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## **Offshore financial centers: Safe or tax havens**

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# Offshore financial centers: safe or tax havens\*

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## Abstract

This paper explains why and how a small country can be an offshore financial center (OFC). We build a model involving a small and a large country competing for portfolio investments. They use two instruments, taxation and institutional infrastructure. We identify the conditions for an OFC to be a tax haven, a safe haven, or both. The existence of a tax haven need not be as bad as claimed in the media because its presence fosters institutional competition which is beneficial to all investors.

**Keywords:** offshore financial centers; portfolio investments; institutional infrastructure competition; tax competition.

**JEL classification:** H40, H54, G20.

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# 1 Introduction

Offshore financial centers are in the midst of major political turmoil. The medias have widely argued that such financial centers are hidden tax havens, which are beneficial only to the rich. The conventional wisdom is that microstates slash tax rates to become attractive investment places, but it is unclear if this is always the case. A recent study by Dharmapala and Hines (2009) investigated 209 countries and territories to determine which jurisdictions become offshore financial centers and why. They found that successful jurisdictions are overwhelmingly small, but that they are especially well governed, with sound legal institutions and low levels of corruption. Poorly run jurisdictions fail to attract or retain foreign capital, and many do not even try. Thus, the quality of governance seems to matter for the existence of offshore financial centers. What is more, Sharman (2010) conducted an audit study realized by soliciting offers from 54 different financial service providers located in 22 countries. Gathering the responses to determine whether the existing legal and regulatory prohibitions on anonymity work in practice, Sharman (2010, p.134) concludes that his “findings cast strong doubt on the proposition that the problem of financial opacity is caused by palm-fringed tropical islands, rather than large high-income economies like the United States and Britain.” In other words, the widespread opinion that offshore financial centers are small exotic places need not be true.

The purpose of this paper is to analyze the viability and behavior of an *offshore financial center* (OFC). Specifically, we address the following questions. When small jurisdictions specialize in international finance, are they necessarily tax havens with the sole purpose to allow the rich to avoid paying income tax? Because governments seem to play a major role in the emergence and development of an OFC, what policy mix does a government choose to promote an OFC? To which extent are OFCs detrimental to large economies? To study these issues, we develop a new model that features two banking centers located in a small country and in a large country as well as investors who choose where to make portfolio investments. Unlike the existing literature that focuses mainly on tax competition (Wilson, 1991; Bucovetsky, 1991; Kanbur and Keen, 1993), we assume that countries compete to attract portfolio investments by using two instruments: tax competitiveness and institutional infrastructure.<sup>1</sup>

In the present context, institutional infrastructure describes the range of instruments de-

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<sup>1</sup>This point has previously been raised in models of fiscal competition in which national governments tax firms but supply an infrastructure appealing to them (Justman et al., 2001; Hindriks et al., 2008; Zissimos and Wooders, 2008; Pieretti and Zanaj, 2011). We differ from these authors by focussing on financial investment. Our approach is related to the idea of “nation branding” developed by Konrad (2008) in which countries advertise and invest in their brand name to attract foreign direct investments. In our framework, investing in the quality of institutions can be seen as an investment by the small country under the brand of being a safe country where to invest.

signed to protect investors' assets and rights and to foster the development of financial intermediation through innovations in regulatory regimes. These instruments aim to secure portfolio investments, to disclose accounting rules that provide investors with the information they need, and to enforce laws and rules by uncorrupted regulators or courts - in short, everything that ensures that investors get their money back. Our approach thus agrees with Gonzalez and Schipke (2001, p.45) for whom "Being a tax haven alone does not guarantee capital flows; strong regulations that inspire confidence are a crucial factor." Indeed, an institutional infrastructure has the nature of a local public good (non-rivalry and non-exclusion) which benefits those who invest in the corresponding country. Countries have very different abilities to offer investors an attractive institutional environment (La Porta et al., 2000). Therefore, we contend that both tax and institutional competition are necessary to determine the conditions under which an OFC can emerge. In this view, a *tax haven* arises when the strategy to build an OFC is based on tax undercutting, whereas a *safe haven* emerges when the country attracts foreign investors by offering them a better institutional framework. Observe that a country can be both a tax and safe haven by offering simultaneously a low tax rate and a good institutional environment. Consequently, OFCs are not be alike.

Our model displays the following main features. First, in accordance with recent international taxation agreements, we assume that depositors are taxed on their capital return according to the residence principle. In other words, when investors offshore their savings, they evade paying taxes in their home country.<sup>2</sup> However, when they are caught by their taxing authority such investors incur a fine. Second, all things being equal, individuals prefer to invest their savings in their home country rather than abroad. However, when they invest abroad, investors bear idiosyncratic costs. Specifically, we assume that they bear a Hotelling-like "transport cost." We will show how this cost takes into account investors' heterogeneity in their attitude toward OFCs as well as the imperfect integration of financial markets. Third, when choosing their policy mix, we acknowledge that governments may pursue different objectives. In line with standard public economics, we consider benevolent governments, which care about national income wherever their residents invest their capital (Hindriks and Myles, 2006). However, to test the robustness of our results, we also retain a public-choice perspective on tax-setting in which Leviathan governments maximize their budgets (Brennan and Buchanan, 1980). It is worth stressing that the difference between the two types of governments is immaterial when the small country is a microstate because the national investors taxed by the Leviathan stand for a very small share of investors, whereas the proceeds redistributed to the

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<sup>2</sup>We consider the most extreme case about investors' behavior. Indeed, it is conceivable that individuals make use of OFCs for more legitimate reasons, taking for example advantage of the existence of institutions that offer higher investors' protection. Accounting for such a clientele makes the analysis more difficult, but does not change the main message of the paper.

small country's inhabitants stem from taxing foreign investors.

Last, the vast majority of OFCs have a small size both in terms of population and domestic capital endowment. Such countries display a high degree of political homogeneity, which allow them to change quickly existing rules and laws in response to new environments and opportunities (Alesina and Spolaore, 1997; Streeten, 1993). Reforming existing laws or passing new ones takes much longer in large and diversified economies, where any change in the status quo involves long negotiations involving a large variety of interest groups. By contrast, small countries are specialized in a handful of sectors, here the banking industry, and thus the absence of a wide range of lobbyists makes the parliament and the entire administrative body much more flexible. Consequently, due to their ability to quickly redesign their regulation environment for new crises and international laws, or simply to update their legal system for new global or local situations, we find it reasonable to assume that small countries are endowed with a comparative advantage in providing high-quality institutional infrastructure (Hampton and Christensen, 2002).

Our main results may be summarized as follows. Consider first the case of tax budget-maximizing governments. When a small country is endowed with a sufficiently strong comparative advantage in designing institutional infrastructure, it always chooses to become *both* a safe haven and a tax haven. This finding is in accordance with the empirical evidence provided by Dharmapala and Hines (2009) and Sharman (2010). Instead, when a small country's comparative advantage to supply institutional infrastructures is low, it can be attractive to foreign portfolio investments by being a pure tax haven only. This is consistent with standard results in the tax competition literature. A less plausible scenario arises when the small country's comparative advantage is quite high, mobility of capital very high, and the taxing authority not very fierce. In this constellation of parameters, the OFC attracts foreign investors by only providing better institutions while taxing more than its rival. We show that this scenario is not only implausible but also unlikely to emerge in the case of a small country.

When governments are benevolent, the mobility of capital leads to equilibria that obey patterns that are qualitatively similar to those described above. There are differences, however. On the one hand, there is a race to the bottom when capital mobility is low. In this case, the smaller country builds its institutional infrastructure by taxing banks' profits. On the other hand, when financial markets are well integrated, the smaller country's government adopts a strategy similar to the strategy of a Leviathan's. There is a further distinctive feature. A benevolent government never builds an OFCs that is a pure tax havens. Nonetheless, pure safe havens are as implausible as with Leviathan governments.

Finally, we show that the global surplus increases when countries choose compete in institutional infrastructure, and not just in tax, the reason being that all investors get a better

protection of their saving. One might think that this result is driven by the gains made in the OFC. Quite the opposite, we show that the surplus of the larger country, which supposedly is hurt by the action of the OFC, is higher when both countries engage in institutional competition. In other words, the supply of high-quality institutional infrastructure mitigates the damaging effects associated with pure tax competition. This idea is in line with recent empirical research in public economics, which highlights the fact that governments combine tax breaks and the provision of material infrastructure to attract firms (Bénassy-Quéré et al., 2007; Hauptmeier et al., 2012).

The next section presents the model. Section 3 describes the equilibrium policy mix chosen by Leviathan governments, whereas Section 4 considers benevolent governments. Section 5 concludes.

## 2 The model

Consider two countries  $S$  and  $L$  whose population size are, respectively, given by  $0 \leq s < 1/2$  and  $1 - s > 1/2$ . Both countries accommodate a banking center. Each resident has the same fixed amount of capital that she deposits in one of the two centers. The total capital amount including the capital return is normalized to 1. In what follows, we disregard competition among banks and focus on strategic interactions between governments that determine the international distribution of financial investments. Admittedly, by considering a two-country setting, we disregard competition between OFCs. However, one of the main messages of this paper being that countries choose to supply differentiated institutional infrastructure, it is reasonable to expect OFCs to relax competition within their group by being differentiated too. In particular, armchair evidence shows a certain geographical specialization of OFCs (Laulajainen, 2003). For example, the Cayman Islands and the Bahamas host the largest banking services directed toward US clients, whereas Luxembourg is mainly oriented toward the residents of its neighboring countries (Germany, France and Belgium).

Country  $S$  accommodates an OFC that provides strict bank secrecy, whereas the onshore center established in country  $L$  does not. Since we focus on OFCs, the financial mobility of the smaller country's residents is irrelevant. In other words, only investors of the larger country are mobile.

The main point of this paper is that the quality of governance, the degree of law enforcement, the level of corruption, and the political and economic stability are all characteristics that affect the risk faced by investors. As a result, country  $i = S, L$  provides institutional infrastructure  $m_i$  with the aim to decrease the risk of investing therein. This variable captures the ability of country  $i$  to react to external shocks, changes in international laws, and the like. More precisely,

the higher  $m_i \geq 0$ , the higher the utility derived from capital investment in country  $i$ . Thus, everything else being equal, a higher institutional quality makes investors better-off.

Governments are aware that creating a trustful environment attracting investors has the nature of a local public good, which leads either to a higher revenue collected through taxes or to a higher total surplus in its country. However, the cost of investing in institutional infrastructure increases at an increasing rate due to the rising complexity involved. For simplicity, we assume that this cost is given by a quadratic function:

$$C(m_i) = \alpha_i m_i^2$$

where  $\alpha_i$  measures the efficiency of country  $i$  in producing its institutional infrastructure. Though  $\alpha_i$  is treated here as exogenous, we recognize that its level is the outcome of a complex political process. Dealing explicitly with such a process would take us far from the main objective of the paper. Nevertheless, as discussed in the introduction, it is reasonable to assume that the smaller country is more efficient than the larger one in designing institutional infrastructure:  $\alpha_S < \alpha_L$ . The numéraire being chosen for  $\alpha_S$  to be normalized to 1, we have  $\alpha \equiv \alpha_L > 1$ .

Taking institutional infrastructure into account, we can write an investor's indirect utility as follows:

$$V_i = 1 + m_i - t_i$$

where country  $i$  provides the institutional infrastructure  $m_i$  and sets a tax  $t_i$ . Investors' utility, which depends on the location of their portfolio investments, is thus positively affected by the net return on their investments,  $1 - t_i$ , as well as by the institutional and financial infrastructure of the country in which they invest,  $m_i$ .

As discussed in the introduction, country  $L$ 's residents are homogeneous in the perception of their home country but heterogeneous in their attitudes toward the OFC, whereas country  $S$ 's residents invest home. To be precise, we assume that  $S$ -country investors are located at  $x = 0$  with mass  $s$ . By contrast,  $L$ -country investors are uniformly distributed along the line  $[0, 1 - s]$ . An individual who invests in the OFC incurs a transaction cost, which has the nature of a "transport cost"  $\tau x > 0$  à la Hotelling (1929). The parameter  $\tau$  can be viewed as an inverse measure of the degree of international financial integration: the lower  $\tau$ , the more integrated the financial markets.<sup>3</sup> Furthermore, the distance  $x$  from an investor's location to the OFC is *not* the geographical distance between this investor located in country  $L$  and the border of country  $S$ . Instead, its role is to capture the idea that individuals favor domestic investments over foreign investments, while recognizing that investors have idiosyncratic preferences in their attitudes toward investing in the OFC. In this context, an investor bearing a low cost does not

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<sup>3</sup>When  $\tau = 0$ , there is perfect capital mobility. In this case, depositors' heterogeneity no longer matters.

care much about where she invests her money. On the contrary, an investor who faces a high cost displays a strong reluctance to invest abroad. The mobility of capital is, therefore, imperfect for the following two reasons: financial markets are imperfectly integrated and investors are heterogeneous.

A country  $L$ 's resident who invests offshore is assumed not to report her foreign interest income to her home government. She thus faces a probability  $p$  of being caught for tax evasion. As a result, her expected indirect utility is given by

$$(1 - p)(1 + m_S - t_S - \tau x) + p(1 + m_S - t_S - \varphi - \tau x)$$

where  $\varphi$  is the fine she has to pay when she is caught.

Let  $\bar{x} \in (0, 1 - s)$  be the location of the investor indifferent between investing home and abroad. Depositors located in  $(0, \bar{x})$  invest in country  $S$ , whereas those located in  $(\bar{x}, 1 - s)$  invest in  $L$ . The indirect utility of an investor is as follows

$$V(x) = \begin{cases} 1 + m_S - t_S & \text{if home residents} \\ 1 + m_S - t_S - \phi - \tau x & \text{if } x \in (0, \bar{x}) \\ 1 + m_L - t_L & \text{if } x \in (\bar{x}, 1 - s) \end{cases}$$

where  $\phi \equiv p\varphi$  is the expected fine. Hence,  $\phi + \tau x$  may be interpreted as the total cost borne by an investor at  $x$  when she chooses to deposit her capital in the OFC.

It is readily verified that the marginal investor, who is indifferent between investing home or in the OFC, is located at

$$\bar{x} = \frac{m_S - m_L + t_L - t_S - \phi}{\tau} \quad (1)$$

which must belong to the interval  $[0, 1 - s]$ . When financial markets are highly integrated and/or investors almost homogeneous (formally,  $\tau$  is very low), (1) shows that the marginal investor is given by  $\bar{x} = 1 - s$  ( $\bar{x} = 0$ ) when the numerator is positive (negative). In this case, small deviations in tax rates or in institutional infrastructure lead all investors to move *en masse*. Such corner solutions are often implausible, as is the solution to the Bertrand price game. In the next section, we will introduce a lower bound on  $\tau$  that guarantees the existence of an interior solution for the marginal investor.

The supply of capital in the smaller country is  $s + \bar{x}$  and the supply of capital in the larger one is  $1 - s - \bar{x}$ . Since our purpose is to study the emergence and behavior of OFCs in small countries, we focus on equilibria in which the smaller country attracts foreign investors, i.e.  $\bar{x} > 0$ . Therefore, we will have to check under which conditions this assumption holds at the equilibrium of the game played by the two governments.

Regarding governments' objectives, we consider two distinct approaches with the aim of testing the robustness of our results. In line with standard public economics, we consider



benevolent governments, which care about total income wherever their residents invest their capital (Hindriks and Myles, 2006). We also retain a public-choice perspective on tax-setting in which Leviathan governments maximize their budgets (Brennan and Buchanan, 1980). Note, however, that this approach is consistent with a more conventional welfarist perspective in which consumers place a high marginal valuation on specific merits goods. In this case, governments maximize the surplus they can extract from investors to finance these public goods.

Assume that  $\bar{x}$  is positive. Since the mobility costs are not mediated by the market, benevolent governments maximize their national income. Furthermore, both those who invest home and abroad use their income to cover their expenditure. As a result, the offshore investors repatriate their income. If  $0 \leq n \equiv p\bar{x} \leq \bar{x}$  of them are caught by the fiscal authority, their net total income is  $(1 - t_S - \varphi)n$ . In this event, the government collects an additional income equal to  $n\varphi$ . Therefore, the total income generated by the offshore investors is equal to  $(1 - t_S)\bar{x}$ . As a consequence, national incomes are given by

$$\begin{aligned} Y_S &= R(s + \bar{x}) + (1 - t_S)s + t_S(s + \bar{x}) - m_S^2 \\ Y_L &= R(1 - s - \bar{x}) + (1 - t_L)(1 - s - \bar{x}) + \\ &\quad + (1 - t_S)\bar{x} + t_L(1 - s - \bar{x}) - \alpha m_L^2. \end{aligned} \tag{2}$$

In these two expressions,  $R$  is the constant banks' profit margin, so that the first term represents banks' profits, while the second one stands for the income of residents who invest in their domestic banks. As seen above, the third one in  $Y_L$  represents the income of the large country residents who invest in the OFC. The last terms are the tax collected net of the investment costs.

Leviathan governments maximize their budgets

$$B_S = (\bar{x} + s)t_S - m_S^2 \tag{3}$$

$$B_L = (1 - \bar{x} - s)t_L - \alpha m_L^2. \tag{4}$$

We do not find it reasonable to add  $p\bar{x}\phi$  to the budget  $B_L$  because this would mean that the large country's government aims to manipulate the number of residents investing offshore. Moreover, using this alternative specification for  $B_L$  does not affect the message of Section 3.

In the next two sections, we consider a two-stage game in which governments, first, choose their institutional infrastructure ( $m_i$ ) and, then, their tax rates ( $t_i$ ). This staging is dictated by the fact that changing institutions is far much less flexible than setting tax rates. The former is also more difficult to implement than the latter. In other words, there is *infrastructure-then-tax* competition.

### 3 Leviathan governments

#### 3.1 Tax competition

In the second-stage subgame, governments choose noncooperatively their tax rates to maximize their revenues conditional upon their institutional infrastructures  $(m_S, m_L)$ . The payoffs being strictly concave and quadratic in taxes, there exists a single Nash equilibrium. When this equilibrium is interior, it is given by

$$t_S(m_S, m_L) = \frac{\tau(1+s) - \phi - (m_L - m_S)}{3} \quad (5)$$

$$t_L(m_S, m_L) = \frac{\tau(2-s) + \phi + (m_L - m_S)}{3}. \quad (6)$$

Thus, tougher measures against fiscal evasion leads the OFC to decrease its tax rate while allowing the larger country to raise its own rate. Plugging (5) and (6) into (1) yields

$$\bar{x}(m_S, m_L) = \frac{\tau(1-2s) + r(m_S - m_L) - \phi}{3\tau}. \quad (7)$$

If the two countries offer the same institutional infrastructures ( $m_S = m_L$ ), or do not compete in infrastructure ( $m_S = m_L = 0$ ), the tax rates are given by

$$t_S^t = \frac{\tau(1+s) - \phi}{3} \quad (8)$$

$$t_L^t = \frac{\tau(2-s) + \phi}{3} \quad (9)$$

and thus

$$\bar{x}_t = \frac{\tau(1-2s) - \phi}{3\tau}. \quad (10)$$

Hence, regardless of the degree of capital mobility, to attract foreign investors the smaller country must set a lower tax rate than the larger one:  $t_S^t < t_L^t$ . The resulting tax gap is the reflection of the population size difference: it widens as countries become more dissimilar in size. This result is in line with the existing literature on tax competition and country size (Wilson, 1991; Bucovetsky, 1991). Note also that the imperfect mobility of capital softens the race to the bottom (Kanbur and Keen, 1993). Indeed, both tax rates increase with  $\tau$  because the tax base of the larger country becomes more captive. By contrast, when the two countries have different institutional infrastructure, the country that enjoys the institutional advantage can build on it to raise its tax rate, whereas the other must lower its own rate to retain investors.

## 3.2 Institutional competition

Plugging (5), (6), and (7) into (3) and (4) shows that both  $B_S$  and  $B_L$  are concave (convex) with respect to own strategy if and only if  $\tau > 1/9$  ( $\tau < 1/9$ ). Because we exclude corner solutions, we assume that  $\tau > 1/9$ .

Maximizing country  $i$ 's budget with respect to  $m_i$  for  $i = S, L$ , we obtain the following solutions:

$$m_S^* = \frac{\alpha\tau(s+1) - \alpha\phi - 1/3}{9\alpha\tau - (1+\alpha)} \quad m_L^* = \frac{\tau(2-s) + \phi - 1/3}{9\alpha\tau - (1+\alpha)}. \quad (11)$$

We determine below a sufficient condition for  $m_S^*$  and  $m_L^*$  to be strictly positive. Using (5) and (6), the corresponding equilibrium tax rates are given by

$$t_S^* = 3\tau m_S^* \quad t_L^* = 3\alpha\tau m_L^*. \quad (12)$$

Thus, in each country the tax rate rises with the institutional infrastructure it supplies. However, the tax rate increases at the higher pace in the larger country because of its comparative institutional disadvantage.

The marginal depositor is located at

$$\bar{x} = \frac{3\alpha\tau(1-2s) - \alpha(3\phi - s) - (1-s)}{9\alpha\tau - (1+\alpha)}. \quad (13)$$

The smaller country is viable as an OFC if portfolio investments flow from  $L$  to  $S$ . In other words, the condition  $\bar{x} > 0$  must hold. For notational simplicity, we want this condition to be satisfied for all admissible values of  $\alpha$ . It is then readily verified that this is so when  $\alpha = 1$ , which yields

$$\tau > \frac{1}{3} + \frac{\phi}{1-2s}. \quad (14)$$

Under this condition, both the numerator and denominator of  $m_S^*$  are positive. Using (11), it is easy to show that  $m_L^*$  is also positive, while (12) implies that  $t_S^*$  and  $t_L^*$  are positive too. In sum, it follows from (14) that all the equilibrium choices made by governments are positively signed regardless of the value of  $\alpha > 1$ . Note, finally, that (14) implies  $\bar{x} < 1 - s$ .<sup>4</sup> However, it should be kept in mind that the condition (14) is more restrictive than what is needed for our analysis to be valid. Indeed, our results hold for a larger set of  $\tau$ -values. This would require replacing (14) with a less stringent inequality in which the right-hand side depends on  $\alpha$ . For simplicity, we assume that (14) holds, which also implies the concavity of payoffs ( $\tau > 1/9$ ).

The condition (14) is more likely to be satisfied when  $s$  is very small, i.e. country  $S$  is a microstate. In other words, the smaller is country  $S$ , the easier it is for this country to become

<sup>4</sup>Indeed,  $\bar{x} < 1 - s$  holds if and only if  $\tau > \frac{1-3\phi}{3(2-s)}$ , which is always satisfied under (14).

an OFC. By contrast, (14) is unlikely to hold when the expected fine is very high. In particular, since (13) decreases with  $\phi$ , *the OFC ceases to be viable when the expected fine is sufficiently high.*

### 3.3 Tax havens, safe havens, or both

For the small country to be a tax haven, a safe haven, or both, we need comparing  $m_S^*$  with  $m_L^*$  and  $t_S^*$  with  $t_L^*$ . Consider first the institutional gap

$$m_S^* - m_L^* = \frac{\tau [\alpha (s + 1) - (2 - s)] - \phi (1 + \alpha)}{9\alpha\tau - (1 + \alpha)}. \quad (15)$$

The condition (14) implies that the denominator of this expression is positive. As for the numerator, it is positive if and only if  $\alpha > \bar{\alpha}$  where

$$\bar{\alpha} \equiv \frac{\tau (2 - s) + \phi}{\tau (s + 1) - \phi} > 1.$$

In other words, the smaller country provides better institutions when its comparative advantage is sufficiently large. Nevertheless, a higher expected fine makes it more difficult for the OFC to be a safe haven. As a result, a smaller OFC will cease being a safe haven before a larger one. To put it bluntly, Switzerland is more likely to be a safe haven than Liechtenstein if efforts to crack down on tax evasion increase.

Consider now the tax differential  $t_S^* - t_L^*$ . Using (11) and (12), we get

$$t_S^* - t_L^* = \tau \frac{\alpha - 3\alpha\tau(1 - 2s) - 6\alpha\phi - 1}{9\alpha\tau - (1 + \alpha)} \quad (16)$$

which means that  $t_S^* - t_L^* < 0$  if and only if  $\alpha > \hat{\alpha}$  where

$$\hat{\alpha} \equiv \frac{1}{1 - 3\tau(1 - 2s) - 6\phi}.$$

Note that  $\hat{\alpha}$  may be positive or negative. Under (14),  $\hat{\alpha}$  is negative, hence  $\alpha > \hat{\alpha}$ , if and only if the condition

$$s < \frac{9\phi}{2} \quad (17)$$

holds. In other words, *the OFC is a tax haven when country S is sufficiently small, the expected fine is high, or both.*

The following propositions summarize our main results.

**Proposition 1** *If the OFC is small and/or the larger country's taxing authority fierce enough ( $s < 9\phi/2$ ), the OFC is a tax haven. Furthermore, if the OFC has a strong comparative advantage in designing institutional infrastructures ( $\alpha > \bar{\alpha}$ ), it is also a safe haven.*

The novelty here lies in the role played by governments in supplying infrastructures that protect investors. This agrees with Dharmapala and Hines (2009) and Hines (2010) who observe that most of the small countries that succeed to attract foreign capital share two main features: (i) they are tax competitive and (ii) they display a high quality level of institutions.

**Proposition 2** *If  $s < 9\phi/2$  and if the OFC has a weak comparative advantage ( $\alpha < \bar{\alpha}$ ), it is a tax haven only.*

This scenario is close to the existing literature on tax competition, which ignores the role played by institutional infrastructure (Hindriks and Myles, 2006). Indeed, because the smaller country has a weak comparative advantage, the size is too small for it to build a relatively strong institutional framework. As a consequence, its only way out to become an OFC is tax undercutting. Under these circumstances, the tax differential  $t_L^* - t_S^*$  must be sufficiently wide to compensate the foreign investors for the low institutional infrastructure gap provided by the OFC. Indeed, since  $m_S^* - t_S^*$  always exceeds  $m_L^* - t_L^*$ , it must be that

$$m_L^* - m_S^* < t_L^* - t_S^*.$$

The following two remarks are in order. Firstly, depending on the size of the OFC, raising the expected fine may have different impacts on the strategic mix chosen by governments. In the first case, country  $S$  is such that  $s < 1/(1 + \alpha)$ . As  $\phi$  rises, the OFC is, first, a safe and tax haven and, then, a tax haven only. In other words, *a tougher policy against tax evasion incentivizes the OFC to move from being a safe and tax haven to a pure tax haven*. Indeed, (16) shows that tax undercutting is exacerbated by higher mobility costs when the mass of domestic investors is very small (Kanbur and Keen, 1993). Therefore, tax undercutting may become an equilibrium outcome as  $\phi$  rises. Eventually, the OFC disappears when  $\phi$  is sufficiently large. In the second case, the smaller country has a size exceeding  $1/(1 + \alpha)$ . As a result, the OFC is always both a tax and safe haven, which stops being viable when  $\phi$  becomes sufficiently high. Since country  $S$  is not that small anymore, tax undercutting loses a good deal of its appeal, which incentivizes this country to invest in infrastructure as long as it remains viable as an OFC.

Secondly, comparing the number of investors under fiscal and institutional competition also yields interesting results. Using (10) and (13), it can be shown that

$$\bar{x}_t - \bar{x} = \frac{\tau(s+1) - \phi}{3\tau(9\alpha\tau - (1 + \alpha))} (\bar{\alpha} - \alpha).$$

Therefore, there are more (fewer) foreign investors under institutional than under tax competition only if, and only if,  $\alpha$  is larger (smaller) than  $\bar{\alpha}$ . When the comparative institutional advantage of the OFC is strong enough for this country to become a safe haven, it attracts more

investors. By contrast, when this advantage is weak, institutional competition incentivizes the larger country to build on its bigger size to provide a better protection to its domestic investors. Eventually, this allows this country to retain a larger number of investors.

**Can “pure” safe havens exist?** A *pure* safe haven is an OFC that displays a higher level of institutional infrastructure than its rival and sets a higher level of taxes. In our model, we can recover such a configuration as an equilibrium choice made by the smaller country. Indeed, if we relax our assumption (17) and allow the taxing authority of the larger country to adopt a policy such that  $\phi < 2s/9$ , then the threshold  $\hat{\alpha}$  takes on a positive value under (14). This has as a direct and surprising consequence: the OFC may then choose a tax level that exceeds the tax rate selected by the larger country,  $t_S^* > t_L^*$ . To be precise, if  $\alpha > \hat{\alpha} > \bar{\alpha}$ , using (15) and (16) shows that  $m_S^* - m_L^* > 0$  and  $t_S^* - t_L^* > 0$ . For this to happen, the following conditions must be satisfied. First, international pressures on OFCs has to be lax ( $\phi < 2s/9$ ). Incidentally, this condition shows that a very small country is unlikely to become a pure safe haven. Second, financial markets have to be fairly well integrated for  $\tau$  not to be too large, and thus  $\hat{\alpha} > \bar{\alpha}$ . Third, and last, the small country must have a strong comparative advantage ( $\alpha > \hat{\alpha}$ ). Because it is hard to meet these three conditions simultaneously, it seems unrealistic to expect an OFC, especially when the country is very small, to be a pure safe haven.

### 3.4 Welfare analysis

In this section, we analyze the welfare effects of infrastructure-then-tax versus tax competition. Since preferences are quasilinear, the social surplus of a country is equal to the sum of its residents’ indirect utilities. Therefore, the social surplus is equal to the national income minus the mobility costs borne by the residents who invest offshore.

We first compare the world surplus generated when governments compete in tax only or when they compete in tax and institutional infrastructure. Under pure tax competition, the world surplus is given by

$$\begin{aligned} W^t &= R(s + \bar{x}_t) + R(1 - s - \bar{x}_t) + (1 - t_S^t)(s + \bar{x}_t) + t_S^t(s + \bar{x}_t) \\ &\quad + (1 - t_L^t)(1 - s - \bar{x}_t) + t_L^t(1 - s - \bar{x}_t) - \frac{1}{2}\tau\bar{x}_t^2 \\ &= R + 1 - \frac{1}{2}\tau\bar{x}_t^2 \end{aligned}$$

where the tax rates,  $t_S^t$  and  $t_L^t$ , and the marginal investor,  $\bar{x}_t$ , are given by (8)-(9) and (10), respectively.

When there is infrastructure-then-tax competition, the world surplus becomes

$$W = R + 1 - \frac{1}{2}\tau\bar{x}^2 + m_S(s + \bar{x}) + m_L(1 - s - \bar{x}) - m_S^2 - \alpha m_L^2$$

where  $m_S$  and  $m_L$  are given by (11) and the marginal investor  $\bar{x}$  by (13).

The difference between the welfare levels reached under these two policies is such that

$$W - W^t = \underbrace{\left( m_S(s + \bar{x}) + m_L(1 - s - \bar{x}) \right)}_{\text{institutional quality gain}} - \underbrace{\left( m_S^2 + \alpha m_L^2 \right)}_{\text{global institutional investment cost}} + \underbrace{\frac{1}{2}\tau(\bar{x}_t^2 - \bar{x}^2)}_{\text{global mobility cost}}. \quad (18)$$

Substituting (11) and (13), it can be shown that the sum of the first two terms is positive. The sign of the third term is determined by

$$\bar{x}_t - \bar{x} = \frac{\tau(s+1) - \phi}{3\tau(9\alpha\tau - (1+\alpha))}(\bar{\alpha} - \alpha)$$

which is positive if and only if  $\alpha < \bar{\alpha}$ . Hence, when  $\alpha < \bar{\alpha}$  the global surplus under institutional competition always exceeds the global surplus under tax competition.

Because  $\bar{x}_t^2 - \bar{x}^2 = 0$  at  $\bar{\alpha}$ , by continuity (18) remains positive when  $\alpha$  exceeds  $\bar{\alpha}$  but is not too large.<sup>5</sup> As a consequence, *infrastructure-then-tax competition yields a higher global surplus than tax competition when the smaller country's comparative advantage is not too large*. The intuition goes as follows. First, when  $\alpha$  is very large, investing in institutional infrastructures is very costly for the larger country. Furthermore, there are more foreign investors in country  $S$  under infrastructure-then-tax competition than under tax competition. This results in higher total mobility costs. When  $\alpha$  is very large, these two forces become strong enough to make infrastructure-then-tax competition welfare-detrimental at the global level.

A natural question that arises at this point is whether the increase in global welfare implies that the onshore country also experiences an increase in its own welfare under infrastructure-then-tax competition. To answer this question, we have to compare  $W_L$  and  $W_L^t$ . Specifically, we show that there exist an interval of  $\alpha$ -values such that  $W_L > W_L^t$  holds. This inequality is equivalent to

$$m_L(1 - s - \bar{x} - m_L\alpha) + R(\bar{x}_t - \bar{x}) > \frac{1}{2}(\bar{x} - \bar{x}_t)(\tau(\bar{x} + \bar{x}_t) + 2)$$

where the right-hand side is negative when  $\alpha < \bar{\alpha}$ . From (14), it then follows that the left-hand side is positive. As a consequence, we obtain the desired result for  $\alpha < \bar{\alpha}$ .

To sum up, we have:

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<sup>5</sup>The proof is tedious and is available upon request from the authors.

**Proposition 3** *If the smaller country is a tax haven ( $\alpha < \bar{\alpha}$ ), infrastructure-then-tax competition yields a higher global surplus and a higher surplus in the larger country than tax competition.*

Hence, when the comparative advantage of the smaller country is not too large ( $\alpha < \bar{\alpha}$ ), competition in infrastructure is welfare-improving compared to the standard tax competition case. This improvement is global and may be driven by the increase of welfare in the larger country. Repeating the argument developed above for the world surplus shows that the same holds when  $\alpha > \bar{\alpha}$  but is not too large. However, when  $\alpha$  is very large, both the world and the larger country surpluses may be damped by an over-provision of institutional protection and high mobility costs.

## 4 Benevolent governments

The national income functions (2) can be rewritten in a more compact way as follows:

$$Y_S = R(s + \bar{x}) + s + t_S \bar{x} - m_S^2 \quad (19)$$

$$Y_L = (R + 1)(1 - s - \bar{x})(1 - t_S)\bar{x} - \alpha m_L^2. \quad (20)$$

Substituting (1) in (19) and (20), we readily verify that  $Y_S(t_S, t_L)$  is strictly concave in  $t_S$ . Applying the first-order condition yields the best reply

$$t_S(t_L) = \frac{m_S - (m_L - t_L) - \phi - R}{2}.$$

By contrast,  $Y_L(t_S, t_L)$  is linear in  $t_L$ . Since  $\partial Y_L / \partial t_L = -(R + t_S) / \tau$  is always negative, the larger country sets a zero capital tax:  $t_L^* = 0$ . Therefore, the equilibrium of the tax competition subgame is given by

$$t_S^* = \max \left\{ \frac{m_S - \phi - m_L - R}{2}, 0 \right\} \quad t_L^* = 0. \quad (21)$$

This means that benevolent governments get trapped into a race to the bottom: the larger country never taxes investors, whereas the smaller one is able to tax investors only if it is able to build a high level of institutional infrastructure. Otherwise, the smaller country cannot escape from a fierce tax competition environment that leads it to select a zero tax rate too.

By implication, when benevolent governments engage only in tax competition ( $m_i = 0$ ), the unique equilibrium outcome is given by  $t_S^* = t_F^* = 0$ , which is reminiscent of Bertrand price competition. Since there are no differences between the two banking centers, there are no cross-border deposits ( $x^* = 0$ ). This underscores once more the implicit assumption made in



the classical tax competition literature that does not recognize the role of institutional quality in investors decisions.

Furthermore, it follows from (21) that  $m_S^*$  must exceed  $m_L^*$  for the smaller country to be an OFC.<sup>6</sup> Indeed, if  $t_S^* = 0$ , the only way to attract foreign investors into the smaller country is to offer them a better institutional infrastructure than that of the larger country. This is a fortiori true when  $t_S^* > 0$ . Hence, unlike what we observe with Leviathan governments, *the smaller country is never a tax haven*. But then, how do governments finance their institutional infrastructure? Since governments are benevolent, institutional infrastructure can be funded through a tax on banks' profits. Clearly, banks' profits will always exceed the cost of building the institutional infrastructures provided that their markup  $R$  is sufficiently high. In other words, *benevolent governments tax banks instead of investors to build better institutions*.

Summarizing the above discussion, we have:

**Proposition 4** *Assume benevolent governments. Then, the smaller country is always a safe haven. Furthermore, the larger country never sets a tax rate exceeding that of the smaller country.*

As in subsection 3.4, we compare the welfare effects of infrastructure-then-tax and tax competition in the relevant case where  $t_S^* = t_L^* = 0$ . In this event, we obtain

$$0 < m_L^* = \frac{1}{2} \frac{R}{\alpha\tau} < m_S^* = \frac{1}{2} \frac{R}{\tau} \quad (22)$$

while the viability condition of the OFC is given by

$$\bar{x} = \frac{(\alpha - 1)R - 2\alpha\tau\phi}{2\alpha\tau^2} > 0. \quad (23)$$

Since the utility difference is now given by

$$W - W^t = sm_S + (1 - s)m_L - \alpha m_L^2 - m_S^2 - \frac{1}{2}\tau\bar{x}^2$$

substituting (22) and (23) into this expression shows that  $W - W^t$  as a function of  $\alpha$  is described by a concave parabola. As a consequence, for relatively low levels of  $\alpha$ , *infrastructure-then-tax competition between benevolent governments is welfare-enhancing*. In addition, as in subsection 3.4, even the larger country's residents are better-off. However, when the comparative advantage of the smaller country becomes sufficiently high, infrastructure-then-tax competition is detrimental to both countries due to the high mobility costs borne by the investors and the high investments costs made by the larger country.

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<sup>6</sup>Under (14), the payoffs of the first-stage game are concave.

## 5 Conclusion

Our main purpose was to pin down the reasons explaining why and how a small country can be viable as an OFC. To address this question, we have developed a model where heterogeneous investors choose to deposit their savings in a small country or in a large country. Instead of following the literature that focusses on tax competition only, we acknowledge that countries use at least two instruments to attract investors, i.e. tax rate and institutional infrastructure. As discussed in the introduction, the empirical evidence supports our idea that tax competition is too restrictive an approach. Given the modeling strategy used here, we show that whether the smaller country becomes a tax haven depends on the integration of financial markets and the intensity of the small country's comparative advantage. The nature of government matters too to the extent that *benevolent governments never build a tax haven*. They prefer to erect an OFC through the provision of better institutional infrastructure.

By contrast, *pure tax havens may emerge under Leviathan governments*. This may explain why tax havens are developed in microstates where there is almost no conflict between social welfare and tax revenues because the local population benefits from the taxes that are mainly levied on foreign investors. However, having Leviathan governments does not necessarily imply that they choose to accommodate a pure tax haven. The small country may become an OFC that builds high-quality institutional infrastructures. Our analysis also reveals that the presence of heterogeneous investors matters for the viability of the OFC and the nature of the policy mix chosen by governments.

A final word, in closing. OFCs need not be as bad as claimed in the media because they foster institutional competition that is likely to be beneficial to all investors. As a consequence, we find it fair to say that safe havens have a place in the global financial environment.

## References

- [1] Alesina, A. and E. Spolaore (1997) On the number and size of nations. *Quarterly Journal of Economics* 112, 1027-56.
- [2] Bénassy-Quéré, A., M. Coupet and T. Mayer (2007) Institutional determinants of foreign direct investment. *The World Economy* 30, 764–82.
- [3] Brennan, G. and Buchanan, J.M. (1980) *The Power to Tax: Analytic foundations of a fiscal constitution*. Cambridge: Cambridge University Press.
- [4] Bucovetsky, S. (1991) Asymmetric tax competition. *Journal of Urban Economics* 30, 167-81.

- [5] Dharmapala, D. and J.R. Hines (2009) Which countries become tax havens? *Journal of Public Economics* 93, 1058-68.
- [6] Gonzalez, M. and A. Schipke (2011) Bankers on the beach. *Finance & Development* (June 2011), 42-8.
- [7] Hampton, M.P. and J. Christensen (2002) Offshore pariahs? Small island economies, tax havens and the re-configuration of global finance. *World Development* 30, 1657-73.
- [8] Hauptmeier S., F. Mittermaier and J. Rincke (2012) Fiscal competition over taxes and public inputs. *Regional Science and Urban Economics* 42, 407-19.
- [9] Hindriks J. and G.D. Myles (2006) *Intermediate Public Economics*. Cambridge (MA): The MIT Press.
- [10] Hindriks, J., S. Peralta and S. Weber (2008) Competing in taxes and investment under fiscal equalization. *Journal of Public Economics* 92, 2392-402.
- [11] Hines, J. R. (2010) Treasure islands. *Journal of Economic Perspectives* 24/4, 103-26.
- [12] Hotelling, H. (1929) Stability in competition. *Economic Journal* 39, 41-57.
- [13] Justman, M., J.-F. Thisse and T. van Ypersele (2001) Taking the bite out of fiscal competition. *Journal of Urban Economics* 52, 294-315.
- [14] Kanbur, R. and M. Keen (1993) Jeux Sans Frontieres: Tax competition and tax coordination when countries differ in size. *American Economic Review* 83, 877-92.
- [15] Konrad, K. (2008) Mobile tax base as a global common. *International Tax and Public Finance* 15, 395-414.
- [16] La Porta, R., F. Lopez-de-Silanes, A. Shleifer and R.W. Vishny (2000) Investor protection and corporate governance. *Journal of Financial Economics* 58, 3-27.
- [17] Laulajainen, R. (2003) *Financial Geography. A banker's view*. London: Routledge.
- [18] Pieretti, P. and S. Zana (2011) On tax competition, public goods provision and jurisdictions' size. *Journal of International Economics* 84, 124-30.
- [19] Sharman, J.C. (2010) Shopping for anonymous shell companies: An audit study of financial anonymity and crime. *Journal of Economic Perspectives* 24/4, 127-40.
- [20] Streeten, P. (1993) The special problems of small countries. *World Development* 21, 197-202.

- [21] Wilson, J.D. (1991) Tax competition with interregional differences in factor endowments. *Regional Science and Urban Economics* 21, 423-51.
- [22] Zissimos, B. and M. Wooders (2008) Public good differentiation and the intensity of tax competition. *Journal of Public Economics* 92, 1105-21.