

Coordination and the fight against tax havens*

Kai A. Konrad[†]

Tim Stolper[‡]

March 9, 2015

Abstract

The success or failure of the fight against tax havens is the outcome of a coordination game between a tax haven and its potential investors. Key determinants are the costly international pressure and the haven country's revenue pool. The latter is determined endogenously by the decisions of many individual investors. Our findings explain why some havens attract large sources of international investment and earn large revenues while other countries do not, and why their profits are not competed away. We identify a trade-off between fighting tax havens and high tax rates or, similarly, small fines for disclosed tax evasion.

Keywords: tax havens, tax evasion, initiatives against harmful tax practices

JEL codes: G20, H26, H87

*We thank Miriam Kohl and Edward Webb as discussants of our paper, conference participants at the University of Tübingen, workshop participants at the Max Planck Institute in Jena and the Max Planck Institute in Munich, and seminar participants at the University of Copenhagen for helpful comments.

[†]Max Planck Institute for Tax Law and Public Finance, Munich, Germany. Email: kai.konrad@tax.mpg.de

[‡]Corresponding author. Max Planck Institute for Tax Law and Public Finance, Department of Public Economics, Marstallplatz 1, 80539 Munich, Germany. Phone: +49 89 24246-5344, Fax: +49 89 24246-5299, Email: tim.stolper@tax.mpg.de

1 Introduction

Offshore tax evasion poses a serious challenge to jurisdictions all over the world. Zucman (2013) estimates that households hold financial assets worth \$5.9 trillion through tax havens, or equivalently 8% of their global net financial wealth, most of which is believed to go unrecorded.¹ Various countries and supranational organizations have implemented several initiatives against tax havens, effectively making it more costly for a country or jurisdiction to offer tax sheltering services. This process, sometimes referred to as a *fight against tax havens*, has partially succeeded. Some countries chose to comply and have abandoned their tax sheltering business, while others have resisted and remain active as tax havens. For observers it remains difficult to see why and when haven countries change their attitudes.

With regard to tax evasion by private investors, the term *tax haven* is primarily used to describe countries with no or only nominal taxation and bank secrecy rules that enable foreign investors to conceal capital and capital income from the tax authorities in their respective home countries.² The OECD is one of the most prominent players that strives for an effective exchange of information between tax authorities and exerts international political pressure on all non-cooperative jurisdictions. The pressure has included, among other things, blacklisting and the threat of economic sanctions.³ In response, many haven countries agreed to exchange information for tax purposes with other countries upon request. If drafted and enforced effectively, an information exchange upon request can suppress the supply of tax concealment services. Other haven countries however either refused to sign such treaties or signed them but did not implement them effectively.⁴ A thorough understanding of why and when a haven country adapts to the international standard of information exchange, and when it does not, will be important for taking the

¹The total wealth hidden in tax havens is likely to be even higher because Zucman's (2013) estimate does not include non-financial wealth, such as art or real estate, and accounts for the year 2008 when global stock markets were low. A detailed industry report estimates the private offshore wealth for the same year at \$6.7tr (BCG, 2009, p.30). The corresponding estimate for 2013 is \$8.9tr (BCG, 2014, p. 9).

²The OECD report on harmful tax competition (1998, pp. 22-25) worked out a number of factors to identify a tax haven. One of these are no or only nominal taxes, generally or in special circumstances, combined with laws or administrative practices that prevent the effective exchange of relevant information for tax purposes.

³cf. G20 (2009, p. 4): "In particular we agree [...] to take action against non-cooperative jurisdictions, including tax havens. We stand ready to deploy sanctions to protect our public finances and financial systems. The era of banking secrecy is over. We note that the OECD has today published a list of countries assessed by the Global Forum against the international standard for exchange of tax information."

⁴The Global Forum on Transparency and Exchange of Information for Tax Purposes (OECD, 2014, pp. 19-35) evaluates jurisdictions with respect to their effective implementation of an information exchange upon request. As of October 2014, it has rated 20 jurisdictions as *compliant*, 38 jurisdictions as *largely compliant*, 9 jurisdictions as *partially compliant*, and 4 jurisdictions as *non-compliant*. 12 jurisdictions revealed shortcomings already in their legal and regulatory frameworks and were not allowed to proceed to the final phase of revision in order to be rated.

next steps to an automatic exchange of information.⁵

This paper develops an equilibrium framework for the decision of a haven country whether to offer concealment services as a tax haven, or not. The provision of such services involves not only benefits, but also some political cost. We focus on the role of coordination or coordination failure among potential users of tax sheltering services and the complementarity between the investors' behavior in the aggregate and the haven country's decision making for whether the haven country operates a secrecy regime or adopts an information exchange. We note that expectations are of key importance in this process and these expectations are themselves endogenous. This provides insights into what factors are important drivers for these expectations and ultimately influence the flow of financial capital and countries' decisions as to whether and when a tax haven business is sustained. Our theory sheds light on the question of why some countries run very successful tax havens with huge revenue pools and large surpluses while other, similar countries do not. The analysis also considers the role of service fees in the haven country, and taxes and penalties for disclosed tax evasion in other, non-haven countries.

Switzerland, for instance, was renowned for its strict bank secrecy laws and has a long-standing reputation as a country that provides concealment services for private investors. In turn, it used to be very successful in attracting a major share of the private financial wealth held offshore from all possible origins.⁶ It resisted multiple attempts by high-tax countries and international organizations to terminate this business model. However, Switzerland has also been a prime target in the fight against tax havens and, seemingly, has given in to the international pressure in recent years. It agreed to the European Savings Directive, signed information exchange treaties with several EU partners, and even enabled its banks to disclose information about their clients to US tax authorities after the banks were indicted by the US for assisting American citizens with tax evasion.⁷ Almost simultaneously with these developments, investors from Europe and North America relocated their funds away from Switzerland, often just before the initiatives came into effect or were ultimately decided.⁸ Our analysis argues that the withdrawal of deposits from Switzerland and the Swiss decision to lessen its banking secrecy did not just happen simultaneously by coincidence. The analysis shows that these events are complementary and mutually reinforcing.

In our formal framework, a haven country may provide concealment services that

⁵See OECD (2014, pp. 13ff).

⁶Zucman (2013) and BCG (2009 & 2014) estimate Switzerland to be the world market leader for offshore private wealth management, accounting for a market share of more than one quarter.

⁷For an account of the change in the Swiss attitude toward its strict bank secrecy, see for example "Swiss banking secrecy: Don't ask, won't tell", *The Economist*, February 11, 2012.

⁸For anecdotal evidence of such capital movements during the negotiations between Switzerland and Germany about a new information exchange treaty, see "Ermittlungen: Steuerfahnder verfolgen Spur nach Asien", *Financial Times Deutschland*, August 10, 2012. For evidence of more systematic movements from Switzerland to less pressured tax havens, see "Switzerland and its rivals: Rise of the midshores", *The Economist*, February 16, 2013, and regular remarks in the annual wealth reports by the Boston Consulting Group, e.g., BCG (2014).

allow its users to hide otherwise taxable income from their respective residence countries. In return, the haven country can charge a small fee either directly or indirectly via taxing the financial sector in the country.⁹ Within the potential tax haven, operating costs and fees may be as small as a percentage of the amounts sheltered but, given the large sums of capital that can be concealed by a haven country, even very small fees can add up to large earnings and make the tax haven business very attractive. The political cost of providing such services originates from international pressure that involves the threat of economic sanctions, forgone beneficial treaties, or the potential loss in business reputation for being blacklisted as a tax haven.

For tax evading investors, it is essential that the haven country does not abandon its concealment business soon after they have located their capital there. If the haven country decides to share information with other countries, then the investors who have concealed capital therein are worse off than by simply paying the taxes in their residence countries. A tax haven that lifts its secrecy regime may unmask its clients' identities and reveal information about previously accrued capital income to the tax offices of the investors' home countries. For tax evaders, this is usually accompanied by severe consequences and penalties.

There is an important feedback loop in the choices of the haven country and the tax evading investors. A haven country is willing to offer its sheltering services only if it can attract a sufficient revenue pool with these services. Without investors, a haven country bears the cost that results from international pressure, but does not obtain the benefits from the tax haven business. On the other hand, a haven country can only attract investors if they can rationally expect that the country will provide concealment services in the future.

Moreover, this complementarity raises deeper issues than some coordination problem between two players, because the investors themselves do not constitute a single player. They are many, independent decision makers. A single investor assesses whether it is likely that the haven country will act as a tax haven in the future, and this likelihood depends, among other things, on the number of other investors moving their funds to this country. This generates a second complementarity that exists among investors.

These two complementarities are at the core of our analysis. We describe the setting as a two-stage game. In a first stage, investors simultaneously decide whether to pay taxes in their residence country or shift their resources to a country that will potentially operate as a tax haven. In a second stage, the haven country decides whether to provide concealment services, given the amount of financial inflow on the one side and the international pressure on the other. We show that the complementarities outlined above generate a multiplicity of equilibria and create strategic uncertainty in a context that is otherwise a perfect information framework.

The equilibrium analysis here can explain why some countries manage to attract major funds by a large number of investors, why investors may trust a haven country and locate their wealth there, and why their expectations are confirmed in equilibrium

⁹Cf. Schön (2005).

and the haven country will offer tax sheltering services. It also explains why and when investors mistrust a haven country and why this country will indeed adopt an information exchange regime.

We also demonstrate that a slight amount of uncertainty overcomes the problem of strategic uncertainty, and identify a unique equilibrium for this case. To derive this result, we formally rely on and use the theory of global games as developed by Carlsson and van Damme (1993) and Morris and Shin (1998). This approach introduces imperfect information about the co-players' types. The unique equilibrium contains a threshold level regarding the political cost of running a tax haven. Below the threshold, a haven country attracts large capital inflows from tax evaders and maintains a secrecy regime. Above it, investors do not shift their funds to the haven country, which then adopts an information exchange regime.

Furthermore, this critical cost level depends on the residence countries' level of taxation, the degree of penalty for disclosed tax evasion, and the prices for tax haven services. The relation reveals a trade-off that emerges between a successful fight against offshore tax evasion in tax havens and high tax rates, for example, in the course of an international tax harmonization. High tax rates make it attractive for investors to evade taxes and render haven countries robust toward international pressure. A similar effect exists for low penalties on disclosed offshore tax evasion, for instance, in the context of special arrangements with reduced fines for tax evaders who self-report on their undeclared offshore wealth. Several countries apply such rules in an attempt to encourage the repatriation of offshore funds. Finally, we can explain why tax havens can charge positive service fees and yield large revenues despite being active in a highly competitive, international financial market and the presence of multiple tax havens. High revenues make haven countries robust toward costly international pressure and hence trustworthy for tax evading investors.

2 Literature and empirical review

Our analysis is related to a growing literature on tax havens and their business model, surveyed in Dharmapala (2008) and Keen and Konrad (2013). One domain in this literature studies the country characteristics of tax havens. Dharmapala and Hines (2009) and Slemrod (2008) provide empirical support for the widespread view that tax havens tend to be small, affluent island countries that have American or British colonial or territorial roots and score particularly well on indices measuring aspects of governance quality, such as the protection of property rights.¹⁰ The importance of investor protection is studied by Bucovetsky (2014) who focuses on the threat of a potential expropriation of investors' financial assets by the haven country. Slemrod and Wilson (2009) argue that small countries have a comparative advantage in becoming tax havens. These analyses

¹⁰The colonial or territorial roots influence, among other things, a country's legal and political system, its official language, and its degree of sovereignty/dependency.

identify natural candidate countries, some of which act or have acted as tax havens in the past and may continue this business in the future.

A related, empirical question asks which active tax haven is likely to terminate its provision of tax sheltering services, if offering such services also generates a political cost. Bilicka and Fuest (2014) and Elsayyad (2012) study the role of haven country characteristics and bilateral country-pair attributes for the likelihood of international agreements being signed in the aftermath of the 2009 G20 Tax Haven Crackdown. Country characteristics and economic and geographical relationships between countries matter. We provide a theoretical underpinning for a causal link between international pressure and a country's choice about whether to offer concealment services as a tax haven. We collapse the various haven country's specific characteristics, its relations to other countries, and the possible effects from the OECD fight against tax havens into a single variable measuring the cost of offering concealment services as a tax haven. We highlight the crucial role of investors and their expectations.

Another domain evaluates particular initiatives in the fight against tax havens. Hemmelgarn and Nicodème (2009), Johannesen (2014), and Klautke and Weichenrieder (2010) study the EU Savings Directive. For an assessment of the G20 Tax Haven Crackdown, see Johannesen and Zucman (2014). Although most studies address the effectiveness of the current initiatives, little has been done to understand the incentives for a haven country when exposed to international pressure. As an exception, Elsayyad and Konrad (2012) consider the interaction between several tax havens, and the consequences of a sequential exit for the haven countries who remain active tax havens. They show that the increase in market shares and market power, that these remaining active tax havens enjoy, makes them increasingly resistant toward international pressure. We consider a single haven country and focus on the trust problem between the haven country and its potential investors and its impact on the haven country's possible reactions to international pressure and the financial decisions of many individual investors.

Furthermore, the current initiatives against tax havens have triggered a controversial discussion about the effects of tax havens on global welfare, surveyed by Hines (2010). Most of this literature considers corporate tax avoidance rather than private tax evasion. On the upside, tax havens allow high-tax countries to levy a de facto differentiated tax rate on mobile capital (cf. Hong and Smart, 2010) effectively limiting the consequences of a harmful tax competition to a subset of the tax base (cf. Keen, 2001); economic activities in haven and nearby non-haven countries are found to be complements rather than substitutes (cf. Desai et al., 2006a & 2006b); total tax revenues may increase as non-haven countries face weaker incentives to enter an aggressive tax competition (cf. Johannesen, 2010); and investors may benefit from fiercer institutional competition (cf. Pieretti et al., 2013). On the downside, tax havens may also contribute to an excessive tax competition by lowering equilibrium tax rates, cause wasteful resource expenditures for purely tax arbitrage activities and the attempt to limit those activities, and increase the shadow price for public revenues in high-tax countries (cf. Slemrod and Wilson, 2009). These are important questions, but they are only tangential to our analysis. We focus on

the activities of tax havens that offer tax sheltering services to private capital investors.

Several authors describe tax havens as juridical entrepreneurs who sell protection from foreign taxation whenever they find it profitable to do so.¹¹ These analyses typically treat the demand for tax sheltering services as a quantity that smoothly reacts to parameter changes. For the phenomenon we study, the decisions of individual investors, the strategic complementarity among them, and the self-fulfilling effect of investors' beliefs on the haven country's actual behavior are crucial and create discontinuous jumps in the tax haven's revenue pool. The beliefs about the stability of a country's potential tax haven are endogenous, and we identify the key drivers for the country's decision whether to provide concealment services or adopt an information exchange.

3 The role of expectations

We consider the most simple environment with one haven country H and a continuum of homogeneous investors $i \in I$, where the mass of I is normalized to 1. Investors reside somewhere outside H and we call this place country R . We can think of R as a representative high-tax country in the OECD.

Each individual investor i holds one unit of capital and chooses between two actions $a_i \in \{0, 1\}$. An investor can keep the capital in R , denoted by $a_i = 0$, or can move it to H , denoted by $a_i = 1$. The individual choices then add up to a total share of capital located in H

$$a = \int_{i \in I} a_i di \in [0, 1]. \quad (1)$$

This amount can be observed by the haven country, and this completes stage 1. Stage 2 is the decision stage for the haven country H , that has the capabilities to operate as a tax haven. It chooses between two possible concealment policies. It can adopt an information exchange regime and share information with the tax authorities of country R , or it can entertain a secrecy regime and offer the typical tax haven concealment services for the future. We denote the choice of H by $h \in \{0, 1\}$ and refer to $h = 0$ as not providing concealment services, and to $h = 1$ as offering concealment services as a tax haven. This choice completes stage 2.

The sequencing of choices naturally maps the situation in which investors make long-term decisions about whether or not to locate their capital in a haven country, and in which tax evading investors are then vulnerable to the possibility that the haven country will not offer a secrecy regime and enter into an information exchange in the future. Thereby the sequencing accounts for the lasting effect of investment choices. However, a dynamic game that considers capital flows and repeated decision making may be interesting. We study a static setting in which the haven country decides on h only once, based on the amount of capital a attracted in stage 1. A more generous interpretation of this setup is, of course, that H is a country that qualifies as a potential haven country, for instance, by having been a tax haven in the past. In this case the

¹¹Palan (2002) refers to this process as the *commercialization of state sovereignty*.

a secrecy regime in the absence of any international pressure or substantial capital flows into the country. Its decision makers may be proud of helping honest business people from abroad avoid illegitimate expropriation claims, feel that giving up bank secrecy is a sacrifice in national identity, or similar. So we allow $\theta \in [\underline{\theta}, \bar{\theta}]$, where $\underline{\theta} < 0$ and $\bar{\theta} > 1$. The resulting profit for the haven country upon providing concealment services is $as - \theta$. This notation assumes that the haven country's operating cost θ and therefore also the amount of international pressure is independent of the haven country's revenue pool a . However, our results are robust to various changes to this assumption and remain qualitatively unchanged provided that the haven country benefits from any additional capital located therein. Summarized, the payoff for the haven country is given by

$$\pi_H(a, h) = \begin{cases} 0 & \text{if } h = 0 \\ as - \theta & \text{if } h = 1 \end{cases} . \quad (3)$$

We assume the service fee s , the tax rate t , and the detection/compliance cost z to be exogenous. In a more general setup, one could consider the residence country to determine t and z , and the haven country to choose s . We discuss this issue as well as the impact of these parameters on the equilibrium outcome in greater detail in section 5. Furthermore, to make our analysis economically interesting and non-trivial, we restrict the allowed parameter ranges such that $s < t$ and $z > 0$. If the haven country's service fee exceeds the tax rate $s \geq t$, an investor would have nothing to gain from locating capital in H . Similarly, if the detection/compliance cost is negative or zero $z \leq 0$, an investor would have nothing to lose when trying to evade taxes.

In the following we solve for the equilibrium of the game for every possible level of the operating cost θ . That is, we solve a whole class of games, one for each value of θ , and make a prediction about whether the haven country adopts an information exchange regime or behaves as a tax haven for any given level of international pressure. This allows us to identify the necessary as well as the sufficient amount of international pressure to induce a haven country to participate in an information exchange. We impose the standard requirement of subgame perfection and obtain the equilibrium characterization as stated in Proposition 1 and graphically summarized in Figure 2.

Proposition 1 [Equilibria with perfect information]

(i) For $\theta < 0$, the unique subgame perfect equilibrium is characterized by $a_i = 1$ for all $i \in I$ and $h = 1$. All investors evade taxes and the haven country offers concealment services.

(ii) For $\theta > s$, the unique subgame perfect equilibrium is characterized by $a_i = 0$ for all $i \in I$ and $h = 0$. All investors refrain from tax evasion and the haven country does not offer concealment services.

(iii) For $0 \leq \theta \leq s$, both $(a_i = 0 \text{ for all } i \in I \text{ and } h = 0)$ and $(a_i = 1 \text{ for all } i \in I \text{ and } h = 1)$ are subgame perfect equilibria. Further, there are equilibria in mixed strategies.

Proof. Consider (i): If $\theta < 0$, then $as - \theta > 0$ for all possible $a \in [0, 1]$. This makes $h = 1$ a dominant choice for the haven country, independent of the investors' behavior.

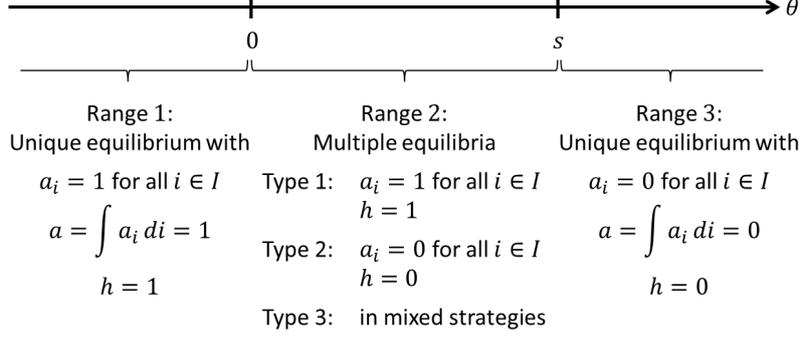


Figure 2: Equilibrium characterization in the fight against tax havens with perfect information.

Anticipating that the haven country will offer concealment services, the investors' unique optimal choice in stage 1 is to shift their capital to H .

Consider (ii): If $\theta > s$, then $as - \theta < 0$ for all possible $a \in [0, 1]$. This makes $h = 0$ a dominant choice for the haven country, independent of the investors' behavior. Anticipating that the haven country will not offer concealment services, the investors' unique optimal choice in stage 1 is to keep their capital in R and pay taxes there.

Consider (iii), when $0 \leq \theta \leq s$. In stage 2, the haven country knows the amount of attracted capital a . So its optimal choice in stage 2 is $h = 1$ if $a > \theta/s$, and $h = 0$ if $a < \theta/s$. For $a = \theta/s$, H is just indifferent and any pure action or randomization thereof gives H the same payoff. In stage 1, investors choose where to locate their capital depending on their expectations about h in stage 2, which, given the optimal reply by H , depends on the aggregate outcome of the co-investors' actions $a = \int a_j dj$. As there is a continuum of investors, an individual investor i 's choice a_i does not significantly affect the aggregate outcome a . If all investors expect that $a \geq \theta/s$, leading to $h = 1$, then their optimal choices are $a_i = 1$ for all $i \in I$. These actions result in $a = 1$ and $h = 1$, confirming the investors' expectations. This establishes that $(a_i = 1$ for all $i \in I$ and $h = 1)$ is a subgame perfect equilibrium. If all investors expect that $a \leq \theta/s$, leading to $h = 0$, then their optimal choices are $a_i = 0$ for all $i \in I$. These actions result in $a = 0$ and $h = 0$, confirming the investors' expectations. This establishes that $(a_i = 0$ for all $i \in I$ and $h = 0)$ is a subgame perfect equilibrium.

We return now to the case $a = \theta/s$. If this equality holds, the haven country is just indifferent and any pure action or randomization thereof gives H the same payoff. This allows for the further equilibria in the range $\theta \in [0, s]$. Let $\Pr(h = 1 | a = \theta/s)$ denote the probability that H will choose $h = 1$ when being indifferent. For $0 < \theta < s$, $a = \theta/s$ implies that only a fraction of investors will shift their capital to H . For that to be optimal, the investors need to be indifferent between $a_i = 0$ and $a_i = 1$. This indifference holds if $\Pr(h = 1 | a = \theta/s) = p$, where p is the solution to the investors' indifference condition

$$p(1 - s) + (1 - p)(1 - t)(1 - z) = (1 - t). \quad (4)$$

There are many combinations of investors' choices that result in an aggregate investment of $a = \theta/s$ in H .¹⁴ Any of these, together with $\Pr(h = 1 | a = \theta/s) = p$ constitutes a subgame perfect equilibrium in mixed strategies.

Finally, consider the borders of the interval $[0, s]$. For $\theta = s$, $a = \theta/s$ requires that all investors, except for a set of measure zero, move their capital to H . This is optimal for them if H randomizes with some probability $\Pr(h = 1 | a = \theta/s) \in [p, 1]$. Similarly, for $\theta = 0$, $a = \theta/s$ requires that all investors, except for a set of measure zero, keep their capital in R . This is optimal for them if H randomizes with some probability $\Pr(h = 1 | a = \theta/s) \in [0, p]$. ■

For the range $\theta \in [0, s]$, Proposition 1 identifies the decisive role of investors' expectations for the actual equilibrium outcome. This range is particularly interesting because it is likely to be the empirically relevant case, in which sufficient international pressure renders the tax haven business costly and yet some haven countries still choose to provide concealment services. If investors believe that the haven country will agree to an information exchange, they prefer to stay away from tax evasion and keep their capital in their country of residence, depleting the revenue pool for the haven country. In response, the haven country will choose to avoid the international pressure and not provide concealment services. If instead investors believe that the haven country will provide effective protection against inquiries from the domestic tax authorities, they prefer to evade taxes and move their capital to the haven country. This makes the concealment business profitable and the haven country will then choose to entertain a secrecy regime. We find that the haven country's decision to operate a secrecy regime and the investors' decisions to shift capital therein are strategic complements. As the investors move first, their beliefs about the haven country's choice establish an investment behavior that makes the country act in line with their expectations. Therefore several sets of mutually consistent investors' beliefs exist, and these beliefs then determine whether the haven country will operate as an active tax haven or will enter into information exchange.

Moreover, this mechanism of self-enforcing beliefs also creates strategic complementarity among the group of individual investors. When deciding whether to shift capital to H , each investor individually assesses the likelihood of a maintained secrecy regime. As we show above, this probability depends among other things on the amount of capital deposited in the tax haven, and hence, on the actions of the other investors. If an individual investor expects a large share of the other investors to locate their capital in H , the individual investor can be confident of the haven country offering concealment services and will consider it profitable to shift the capital to the haven country, too. Inversely, if an individual investor believes that no or only few other investors will move their capital to H , the haven country is likely not to provide concealment services and the individual investor is better off not trying to hide capital therein either. So there is a coordina-

¹⁴For instance, there is one equilibrium in which all investors play the same mixed strategy, in which each investor shifts capital to H with probability θ/s . Other equilibria contain all investors playing a pure strategy, which differs across investors. Again, other equilibria have some investors playing pure strategies and other investors playing mixed strategies.

tion problem among many individual investors, in which the investors' beliefs, the beliefs about the other investors' beliefs, and even higher order beliefs affect the outcome and determine whether the haven country will operate as a tax haven or not.

The coordination game among investors and the self-fulfilling nature of beliefs may explain why some haven countries are very successful in attracting large amounts of investment, and why investors keep their trust and capital in these countries; or why other haven countries fail in the attempt to attract large sources of international investment, and why investors neither invest nor trust in those countries.

Intuitively, we expect that the beliefs of investors are driven by the fundamentals of a haven country, such as institutional aspects, a country's track record of its secrecy regime with a long-standing tradition, and norms and values that are anchored in the society of the haven country.¹⁵ However, except for extreme values with $\theta < 0$ or $\theta > s$, Proposition 1 comes with little predictive power. An optimistic interpretation suggests that even very little pressure, in terms of a small but positive θ , may be enough to destroy the tax haven business model. But in fact we cannot even conclude that increased international pressure will make it more likely that a haven country will adopt an information exchange regime. Given that there is a wide range of cost parameters for which multiple equilibria exist, it is compatible with Proposition 1 that some $\theta_1 \in [0, s]$ leads to an information exchange and no tax evasion while some other $\theta_2 \in [0, s]$ may lead to tax evasion and the supply of concealment services, even if $\theta_2 > \theta_1$.

The indeterminacy is caused by the particularly simple information structure considered so far. Perfect information and in particular common knowledge about the operating cost θ allows the players' equilibrium beliefs and actions to be perfectly aligned contingent on the level of θ that is known to prevail. While this approach underlines the importance of investors', first and higher order, expectations for the haven country's concealment policy, the set of beliefs that prevails is in the end determined exogenously, pointing to factors outside the model. In a more realistic setup, investors face some uncertainty about the true operating cost of a tax haven and even greater uncertainty about the beliefs and choices of their co-investors. Including some small amounts of uncertainty in our framework allows us to deal with the investors' beliefs endogenously, and yields a unique equilibrium prediction that depends on the parameters of the model. This setup is commonly referred to as a *global game*, which was initiated by Carlsson and van Damme (1993) and Morris and Shin (1998), and is reviewed, for example, in Morris and Shin (2003).¹⁶

¹⁵For empirical analyses on the characteristics that make countries likely to operate as tax havens, see Dharmapala and Hines (2009) and Slemrod (2008). Some of the driving factors are also mentioned in Section 2.

¹⁶The *global game* approach has already been applied to many different environments with a coordination problem, and it can be considered a standard tool in the coordination literature. Applications include studies on currency crises, debt pricing, bank runs, political revolutions, and the adoption of new network technologies. See, e.g., Morris and Shin (2003, pp. 71-77) for a review of the most common applications. The approach has been broadened in many directions, for example, to allow for heterogeneous agents, by Corsetti et al. (2004) and Sakovics and Steiner (2012).

4 Small amounts of uncertainty

Not all aspects that determine the true cost θ are publicly observable. One interpretation is that investors can perfectly observe international initiatives against tax havens, but have slightly different interpretations as to how they translate into costs for the haven country. Another interpretation is that the costs associated with the initiatives may be publicly observable, but the decision about the concealment policy is made by political actors such as country leaders, the group of people in government, or members of a parliament in the haven country. These decision makers may emotionally cope differently with international pressure, or differ in their own personal convictions. Their psychic cost and benefit enters into the true cost θ and must be assessed by the investors, based on the information they receive.¹⁷ A more realistic framework therefore assumes that each single investor receives pieces of information, but does not learn the precise value of the haven country decision maker's actual cost θ . An investor's perceived cost level is close to the true θ and is therefore correlated with the co-investors' beliefs, but the actual value of θ is no longer common knowledge.

In this line of reasoning, we assume that each investor receives an individual and private signal $x_i = \theta + \sigma\varepsilon_i$, where $\sigma \in (0, 1]$ is a scaling parameter and ε_i is a random draw from some noise distribution with support on the interval $[-\frac{1}{2}, \frac{1}{2}]$ and a continuous cumulative distribution function $F(\cdot)$.¹⁸ We indicate random variables with a tilde, and require $\tilde{\varepsilon}_i$ to be identically and independently distributed across investors and to be independent of the true operating cost θ . Investors have no prior information about the true cost and learn about θ only through their private signals. So we assume that θ is the realization of a random variable $\tilde{\theta}$ that is uniformly distributed over $[\underline{\theta}, \bar{\theta}]$, where $\underline{\theta} < -\sigma$ and $\bar{\theta} > s + \sigma$.¹⁹ We discuss the importance and validity of the assumption on the allowed parameter range below. Then, except for signals close to the boundaries $\underline{\theta}$ and $\bar{\theta}$, an investor with signal x_i forms the belief that $\tilde{\theta}$ is distributed as $x_i - \sigma\tilde{\varepsilon}_i$, and for a given θ an investor's signal \tilde{x}_i is distributed according to $F(\frac{x_i - \theta}{\sigma})$. Everything apart from the true underlying θ and the actual values of the other investors' signals remains common knowledge.

Nature determines the true value of θ , but this value is known only to the haven country. The investors' strategies must be based on their signals about θ and their expectations about the other investors' signals and choices, rather than specifying an action for the cost level that is commonly known to prevail. For reasons of clarity and

¹⁷A similar reason for imperfect information in the context of international bargaining that draws on the mental constitution and the potential psychic elements of cost and benefit in the minds of political decision makers is applied in Konrad and Thum (2014).

¹⁸Note that we will solve for the equilibrium of the game for any level of $\sigma \in (0, 1]$ including very small but positive values of σ .

¹⁹A uniform prior probability distribution can be seen as a limiting case when the individual signals become very precise compared to any prior information about θ . For a discussion on how this assumption can be significantly weakened, see Morris and Shin (2003, pp. 77-86). They show that any well-behaved prior distribution becomes approximately uniform as $\sigma \rightarrow 0$. Hence, for a small σ , our setting approximates one with a non-uniform prior.

brevity, we restrict our attention to situations in which all investors follow a cut-off strategy and on symmetric equilibria. A cut-off strategy for an investor i is described by a cut-off value x of the investor's signal x_i such that i chooses $a_i = 1$ if this investor's signal is $x_i \leq x$, and $a_i = 0$ otherwise. The assumption can be weakened and the uniqueness result can be generalized using standard reasoning.²⁰ Further, to avoid technical complications that arise if a player's optimal choice is on the boundary of an open set, we impose tie-breaking rules as follows. If indifferent, the haven country provides concealment services, and an investor who is indifferent shifts the capital to H .²¹ Proposition 2 describes the perfect Bayesian Nash equilibrium of the game.

Proposition 2 [Imperfect information] *The game has a unique perfect Bayesian Nash equilibrium. In it the haven country provides concealment services ($h = 1$) if and only if*

$$\theta \leq \theta^E(s, t, z) = s \frac{t - s}{t + (1 - t)z - s}, \quad (5)$$

and each investor shifts the capital to the haven country ($a_i = 1$ for all $i \in I$) if and only if

$$x_i \leq x^E(s, t, z, \sigma) = s \frac{t - s}{t + (1 - t)z - s} + \sigma F^{-1} \left(\frac{t - s}{t + (1 - t)z - s} \right). \quad (6)$$

Proof. When deciding on its concealment policy, the haven country H is perfectly informed about where investors have located their capital and knows its true operating cost θ . So H chooses $h = 1$ if $as \geq \theta$, and $h = 0$ if $as < \theta$. This fully describes the sequentially rational outcome in stage 2 of the game.

We now show that there is a unique cut-off value $x = x^E$ such that, if all other investors $j \in I$ follow the cut-off strategy characterized by x^E , it is optimal for every individual investor i to also follow this strategy. An investor's individual choice does not affect a significantly. The amount of capital a in the haven country is fully determined by the decisions of all other investors and is a function of their common cut-off strategy x and, indirectly, the true cost θ by affecting the investors' signals. Because the error terms $\tilde{\varepsilon}_i$ are identically and independently distributed and because there is a continuum of investors, the share of investors who move their capital to H is equal to the probability of any single investor $j \in I$ observing a signal $\tilde{x}_j \leq x$. Given θ , this probability is $\Pr(\tilde{x}_j \leq x \mid \theta) = F\left(\frac{x - \theta}{\sigma}\right)$. So we can write

$$a(x, \theta) = F\left(\frac{x - \theta}{\sigma}\right), \quad (7)$$

which is continuous in both arguments and non-increasing in θ . Figure 3 illustrates the aggregate investment a flowing to the haven country as a function of θ for three different levels of x .

²⁰There is a standard proof in the literature showing that the derived equilibrium is the only one in the entire strategy space to survive the iterated elimination of strictly dominated strategies. For example, see Morris and Shin (2003, pp. 64-67).

²¹In the literature on global games, the equilibrium is sometimes described as being essentially unique because players are indifferent at their cut-off value, where any action can be rationalized. Note, however, that this situation occurs with zero probability mass.

Applying $a(x, \theta)$, we can rewrite the haven country's choice in stage 2 for any θ as a function of x . For a given cut-off strategy with x being chosen by a mass of investors of size 1, the haven country is indifferent with respect to $h \in \{0, 1\}$ if the true value of θ is $\theta^*(x)$, defined by

$$\theta^*(x) = sF\left(\frac{x - \theta^*(x)}{\sigma}\right). \quad (8)$$

It offers concealment services for all $\theta \leq \theta^*(x)$, and does not offer concealment services for $\theta > \theta^*(x)$. Note that θ^* as in (8) is continuous in x , equal to 0 for $x \leq -\frac{1}{2}\sigma$, equal to s for $x \geq s + \frac{1}{2}\sigma$, and strictly increasing in x with a slope of

$$\frac{d\theta^*(x)}{dx} = \frac{sF'\left(\frac{x - \theta^*(x)}{\sigma}\right)}{\sigma + sF'\left(\frac{x - \theta^*(x)}{\sigma}\right)} < 1$$

for $x \in (-\frac{1}{2}\sigma, s + \frac{1}{2}\sigma)$.

Now, consider an individual investor i . Given the observed signal x_i and the cut-off strategy x of all other investors, i anticipates that H will provide concealment services if and only if $\tilde{\theta} \leq \theta^*(x)$, and assesses the likelihood of such an event to be

$$p(x_i, x) = \Pr\left(\tilde{\theta} \leq \theta^*(x) \mid x_i\right) = 1 - F\left(\frac{x_i - \theta^*(x)}{\sigma}\right). \quad (9)$$

The investor i does not move the capital to H if $p(x_i, x) < p$, and moves the capital to H if $p(x_i, x) \geq p$, where p is the solution to the investors' indifference condition

$$p = \frac{(1-t)z}{t + (1-t)z - s}, \quad (10)$$

also given in (4). The subjective probability $p(x_i, x)$, that i assigns to the outcome with a sustained tax haven business, is equal to 1 for $x_i \leq \theta^*(x) - \frac{1}{2}\sigma$, equal to 0 for $x_i \geq \theta^*(x) + \frac{1}{2}\sigma$, and strictly decreasing in x_i for $x_i \in (\theta^*(x) - \frac{1}{2}\sigma, \theta^*(x) + \frac{1}{2}\sigma)$. So for a given cut-off strategy x played by all other investors, i 's best response is to also follow a cut-off strategy around some x^* . Equating (9) with (10) and subsequently solving for x_i gives us i 's optimal cut-off value as a function of the other investors' strategy x

$$x^*(x) = \theta^*(x) + \sigma F^{-1}\left(\frac{t-s}{t + (1-t)z - s}\right). \quad (11)$$

Any equilibrium requires $x^* = x$. For all aggregate cut-off values $x \leq -\frac{1}{2}\sigma$, $x^*(x) = \sigma F^{-1}\left(\frac{t-s}{t + (1-t)z - s}\right) > -\frac{1}{2}\sigma$. Similarly for all $x \geq s + \frac{1}{2}\sigma$, $x^*(x) = s + \sigma F^{-1}\left(\frac{t-s}{t + (1-t)z - s}\right) < s + \frac{1}{2}\sigma$. In the intermediary range $x \in (-\frac{1}{2}\sigma, s + \frac{1}{2}\sigma)$, $x^*(x)$ is monotonically increasing with a slope of $\frac{dx^*}{dx} = \frac{d\theta^*(x)}{dx} < 1$. Therefore, there is one and only one intersection of $x^*(x)$ with the locus $x^* = x$. This solution defines $x = x^* \equiv x^E$, the unique symmetric equilibrium in cut-off strategies.

Finally, it remains to derive the equilibrium cut-off levels x^E and θ^E as stated in Proposition 2. Evaluating (11) at x^E gives $x^E = \theta^*(x^E) + \sigma F^{-1}\left(\frac{t-s}{t + (1-t)z - s}\right)$. Substituting it into (8), also evaluated at x^E , yields $\theta^E \equiv \theta^*(x^E) = s \frac{t-s}{t + (1-t)z - s}$. ■

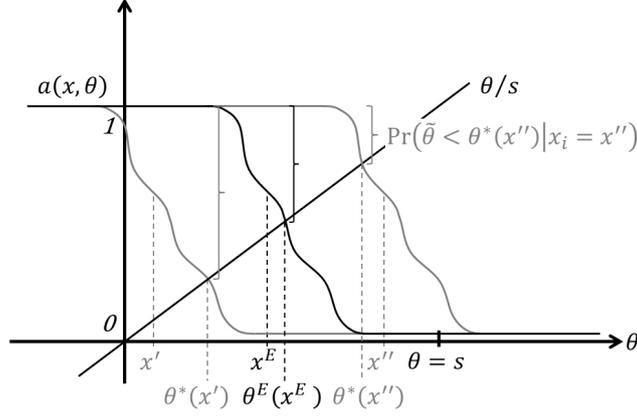


Figure 3: Amount of capital in the haven country for different values of x plotted against the necessary aggregate investment for the tax haven to break even.

To derive the equilibrium intuitively, assume all investors coordinate to switch around some cut-off signal x . An investor who then receives this critical signal $x_i = x$ believes that all other investors with a smaller signal $x_i \leq x$ will shift their capital to H and that the investors with a larger signal $x_i > x$ will keep their capital in R . Except for small boundary regions close to $\underline{\theta}$ and $\bar{\theta}$, the critical investor has no other information than the individually observed signal and expects the other investors' signals to be similarly distributed around the own signal for all possible coordination levels of x . That is, regardless of whether investors coordinate on a high or low level of x , an investor who then observes the cut-off signal x always expects the same amount of capital in H . On the other hand, the necessary aggregate investment for the haven country to break even and hence to offer concealment services is increasing in θ . So the probability that the critical investor assigns to the outcome with a maintained secrecy regime is decreasing in the coordination level x . As the investors' payoffs in the respective outcomes remain constant, there is a unique coordination level of x for which the critical investor is indifferent and for which a uniformly applied cut-off strategy around this signal is indeed rational. This value of x defines the investors' equilibrium switching signal, which in turn also implies the equilibrium switching point of the haven country.

Figure 3 shows the aggregate investment $a(x, \theta)$ in the haven country as a function of θ for three different coordination levels - x' , x'' , and x^E . The required amount of investment for the haven country to break even is depicted by the function $\frac{\theta}{s}$. Given some coordination level x , the intersection of the amount of capital in H and the required investment to break even defines the best response switching point for the haven country. Then the probability that the critical investor assigns to the outcome with concealment services being provided is just one minus the aggregate investment in H at the point $\theta = \theta^*(x)$, illustrated by the curly brackets in the figure. One can see that the perceived probability of sustained tax haven activities by the critical investor is decreasing in the coordination level x .

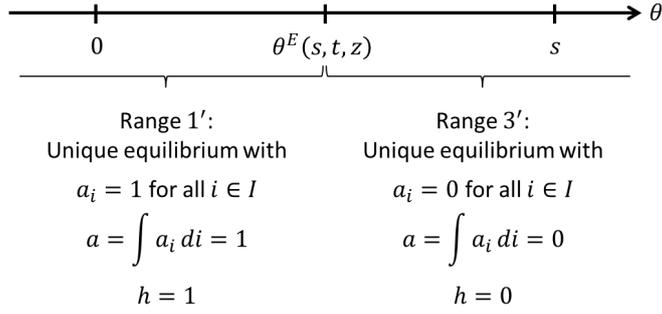


Figure 4: Equilibrium characterization in the fight against tax havens with imperfect information.

Proposition 2 does not make an equilibrium selection argument based on axiomatic considerations. The equilibrium in Proposition 2 is derived from plausible assumptions on the available information to investors. To arrive at this unique equilibrium, we required very few additional assumptions. One of these is that the support of the prior probability distribution of θ covers a sufficiently wide range. In particular, investors must have a dominant action to move their capital to H for very low levels of θ , and to keep their capital in R for very large levels of θ . Still it seems plausible that investors perceive tax evasion as being risky and consider such levels of costs occurring to the haven country from the international pressure possible.

Proposition 2 provides a clear-cut equilibrium prediction for the outcome of the fight against tax havens depending on the haven country's operating cost θ . It identifies an endogenous cost threshold below which the equilibrium predicts an effective secrecy regime, and above which the equilibrium contains an information exchange regime. Yet, an investor's decision to shift capital to H need not be perfectly aligned with the haven country's decision to operate as a tax haven for two reasons. Both depend on the degree of uncertainty σ and the shape of the noise distribution F . First, an investor can observe a signal that is too far away from the true operating cost θ . Second, the investors' optimal switching signal x^E may differ slightly from the haven country's equilibrium switching point θ^E . As the amount of uncertainty becomes very small, i.e., $\sigma \rightarrow 0$, both sources of miscoordination disappear and $x^E \rightarrow \theta^E$.²² To simplify interpretations and enhance the tractability of subsequent calculations, we assume this limiting case from here on for the remainder of the paper. We will point out when the assumption becomes important and discuss how the results would change for a larger σ . The limiting case is illustrated in Figure 4.

A notable property of our equilibrium is that, for levels of international pressure resulting in $\theta \in (\theta^E, s)$, the haven country agrees to an information exchange even though an active tax haven business would yield higher returns for both, the haven country and

²²Remember that we have solved for the equilibrium of the game for any level of $\sigma \in (0, 1]$ including very small but positive values of σ . For a discussion on the difference between perfect information and very small amounts of uncertainty, see e.g., Carlsson and van Damme (1993, pp. 1008ff).

its investors. Even if an individual investor is certain that there exists a payoff dominant outcome, this is not such common knowledge that investors could coordinate on moving their capital to H . In fact, in the unique equilibrium for such levels of θ , investors consider the supply of concealment services to be too risky and prefer to locate their capital in R , depleting the revenue pool of the potential tax haven.

With the clear-cut equilibrium prediction at hand, we are now able to study the impact of the exogenous variables on the equilibrium outcome.

5 Policy implications

Proposition 2 identifies an endogenous cut-off point θ^E that partitions the interval of possible operating cost levels into two subsets, for each of which the equilibrium specifies an unambiguous outcome prediction. Moreover, this threshold level $\theta^E(s, t, z)$ is a function of the parameters s , t , and z . It thereby carries further implications about how a change in one of these parameters affects the equilibrium outcome. For our analysis we considered these variables as exogenous. However, we can ask what a change in these parameters implies for the equilibrium interaction between the haven country and the investors.

One may argue that all variables such as s , t , z , and θ along with a and h are endogenous choice variables and strategically interdependent. However, decisions on s , t , and z are predominantly influenced by many factors. These include a country's attitude toward redistribution, its need or opportunities for publicly provided goods, its ability to generate tax revenue, and its exposure to international tax competition. Also general value judgments and attitudes may play a role. Similarly, the size of θ may be strongly influenced by institutional and technological factors. In a static setup as we consider it, this translates into a comparative static analysis in which the variables are predetermined and fixed at the stage when the haven country and the investors interact. A comparative static analysis is different from considering an extended game in which the OECD or its countries are players in a game theoretic sense, or in which the fees set by the haven country become part of the strategy choices.

5.1 The residence country's tax code

The tax rate t and the detection and/or compliance cost z are specified in the tax code of the residence country that can be seen as representative of the OECD high-tax countries. As argued in the introduction, offshore tax evasion is quantitatively important and should therefore matter in the design of a high-tax country's tax system.²³ Our model relates the residence country's level of taxation and the degree of penalty for disclosed tax evasion to the amount of international pressure that a haven country can resist and still operate as a tax haven. We can ask what would be the tax rate t and the detection/compliance cost

²³Zucman (2013) estimates that 8 percent of the private financial wealth is held through tax havens, most of which is believed to escape taxation.

z that maximize the probability of success for the attempt to make the haven country compliant. Corollary 1 describes the impact of t and z on the haven country's ability to withstand costly pressure.²⁴

Corollary 1 *The required amount of international pressure to make the haven country adopt an information exchange is higher for a higher t , and lower for a higher z .*

Proof. The operating cost θ of a tax haven is higher if the level of international pressure is higher. Hence, everything else being constant, a higher equilibrium switching point θ^E requires a larger amount of international pressure to induce the haven country to share information. Now, observe that the function $\theta^E(s, t, z)$ is increasing in t

$$\frac{\partial \theta^E(t, \cdot)}{\partial t} = s \frac{z(1-s)}{[(1-z)t + z - s]^2} > 0 \quad (12)$$

and decreasing in z

$$\frac{\partial \theta^E(z, \cdot)}{\partial z} = -s \frac{(1-t)(t-s)}{[(1-t)z + t - s]^2} < 0. \quad (13)$$

■

Intuitively, a high level of taxation or weak penalties increase the relative payoff from tax evasion. Investors will therefore shift their capital to H , even if they expect only a moderate probability of sustained tax haven activities. That is, they will locate their capital in H owing to a wide range of signals, and the critical switching signal that makes an investor just indifferent must indicate a large amount of international pressure. As the decisions of the investors and the haven country are strategic complements, the haven country will in response provide concealment services for a wide range of operating cost levels, including large values of θ . In equilibrium the strong payoff incentive for investors to shift capital to H is balanced with a small perceived probability by the critical investor that the haven country will behave as a tax haven.

Our results suggest that the chances for an agreement on an information exchange with the haven country and no offshore tax evasion are better if the high-tax country has a low level of taxation and strong penalties for disclosed tax evasion. This reveals an inherent trade-off between the fight against tax havens and high tax rates, for instance, in the course of an international tax harmonization. In cases with an overly excessive tax competition that is considered harmful, harmonizing tax rates is a popular countermeasure to maintain or possibly increase the level of taxation, and is often mentioned as a joint objective together with a crackdown on tax havens. However, Corollary 1 suggests

²⁴Strictly speaking, a high-tax country cares about the amount of evaded tax revenue, which is determined by the cut-off point in the investors' strategy rather than the haven country's switching point. As shown in Proposition 2, they may differ slightly from each other for significant levels of uncertainty. Yet, the effects of the tax rate and the detection/compliance cost on the switching signal x^E are qualitatively the same and are even slightly stronger than the effects on θ^E , with the exact magnitude depending on the shape of F .

that a high tax rate renders the haven country robust against international pressure and thereby deteriorates the success prospects of the initiatives against tax havens.

Also, in order to encourage the repatriation of offshore capital, several countries apply special arrangements with reduced fines for tax evaders who self-report on their undeclared offshore wealth. We find that such arrangements not merely encourage tax evasion on a personal level but also contribute to the resistance of haven countries against international pressure.

5.2 The pricing of tax haven services

Similarly we can consider the impact of the service fee s on the haven country's concealment policy in the equilibrium. As tax havens typically attract large amounts of capital relative to the size of their own economy and population, earnings from or taxes on the haven industry account for a major share of their public revenues.²⁵ Corollary 2 characterizes the relation between the service fee and the haven country's ability to entertain a secrecy regime despite the international initiatives. Notably, a high service fee is not always accompanied by a high resistance capability. Rather, the haven country can withstand larger amounts of international pressure if the service fee is at an intermediate level.

Corollary 2 *The service fee that maximizes the haven country's ability to resist international pressure is*

$$\underline{s} = [t + (1 - t)z] - \sqrt{(1 - t)z[t + (1 - t)z]}. \quad (14)$$

Proof. Remember that the operating cost θ of a tax haven is higher if the level of international pressure is higher. Hence, everything else being constant, the level of s that maximizes H 's ability to resist costly pressure is given by the value of s that maximizes the equilibrium switching point θ^E . Note that $\theta^E(\cdot)$ is a concave function of s as $\frac{\partial^2 \theta^E(s, \cdot)}{\partial s^2} < 0$. So the service fee that maximizes H 's resistance capability is \underline{s} , which is defined by $\left. \frac{\partial \theta^E(s, \cdot)}{\partial s} \right|_{s=\underline{s}} = 0$ and is stated in Corollary 2.

Finally, it can be shown that \underline{s} satisfies $\underline{s} \in (0, t)$. Assume to the contrary that $\underline{s} < 0$. Inserting the expression from (14) and rearranging yields $t < 0$, which violates $t \in (0, 1)$. The same reasoning holds true for $\underline{s} > t$. ■

For a very small service fee, the haven country will exchange information already under small amounts of international pressure because, even if all investors shift their capital therein, the return on supplying concealment services is simply very low. For a very large service fee close to the residence country's tax rate, the haven country won't operate as tax haven for low values of θ either because it can barely attract a revenue pool. Even if it provides concealment services, investors benefit little from them. Investors will

²⁵A comparison of the size of tax havens and the amount of international investment that they attract can be found in Hines (2010, pp.105-111).

therefore locate their capital in H only if they can expect the haven country to maintain a secrecy regime with a high probability, that is, if their signals indicate very small costs for the haven country from the international pressure. Taking both effects together, the service fee that maximizes the tax haven's resistance capability must lie between the two extremes.

Note that the service fee \underline{s} also characterizes the highest equilibrium switching point $\theta^E(\underline{s}, t, z)$ that can emerge in the perfect Bayesian Nash equilibrium. This switching point in turn also implies the maximum amount of international pressure that a haven country can withstand and still provide concealment services.

Corollary 2 provides insights into the pricing of tax haven services. They may contribute to the explanation why tax havens typically yield large profits despite being active in a competitive, global financial market. It is those profits that render haven countries robust against international initiatives and make them trustworthy for tax evading investors. Competition between multiple tax havens may of course exert downward pressure on a haven country's optimal service fee, but it is unlikely to drive equilibrium prices down to zero. As we have shown, a very small service fee makes the haven country prone to adapt an information exchange regime and hence of little attraction to tax evaders.

6 Concluding remarks

Our model provides insights into why and when haven countries choose to operate a secrecy regime, and when they decide to share information with other, non-haven countries. We identify a key factor driving their decisions, a many player coordination game between the haven country and its potential investors. This can explain why some haven countries are successful in attracting large sources of international investment and are robust toward international initiatives, and why other countries are not. Applying a standard equilibrium selection approach from the literature on coordination games, we derive an endogenous operating cost threshold above which a haven country agrees to an information exchange for tax purposes. Notably, this critical cost level falls below the potential revenues that a country could realize with an active tax haven business. Furthermore, this cost threshold depends on exogenous parameters only, which allows us to pin down the parameters that influence the equilibrium outcome and to derive policy implications.

First, we find an inherent trade-off between the fight against tax havens and high tax rates, for example, in the course of an international tax harmonization. Second, low penalties for disclosed offshore tax evasion not only makes it attractive for private investors to evade taxes, but also render haven countries resistant toward costly pressure. Third, we give insights into the pricing of tax haven services and explain why the empirically observable large returns on providing concealment services are not competed away despite a competitive, international financial market and the presence of multiple tax havens. Large profits make haven countries robust toward international initiatives and therefore trustworthy for investors.

References

- [1] Boston Consulting Group (BCG), 2009. Global wealth report: Delivering on the client promise. http://www.bcg.com.cn/export/sites/default/en/files/publications/reports_pdf/BCG_Global_Wealth_Sep_2009_tcm42-28793x1x.pdf, accessed December 10, 2014.
- [2] Boston Consulting Group (BCG), 2014. Global wealth report: Riding a wave of growth. http://www.bcg.com.cn/export/sites/default/en/files/publications/reports_pdf/BCG_Riding_a_Wave_of_Growth_Jun_2014.pdf, accessed December 10, 2014.
- [3] Bilicka, K., Fuest, C., 2014. With which countries do tax havens share information? *International Tax and Public Finance* 21(2), 175-197.
- [4] Bucovetsky, S., 2014. Honor among tax havens. *Journal of Public Economics* 110, 74-81.
- [5] Carlsson, H., van Damme, E., 1993. Global games and equilibrium selection. *Econometrica* 61(5), 989-1018.
- [6] Corsetti, G., Dasgupta, A., Morris, S., Shin, H.S., 2004. Does one Soros make a difference? A theory of currency crises with large and small traders. *Review of Economic Studies* 71(1), 87-113.
- [7] Desai, M.A., Foley, C.F., Hines Jr., J.R., 2006a. Do tax havens divert economic activity? *Economics Letters* 90(2), 219-224.
- [8] Desai, M.A., Foley, C.F., Hines Jr., J.R., 2006b. The demand for tax haven operations. *Journal of Public Economics* 90(3), 513-531.
- [9] Dharmapala, D., 2008. What problems and opportunities are created by tax havens? *Oxford Review of Economic Policy* 24(4), 661-679.
- [10] Dharmapala, D., Hines Jr., J.R., 2009. Which countries become tax havens? *Journal of Public Economics* 93(9-10), 1058-1068.
- [11] Elsayyad, M., 2012. Bargaining over tax information exchange. *Max Planck Institute for Tax Law and Public Finance Working Paper* No. 2012-02.
- [12] Elsayyad, M., Konrad, K.A., 2012. Fighting multiple tax havens. *Journal of International Economics* 86(2), 295-305.
- [13] The Group of 20 (G20), 2009. London summit communiqué: Global plan for recovery and reform. http://www.g20ys.org/upload/files/London_1.pdf, accessed December 10, 2014.

- [14] Hemmelgarn, T., Nicodème, G., 2009. Tax co-ordination in Europe: Assessing the first years of the EU-savings taxation directive. *CESifo Working Paper* No. 2675.
- [15] Hines Jr., J.R., 2010. Treasure islands. *Journal of Economic Perspectives* 24(4), 103-125.
- [16] Hong, Q., Smart, M., 2010. In praise of tax havens: International tax planning and foreign direct investment. *European Economic Review* 54(1), 82–95.
- [17] Johannesen, N., 2010. Imperfect tax competition for profits, asymmetric equilibrium and beneficial tax havens. *Journal of International Economics* 81(2), 253–264.
- [18] Johannesen, N., 2014. Tax evasion and Swiss bank deposits. *Journal of Public Economics* 111, 46-62.
- [19] Johannesen, N., Zucman, G., 2014. The end of bank secrecy? An evaluation of the G20 tax haven crackdown. *American Economic Journal: Economic Policy* 6(1), 65-91.
- [20] Keen, M., 2001. Preferential regimes can make tax competition less harmful. *National Tax Journal* 54(4), 757-762.
- [21] Keen, M., Konrad, K.A., 2013. The theory of international tax competition and co-ordination, in: Auerbach, A.J., Chetty, R., Feldstein, M., Saez, E. (Eds.), *Handbook of Public Economics*, Vol. 5. Elsevier, Amsterdam, 257-328.
- [22] Klautke, T., Weichenrieder, A.J., 2010. Interest income tax evasion, the EU savings directive and capital market effects. *Fiscal Studies* 31(1), 151-170.
- [23] Konrad, K.A., Thum, M., 2014. Climate policy negotiations with incomplete information. *Economica* 81(322), 244-256.
- [24] Morris, S., Shin, H.S., 1998. Unique equilibrium in a model of self-fulfilling currency attacks. *American Economic Review* 88(3), 587-597.
- [25] Morris, S., Shin, H.S., 2003. Global games: Theory and applications, in: Dewatripont, M., Hansen, L.P., Turnovsky, S.J. (Eds.), *Advances in Economics and Econometrics: Theory and Applications, Eighth World Congress*, Vol. 1. Cambridge University Press, Cambridge, 56-114.
- [26] Organisation for Economic Co-operation and Development (OECD), 1998. Harmful tax competition: An emerging global issue. <http://www.oecd.org/tax/transparency/44430243.pdf>, accessed December 10, 2014.
- [27] Organisation for Economic Co-operation and Development (OECD), 2014. OECD secretary-general report to the G20 leaders. <http://www.oecd.org/tax/transparency/OECD-secretary-general-report-tax-matters-brisbane-november-2014.pdf>, accessed December 10, 2014.

- [28] Palan, R., 2002. Tax havens and the commercialization of state sovereignty. *International Organization* 56(1), 151-176.
- [29] Pieretti, P., Thisse, J.F., Zana, S., 2013. Offshore financial centers: Safe or tax havens. *CREA Discussion Paper* No. 2013-20.
- [30] Sakovics, J., Steiner, J., 2012. Who matters in coordination problems? *American Economic Review* 102(7), 3439-3461.
- [31] Schön, W., 2005. Playing different games? Regulatory competition in tax and company law compared. *Common Market Law Review* 71(1), 242-247.
- [32] Slemrod, J., 2008. Why is Elvis on Burkina Faso postage stamps? Cross-country evidence on the commercialization of state sovereignty. *Journal of Empirical Legal Studies* 5(4), 683-712.
- [33] Slemrod, J., Wilson, J.D., 2009. Tax competition with parasitic tax havens. *Journal of Public Economics* 93(11-12), 1261-1270.
- [34] Zucman, G., 2013. The missing wealth of nations: Are Europe and the US net debtors or creditors? *Quarterly Journal of Economics* 128(3), 1321-1364.