0.364)	(0.393)
OtherHaven * Intra	-0.925***	-0.763**	-1.624***
	(0.249)	(0.336)	(0.391)
Group-service-year FE	Yes	Yes	Yes
Country-year FE	Yes	Yes	Yes
No. of observations	7762579	5777468	1507186
Pseudo R2	0.814	0.779	0.893

Standard errors in parentheses

\* p < 0.10, \*\* p < 0.05, \*\*\* p < 0.01

Table 8. Value of services imports – distinction between havens differently targeted by Portuguese policies

Notes: The table reports estimated coefficients from a Poisson pseudo-maximum-likelihood model. The dependent variable and *Intra* are defined in Table 7. *BlackHavenNT*, *BlackHavenT*, and *OtherHaven* are defined in Table 5. Standard errors are clustered at the country level. Higher and lower-risk services are defined in Table 3.

services imports from tax havens in a high-tax country whose policies provide strong disincentives to conduct transactions with havens. On the extensive margin, we showed that only a few multinational groups engage on those imports, and that those groups tend to be the larger ones and the ones with a more extensive geographical footprint. Controlling for a genuine specialization of havens in services, we showed that multinational groups do not have a systematic excess propensity to import intra-group services from havens relative to other countries. Instead, they systematically avoid importing from havens targeted by Portuguese antitax planning policies relative to other countries. These results provide illustrative evidence on the role of those policies.

Extending the analysis to the intensive margin, we documented that it is not only the case that there are only a few (large) groups engaging on intra-group imports from havens, but also the value of those imports is highly concentrated on a small share of them. Moreover, we showed that the value of imports from a specific set of blacklisted havens is abnormally large, and we provided illustrative evidence consistent with the interpretation that those groups may be benefiting from exceptions to the policies, for example through advance agreements with the tax authority. Future research that explores policy changes and their impact on intra-group services trade with tax havens is of utmost importance to evaluate the importance of policies aiming at fighting international tax planning. Given the initial evidence that we provide on the potential role of Portuguese policies, this may include exploiting future potential meaningful changes in the composition of the Portuguese blacklist. Another interesting avenue is exploiting the impact of the set of measures adopted under the G20-OECD Base Erosion and Profit Shifting (BEPS) initiative.

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#### Appendix: Additional tables and charts

American Samoa	Liechtenstein
Andorra	Maldive Islands
Anguilla	Marshall Islands
Antigua and Barbuda	Mauritius
Aruba	Monaco
Ascension Island	Montserrat
Bahamas	Nauru
Bahrain	Netherlands Antilles
Barbados	Northern Mariana Islands
Belize	Niue Island
Bermuda	Norfolk Island
Bolivia	Pacific Islands
British Virgin Islands	Palau Islands
Brunei	Panama
Cayman Islands	Pitcairn Island
Channel Islands	Puerto Rico
Christmas Island	Qatar
Cocos (Keeling)	Qeshm Island
Cook Islands	Saint Helena
Costa Rica	Saint Kitts and Nevis
Djibouti	Saint Lucia
Dominica	Saint Pierre and Miquelon
Falkland Islands	Samoa
Fiji Islands	San Marino
French Polynesia	Seychelles
Gambia	Solomon Islands
Gibraltar	St Vicente and the Grenadines
Grenada	Sultanate of Oman
Guam	Svalbard
Guyana	Swaziland
Honduras	Tokelau
Hong Kong	Trinidad and Tobago
Isle of Man	Tristan da Cunha
Jamaica	Turks and Caicos Islands
Jordan	Tuvalu
Kingdom of Tonga	United Arab Emirates
Kiribati	United States Virgin Islands
Kuwait	Vanuatu
Labuan	Yemen Arab Republic
Lebanon	Uruguay
Liberia	

Table A.1. Portuguese official blacklist of jurisdictions with clearly more favorable taxation regimes

Notes: Official list prevailing in 2014-2018. Jersey (included in the Channel Islands), Uruguay and the Isle of Man were temporarily removed from the list in 2017 and reincluded in 2018.

EBOPS Code	Description
SB	Maintenance and Repair Services n.i.e.
SC11	Sea Transport - Passenger
SC12	Sea Transport - Freight
SC13	Sea Transport - Other
SC21	Air Transport - Passenger
SC22	Air Transport - Freight
SC23	Air Transport - Other
SC3B1	Rail Transport - Passenger
SC3B2	Rail Transport - Freight
SC3B3	Rail Transport - Other
SC3C1	Road Transport - Passenger
SC3C2	Road Transport - Freight
SC3C3	Road Transport - Other
SC3D	Inland Waterway Transport
SC4	Postal and Courier Services
SE1	Construction Abroad
SE2	Construction in the Reporting Economy
SF1	Direct Insurance
SF2	Reinsurance
SF3	Auxiliary Insurance Services
SF4	Pension and Standardized Guarantee Services
SG	Financial Services
SH1	Franchises and Trademarks Licensing Fees
SH3	Licenses Computer Software
SH41	Licenses to Reproduce and/or Distribute Audio-Visual Products
SH42	Licenses to Reproduce and/or Distribute Other Products
SI1	, Telecommunications Services
SI2	Computer Services
SI31	Information Services - News Agency
SI32	Information Services - Other
SJ1	Research and Development Services
SJ211	Legal Services
SJ212	Accounting, Auditing, Bookkeeping, and Tax Consulting Services
SJ213	Business and Management Consulting and Public Relations Services
SJ22	Advertising, Market Research, and Public Opinion Polling Services
SJ311	Architectural Services
SJ312	Engineering Services
SJ313	Scientific and Other Technical Services
SJ32	Waste Treatment and De-Pollution, Agriculture and Mining Services
SJ33	Operating Leasing Services
SJ34	Trade-Related Services
SJ35	Other Business Services n.i.e.
SK1	Audio-Visual and Related Services
SK21	Health Services
SK22	Education Services
SK23	Heritage, Recreational and Sport Services
SK24	Other Personal Services

Table A.2. Service categories

	Firn	ıs
Country	Number	Share
Spain	11072	25.37
France	3680	8.43
United Kingdom	2807	6.43
Netherlands	2684	6.15
United States	2423	5.55
Germany	2081	4.77
Luxembourg	2067	4.74
Brazil	1739	3.98
Italy	1324	3.03
Angola	1210	2.77
Mozambique	1107	2.54
Switzerland	1088	2.49
Malta	890	2.04
Belgium	696	1.59
Ireland	432	0.99
Cyprus	395	0.91
Panama	393	0.90
Cape Verde	364	0.83
Sweden	364	0.83
British Virgin Islands	342	0.78
Other	6485	14.86
Haven countries	10393	23.8
Non-haven countries	33250	76.2

Table A.3. Geographical distribution of firms that belong to multinational groups with a presence in  $\ensuremath{\mathsf{Portugal}}$ 

Notes: Distribution of firms located outside of Portugal. Haven countries – list detailed in section 3.2.

	SB	SC	SE	SF	SG	SH	SI	SJ	SK
Intra	0.162***	0.140***	0.177***	0.305***	0.216***	0.237***	0.191***	0.212***	0.134***
	(0.032)	(0.028)	(0.031)	(0.059)	(0.032)	(0.041)	(0.032)	(0.028)	(0.025)
Haven * Intra	-0.024	-0.050	-0.039	-0.198***	-0.075**	-0.068	-0.093**	-0.046	-0.076***
	(0.050)	(0.037)	(0.042)	(0.073)	(0.038)	(0.062)	(0.039)	(0.035)	(0.029)
Group-service-year FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Country-year FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
No. of observations	534936	895032	191456	570152	438464	251224	1530408	4179048	490544
Adjusted R2	0.318	0.237	0.271	0.257	0.215	0.210	0.273	0.245	0.227

Standard errors in parentheses

\* p < 0.10, \*\* p < 0.05, \*\*\* p < 0.01

Table A.4. Imports of services – extensive margin

Notes: The table reports estimated coefficients from a linear probability model. The dependent and independent variables are defined in Table 3. Standard errors are clustered at the country level. Service categories: SB – maintenance and repair services; SC – transport services; SE – construction; SF – insurance and pension services; SG – financial services; SH – charges for the use of intellectual property; SI – telecommunications, computer and information services; SJ – other business services; SK – personal, cultural, and recreational services.

	HR1994	OECD2000	DL2009	H2010
Intra	0.214***	0.203***	0.217***	0.215***
	(0.029)	(0.027)	(0.029)	(0.029)
Haven * Intra	-0.102***	-0.169***	-0.110***	-0.104***
	(0.036)	(0.032)	(0.035)	(0.035)
	( )	· · ·	( )	<b>、</b>
Group-service-year FE	Yes	Yes	Yes	Yes
Country-year FE	Yes	Yes	Yes	Yes
No. of observations	6969296	6969296	6969296	6969296
Adjusted R2	0.245	0.244	0.245	0.245

Standard errors in parentheses

\* p < 0.10, \*\* p < 0.05, \*\*\* p < 0.01

(a) Higher-risk services

	HR1994	OECD2000	DL2009	H2010
Intra	0.151***	0.142***	0.153***	0.152***
	(0.025)	(0.024)	(0.025)	(0.025)
Haven * Intra	-0.092***	-0.138***	-0.092***	-0.094***
	(0.033)	(0.028)	(0.031)	(0.032)
Group-service-year FE	Yes	Yes	Yes	Yes
Country-year FE	Yes	Yes	Yes	Yes
No. of observations	2111968	2111968	2111968	2111968
Adjusted R2	0.247	0.247	0.248	0.248

 $\label{eq:standard} \hline {\mbox{Standard errors in parentheses}} \\ {\mbox{* } p < 0.10, \ {\mbox{** } p < 0.05, \ {\mbox{*** } p < 0.01}} \\ \hline \end{tabular}$ 

(b) Lower-risk services

Table A.5. Imports of services, different classifications of tax havens - extensive margin

Notes: The table reports estimated coefficients from a linear probability model. The dependent and independent variables and column labels are defined in Table 4. Higher and lower-risk services are defined in Table 3. Standard errors are clustered at the country level.



Figure A.1: Distribution of intra-group services imports from tax havens

Notes: Services imports of each category computed as an aggregation of firm-level imports over 2014-2018.

	baseline	HR1994	OECD2000	DL2009	H2010
Intra	2.231***	2.142***	2.058***	2.140***	2.142***
	(0.267)	(0.245)	(0.212)	(0.245)	(0.245)
Haven * Intra	-0.749**	-0.586	1.897***	-0.561	-0.586
	(0.334)	(0.443)	(0.352)	(0.438)	(0.443)
Group-service-year FE	Yes	Yes	Yes	Yes	Yes
Country-year FE	Yes	Yes	Yes	Yes	Yes
No. of observations	5777468	5777468	5777468	5777468	5777468
Pseudo R2	0.778	0.778	0.777	0.778	0.778

Standard errors in parentheses

\* p < 0.10, \*\* p < 0.05, \*\*\* p < 0.01

(a) Higher-risk services

	baseline	HR1994	OECD2000	DL2009	H2010
Intra	2.852***	2.626***	2.547***	2.638***	2.626***
	(0.332)	(0.273)	(0.252)	(0.276)	(0.273)
Haven * Intra	-1.577***	-0.908**	1.762***	-0.948**	-0.908**
	(0.392)	(0.445)	(0.327)	(0.402)	(0.445)
Group-service-year FE	Yes	Yes	Yes	Yes	Yes
Country-year FE	Yes	Yes	Yes	Yes	Yes
No. of observations	1507186	1507186	1507186	1507186	1507186
Pseudo R2	0.892	0.890	0.889	0.890	0.890

Standard errors in parentheses

\* p < 0.10, \*\* p < 0.05, \*\*\* p < 0.01

(b) Lower-risk services

Table A.7. Imports of services – different classifications of havens, by service type

Notes: The table reports estimated coefficients from a Poisson pseudo-maximum likelihood model. The dependent and independent variables and column labels are defined in Table 7. Higher and lower-risk services are defined in Table 3. Standard errors are clustered at the country level.

	baseline	HR1994	OECD2000	DL2009	H2010
Intra	1.052***	1.022***	1.021***	1.016***	1.021***
	(0.076)	(0.076)	(0.072)	(0.075)	(0.076)
Haven * Intra	-0.144	0.044	$1.670^{***}$	0.109	0.048
	(0.151)	(0.244)	(0.266)	(0.236)	(0.244)
Group-service-year FE	Yes	Yes	Yes	Yes	Yes
Country-year FE	Yes	Yes	Yes	Yes	Yes
No. of observations	89550	89550	89550	89550	89550
Adjusted R2	0.426	0.426	0.426	0.426	0.426
Standard arrays in paranthasas					

 $\begin{array}{l} \mbox{Standard errors in parentheses} \\ ^* \ p < 0.10, \ ^{**} \ p < 0.05, \ ^{***} \ p < 0.01 \end{array}$ 

Table A.9. Imports of services - intensive margin

Notes: The table reports estimates from a linear model. The dependent variable is the logarithm of the import value of service s by the multinational group g from country c at year t. The independent variables and column labels are defined in Table 7. Standard errors are clustered at the country level.

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