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From tax evasion to tax planning

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Abstract

The aim of this paper is to analyze within a simple model how a removal of bank secrecy can impact tax revenues and banks'profitability assuming that offshore centers are able to offer sophisticated but legal or not easily detectable tax planning. Two alternative regimes are considered. A first in which there is strict bank secrecy and a second where there is international information exchange for tax purposes. We show in particular that sharing tax information with onshore countries can be a dominant strategy for an OFC if there is enough scope for providing tax planning. Moreover, a partial reduction of tax liabilities can already prompt OFCs to voluntarily exchange relevant tax information. We also highlight a surprising result. The possible removal of bank secrecy may, under some conditions, reduce the onshore country's tax revenue.

KEY words: offshore centers, tax planning, tax evasion
JEL classifications: F21, H26, H87

1 Introduction

Since the mid nineties, there have been a lot of attacks against bank secrecy and opaque financial structures which have been accused for extensive tax evasion (OECD 1998, FSF 2000). In the wake of the financial crisis of 2008, an anti-evasion action has been re-launched by the G-20 which have urged

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about hundred OECD and non-OECD countries (including most of OFCs) to sign "Tax information exchange agreements" (TIEAs).[1] Actions have also been taken at the bilateral level. Thus the US authorities have accused Swiss banks (UBS and Credit Suisse Group) of aiding in tax-evasion schemes.

These attacks mostly targeted at tax evasion by individual investors in off-shore financial centers are seemingly beginning to point in the right direction. For example, Switzerland recently moved to make easier for foreign governments to target individuals engaging in tax cheating.[2] However, the question arises whether the present measures are likely to mitigate substantially tax leakages experienced by the countries pressing for more tax transparency ? Furthermore, will increasing international exchange of information for tax purposes not result in more complex tax mitigation strategies which are not necessarily illegal given the current state of regulation.[3] Even if these avoidance practices fail to comply with the law, they can be extremely difficulty to detect ? Indeed, when exchange of information is realized on request, which is the current situation within OECD TIEAs, the tax administration has to know exactly what it is looking for (Tax Justice Network, 2009). If countries would adopt a multilateral automatic exchange of information, this type of exchange is difficult to implement for technical reasons (Spencer, 2006).

In a recent report (2009), the OECD expresses concern about the fact that High Net Worth Individuals (HNWIs) present tax administrations with particular challenges because of the complexity of their affairs, the amounts of tax revenue that are at stake and especially the opportunity to undertake aggressive tax planning. Noting that the attractiveness of Switzerland for tax evasion is declining, Geiger and Hürzeler (2003) explain that the Swiss banks are adapting to this development by improving, among other abilities, the expertise available in international tax and estate planning instruments, such as the Anglo-Saxon trust. Interestingly, bank secrecy seems not to be essential for tax mitigation. The financial press abounds of statements made

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[1]More than 700 agreements have been signed on August 10th 2011 (OECD 2011) even between OFCs and OECD countries. These agreements require that jurisdictions should exchange information on request without restriction caused by bank secrecy or domestic tax interest requirements.

[2]Wall Street Journal, "Swiss boost effect to crab tax cheats", 16/2/2011. Furthermore, the Swiss HSBC subsidiary declared it would no longer provide wealth management services to US clients at HSBC offices outside the US (Wall Street Journal, HSBC acts on offshore cash, 20/7/2011)

[3]There are basically two ways according to which information exchange can occur. The first is exchange upon request and the other, automatic exchange of information.

by bankers, tax lawyers, tax advisers..., praising their various sophisticated structures that legally lower the tax bill in the tax payer's home country without dependency on bank secrecy. According to Kenneth Rubinstein (2010), a New Yorker Lawyer, "secrecy has no place in proper tax planning" and " rather than falling for promises of secrecy from unscrupulous marketers, investors should seek guidance from qualified tax counsel and ensure that their international assets are structured in a tax-compliant manner." Individual investors are also disposed to use more sophisticated methods initially created for tax planning of Multi-National Enterprises (MNEs). A legal way of international tax planning for individual investors can be achieved by using special entities in international financial centers. According to OECD (2009, p.26), "Wealthy investors are often highly mobile and may be attracted to countries perceived as offering a favorable taxation environment. This may include such factors as no or low capital gains tax on the disposition of privately-held assets and the presence of a good treaty-network. Rather than changing their tax residence, wealthy investors may hold investments through no or nominally taxed offshore entities with a view to mitigate tax on foreign source income or gains." Additionally, sophisticated fiscal engineering relying on legal vehicles, is less or not dependent on bank or professional secrecy. In that case we are confronted with tax planning rather than tax evasion, although the dividing line is not always clear (Slemrod, Yitzhaki 2001).

Among the various international tax planning strategies, holding corporations is an interesting vehicle used for Individuals and for MNEs as well (Gravelle 2009, Mc Cann 2006, Mintz and Weichenrieder 2010).[4] In particular, Offshore Financial centers (OFCs), have designed holding companies to exploit Double Tax treaties (DTTs)[5] and the EU Directive "Parent-Subsidiaries" (1990)[6] and have thus encouraged extensive treaty shopping (Avi-Yonah and Panayi 2010). Interestingly there has recently been a proliferation of DTTs. Rawling (2007) argues that the recent initiatives of the OECD, the EU and the IMF for information exchange agreements have encouraged bilateral DTTs as part or separate to TIEAs and now many OFCs

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[4]Schmidt and Lady (2007) explain in detail tax rules applied by the US administration for the use of holding companies by High Net Worth Individuals (HNWI).

[5]DTTs are agreements between two states which are designed since the 1920s to protect investors against the risk of double taxation. DTT networks have increased in parallel to the development of foreign direct investments.

[6]Modified in 2003

have concluded DTTs they did not have before. Indeed, more than 3000 bilateral tax treaties, connecting about 180 countries are in force today (Rixen 2010, Rixen 2011). The OECD treaty model represents the general consensus on international taxation, but the rules have become more sophisticated and complex over time (Rixen 2010) creating loopholes exploited by low tax jurisdictions. The EU Directive "Parent-subsidiaries" intends to eliminate tax obstacles on profit distribution between groups of companies in the EU, notably by abolishing withholding taxes on dividends between subsidiaries and parent.[7] To benefit from these exemptions, the parent and subsidiaries have to be fully taxable and a minimal permanent shareholding is required. Indeed, special entities also called "conduit companies" exploiting DTTs and Parent-Subsidiaries Directive have known an exponential growth during the last decade reflecting the development of tax planning. The number of Luxembourg financial companies called Soparfi[8] (see the Appendix) increased from 2800 in 2000 to 55 000 in 2011. Dutch financial holding companies were evaluated to 42 072 in 2007, and similar or comparable legal vehicles exist notably in Cyprus, Malta, Switzerland, Caribbean OFCs (often called International Business companies)

The aim of this paper is to analyze within a simple model how a removal of bank secrecy can impact tax revenues, banks' profitability assuming that offshore centers are able to offer sophisticated but legal or not easily detectable tax planning. Therefore we consider a two-country world in which one jurisdiction is a small offshore financial center (OFC) attracting investors located in the rest of the world. Two regimes are considered. In a first case the OFC enjoys strict bank secrecy and is thus attractive to tax evaders. The onshore economy is however able to pressure the tax haven by shaming and blaming it to hurt its reputation and thus to limit tax evasion. In a second case, we consider that the OFC agrees to share information for tax purpose with the onshore economy. Sophisticated tax planning appears now as an alternative to tax evasion. In this paper, we adopt a positive approach rather than a normative one by assuming that the competing jurisdictions are self-interested when each one chooses its preferred regime. The OFC is motivated by maximizing its banks' profits while the onshore government is concerned with maximizing its net tax revenue[9].

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[7]This double taxation represented a discrimination compared to the situation where the two entities were located in the same country.

[8]SOciété de PArticipation FInancière

[9]This is a suitable way to characterize the objective of onshore governments given the

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The main results obtained in this paper can be summarized as follows. We first show that sharing tax information with onshore countries can be a dominant strategy for an OFC if there is enough scope for providing tax planning to its clientele without infringing tax laws. It follows that the willingness of an OFC to provide tax information does not necessarily lead to its close down. Furthermore, we show that a partial reduction of tax liabilities can already prompt OFCs to voluntarily exchange relevant tax information. The required share of tax mitigation leading to this cooperative behavior depends however of exogenous parameters such as the level of international financial integration. We finally highlight a surprising possible result. We show that the removal of bank secrecy may, under some conditions, reduce the onshore country's tax revenue.

Our paper relates to the recent literature on tax avoidance through tax havens, though these contributions are mainly focused on tax planning strategies implemented by MNEs. In this context, Slemrod and Wilson (2009) demonstrate the parasitic effect of tax havens on other countries' welfare. In their setting, tax havens waste resources for providing tax evasion services to firms and tax administrations incur expenditures to limit tax evasion. Other authors (Hong and Smart, 2010; Desai, 2006) however, highlight beneficial effects of tax havens. For example, reducing their tax burdens by the use of offshore entities, MNEs may enhance their activity in non-tax havens. Johannesen (2010), analyses the effect of tax havens on low and high tax jurisdictions within a framework of imperfect competition. In particular, he shows that an equilibrium may arise in which the tax rate of the low tax country is increased, while tax bases of non-tax havens decrease. Elsayyad and Konrad (2012) analyze how fighting tax-havens, in particular by imposing tax information exchange agreements, modifies the competition pattern between tax havens. They show that if initiatives are taken in a sequential way, the ensuing exit of some tax havens increases the market concentration among the remaining tax havens which become more profitable. This makes them more resistant to complying and actions taken against tax havens may be welfare reducing for the OECD. Our paper is also concerned with possible adverse effects of tax havens reacting to initiatives taken against them. However, contrary to Elsayyad and Konrad (2012), our paper is rather fo-

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current economic situation, as noted by Nicodème (2009).

cused on changes within tax havens which can be more or less able to substitute tax planning activities which are not illegal to traditional tax evasion services rather than on changes in competition between tax havens. The offshore business does not necessarily disappear with official compliance to information exchange agreements but its nature can change. So by contrast to Johannesen (2010) and Elsayyad and Konrad (2012), we do not focus on competition between different tax havens.

The work of Bacchetta and Espinoza (2000) bears some resemblance to our paper. These authors derive general conditions under which two, possibly asymmetric, countries may add a bilateral information-exchange clause in a tax treaty. Analogously, our model also tries to identify conditions under which an OFC is (unilaterally) willing to transmit tax information to a high tax country. Their model is based on bilateral exchange and necessitates repeated games to make information exchange sustainable. In our paper however, the willingness of the OFC to cooperate can be reached in a one-shot game because giving up bank secrecy can, under specific conditions, make legal tax planning more profitable than pure tax evasion.

The paper is organized as follows. In Section 2 we model how an OFC competes with the onshore world by providing tax benefits. In this context, we successively consider strict bank secrecy and information sharing. Section 3 discusses under which conditions the OFC may voluntarily accept to give up bank secrecy. Then we analyze how the possible decision of the OFC to comply with international tax exchange rules can impact the onshore tax revenue. Section 4 concludes.

2 Model setting

Consider an offshore financial center (OFC) located in country F competing with a financial center located in country H. We assume that banks located in a jurisdiction compete in unison with banks located in another country.[10] The OFC attracts investors living in the country H, while the reverse does not take place. Investors who reside in the OFC are supposed to keep their capital in the OFC. This underlines the fact that OFCs are generally very low populated and offer intermediation services predominantly to large foreign

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[10]The aim is to neglect competition among banks within a joint location in order to focus exclusively on the interaction between banking centers.Consequently, only one representative bank for each jurisdiction will be considered.

(onshore) economies. Investors of the onshore country H are heterogeneous and uniformly distributed with unit density on the interval $[0,1]$ according to their attachment to home indexed by x. The closer an individual is to the origin, the more she is attached to her home country. Each individual is endowed with one unit of capital she can invest in the home banking system or in the OFC.

An individual of type $x \in [0,1]$ who offshores her money incurs a cost equal to a moving cost $k > 0$ times x. The coefficient k can be viewed as a measure of the degree of international financial integration. The government of country H taxes capital according to the home country principle, whereas the OFC does not impose a tax on capital. In this paper we analyze how the OFC and the onshore economy compete for investors by considering two alternative regimes: Strict bank secrecy and information sharing. Under strict bank secrecy, the OFC does not share any type of information about its clientele with country H, while under the second scenario information sharing takes place. Importantly, in the second regime, legal tax planning can emerge as an alternative to tax evasion, as it will be detailed in Section (2.2).

The onshore region and the OFC interact at different levels. First, investors from the onshore economy are enticed to avoid tax by offshoring their money. The ensuing tax loss induces the onshore economy to react by setting an appropriate tax rate and deciding on actions to hurt the OFCs reputation. Secondly, there is competition between the banks of both countries. In this context, we assume that the interest rates offered to investors result endogenously from a non-cooperative game between both banking systems. The consequence is that these rates reflect the relative tax attractiveness of the OFC which in turn depends on the possible existence of bank secrecy and the ease with which tax planning opportunities can be provided.[11]

The timing of the decisions is given as follows. The onshore government decides first about the appropriate policy to maximize its tax revenue and then banks located in the different jurisdictions compete to attract investors.

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[11]The fact that interest rates reflect international taxation conditions is consistent with English and Shahin (1994) who find that, following the passing in the late 1980s of two laws that effectively removed banking secrecy for cases of insider trading and money laundering, Swiss banks raised deposit rates by 53 and 105 basis points, respectively. According to Besson (2004, p.64), Swiss banks can afford to charge higher-than-average fees by virtue of their high-end image, their reputation for financial strength, and, last but not least, banking secrecy. Besides fees, banking secrecy affects deposits rates.

2.1 Strict bank secrecy

Under this regime, the OFC provides strict bank secrecy to its investors while the onshore center does not. This perfect opacity allows tax evasion by investing in non sophisticated assets like riskless deposits. Because strict bank secrecy makes tax evasion difficult to detect, authorities of onshore countries try to make OFCs less attractive for tax evasion by actions[12] intended to disparage their reputation. Consequently, the tax evaders will endure a premium that increases with the loss of reputation (Picard and Pieretti, 2011) of the non-cooperative tax haven in which they invest.[13]

Two options are then available to the H country's resident. Either the investor puts her money in the home bank where she incurs a tax or she evades taxes by investing in the OFC. One unit of wealth invested at home by an individual of type $x \in [0, 1]$ yields

$$V_H = r_H - t,$$

where r_H is the rate of return and t the tax rate. If the same individual invests in the OFC, she avoids the home tax but has to incur in addition of a reputation cost, a moving cost which reflects her attachment to home and the ease with which money can be transferred abroad.

It follows that one unit of wealth invested by the individual of type x in the offshore financial center yields a return r_F diminished by the mobility cost kx and a reputation harm α. The corresponding indirect utility is given by

$$V_F = r_F - kx - \alpha$$

Given the utility of the different options, the individual of type $x \in [0, 1]$ chooses to invest in the country which offers the highest net return. It follows that the individuals of type $x \in [0, \overline{x})$ where

$$\overline{x} = \frac{r_F - r_H + t - \alpha}{k}$$

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[12]Recently, the fight against tax evasion has become a major priority in developed countries and pressure (by blacklisting and threat of economic sanctions) against tax havens has increased. These actions are intended to entice the OFC to exchange tax information.

[13]Indeed, Sharman (2001 p.12) observes that, "investors tend to avoid or leave jurisdictions with bad reputations not only out of concern that their money will be misappropriated, but also because firms risk harming their own reputations, as reflected in their share prices."

opt for tax evasion and those of type $x \in [\bar{x}, 1]$ decide to invest at home. As a result, the investment supply to the home banking place equals to $D_F = \bar{x}$ and the supply to the tax haven equals $D_H = 1 - \bar{x}$.

Banks' decision The banking systems of countries H and F raise funds from investors and offer respectively the interest rates r_H and r_F. The collected funds by the banks are invested into risk-free assets that yield a given (world) rate of return r. The banks' profit functions in the countries H and F are given as follows

$$\Pi_H = (r - r_H)D_H \quad and \quad \Pi_F = (r - r_F)D_F.$$

Each banking center selects its return rate supposing that the rate of its rival is given. The equilibrium rates are

$$r_H = r - \frac{2k - t + \alpha}{3} \quad and \quad r_F = r - \frac{k + t - \alpha}{3}.$$

The corresponding investment supplies are respectively

$$D_H = \frac{2k - t + \alpha}{3k} \quad and \quad D_F = \frac{k + t - \alpha}{3k}.$$

Onshore government decision We suppose that the investor's reputation harm is a policy variable that depends on the pressure that the onshore jurisdiction is able to exert place on the OFC, for example, by blacklisting or campaigning about the risks of tax evasion. We further consider that the cost of exerting pressure is given by a quadratic function $C(\alpha) = \alpha^2/2$. The convexity of the cost function may reflect the increasing difficulty to exert pressure which can in particular rely on the existence of institutional limitations. For example, a successful crackdown on bank secrecy requires collective action of onshore jurisdictions which can be hard to sustain or can lead to unacceptable infringement on the sovereignty of other states. Finally, we assume that policy makers of the home country maximize their net tax income $T_H^E(t, \alpha) = tD_H - C(\alpha)$ with respect to the tax rate t and the pressure variable α. This way to characterize the onshore government's objective is consistent with the current period of global crisis forcing countries to fix

their fiscal imbalances (Nicodème, 2009). Solving the maximization problem yields the equilibrium values

$$\alpha^* = \frac{2k}{6k-1} \tag{1}$$

and

$$t^* = k + \frac{\alpha^*}{2} = \frac{6k^2}{6k-1} \tag{2}$$

with $t^* < 1 \Leftrightarrow 1/5 < k < 3/4$ which guaranties the positivity of α^*, as well. Notice that financial integration captured by k affects the optimal tax rate directly and indirectly through its effect on α^*. As a matter of fact, two opposing forces are at play. An increasing mobility cost k augments directly taxation because taxpayers become more captive, but it lowers indirectly taxation because a higher offshoring cost implies lower international pressure. This explains why the effect of k on t^* is not monotone. Indeed, a higher k yields a higher tax rate if $k > 1/3$, whereas a higher k induces lower taxation if $k < 1/3$. In the first case, the direct effect dominates, while the indirect effect dominates in the second case. The two forces equalize if $k = 1/3$.

International banking competition The banking systems of countries H and F raise funds from investors and offer respectively the interest rates r_H and r_F. The collected funds by the banks are invested into risk-free assets that yield a given (world) rate of return r. The interest rates offered to the investors result endogenously from competition between the OFC and the onshore banking system. It follows that the banks in the countries H and F maximize the following profits respectively

$$\Pi_H = (r - r_H) \times D_H \text{ and } \Pi_F = (r - r_F) \times D_F.$$

The equilibrium deposit supplies become

$$D_H^* = \frac{2k}{6k-1} \text{ and } D_F^* = \frac{4k-1}{6k-1}.$$

The supplies are positively signed if $k > 1/4$. It follows that if $k \leq 1/4$ there is no tax evasion ($D_F = 0$). The reason is that capital mobility in this interval entices the onshore government to pressure the uncooperative

tax haven to such an extent that investors apprehend tax evasion because of very high reputation costs. The equilibrium interest rates are

$$r_H^* = r - \frac{2k^2}{6k-1} \text{ and } r_F^* = r - k\frac{4k-1}{6k-1}.$$

Because the OFC offers tax shelter, one could expect that the interest rate is always higher in the onshore banking center. This is however not always the case. Indeed, we have $r_H^* < r_F^*$ if $k < 1/2$ and $r_H^* > r_F^*$, if $k > 1/2$. When financial integration is high , i.e. $k < 1/2$, international pressure α is high to counteract tax evasion and thus investors become more reluctant to offshore their money. This prompts the onshore bank to offer a lower interest rate than its offshore rival.

The corresponding equilibrium profits are given by

$$\Pi_H^* = \frac{4k^3}{(6k-1)^2} \text{ and } \Pi_F^* = \frac{k(4k-1)^2}{(6k-1)^2}$$

The net tax income $B_H = T_H - \alpha^2/2$ of the onshore country is

$$B_H^* = \frac{2k^2}{6k-1}$$

It is straightforward to show that $B_H^* = \frac{1}{3} t^*$. This implies that at equilibrium, the net tax revenue of the onshore country B_H^* increases with the mobility cost if $k > 1/3$ but decreases with k if $\frac{1}{4} < k < \frac{1}{3}$.

The equilibrium global income of the onshore country is

$$B_H^* + \Pi_H^* = B_H^* \frac{8k-1}{6k-1}$$

2.2 Tax information sharing

Now consider that the OFC provides tax information exchange to the onshore economy according to international accepted standards[14]. As a consequence,

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[14]Owing to the OECD, information exchange "on request" constitutes the "internationally agreed standard". However, the G20 Leaders at their June 2012 summit in Mexico committed to lead by example in implementing the practice of automatic exchange of tax information (AIE).

sophisticated tax planning appears as an alternative to tax evasion. We assume that the tax information exchange mechanism is effective enough to hinder fractiously tax evasion. Consequently, if OFCs comply with international requirements of fiscal transparency they are no more blamed and blacklisted for uncooperative behavior.

Tax planning is considered as a legal way to avoid tax or as a strategy situated in grey areas of law.[15] It follows that strict bank secrecy is no more necessary for tax mitigation, but a certain amount of opacity still can exist because of imperfect information sharing. If we take the case of exchange of information on request which is the current rule, tax administrations have to know exactly the type of information they want (Tax Justice Network, 2009). Even if countries would agree upon automatic information sharing, the exchange still remains difficulty for technical reasons (Spencer, 2006). Furthermore, increasing sophistication of tax planning contributes to reduce financial transparency (Balakrishnan, Blouin and Guay, 2010). It follows that exchange of information under existing tax treaties would be limited to less sophisticated assets and would exclude complex arrangements using special entities.

In addition to investing at home, we assume now that there are two ways of placing savings offshore. One way is to invest in a riskless asset subject to residence-based taxation and another is to opt for a complex investment structure which allows to save tax. In the first case, an individual of type x living in country H can invest in a riskless asset which yields a return r_F^l. After taking account of a moving cost kx and a unit tax rate of t which is due to her home country according to bilateral agreements, the net return equals $V_F^l = r_F^l - kx - t$. The transmission of information about this type of asset results from its lack of complexity. In the second case, the investor can benefit from a tax reduction equal to b $(0 < b \leq 1)$ times the tax rate t imposed by the (onshore) country of residence. If $b \longrightarrow 0$, tax planning becomes less and less effective and if $b = 1$, tax planning completely eliminates the tax charge.

We further assume that the value of b is increasing with the sophistication degree of tax planning. The effectiveness in mitigating the tax bill is also dependent on the the resources of accounting, legal and banking services to

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[15] OECD (2009), defines "taking a tax position that is favourable to the taxpayer without openly disclosing that there is uncertainty whether significant matters in the tax return accord with the law" as a part of aggressive tax planning.

provide financial and investment advice and the ability and competence to manage the mobile capital inflows (McLaren and Passant, 2010). However, using complex tax planning structures is not free of risks to investors. The more sophisticated these structures are, the more it is difficult to draw a separating line between abusive tax avoidance and acceptable tax planning or tax minimization (Duff, 2009). It follows that investors choosing highly complex tax planning structures are likely to be exposed to courts which may view these practices as abusive tax avoidance.

However, the limits of legality of tax planning are not invariably given. According to Duff (2009), the increase of tax avoidance activity over the past decades has prompted governments to adopt legislative and administrative measures to discourage this phenomenon. Nevertheless, the legality of these anti-avoidance rules is questionable. As Kessler and Eicke (2007) notice, the question if anti-treaty-shopping and anti-avoidance rules are in accordance with EC law remains still open. Evers and de Graaf (2009), analyzing decisions of the European Court of Justice show that European Member States have substantial discretion as regards combating artificial arrangements that are intended to minimize taxation on capital payments and/or capital gains.

Consequently, the legal uncertainty we just highlighted, creates a risk specific to tax planning which rises with its sophistication device. It follows that the return of the complex investment structure can be considered as a random variable $\widetilde{r}_F^s$. We assume that the investor who opts for tax planning has an exponential utility and a distribution over the return that is normal. Specifically, the investors' gross return follows a normal distribution of mean $r_F^s = E(\widetilde{r}_F^s)$ and variance σ^2. As highlighted above, the variance is increasing with b which is correlated with the complexity of tax planning. We also consider that the investors in the home country are ranked uniformly with unit density on the interval $[0, 1]$ according to their risk aversion which, for sake of simplicity, coincides with their home attachment. Consequently, the variable x can also be used for defining investors" risk aversion. This specifications allows us to write the utility function of an investor of type x who opts for a tax planning structure as a linear[16] function of r_F^s and $b\theta x$, where θ can be influenced by policy measures which affect the variance of the investment

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[16]Specifically, the gross return investors receive follows a normal distribution of mean $r_F^s = E(\widetilde{r}_F^s)$ and variance $\sigma^2 = 2b\theta$. Investors are risk-averse and their utility is given by $U(\tilde{r}) = 1 - e^{-x\widetilde{r}^s}$, where x is the constant absolute risk aversion coefficient. Consequently, an investor's expected utility is given by $E\left[U(\widetilde{r}_F^s)\right] \smallfrown r_F^s - b\theta x$.

return.[17] Hence, the indirect utility can be written as follows

$$V_F^s = r_F^s - b\theta x - kx - (1-b)t$$

Being confronted with different alternatives, the individual of type $x \in [0,1]$ chooses to invest in the country which offers the highest net return. It follows that the individuals of type $x \in [0, x_1)$, where

$$x_1 = \frac{r_F^s - r_F^l + bt}{\theta b}$$

opt for tax planning. Clearly, the higher θ, the higher the variance of the return associated to tax planning and thus the smaller the number of depositors who choose tax planning. Individuals of type $x \in (x_2, 1]$ where $x_2 = \frac{r_F^l - r_H t}{k}$ invest their money in their home country. Finally, individuals of type $x \in x_1, x_2)$ offshore their money and pay taxes in their home country. The investor supplies are equal to

$$D_F^s = x_1, \ D_F^l = (x_2 - x_1) \text{ and } \widetilde{D}_H = 1 - x_2$$

We now derive the equilibrium interest and tax rates when the OFC complies to international accepted information exchange standards.

International banking competition   The onshore bank maximizes its profit by choosing r_H and considers its rival's rate as given. Its profit equals

$$\Pi_H = (r - r_H) \times D_H.$$

The offshore banking center maximizes its profit by choosing r_F^l and r_F^s ,while considering r_H as given. Its profit function is

$$\Pi_F = (r - r_F^l)D_F^l + (R - r_F^s)D_F^s,$$

where R is the world interest rate for the sophisticated type of investment. We assume that R equals the basic world interest rate r augmented by a fee which is proportional to the complexity of tax planning. In other words, we write $R = r + \gamma b$ where $\gamma > 0$.

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[17]For example, the implementation of regulations limiting tax planning opportunities by extending anti-avoidance rules.

The onshore government' decision The onshore government chooses the tax rate t that maximizes

$$T_H = t \left[D_H + D_F^l + (1 - b) D_F^s \right]$$

This yields the equilibrium tax rate

$$\bar{t} = \frac{\theta}{b} - \frac{\gamma}{2} \tag{3}$$

An increase in θ which raises the risk of tax planning, increases the tax rate in the onshore country since the onshore tax payers become more captive. Moreover, the condition $1 > \bar{t} > 0$ is satisfied if $\theta \in \left(b\frac{\gamma}{2}, b\frac{\gamma}{2} + b \right)$. The optimal solution is

$$\bar{r}_F^s = R - \left(\frac{\theta}{2} + \frac{k}{3} + \frac{1}{4} b\gamma \right), \ \bar{r}_F^l = r - \frac{k}{3} \text{ and } \ \bar{r}_H = r - \frac{2k}{3},$$

We assume that r is high enough so that the margins of the different types of investments are always positive. Surprisingly the interest rate offered by the offshore center decreases with the risk parameter θ. As highlighted above, an increase in θ raises the tax rate t which makes tax planning more attractive. This finally explains why the offshore financial center is able to lower its interest rate. The equilibrium investments are

$$\overline{D}_F^s = \frac{1}{3}, \ \overline{D}_F^l = 0 \text{ and } \ \overline{D}_H = \frac{2}{3}.$$

The banks' equilibrium profits equal

$$\overline{\Pi}_F = \left(R - \bar{r}_F^s \right) \overline{D}_F^s = \frac{4k + 6\theta + 3b\gamma}{36} \text{ and } \ \overline{\Pi}_H = \frac{4k}{9}.$$

The equilibrium tax income of the onshore economy equals

$$\overline{T}_H = \frac{(2\theta - b\gamma)(3 - b)}{6b}$$

Notice the tax revenue in the onshore country augments with θ. It follows that making tax planning more risky improves the onshore country's tax revenue.

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3 Removing bank secrecy

In the following we analyze the incentives of an OFC to voluntary disclose tax information. Then we focus on how the removal of bank secrecy impacts the tax revenue in the onshore country.

3.1 Incentives to provide tax information

In this section we consider under which conditions the offshore center has an incentive to abandon bank secrecy and to comply with international information sharing rules. We assume that the OFC chooses the regime which involves the highest bank profitability. For that reason, we will closely look to the difference $\overline{\Pi}_F - \Pi_F^*$ which equals

$$\Psi(b, k, \theta) = \frac{1}{12}\gamma b + \left(\frac{1}{9}k + \frac{1}{6}\theta - \Pi_F^*\right)$$

It follows that $\Psi(b, k, \theta) > 0$ if $b > \widehat{b}$ where $\widehat{b} = \frac{12}{\gamma}\Pi_F^* - \frac{2}{3\gamma}(2k + 3\theta)$. We can then state the following proposition.

Proposition 1 *If the share of tax benefit b is high enough ($b > \widehat{b}$), the OFC has an incentive to accept information sharing for tax purpose only.*

A direct implication of this proposition is that the willingness of an OFC to provide tax information does not necessary lead to its close down. The reason is that the OFC may be able to set up legal structures designed to provide tax planning as an alternative to illegal tax evasion. However, the threshold beyond which the OFC accepts to comply with tax information regulations is not immutable. It changes in particular with the risk parameter θ which can for example be influenced by anti-avoidance tax rules designed by onshore governments and k, the level of international financial integration.

We first see that the threshold value $\hat{b}$ decreases with θ. In other words, it is more likely that the OFC will cooperate by exchanging tax information when tax planning is more risky. This is a surprising result because one would expect that riskier tax planning decreases the willingness of the OFC to give up bank secrecy. Things become however clearer if we bear in mind that an increase in θ makes investors more reluctant to offshore their money, which in turn gives the onshore government more power to tax and the onshore banks more liberty to lower interest rates. As a result, the OFC will also have

an incentive to lower the return it offers to tax planners if the elasticity of investment supply it faces is sufficiently low as it is the case in our model[18]. Finally, tax planning becomes more profitable for offshore banks and the OFC is thus more inclined to opt for information sharing.

Corollary 2 *The more risky the tax planning, the more it is likely that the offshore center will accept to share tax information.*

Since increasing financial openness (lower k) decreases the banks' profit in each scenario, it follows that the total effect of k on the difference $\overline{\overline{\Pi}}_F - \Pi_F^*$ and hence on the threshold value $\widehat{b}$ is ambiguous. Indeed, it appears that the sign of[19] $\frac{\partial \widehat{b}}{\partial k}$ changes with a threshold value $\overline{k} = 0.253\,89$. In particular, if $k > \overline{k}$ we have $\frac{\partial \widehat{b}}{\partial k} > 0$, which means that increasing mobility costs makes the OFC less willing to abandon bank secrecy.

3.2 Does information sharing always improve onshore tax revenue ?

Before analyzing how a possible removal of bank secrecy impacts the tax revenue of the onshore country, it is interesting to highlight some surprising results. Our model shows that the information sharing regime compared with strict bank secrecy can be consistent with higher offshore investments ($\overline{D}_F^s > D_F^*$) if capital mobility is high enough ($k < 1/3$) and with a lower tax rate for appropriate parameter values [20]. Hence, switching to information sharing can entail ambiguous effects on the onshore country's budget. Let us now analyze in more details this effects. Towards this end, we define $\Phi(b, k, \theta) = \overline{T}_H - B_H^*$ which equals

$$\Phi(b, k, \theta) = \frac{(2\theta - b\gamma)(3 - b)}{6b} - B_H^* = \frac{1}{6b}\left(\gamma b^2 - (6B_H^* + 2\theta + 3\gamma)b + 6\theta\right).$$

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[18]Remember that in our model, the equilibrium demand for tax planning is independent of the offered return.

[19]It is easy to show that $\frac{\partial \widehat{b}}{\partial k} = \frac{\partial \widehat{b}}{\partial \Pi}\frac{\partial \Pi}{\partial k} - \frac{4}{3\gamma}$ where $\frac{\partial \widehat{b}}{\partial \Pi}\frac{\partial \Pi}{\partial k} > 0$ equals zero only if $\overline{k} = 0.253\,89$.

[20]Indeed, direct comparison (3) and (2) shows that the difference $t^* - \overline{t} = 6\frac{k^2}{6k-1} - \overline{t}$ has two complex roots if $\frac{2\theta - b\gamma}{b} < \frac{4}{3}$.

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Solving the equality $\Phi(b, k, \theta) = 0$ for b, we show in Appendix 2 that there is only one real root denoted by $\bar{b}$ satisfying the condition $\bar{b} \in [0, 1]$. It follows that $\Phi(b, k, \theta) > 0$ for $b \in [0, \bar{b}]$. In other words, if the tax benefit measured by b exceeds the threshold $\bar{b}$, we get $\Phi(b, k, \theta) < 0$.

This leads us to the following proposition

Proposition 3 *If the tax benefit resulting from tax planning is high enough ($b > \bar{b}$), switching from bank secrecy to information exchange does not improve tax revenue in the onshore country.*

The above analysis shows that the effectiveness of tax planning in reducing tax liabilities is crucial in gauging the success of the regime of information exchange. In particular, if tax havens are sufficiently skilled at setting up legal structures for tax optimization purposes, pushing for the removal of bank secrecy with the aim of maximizing tax income may be inconsistent. However, the threshold value $\bar{b}$ can be increased if the onshore world is able to augment the risk parameter θ, since $\frac{\partial \bar{b}}{\partial \theta} > 0$. This can occur if onshore governments are able to improve international tax legislation to deter the use of increasingly sophisticated forms of tax avoidance.

It is also interesting to discuss how financial integration modifies the threshold $\bar{b}$ beyond which the regime of information sharing is not desirable for a tax maximizing country. To this end, we calculate the derivative of $\bar{b}$ with respect to k. This yields $\frac{\partial \bar{b}}{\partial k} > 0$ if $\frac{1}{4} < k < \frac{1}{3}$ and $\frac{\partial \bar{b}}{\partial k} < 0$ if $k > \frac{1}{3}$. In other words, when mobility costs are "low" ($\frac{1}{4} < k < \frac{1}{3}$), more financial integration makes the regime of information exchange less attractive to the onshore country. However, when mobility costs are "high" ($k > \frac{1}{3}$), we observe the opposite effect. How to explain this result ? Since $\overline{T}_H$ does not depend on k, we only focus on the tax revenue associated to the bank secrecy regime. We know (see Section 2.1.) that in this case the onshore country's tax revenue is a linear function of the optimal tax rate which is affected by two opposing forces when mobility costs change. Therefore, when capital mobility increases (k decreases), there is a first action which lowers tax revenue (and the tax rate) because taxpayers become less captive. Additionally, there is a second action increasing tax revenue (and the tax rate) because onshore governments strengthen their campaign against tax havens and make investors more reluctant to offshore their money. The regime of information regime becomes more attractive when the first effect dominates, which occurs for $k > \frac{1}{3}$. However, the desirability of bank secrecy increases if the second effect dominates, which occurs when $\frac{1}{4} < k < \frac{1}{3}$.

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4 Conclusion

We observe that while there is a crackdown on bank secrecy which favors tax evasion, tax planning using sophisticated legal structures still prospers. Most of these techniques, initially designed for multinational corporations, are generally based on a network of international tax treaties. They thus allow wealth management, which utilizes large groups of tax consultants, to mitigate tax liabilities without bank secrecy.

Our paper models competition between OFCs and onshore banking centers by considering successively, strict bank secrecy with pure tax evasion and tax information exchange with tax planing.Two interesting results are highlighted. The first is that an OFC can voluntarily abandon strict bank secrecy, but without closing down its activity. This decision hinges on the ability of the OFC to offer tax benefit by legal but sophisticated means. The model defines a parameter to capture this ability which has to exceed a given level. This threshold depends, in particular, on the legal uncertainty resulting from efforts deployed by onshore countries and/or international bodies to refine and implement anti-avoidance regulations. Surprisingly, the model shows that, under conditions of high capital mobility, these attempts can make OFCs less prone to abandon strict bank secrecy. Secondly, it may occur that tax revenue earned by onshore countries shrinks with the removal of strict bank secrecy if the OFCs are able to reduce sufficiently and legally the tax liabilities of their customers. This threshold can however be increased, but not necessarily eliminated, by strengthening international regulations. This surprising result points up a possible inconsistency in the effort of onshore countries pushing tax havens to exchange relevant tax information for exclusively fiscal goals.

It follows that only targeting the abolition of strict bank secrecy may not be enough. More precisely, combating bank secrecy policy is a complex task which needs a clear understanding of modern OFCs and their capacity to adapt their tax minimization strategies to ever-changing regulatory environments. However, this ability to implement increasingly sophisticated tax planning devices is not equally shared. There is thus scope for vertical differentiation among the various OFCs with eventually the possibility that some of them will have to shut down. Our model does not account for this extension. This should be done in a future work. On the other hand, the objectives which guide onshore countries in their fight against tax havens should also be clarified. Are tax equity considerations the only pursued in-

tentions? Or, as the facts suggest, do onshore countries first and foremost want to increase their tax revenue? Tending more to this second objective is however more likely to impact important strategic variables like taxes and in turn, induce the types of results highlighted in our paper.

5 Appendix 1: Example of international tax planning

An example of tax structuring with a Luxembourg financial holding company (SOPARFI) illustrates a method of tax planning non dependent on bank secrecy. Similar or comparable legal vehicles exist in Cyprus, Switzerland, Netherland, UK, Malta, the Netherlands Antilles, and Barbados... The SOPARFI is constituted as a taxable Luxembourg company and then eligible for the application of EU directive "parent-subsidiaries" and DTT. This company is owner of subsidiaries shares.

Let us envisage a simplified example of tax planning for an individual investor. An individual investor founds a SOPARFI in Luxembourg which acquires a share of a corporate capital in a typically onshore country (France for example). The corporate income of the French company is taxed at normal rate (34.4% including social contributions). If the investor perceives dividends directly, he will be subject to a withholding tax on dividends (31.5% including social contribution). But in our case, the financial incomes are perceived by the SOPARFI:

1.   The Parent-Subsidiary Directive and DTT eliminate withholding tax on dividends paid by the subsidiary to the Luxembourg SOPARFI.

2.   If the SOPARFI fulfils the requirements of the Luxembourg exemption regime, the company may be exempt on :

   - Financial income received from its shareholding

   - Capital gains realized upon the sale of shares

3.   On the side of repatriation and remuneration planning, dividends paid by a SOPARFI are subject to the normal Luxembourg dividend tax (15%) However, dividend distribution to corporate shareholders can also be exempt from withholding tax if the subsidiary is a Luxembourg resident entity, or an entity which is covered by the Parent-Subsidiary Directive, or by DTT. For example, dividends can be perceived by a "Special Investment Funds" (SIF) in Luxembourg, which are dedicated to professional and other

well-informed investors. These SIF are entitled to full exemption from taxation except a small subscription tax and an annual tax of 0.01% on all assets of the SIF.
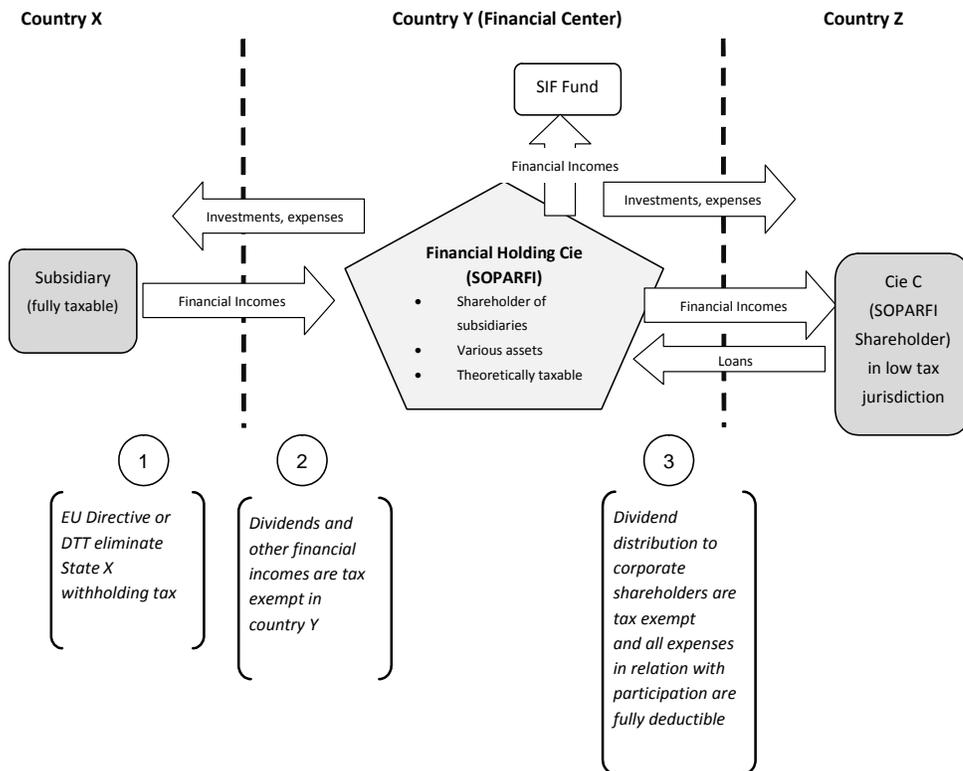
The use of financial company in other low tax jurisdictions can allow the extraction of profit from a Luxembourg SOPARFI to low or zero-tax. To authorize an exemption[21], Luxembourg tax authorities generally consider that the foreign tax must be assessed at a minimum tax rate of 11%.

Furthermore, a high debt-equity ratio (85/15) is acceptable to the Luxembourg tax administration for SOPARFI on equity participation. The

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[21]It is possible to obtain advance pricing agreements from the Luxembourg tax authorities

SOPARFI are generally under-capitalized and then, within this limit, interests on debt paid are tax deductible and payments do not suffer withholding tax.

The financial profits of the SOPARFI can also be invested in real estate or used for various purchases in another country or in the origin country...

Appendix 2

Solving $\Phi(b,k,\theta) = 0$ with respect to b yields the real roots of $\Phi(b,k,\theta) = \frac{1}{6b}\left(\gamma b^2 - (6B_H^* + 2\theta + 3\gamma)b + 6\theta\right) = 0$ are

$$\bar{b} = \frac{1}{2\gamma}\left(6B + 2\theta + 3\gamma - \sqrt{24B\theta + 36B\gamma + 36B^2 + (2\theta - 3\gamma)^2}\right)$$

$$\bar{\bar{b}} = \frac{1}{2\gamma}\left(6B + 2\theta + 3\gamma + \sqrt{24B\theta + 36B\gamma + 36B^2 + (2\theta - 3\gamma)^2}\right)$$

It is easy to check that $\bar{\bar{b}} > 1$ since B_H^* and γ are strictly positive. It also appears that $\bar{b} > 0$. In addition, we have $\bar{b} \leq 1$ if $B_H^* \geq \left(\frac{2\theta - \gamma}{3}\right)$, which is always the case since we assume that $\theta \in \left(b\frac{\gamma}{2}, b\frac{\gamma}{2} + b\right)$. It follows that $\bar{b}$ is the only admissible root of $\Phi(b,k,\theta) = 0$ satisfying the condition $\bar{b} \in [0,1]$. As a consequence, $\Phi(b,k,\theta) > 0$ if $b < \bar{b}$ and $\Phi(b,k,\theta) < 0$ otherwise.

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