

# Tax evasion and the “Swiss cheese” regulation

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## Abstract

The 2005 Savings Tax Directive is the most far-ranging tax policy initiative to date in the attempt to curb tax evasion of European households in Switzerland. Under this program, tax evaders holding interest-yielding accounts in Switzerland have two choices: they can either report their accounts to the fiscal authorities of their resident countries or they can pay a tax upfront and keep their anonymity. While celebrated as a major breakthrough, my computations show that less than 20% of the European offshore wealth in Switzerland is either taxed or declared under the Directive in 2013. This paper presents an exhaustive analysis of the loopholes in the Directive, shedding light on the strategic behavior of evaders to avoid paying the upfront tax. While they remain fairly low, declarations of offshore wealth under the Directive have more than quadrupled over the period 2006-2013. This paper demonstrates that monetary incentives, such as tax amnesties in the evader’s home country or the increase in the upfront tax in Switzerland, are the first drivers of declarations. Conversely, bilateral information exchange treaties that were praised as a way to “end bank secrecy” have by far the least effect on declarations. The policy implications of these findings are also discussed.

## Acknowledgements

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# 1 Introduction

At a time when budget deficits and sovereign debt rocket, European governments are looking for ways to raise revenues without putting additional fiscal pressure on their citizens. In this context, curbing tax evasion should be an appealing option. However, while policy initiatives such as information exchange treaties, increased control of money flows, or tax amnesties have soared in the last decade, offshore centers have continued flourishing. In Switzerland, the amount of offshore wealth has increased from an estimated \$ 1,877 bn in July 2005 to an estimated \$ 2,415 bn in December 2013<sup>1</sup>, that is an increase of 29%. This paper is motivated by the divergence between the political rhetoric and the reality on “the end of bank secrecy”. Indeed, in the past decade, clamping down on fiscal evasion has been flagged as a priority in the international political agenda. However, acknowledging all the steps that need to be taken is not equivalent to implementing them. Despite empirical evidence on the persistence of offshore center activities, politicians already consider that tax evasion belongs to the past. To take but one example, the French president François Hollande during his visit in Switzerland in May 2015 declared: “the fiscal discord with Switzerland is behind us”.

It would however be fallacious to assert that no step has been taken to end tax evasion. In fact, one of the most far-ranging tax policy initiative in the attempt to drain evaders’ revenues back in the tax base was implemented in Europe starting in 2005 under the name “Savings Tax Directive”. Before this Directive, there was no way for a European country tax administration to tax offshore wealth hidden in Switzerland. Under the Directive, tax evaders holding interest-yielding accounts on their own behalf in a cooperative offshore center such as Switzerland were given two choices: either report their accounts to the fiscal authorities of their resident countries or pay an upfront tax and keep their anonymity. While this policy has been much debated in political circles, little is known about its actual effects since fiscal evasion goes, by definition, undetected.

The paper is first and foremost an attempt at assessing the efficiency of the Directive from different perspectives. The agreement on the Savings Directive has been celebrated as a major breakthrough. Against this background, my computations show that the scope of the Directive remains below 20% of the EU offshore wealth in Switzerland in 2013. In this paper, I track the behavior of two types of agents, tax evaders and Swiss banks, to find patterns in investment strategies that reflect avoidance of the Directive. I find that three distinct characteristics earned the regulation its “Swiss cheese” denomination. Because the tax only applies to interest-yielding accounts held directly by EU customers, the Directive induced a significant switch to dividend-yielding investments as well as the opening of sham corporations. I also

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<sup>1</sup>These numbers were computed using the methodology in Zucman(2013) and the data from the Swiss National Bank. They are computed in current dollars.

find that banks have only been partly compliant in centralizing all interest-revenues taxes and transferring them to the Swiss authorities, at least in the first years of application of the Directive. I finally show that the tax only targeted small declarants, leaving the bulk of very high-net-worth households unaffected. Two datasets were used to gather material on the strategic reaction of evaders. The first one is the Swiss National Bank annual publication on the value of the offshore portfolios in Swiss banks. The second stream of data comes from the Swiss Fiscal Administration, which publishes an annual breakdown of the amount of interests that is taxed under the Directive and the amount that is declared by EU citizens to their home administration.

Analyzing the evolution of declarations of offshore wealth, we observe an increasing trend from 2006 to 2013. While the share of offshore wealth in the scope of the Directive<sup>2</sup> was about 6.6% in 2006, it has gone up to 16.5% by 2013. This increase is mostly due to a rise in declarations. The latter were influenced by several public policies at the same time: the increase in the Savings Directive tax rate from 15% in 2005 to 35% in July 2011 on, the multiplication of tax amnesties in evaders' home countries and the signature of bilateral treaties between Switzerland and some EU countries. The paper offers a simple model that gathers all these public policies in a single payoff function of evasion and explains the mechanisms through which each of these policies can impact declarations of offshore wealth. While the model predicts the sign of the relation between the payoff of evasion and the different policies, the empirical analysis will allow us to assess the magnitude of these coefficients. In this respect, there are broadly two alternatives. Either evaders declare mostly because the recent advances in the fight against tax dodging, notably the signature of bilateral tax treaties, are credible and they fear to be discovered. Or, declarants are mostly motivated by monetary incentives: they decide to declare when the Swiss tax rate exceeds the tax they would pay in their home country, or when a window of opportunity is offered to limit the cost of declaration, for instance during tax amnesties. I gather information on capital tax rates from the International Bureau of Fiscal Documentation annual "European Tax Handbook" publications and tax treaties are documented using the OECD Exchange of Tax Information Portal. Finally, I create a new database on Voluntary Disclosure Programs using OECD qualitative publications on the topic as well as consulting firms' reports. Using this unique combination of datasets, the paper claims that monetary incentives are the first drivers of declarations. Conversely, bilateral information exchange treaties that were praised as a way to "end bank secrecy" have by far the least effect on declarations.

Several previous papers are directly concerned with the assessment of the 2005 European Savings Tax Directive. They can be split into two major categories: empirical and theoretical. On the empirical side, Hemmelgarn and Nicodème (2009) is an early study on the effects of the Directive. Using sectoral

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<sup>2</sup>In other words, the share of offshore that is either taxed or declared under the Directive

account data, Bank for International Settlements deposit data, and European Commission withholding tax revenue data, they conclude that the Savings Directive had no measurable effects on international savings. While this claim may be true if we consider EU as a whole, my paper demonstrates that it certainly is not the case when focusing on offshore centers. Johannesen (2014) shows a decrease in EU-owned bank deposits in Switzerland of about 30-40% in the months following the enforcement of the Directive. He then presents evidence that this decrease was not driven by repatriation but rather by behavioral responses aiming to escape the withholding tax. Examples of such behaviors are the shift of accounts in offshore centers that did not abide by the Directive or the opening of sham corporations through which the Directive would not look, in Panama for instance. Klautke and Weichenreider (2010) exploit a loophole in the Directive, namely the exemption of withholding tax for certain types of bonds. They argue that if working around the Savings Directive is difficult for tax evaders in Europe, then investors should be willing to pay a premium for bonds that are exempt from the withholding tax. However, they observe no such differential return in their data. They conclude that the panel of existing loopholes is large enough to allow tax evaders to continue evasion at negligible additional cost. Finally, Zucman (2015) dedicates a chapter of his book “The hidden wealth of nations” to the “Savings Tax Directive scandal”. He notably explains how the Directive significantly increased the share of European offshore wealth in Switzerland held through sham corporations. While the previous studies targeted a specific failure of the Directive, the paper I present is the first to provide an exhaustive analysis on the extent to which evaders adopted strategic behaviors.

The Directive also inspired theoretical works: Gérard and Granelli (2013) address the question of efficiency regarding regimes of information exchange and coordinated withholding taxation. Taking the U.S. Foreign Account Tax Compliance Act and the European Savings Tax Directive as their benchmark, they conclude that only three tax designs ensure efficiency: a framework of taxation based on the principle of residence, perfect information exchange for all substitutable assets and strategies, and a system of withholding taxation where the residence country can choose the tax rate and receives all the withholding tax revenues from abroad.

This paper also complements the seminal work of Zucman(2013). Indeed, his paper estimates that the total offshore wealth in tax havens amounts to \$ 5.9 tr. at the end of 2008, out of which \$ 2 tr. are in Switzerland. Combining his methodology with my set of data on capital taxes and penalties applied to evaders in 20 European countries allows me to assess the total revenue that the taxation of offshore wealth could yield to these 20 European governments. I find that applying penalties to offshore wealth hidden in Switzerland would amount to \$ 297 bn in 2013, and that it could yield an additional \$ 14 bn in annual tax revenues. Taxing EU hidden wealth worldwide could yield roughly twice these amounts. While these computations are subject to some margin of error, they are an additional step in the understanding of the

magnitude of tax dodging in Europe and its impact on public budgets.

This article also relates to a substantial and conflicting literature on the impact of Voluntary Disclosure programs on tax compliance. Le Borgne (2006) shows that tax amnesties are more likely to be implemented when a state is experiencing a growing budget deficit which implies that amnesties are viewed as means to increase state revenues quickly. However, Alm and Beck (1993), reviewing the experience of the 1985 Colorado amnesty, argue that amnesties have no long run impact on either the level or the trend of tax collections. Alm et al. (1990), using an experimental design, finds that compliance usually decreases after amnesties, but rises if amnesties are combined with tighter enforcement. Focusing on a more recent tax amnesty, Langenmayr (2015) finds evidence in the 2009 U.S. offshore voluntary disclosure program that these mechanisms increase tax evasion. Most empirical papers in the literature on voluntary disclosure programs focus on the United States. This is partly due to data availability as the Federation of Tax Administrators keeps track of most programs since 1982<sup>3</sup>. This paper is the first to analyse the effect of these programs on tax compliance in a European cross-country panel. I find that Voluntary Disclosure programs do have a positive and significant short-run impact on offshore revenue declarations. However, this result is mitigated by the fact that most declarants under these programs are the least wealthy of tax evaders so that the increase in tax revenues is limited, even in the short-run.

Finally, this article fits into a growing literature that focuses on behavioral response of tax evaders, and more broadly high net wealth profiles, to public policies. A related paper is Johannesen and Zucman (2014) where the authors demonstrate that information exchange treaties signed between some offshore centers and other countries did not imply an increase in declaration of offshore wealth, but rather induced shifting of deposits in offshore centers outside the scope of these treaties. Another recent paper, Akcigit et al. (2015), focuses on the mobility of people rather than the mobility of capital and shows that top tax rates have a significant impact on the mobility of a specific subset of wealthy households, namely the superstar inventors.

When addressing the effectiveness of policies to curb tax evasion, studies most often use metrics such as the variation in amounts hidden in offshore centers or in tax revenues (Johannesen and Zucman (2014), Johannesen (2014), Alm and Beck (1993), Langenmayr (2015)). However, little empirical work has been done to understand the underlying motives of evaders to either conceal or declare their offshore revenues. Indeed, if the motivation to evade in the first place is obviously to avoid paying taxes, the reasons to declare once an individual owns an offshore account are less transparent. In particular, the simultaneity of policies to incentivize evaders makes it hard to attribute the rise in declarations to one or the other. This paper sheds light on this specific topic, which is core to future public policy designs.

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<sup>3</sup><http://www.taxadmin.org/fta/rate/amnesty1.pdf>

The paper proceeds as follows: Section 2 presents the tax environment in Switzerland from an historical perspective and explains the emergence of the Savings Directive in this context. Section 3 provides details on the datasets used in the descriptive analysis while Section 4 explores how evaders took advantage of the loopholes in the Directive. The fourth section also describes the evolution of declarations over the 2006-2013 time span, as well as the characteristics of the evaders who end up declaring their accounts. Section 5 models the payoff function from evasion and explains the mechanisms through which public policies can impact this payoff. Then, section 6 explains the empirical strategy that is used to disentangle the effect of public policies on declarations. Finally, section 7 provides the results of the econometric analysis as well as their policy implications.

## **2 The Swiss tax environment: Historical background and current developments**

This section explores the current state of Swiss tax environment. Specifically, the first and third part answer the following question: how can non-Swiss residents escape all forms of capital income taxation by holding securities or deposits in Switzerland? The other two sub-sections describe how a consensus emerged for the adoption of the European Savings Tax Directive and what the main features of this Directive are.

### **2.1 Bank secrecy: an attractive feature for tax evaders**

Following the methodology in Zucman (2013), I find that there are \$ 2,400 bn of offshore wealth in Switzerland at the end of 2013, out of which \$ 1,350 bn are from EU citizens. This represents 5.6% of the net financial wealth of EU households<sup>4</sup>. How can we explain such attractiveness of the Swiss financial center? The answer resides in the 1934 Swiss Federal Act on Banks and Savings Banks. Under this law, privacy is statutorily enforced. In practice, it means that banks will not share their clients' bank account details with any third party, be it foreign governments or even Swiss authorities. Divulgence of information is permitted only in cases of severe criminal acts, such as terrorist activities or money laundering. Importantly, the non-reporting of taxable income is not considered as a criminal act and simple tax evaders are therefore safely out of the reach of their home tax administrations.

In the aftermath of the G20 2009 crackdown on tax evasion, Switzerland signed 12 new exchange of information treaties, updated previous conventions and announced in March 2009 that the distinction between tax fraud and tax evasion would be suppressed for foreign clients. Therefore, all countries with which Switzerland has signed a tax treaty can theoretically obtain accounts information on their residents. However, the exchange of information is not automatic: countries can only request information on

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<sup>4</sup>This statistics is derived using the 2014 "Global Financial Wealth" publication of the Crédit Suisse, for statistics at the country-level see Appendix Table 7

households that are suspected of tax evasion. Therefore, France for instance cannot ask for the list of all the French residents who own an account in Switzerland. Instead, the French government needs to have serious evidence of tax evasion before it can submit a request to the Swiss tax authorities. One can easily see how such terms of enforcement will not stand the test of practicality: because of the opacity of international financial markets, evidence on fiscal evasion are very difficult to gather and France will rarely be able to send a proper request to Switzerland. Between January 2011 and December 2012, France only sent 605 information requests to Switzerland<sup>5</sup>. A final constraint is that the “relevance” of the request is assessed by Swiss authorities at their entire discretion.

Despite some front efforts to converge towards transparency, bank secrecy in Switzerland has undergone very little effective change since 1934 and evaders still benefit from the opacity of Swiss banks, which explains why the country remains at the heart of the offshore wealth management circuit.

## **2.2 The Savings Tax Directive: general framework**

The Savings Tax Directive introduced a system of taxation of foreign interest income for EU resident households. The Directive was signed in 2003 by EU countries, and fifteen tax havens, including Switzerland, signed equivalent agreements in the following year. The Directive came into force simultaneously on July 1st 2005.

Importantly, two alternatives were offered to signing countries regarding the implementation of the tax system. Under the first regime, banks should automatically transmit the information they possess on interest income to their national tax authorities. Once they have aggregated all information, the national tax administration forwards them to the country of residence of the account’s beneficial owner. Under the second regime, banks levy a withholding tax on the savings income of EU households and 75% of this amount is redistributed to the home country of the beneficial owner. Regarding the withholding tax rate, the applicable rule is the following: 15% for the interest payments before June 30th 2008, 20% for the interest payments between July 1st 2008 and July 1st 2011 and 35% for the interest payments from July 1st 2011 on. Under both regimes, transmission of information is necessary only if the household does not already self-report his revenue to his home tax administration. Therefore, the Directive aims at taxing individuals who did not declare their offshore interest-yielding accounts, the others remain unaffected. The agreement with Switzerland was signed on October 26th 2004. Contrary to most EU countries, Bern opted for the second regime. This way, the Directive does not conflict with its bank secrecy rule: banks redistribute the withholding tax to Swiss authorities without disclosing the identity of the beneficial owner.

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<sup>5</sup>The data source for this number is the “Annexe au projet de loi de finances pour 2014 - rapport annuel du gouvernement portant sur le réseau conventionnel de la France en matière d’échange de renseignements”

Concretely, those who used to declare their Swiss interest income to their home country before July 1st 2005 will now be recorded as “declarations under the Directive” but their tax rate will remain the one of their home country. For the others, two options will be available. They can opt for the withholding tax, preserve their anonymity, and see their tax rate on interest income increase from 0% to 15% in 2005, 20% in mid-2008 and 35% in mid-2011. Alternatively, they can decide to come forward to their home tax administration, pay potential immediate penalties and, from then on, be taxed at their home country rate. Since one cannot declare partially his offshore wealth, declarants will be taxed both on their interest and dividend yielding accounts.

To be complete, let us note that other adaptations from the initial Directive signed by EU countries were agreed upon. For instance, the grandfathering (exemption of tax) of negotiable bonds that were emitted before March 1st 2001 or the grandfathering of revenues from mutual funds which invest less than 15% of their assets in interest-yielding securities.

### **2.3 The 35% Swiss advance tax**

The Savings Tax Directive is theoretically not the first occurrence of a withholding tax applied to foreign residents' interest income in Switzerland. Since the Federal Act of 13 October 1965 on withholding tax, interest paid to Swiss and foreign residents on Swiss bank accounts and deposits are subject to an anticipatory tax (35% in current days). This means that any deposit account held with a Swiss bank, in which interest income is earned, will be subject to a 35% anticipatory tax on this income. Simple interest on a term deposit or a savings account is considered as Swiss source income, regardless of the currency of the account. However, it is easy to avoid the withholding tax by entrusting funds to a Swiss bank in its capacity as fiduciary agent. Swiss fiduciary deposits are deposits made by Swiss banks on behalf of their customers in banks in other jurisdictions. Since the interests paid by the other jurisdiction is not considered as Swiss-source, fiduciary deposits are exempt from the 35% Swiss anticipatory tax. As long as the funds are held in another jurisdiction which has no withholding tax itself, the income is earned Swiss tax free. Importantly, funds placed on fiduciary deposit still take advantage of Swiss banking secrecy laws. As noted in Johannessen (2012), the bulk of foreigners (90% in 2005) who invest their money in deposits opt for the fiduciary, rather than ordinary, deposits.

Therefore, before 2005, interest payments to tax evaders remained off the grid of both home and Swiss tax administrations, whether the money was invested in interest-yielding securities or deposits. Conversely, the EU Savings Directive looks through this scheme and taxes the beneficial owner of the deposit.

## **2.4 Coordination on the taxation of savings income, a recurrent idea**

The first attempt to coordinate on the taxation of European savings income was led by the EU Commissioner Christiane Scrivener in 1989. The aim of her reform was to create a common withholding tax in all the EU Member States on interest income paid out to other EU residents. This proposal required unanimity to be passed and was not adopted because of the opposition of Luxembourg and the United Kingdom. The second attempt was directed by Mario Monti, at the time Commissioner for Internal Market, Financial Services and Financial Integration, Customs, and Taxation. Monti's proposal was milder than the previous attempt since it provided Member States with two alternatives: either a withholding tax levied at source, like in the one proposed by Scrivener, or a systematic exchange of information within EU borders. However, this proposed reform suffered the same fate as its predecessor. Finally, an agreement was reached in 2000 and led to the adoption of the EU Directive on Savings Income Taxation in 2003. The 2004/911/EC Council Decision sealed the agreement between the European Community and the Swiss Confederation providing for measures similar to those laid down in Council Directive 2003/48/EC on taxation of savings income in the form of interest payments.

While the Directive aimed at discouraging tax evasion in Switzerland, the amount of EU offshore wealth in the tax haven has increased from an estimated 1,050 billion \$ in July 2005, the date at which the Directive came into force, to an estimated 1,350 billion \$ in December 2013, that is an increase of 29%<sup>6</sup>. Despite a lively political enthusiasm around the Directive, the experience appears to have little effect on tax compliance eight years after its entry in force. Sections 3 and 4 try to provide explanations for the failure of the Directive.

## **3 Data for the descriptive statistics**

The main data source is the Swiss Federal Fiscal Administration ("Administration fédérale des contributions") yearly publication on the amount of interests earned directly by each EU country. The publication separates the amount of interests that is taxed from the amount that is declared by EU citizens to their home administration. For instance, in 2013, French residents earned 338 million CHF in interest and declared 44 million CHF, so the fraction declared out of the total interest income earned is 13%. This dataset allows us to compute, for the 2006-2013 period, the share of interest declared out of the total interests earned for all 27 European countries.

The second important dataset is the publications of the Swiss National Bank. Since 1998, the Swiss National Bank has published the value of the offshore portfolios in Swiss banks. Zucman (2013) is the

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<sup>6</sup>in nominal terms

first to use this dataset to investigate the wealth held offshore. Following his methodology, I extend the computation of offshore portfolio wealth held in Switzerland to 2014<sup>7</sup>. Interestingly, the Swiss National Bank provides a breakdown of securities held by foreigners (and Swiss residents) by asset categories (bonds, equities, mutual fund shares) and by type of holders (private customer, commercial customers or institutional investors)<sup>8</sup>. These breakdowns will allow us to analyse strategic patterns of investments following the Directive.

The Swiss National bank provides a second stream of information on offshore wealth. Indeed, in Switzerland, households can hide money not only by holding foreign securities but also by using a unique kind of deposit, the fiduciary deposits<sup>9</sup>. Since fiduciary deposits cannot be used as a medium of exchange, corporations have no incentive to resort to them. Conversely, it enables the private customers to avoid the 35% withholding tax imposed by Switzerland on Swiss-source capital income. Since 1976, the SNB has published a country breakdown of the owners of fiduciary deposits. As pointed out in Zucman (2013), this breakdown necessitates some adjustments. Indeed, the SNB wrongly records a large amount of funds as belonging to other tax havens such as the British Virgin Islands. This surprising result derives from the fact that the SNB does not look through sham corporations. Therefore, it will register the shell company of a British resident opened in the islands as belonging to the British Virgin Islands. Once we have re-integrated haven-held funds to their final owners, we can derive the share of fiduciary deposits held by each European country in Swiss banks. For instance, we can say that France holds 6.3% of fiduciary deposits in Switzerland in 2013. Assuming that this repartition holds for the total offshore wealth held by Europeans in Switzerland, we are able to derive offshore wealth for each EU country.

In order to obtain the share of offshore wealth that is under the scope of the Directive, we need to compute the total value of interest-yielding accounts. While the Swiss Federal Fiscal Administration provides information on the amount of interest earned, it does not give the value of the underlying accounts. Therefore, we need to find the average interest rate on foreign-held accounts in Switzerland. Indications we have on the type of financial investments that foreigners make in Switzerland are limited. However, we can tell from the Swiss National Bank data that, for investment in bond shares, the distribution is roughly 1/6 in public sector and 5/6 in private sector, which is indicative of a risk-loving profile. This is also coherent with the general idea that foreigners who invest their money in Swiss banks are seeking high returns. In order to approximate the interest rate on public and private sector investment, I chose to use, respectively, the returns on Vanguard Intermediate-Term Treasury Fund Investor Shares and Vanguard

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<sup>7</sup>see Appendix Figure 1 for the historical evolution from 1998 on.

<sup>8</sup>Let us note here that the later breakdown is fictitious. Indeed, there is no evidence that Swiss banks provide custody services for foreign corporations (Zucman(2013)). Therefore, individuals are also the final holders of accounts registered as belonging to “Institutional investors”.

<sup>9</sup>The characteristics of these deposits were described in more details in Section 2.3

Total Bond Market Index Fund Investor Shares. For 2013, the estimated return is 2.41%. Considering that European evaders are high-net-worth individuals who are advised by qualified bank managers, these estimates are very conservative. Consequently, I obtain the lower-bound for the true interest rate and the upper-bound for the total interest yielding accounts taxed or declared under the Directive. In other words, if anything, I over-estimate the efficiency of the Directive by granting it more wealth declarations than there actually are.

## 4 Evaluation of the effective tax base of the Directive

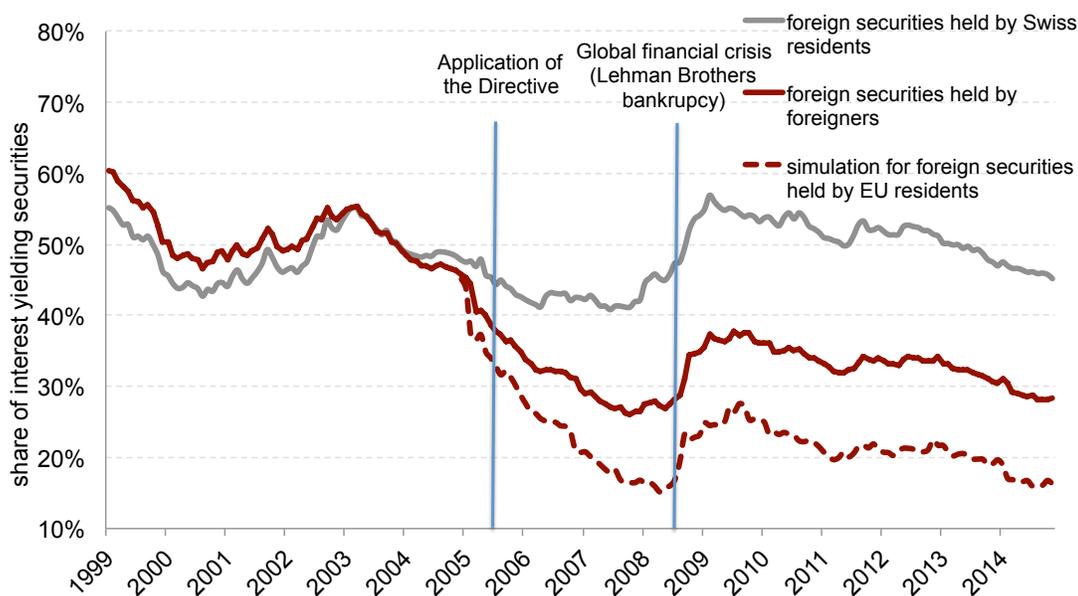
### 4.1 Loopholes in the scope of the Directive

The share of EU offshore wealth declared or taxed under the Directive remained below 10% until 2011 and the latest data show that it remains below 20%<sup>10</sup>. How can we explain that such a small fraction of offshore wealth is effectively affected? The Directive has two major blind spots that tremendously restrain its reach. The first and most obvious one is that the European Commission decided to target only interest revenues, and leave aside all dividend income. From a purely static analysis, we can observe that in July 2005, only half of the total offshore wealth is invested in interest-yielding securities (bond issues, money market instruments) or deposits<sup>11</sup>. In other words, from the very beginning, the Directive left out of its reach half of European fortunes hidden in Swiss accounts. Furthermore, from a dynamic perspective, active investors could just shift their portfolios from interest to dividend yielding securities. Figure 1 provides some evidence that such optimization was used by offshore account holders.

Let us first focus on the two curves: “foreign securities held by Swiss residents” and “foreign securities held by foreigners”. We observe that between 1999 and January 2005, the common trend assumption is verified: the evolution of the share of interest-yielding securities is strikingly similar for both types of investors. In January 2005, six months before the entry in force of the Directive, the share of interest-yielding securities in the portfolio of foreigners starts to decrease sharply: by July 2005, it had already gone down from 45% to 39%, while in the meantime this share remained roughly stable at 45% for Swiss residents. In other words, some EU tax evaders anticipated the taxation of interest income starting in July and decided to reinvest their money in securities that are tax-free, such as dividends. The decreasing trend goes on in the following two years: by December 2007, the share of interest-yielding foreign securities in the portfolio of non-Swiss residents had reached its rock bottom at 26%. In the same period, for Swiss residents, this share has remained above 40% at every point in time and topped at 42% in December 2007. The differential trend between Swiss residents and foreign residents as of January 2005 and until December 2007 presents strong evidence that Europeans strategically invested their money to avoid paying taxes

<sup>10</sup>See Appendix Table 13 and 14 for a country-year level breakdown.

<sup>11</sup>This statistic is derived from authors' computations based on SNB data.



Notes: The figure reports monthly data and the date displayed on the x-axis are January of each year. Source: author's computations using SNB data.

Figure 1 – The change in the share of interest income in total capital income for foreigners

on their Swiss accounts.

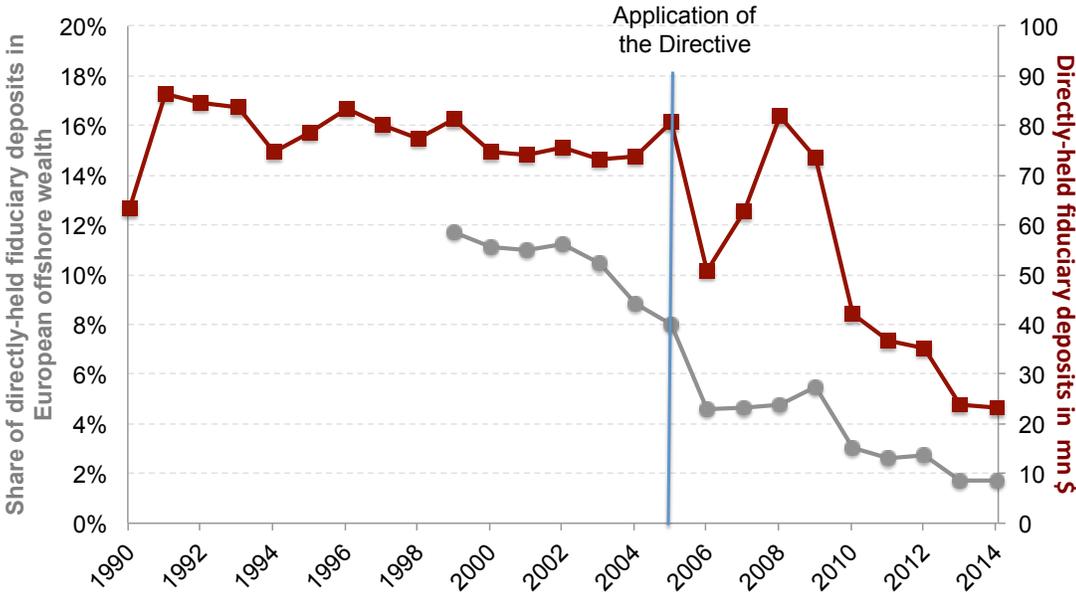
The decrease in the share of interest-yielding accounts is even sharper if we try to isolate Europeans from the other foreign countries. Indeed, we can consider that the decrease is driven only by European re-allocation of assets: non-EU households have no incentive to re-invest their money as they are not subject to the EU withholding tax. STD countries, that is countries that are subject to the Directive, represent about 56% of the total offshore portfolio of foreigners<sup>12</sup> each year. Therefore, assuming that from January 2005 on, non-EU foreigners' share evolves in the same way as Swiss residents' one, we can simulate the evolution of EU residents' portfolio. According to this simulation, the share of interest-yielding accounts in Europeans' securities melts away. By December 2007, only 17% of STD countries' securities remain invested in bond issues or money market instruments.

Finally, a confounding scenario would be the following: from 2005 on, for an exogenous reason, foreigners and Swiss start investing differently. If this was true, then we should observe different trends not only in the couple of years after the Directive but also in 2013. Conversely, if the Directive is the only cause of the change, then once the active investors have switched their portfolio to dividend yielding securities, the general trend should be back on the same tracks as Swiss residents. Empirically, we observe that from 2008 onwards, foreigners and Swiss residents' curves have parallel evolutions. This outcome comforts us in our analysis: the Directive is the main factor that can explain the dramatic drop in interest-yielding

<sup>12</sup>This statistic is derived from authors' computations based on SNB data. See appendix table 13.

custody accounts held by STD countries.

There are two major components of Swiss offshore wealth portfolios: custody accounts and fiduciary deposits. We have just studied the evolution of interest-yielding securities in custody accounts. One could object that the decrease in the former may be compensated by a tremendous increase in the share of directly-owned fiduciary deposits so that, overall, the share of interest yielding accounts in EU offshore portfolios has not changed. However, what we observe empirically is that the amounts invested in fiduciary deposits have significantly decreased from 2004 to 2005. In the following years, despite an increase in EU offshore wealth in Switzerland, fiduciary deposits never reached their 2004 level again and their share in the offshore wealth has persistently decreased as illustrated in Figure 2.



Notes: The figure reports monthly data and the date displayed on the x-axis are January of each year. Source: author's computations using SNB data.

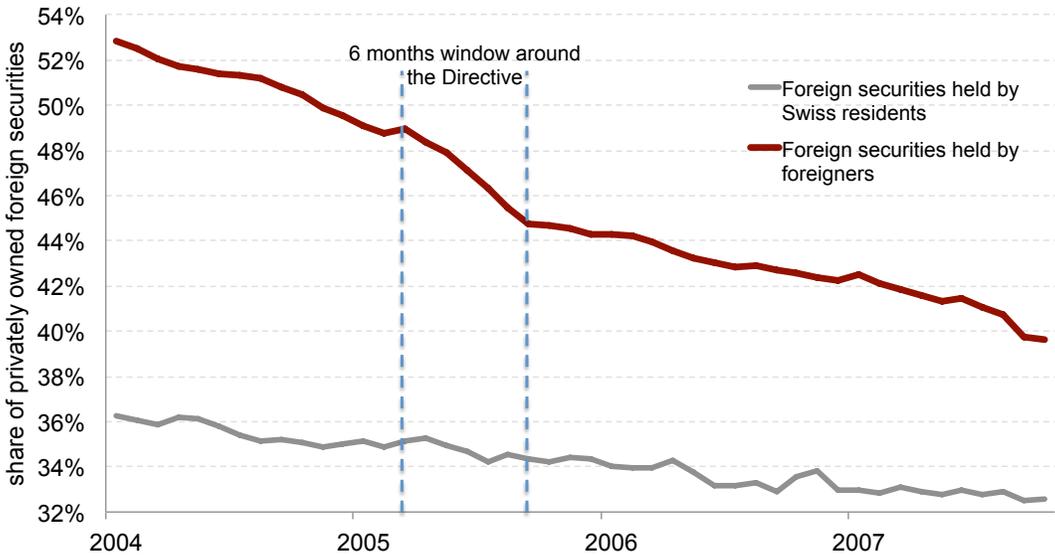
Figure 2 – Evolution of STD owned fiduciary deposits and evolution of the share of fiduciary deposits in total STD offshore portfolio

The second blind spot of the Directive is that it only applies to securities held directly by EU citizens. This leaves yet another opportunity for evaders to circumvent the taxation of their offshore income. Indeed, they can transfer the ownership of their assets to a sham corporation outside the EU. Consider a French evader who wants to avoid paying the tax by opening a sham corporation in Panama. The dummy company will fictitiously own his Swiss accounts. From then on, even if the final beneficiary of the account is French, the direct ownership rule applies and the account is considered as Panama-owned.

Therefore, Swiss authorities, which do not look through the scheme, register the account as being possessed by Panama. Finally, as Panama is not inside the EU, the account will be exempt from the tax.

This effect of the Directive has been studied in depth by Johannessen (2012) who shows a decrease in EU-owned bank deposits in Switzerland of about 30-40% in the months following the enforcement of the Directive. This decline is not due to repatriation; instead, it is the result of a moderate shift of deposits in offshore centers outside the Savings Directive like Macao and by an increase of 129% in Panama-owned bank deposits, which suggests a shifting from direct ownership to the holding of accounts through sham corporations. To obtain these results, Johannessen uses cross-border bank deposits from the Bank for International Settlements. In this section, we will use the SNB data to confirm this trend with data on custody accounts, that make up for the bulk of tax evaders' portfolio, rather than deposits.

Figure 3 presents the evolution of the share of custody account held by foreign private customers. Let us remind that when an individual transfers the ownership of his account to a sham corporation, the Swiss National Bank shifts the holding of the account from "private customer" to "institutional investor". Therefore, the share of custody accounts held by foreign private customers is the one possessed directly by individuals, while the share held by "institutional investors" is the one held through sham structures in offshore centers.



Notes: The figure reports monthly data and the date displayed on the x-axis are January of each year. Source: author's computations using SNB data.

Figure 3 – The change in the share of Swiss offshore wealth held directly by foreigners

First, note that opening a sham corporation is used not only to avoid the withholding tax but also,

more generally, to decrease the probability of being caught by adding a layer of secrecy. That is why we observe that the share of privately owned accounts has persistently decreased among foreigners since 2004.<sup>13</sup> Therefore, in contrast with the analysis of the share of interest-yielding securities in custody accounts, it is hard to consider the share of private customers in Swiss residents' data as a control group or to simulate an "EU" share with the same method as in the previous section. However, these limitations do not prevent us from drawing conclusions on the impact of the Directive on the share of private customers in EU-owned custody accounts. Indeed, while the average annual decline between 2004 and 2014 (excluding 2005) is 2.1 percentage points, there is a sharp decline of 4.2 percentage points between March and September 2005 (6 months window), right at the time of the Directive. In other words, the decline between March and September 2005 is 4 times the average decline between 2004 and 2014 (excluding 2005). Additionally, this decline is only the lower bound for the true decline in STD countries' directly held custody accounts. For instance, if we consider that the decline of non-EU share in this period is equal to the average decline over 2004-2014, then the estimated decline in the share of directly held accounts for EU countries is of 6.7 percentage points in only 6 months, that is more than 6 times the average decline between 2004 and 2014. This computation allows us to confirm the results found by Johannessen with a complementary dataset that provides evidence for custody accounts.

In the same vein, we can cite the work of Zucman (2015) in his book "The Hidden Wealth of Nations"<sup>14</sup>. Using the SNB annual country breakdown of fiduciary deposits, he considers the evolution of fiduciary accounts held by Europeans on their own behalf vs. fiduciary accounts held through sham corporations. As evidence in Figure 4<sup>15</sup>, the Directive has translated into an immediate and sharp increase in the share of fiduciary accounts held through sham corporations and a symmetric decrease in the one held directly by Europeans.

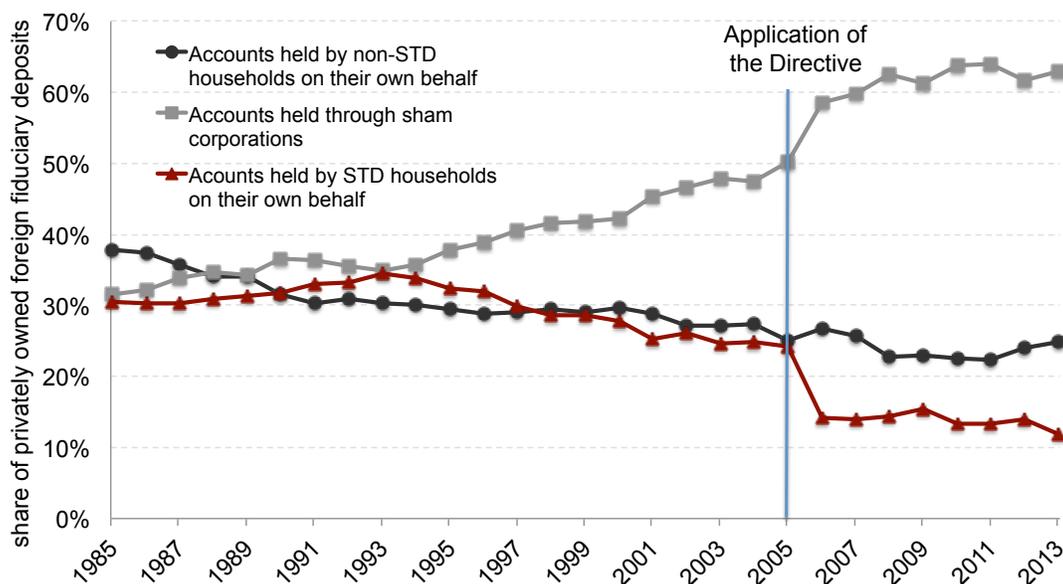
These limits were acknowledged as soon as 2008 by the European Commission. Indeed, under Art. 18 of the STD, the Commission must report every three years on the Savings Directive and suggest to the Council amendments that are necessary to ensure its main aim. The first review on the efficiency of the Directive was run in 2008. In the commission staff working document accompanying the proposal for an amendment of the Council Directive 2003/48/EC, they already expressed concerns about the various loopholes of the Directive: "Pursuing the aim of the 2003 Directive would require that interest payments obtained by an individual through an intermediate vehicle are given the same treatment as interest

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<sup>13</sup>Appendix figure 2 provides a "zoom out" of this figure for the period 1999-2014 so that the persistent decline of the share of privately owned accounts is more visible

<sup>14</sup>forthcoming University of Chicago Press, September 2015

<sup>15</sup>which reproduces Figure 3 of Chapter 3 in Zucman's book only expanding it to more recent years



Notes: The figure reports monthly data and the date displayed on the x-axis are January of each year. Source: author's computations using SNB data.

Figure 4 – Evolution of the share of directly-owned fiduciary deposits

payments received directly by the individual. The same applies to those income payments that can be considered equivalent to interest payments because they arise from savings products with similar levels of risk and liquidity as debt claims. If consistent treatment of other comparable situations is not achieved, not only is the effectiveness of the Directive endangered, but there can be distortions in competition between comparable savings products and structures.” (p.6).

#### 4.2 The absence of binding mechanism, the door open to deviations

A last question with respect to the effectiveness of the Directive remains to be answered. Indeed, for the interest income to be effectively taxed, banks should truthfully report the income of all their EU clients to tax authorities. In practice, to abide by the confidentiality principle, only aggregated amounts are reported by banks. This implies that tax authorities, either Swiss or European, have no means to control that banks report accurately their clients’ interest income: one must rely on banks’ good faith. Therefore, one can wonder whether the theoretical tax base of the Directive is properly taxed. In other words, are banks fully compliant with the Directive?

In order to answer this question, one must be able to compute the theoretical tax base, that is the total offshore wealth that should be taxed if the Directive was fully applied. In order to find this amount, we must make several assumptions. Regarding fiduciary deposits, since they are subject to the Savings

Tax as long as they are held directly by Europeans, I wave the deposits held through tax havens but assume that 100% of fiduciary deposits held directly by Europeans belong to private customers and should therefore be taxed. This is a reasonable assumption: fiduciary deposits cannot be used as a medium of exchange so they are useless to corporations. Regarding custody accounts, they are considered taxable only if they are both held directly by EU private customers and interest-yielding. To compute the share of interest-yielding securities held by EU citizens, I take the most conservative estimate (that is the smallest percentage share), namely the one derived under the simulation for EU (see Figure 1). While one may object that a small fraction of interest-yielding accounts were grandfathered and should be excluded from the total, one should also see that the computational method I use puts 0% weight on foreign issued shares, units in collective placement schemes and structured products which represent a way higher share of offshore wealth than exempt bond and which, under specific rules<sup>16</sup>, should be taxed. Therefore, overall, my estimate of the theoretical tax base is a lower bound for the true estimated tax base.

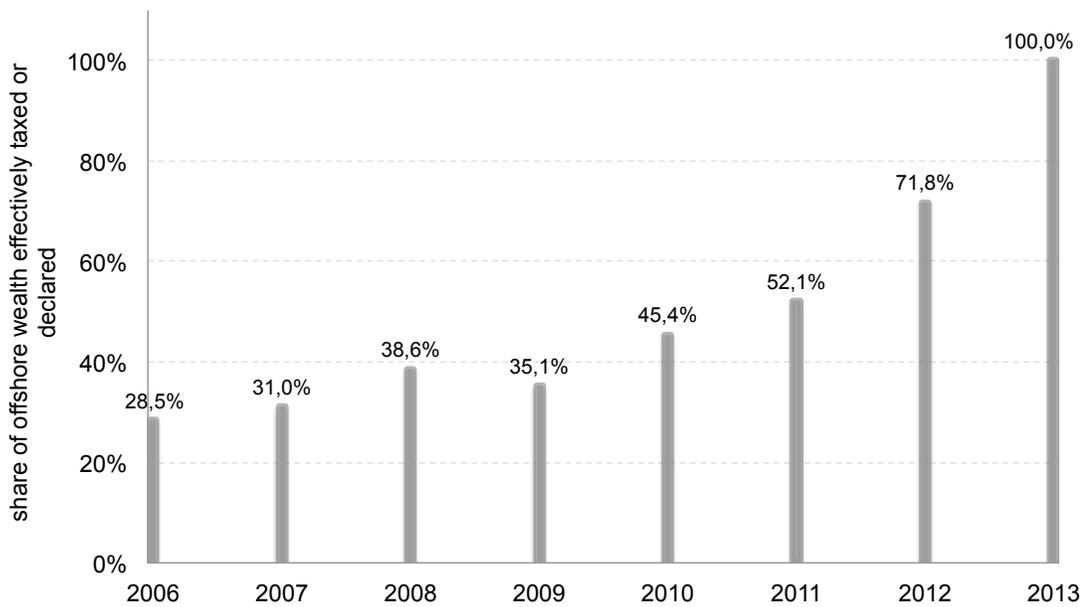
Then, I compute the share of "theoretically" taxable accounts that are actually taxed. Non-compliance of banks would imply that this "deviation ratio" is below 100%, that is that there are less accounts taxed than there should be. A final adjustment is made after computing the raw deviation ratio. Indeed, it was equal to 164% in 2013. As there is no rationale for this measure to be above 100%, I set the ratio in 2013 at 100% and normalize all previous years using the 2013 raw estimate value.<sup>17</sup> Figure 5 provides the evolution of this "deviation ratio" over time. As we can observe, in the six years that followed the entry in force of the Directive, Swiss bankers declared at most half of the accounts they should have reported. Worryingly, as illustrated in Figure 6, more than half of the variation in the deviation ratio over the period 2006-2013 is due to a decrease in the theoretical tax base rather than an increase in the total amount taxed or declared. This situation illustrates the limits of the *pacta sunt servanda* principle of international law: it relies on the good faith of all parties.

This outcome should come as no surprise. Indeed, in the absence of control, Swiss banks have already demonstrated that they would actively try to protect their clients against the law. The book by Schaufelbuehl (2009) on the trial of strength between France and Switzerland in the years after the second world war is very informative on this part. At the time, French residents were already massively taking advantage of Swiss bank secrecy to hide their wealth. In 1945, an estimated 6 to 8 billion Swiss Francs are assumed to belong to French evaders, 2/3 of which were invested in Swiss securities and 1/3 of which

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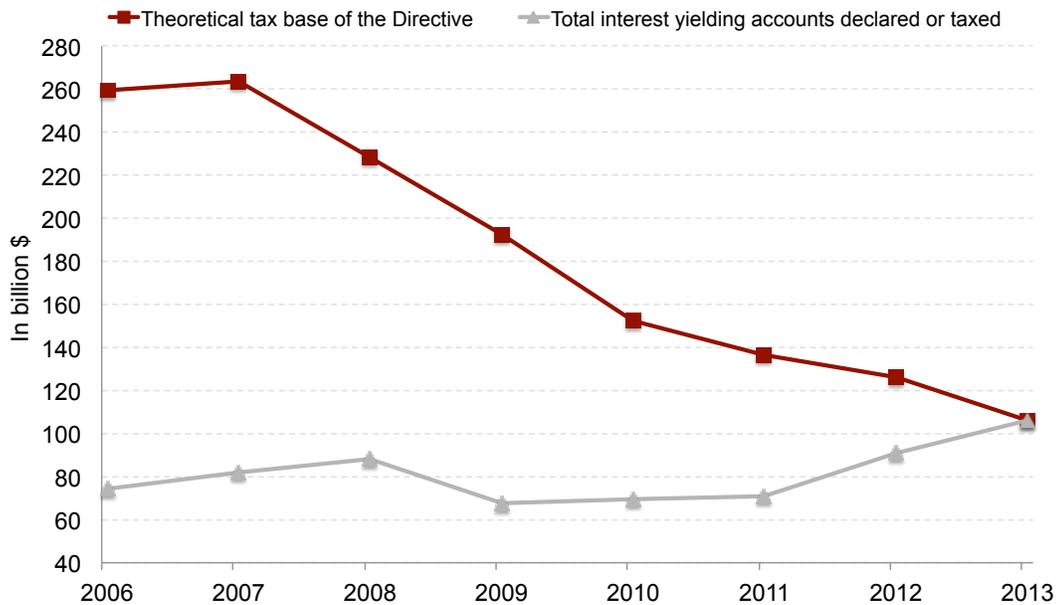
<sup>16</sup>For instance, for funds that invest more than 15% of the wealth they manage in interest-yielding assets, then revenues are subject to the withholding tax

<sup>17</sup>Let us note here that setting year 2013 at 100% is a normalization and it is in fact possible that, in 2013, the effective tax base of the Directive is still below the notional tax base. Indeed, my estimates of the theoretical tax base of the Directive are very conservative.



Notes: The figure reports annual data. Source: author's computations using AFC and SNB data

Figure 5 – Evolution of the deviation ratio



Notes: The figure reports annual data. Source: author's computations using AFC and SNB data. The theoretical tax base in 2013 was normalized at 100%. All values are converted from CHF to \$ using the constant 2006 exchange rate

Figure 6 – Decomposition of the deviation ratio

was invested in American securities, considered a safe haven in the war period. A decree from the Swiss Federal Council in July 1940 had frozen all French assets in Swiss banks and the challenge for France in

1945 was to obtain their repatriation. Paris was not offered any fiscal assistance from Swiss authorities: in February 1948, despite an agreement, in 1945, to consult with France in the event of a release of French assets in Switzerland, Bern unilaterally decided to unfreeze them all. However, Swiss authorities had no hold on the money invested in the United States and John Snyder, the United States Secretary of the Treasury in 1948, was unyielding: the release of assets would be conditional on the identification of the beneficial owner of the account. From then on, Swiss bankers were eager to find the flaws in the system, that is to find ways to repatriate French assets directly in Switzerland without having to declare them at the “Office Français des changes” (French currency control bureau). They quickly came up with a scheme: In march 1948, the Swiss Compensation Office shortened to 3 months the necessary stay to be considered a Swiss resident. It was therefore enough for a French household to rent an hotel room in Switzerland for a couple of months, obtain the Swiss residency and then repatriate American securities in Switzerland without transiting through France. Thanks to this trick as well as a number of political deals, only 4% of American securities held by French citizens were unfrozen under the “regular” procedure, that is the declaration to the “Office Français des changes”.

### **4.3 The profile of declarants**

In this paragraph, we explore the wealth profile of evaders who decide to declare during the period 2006-2013. There are broadly 2 possibilities for the decomposition of the total amount declared under the Directive: either it derives from a small number of accounts that concentrate large amounts or it is made of numerous accounts with relatively “small amounts”. To put it clearly, the question is: Are we after the individual powerhouses of the tax haven system?

The Swiss Fiscal Administration annual data on declarations provides, along with the total interest declared, the number of accounts declared. We can therefore derive the average interest account declared<sup>18</sup>. While this statistic more than doubles during the period, it only reaches \$ 523,000 on average for all STD countries in 2013. Even if we add dividend yielding accounts<sup>19</sup> the average hidden offshore wealth of a declarant is only slightly above \$ 1 million.

Table 1 allows us to understand better how this average wealth declared under the Directive ranks within each country’s financial wealth distribution. In most countries, the average declared wealth under the European Directive is below the average financial wealth of the top1% in the evader’s home country.

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<sup>18</sup>see Appendix table 4 for a country-year level breakdown

<sup>19</sup>Using SNB data, we can derive the share of interest yielding account in the offshore portfolio of foreigners and therefore deduce the total of dividend + interest yielding accounts of declarants. The methodology used in the paper to compute the share of dividend yielding accounts for declarants is to consider that after 2005, the investment strategy of declarants is similar to the one of non-EU citizens. The idea behind this assumption is that declarants are the ones who do not actively try to circumvent the Directive by shifting to more dividend yielding investments.

Usually, the median of wealth declared is below the average amount declared<sup>20</sup>, which confirms that the bulk of declarants are in the lower end of the distribution of tax evaders.

**Table 1: Average declared wealth (in thousand \$) and ranking of declarants in their home country's wealth distribution**

Unit: thousand \$	Average wealth declared under the Directive	Average financial wealth (per adult) in the country	Top 10% share of wealth in the country	Top 1% share of wealth in the country	Top 10% Average financial wealth in the country	Top 1% Average financial wealth in the country	Declarant position in the distribution of average wealth
Austria	1272	102	63,6%	29,0%	649	2961	between top10% and top1%
Belgium	1653	159	47,3%	17,3%	754	2757	between top10% and top1%
Czech Republic	2185	24	65,3%	36,3%	159	887	above the top1%
Denmark	1521	218	65,8%	27,6%	1432	6008	between top10% and top1%
Finland	1428	74	54,5%	22,0%	403	1627	between top10% and top1%
France	703	117	52,2%	20,5%	612	2404	between top10% and top1%
Germany	891	97	61,7%	28,0%	601	2729	between top10% and top1%
Greece	755	38	54,1%	24,6%	203	925	between top10% and top1%
Ireland	1629	123	58,4%	27,2%	717	3339	between top10% and top1%
Italy	747	100	50,6%	20,6%	504	2054	between top10% and top1%
Netherlands	1514	203	54,5%	22,4%	1105	4543	between top10% and top1%
Poland	3134	15	62,2%	32,4%	91	472	above the top1%
Portugal	2030	59	57,8%	26,4%	342	1561	above the top1%
Spain	1783	61	54,8%	26,0%	335	1588	above the top1%
Sweden	2011	179	68,8%	30,9%	1232	5534	between top10% and top1%
United Kingdom	1297	147	53,6%	22,8%	787	3350	between top10% and top1%

Source: AFC, SNB data, Credit Suisse annual Global Wealth Databook and author's computations. Some countries are missing because no data were available on the share of top1% and top10% in the country's wealth. Also note that data on top1% and top10% share in the country's financial wealth were not available in Credit Suisse annual Global Wealth Databook but that one can think of their share in total wealth as a lower bound for their share in the financial wealth.

This outcome is coherent with the idea that, in a context of increasing concentration of wealth (Piketty and Zucman (2015)) Swiss banks (and government) are ready to give up on the small accounts to focus on the very high-net-worth profiles. It is also important to keep this feature in mind when considering the investment profile of agents that end up declaring. Indeed, as risk aversion is decreasing with wealth (Riley and Chow (1992)), the declarants likely have portfolios skewed towards more interest-yielding shares than the rest of evaders. While this paragraph is purely descriptive, the model and econometric approach in Sections 4 and 5 allow us to explain why only small offshore account owners make the decision to self-report their hidden wealth.

#### 4.4 Discrepancies in the declarations under the Directive: empirical evidence and methodological choices

It is important as a preliminary methodological note to clarify the distinction between two notions: the share of offshore wealth declared under the Directive and the fraction of interest income declared (that

<sup>20</sup>see Appendix Section Voluntary Disclosure Programs and the fiscal gift for more details on this aspect

we will then refer to as the “fraction declared”). While the first is the ratio of wealth declared under the Directive over the total offshore wealth in Switzerland for a given country, the second is the ratio of interest income declared over the sum of interest income declared and taxed under the Directive, for a given country. In the remaining of the paper, we will mostly study the evolution of the fraction declared. This choice may appear surprising in the first place. Indeed, the concept is slightly more difficult to grasp than simply the share of offshore wealth declared under the Directive. The main reason for this choice is that the computation of the fraction declared is more reliable. Indeed, it does not depend on any estimation and it derives from only one source: the Swiss Fiscal Administration. As a result, it is a very transparent metric. Conversely, to compute the offshore wealth declared under the Directive, we first need to resort to two datasets: the Swiss Fiscal Administration for the numerator, that is the wealth declared, and the Swiss National Bank for the total offshore wealth declared. Second, and most importantly, this ratio relies on several assumptions and extrapolations. The Swiss Fiscal Administration only provides the country-level interest income declared: Therefore, to obtain the wealth declared, we need to make some assumptions on the yearly interest rate on offshore accounts<sup>21</sup>. Additionally, when we refer to the wealth declared, we need to include both interest and dividend yielding accounts. However, the Swiss Fiscal Administration only provides information on interest yielding accounts declared. Therefore, we need to extrapolate the share of dividend yielding accounts in the portfolio of declarants, using macro data on foreigners’ investment choices from the Swiss National Bank. Finally, the country-level breakdown of offshore wealth is only available for fiduciary deposits. Therefore, we need to assume that the shares are the same for all other types of offshore assets to derive each country’s total offshore wealth in Switzerland. For these reasons, the analysis onwards will be mostly based on the fraction declared, but I will also provide results for the other variable as it is more straightforward to interpret.

While the Directive is strewn with pitfalls, we still observe a clear-cut increasing trend in the share of offshore wealth taxed or declared over the period 2006-2013. Indeed, the share of offshore wealth in the scope of the Directive has almost tripled, going from about 6.6% in 2006, to 16.5% in 2013, as evidence in Figure 7. The increase is mostly due to a rise in declarations.

Figure 8 represents the fraction declared for different countries and demonstrates the existence of significant spatial disparities: while the initial fraction declared for Germany is 41.7%, it is only 2.5% for France. Appendix Table 12 provides all values of the fraction declared at the country-year level. The two figures also show that the evolution of the fraction declared and the share of offshore wealth declared in Switzerland are highly correlated.

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<sup>21</sup>Section 3 provides details on these assumptions

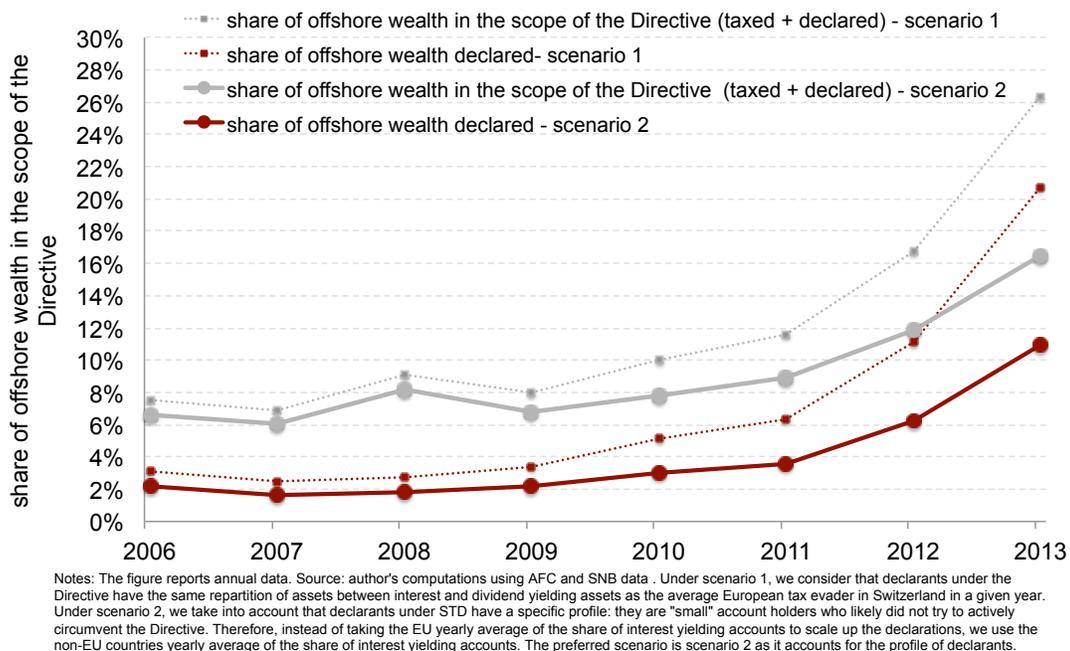


Figure 7 – Evolution of offshore wealth under the scope of the Directive

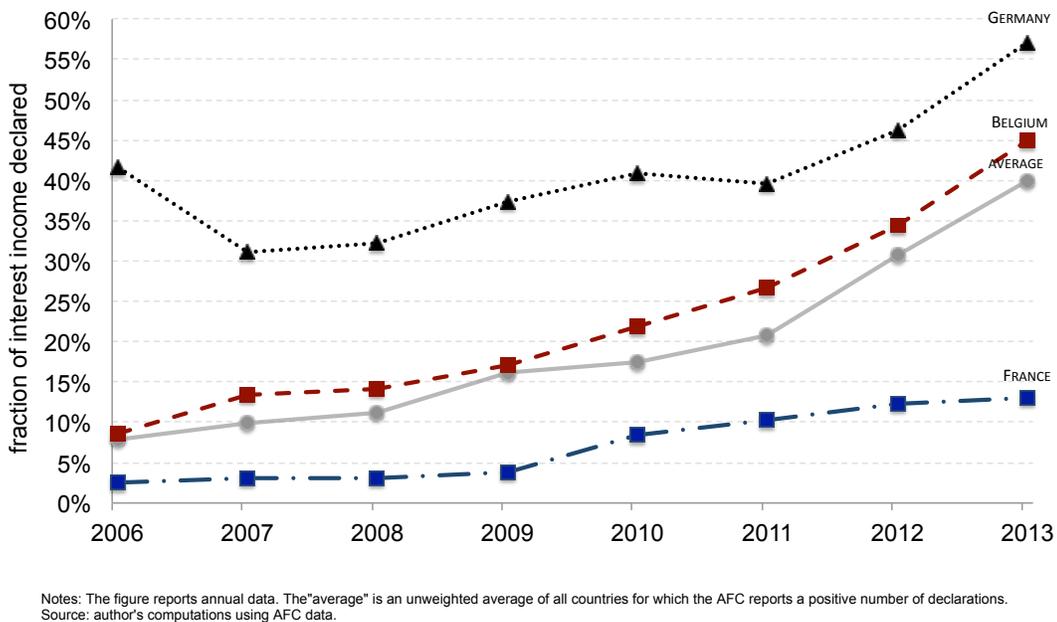


Figure 8 – Country-level evolution of the fraction declared

Over the period 2006-2013, a number of policies targeted offshore wealth: not only did the upfront tax in Switzerland go up from 15% in July 2005 to 35% from July 2011 on, but information treaties

were signed between Switzerland and other European countries in the aftermath of the 2009 G20 summit. Simultaneously, several European countries offered to reduce the penalty imposed on evaders if they decided to self-report their offshore wealth. As all these actions were taken at the same time in a number of countries, the advocates of each and every single policy got to claim the success of their proposition as declarations indeed soared. In practice, it is unlikely that all these policies impacted declarations, at least not to the same extent. Consequently, our objective in Section 5 to 7 is to disentangle the real motivation of evaders when choosing to declare their accounts. First, we must start by providing more background on the three main public policies that can have an effect on tax evasion.

The most obvious one is tax rates. Specifically, in the case of tax evasion in Switzerland, two tax rates are directly impacting the decision to declare offshore wealth: the capital tax rate in the home country of the tax evader and the withholding tax rate in Switzerland. Intuitively, the higher the tax rate at home, the more costly it is to declare and, conversely, the higher the tax rate in Switzerland the more incentives there are to declare.

Information exchange treaties between Switzerland and European countries is another factor that can affect declarations. These bilateral treaties, already described in detail in Section 1, force Switzerland to provide, on request, access to the evader's identity. Because these treaties increase the chance of an evader to get caught, it enters his decision to declare his offshore accounts. One major limitation however is that banking secrecy is waived only if the home country has sufficient evidence ex-ante of the misbehavior of its citizen.

The last public policies that can incentivize tax evaders to "settle the bill" with their home tax administration are voluntary disclosure programs. Baer and Le Borgne (2008) provide a precise definition of this specific subset of tax amnesties: they are an offer by the government to pay a defined amount, in exchange for forgiveness of a tax liability (including interest and penalties) as well as - most of the time - freedom from legal prosecution. Policymakers often view such programs as a tool that simultaneously produces short- and medium-run benefits. Amnesties immediately yield additional revenue but they are also expected to increase future revenue collection as tax evaders re-enter the country's tax base. The Italian Scudo Fiscale (2001), which targeted undeclared offshore capital, is one of those recent policies that got strong media coverage as it enabled the repatriation of some 60 billion euros (Baer and Le Borgne (2008)). In the aftermath of this successful disclosure program and since additional revenue are particularly welcomed in recession times, variants of this amnesty program emerged across several European countries in the years 2010 onwards. For instance, Spain offered a similar program under the name "Declaracion tributaria especial" in 2012, limiting the tax to 10% of the asset declared and waiving all other interests or penalties. France also implemented in 2013 a similar program, which is described in detail in the Appendix section "Voluntary Disclosure Programs and the fiscal gift". Finally, some countries

have Voluntary Disclosure Programs that are permanent. It is for instance the case of Germany where evaders that self-report their offshore wealth only pay, in penalties, five per cent of each of the understated taxes to the public treasury<sup>22</sup>.

## 5 Modeling the behavior of tax evaders

In this section, we explore the underlying motivations of tax evaders to declare their offshore wealth in Switzerland. The objective is to develop a simplified model of agents' returns to evasion. This will allow us to unveil the channels through which the public policies described in the previous paragraph can affect the choice of evaders to declare their offshore wealth.

For that purpose, let us consider a one period model with a representative tax evader who faces the decision to either declare his offshore account or to keep it secret. Importantly, we do not consider here an agent who is compliant and decides whether or not to evade, we are focusing on a household whose money is already hidden in Switzerland and who faces the choice to either self-report his wealth to his home tax administration or to keep on evading. We can first try to assess the fiscal cost of declaration. Let us consider  $\tau^c$ , the top tax rate on capital income in the home country  $c$  of the evader and  $F_s^c$ , the rate of the penalty in the event that the evader self reports his offshore wealth to his home country  $c$ <sup>23</sup>.  $\left[\tau^c + F_s^c\right]$  can then be interpreted as the tax rate that the evader avoids paying by keeping his money hidden in Switzerland. Indeed, the first rate  $\tau^c$  is simply what the evader escaped in the first place by hiding his money from his home country tax authorities. However, if we want to fully account for the cost of declaration we should also consider the penalties that the evader will face when admitting his non-compliance. We epitomize this cost in the rate  $F_d^c$ . It is worth noting that  $F_s^c$  can be interpreted more broadly than just a monetary incurred cost: it can also encompass penal prosecutions or moral shaming. Let us now turn to the fiscal cost of evasion. We first need to define the following set of variables:

- $p_i^c$  is the probability that the evader gets caught by his home country tax authorities
- $F_d^c$  is the rate of the penalty in the event that the evader is discovered by his home country tax authorities.<sup>24</sup>
- $\tau^s$  is the tax rate in Switzerland applied on foreigner's capital income (European Savings Tax)
- $s_i$  = share of offshore wealth taxable by the European Savings Tax, that is the interest income derived from accounts held directly by evader  $i$ .

Then,  $\left[p_i^c \times (\tau^c + F_d^c) + (1 - p_i^c) \times (\tau^s \cdot s_i)\right]$  can be interpreted as the tax rate that the evader faces by hiding his money in Switzerland. With a probability  $p_i^c$ , the evader will be caught by his home administration

<sup>22</sup>The evader also has to pay the evaded taxes and an interest rate of 6%.

<sup>23</sup>The subscript  $s$  stands for "Self-report".

<sup>24</sup>The subscript  $d$  stands for "Discovered".

and then will have to pay  $\tau^c$  as well as an additional penalty tax  $F_d^c$ . Typically,  $F_d^c \geq F_s^c$ : being caught always leads to at least as much penalties as self-reporting. With a probability  $1 - p_i^c$ , the evader remains out of reach and only pays the European Savings Tax  $\tau^s$  on the fraction of his offshore income that he earns in interest from accounts he owns directly,  $s_i$ .

Finally, the difference between  $\left[ \tau^c + F_s^c \right]$  and  $\left[ p_i^c \times (\tau^c + F_d^c) + (1 - p_i^c) \times (\tau^s \times s_i) \right]$  multiplied by the amount on which those rates are applied,  $w_i^c$ , represents the payoff of evasion which can be expressed as follows:

$$\Pi_i = w_i^c \times \left[ \left[ \tau^c + F_s^c(VD^c, W_i^c) \right] - \left[ p_i^c(T^c, W_i) \times [\tau^c + F_d^c(W_i^c)] + [1 - p_i^c(T^c, W_i^c)] \times [\tau^s \times s_i(W_i^c)] \right] \right] \quad (1)$$

The variables in the payoff equation are expressed as functions of the public policies we described in Section 4.5:

- $VD^c$  is a continuous variable indicating the intensity of voluntary disclosure program in country c ( $VD^c = 0$  is equivalent to an absence of VD program)
- $T^c$  is a continuous variable measuring the enforcement efficiency of information exchange treaties with Switzerland ( $T^c = 0$  is equivalent to an absence of treaty).

Facing this payoff function, the evader has two choices:

- keep his offshore funds hidden. This decision is made if the gains of evasion offset the costs incurred that is if  $\Pi_i > 0$
- declare his offshore accounts to his home tax administration. This decision is made if evasion is no longer profitable, that is if  $\Pi_i < 0$

The next step is to understand how the parameters of the profit function affect this decision. In particular, we want to take a closer look at how the policies we are interested in, that is tax rate settings, voluntary disclosure programs or the signature of a treaty, affect the variables in the payoff function and in turn the decision of the evader :

- $F_s^c$  is a function of the existence of voluntary disclosure programs. Indeed, voluntary disclosure programs provide for lower penalties in the event that the evader comes forward to his home tax administration. Therefore:

$$\frac{\partial F_s^c(VD^c, W_i^c)}{\partial VD^c} \leq 0 \longrightarrow \frac{\partial \Pi_i}{\partial VD^c} \leq 0 \quad (2)$$

- $p_i^c$  is a function of the existence of an information exchange treaty between Switzerland and the home country of the evader,  $T^c$ . Indeed, the treaty allows for more transparency between the two countries and therefore increases the probability of an evader to be caught.

$$\frac{\partial p_i^c(T^c, W_i^c)}{\partial T^c} \geq 0 \longrightarrow \frac{\partial \Pi_i}{\partial T^c} \leq 0 \quad (3)$$

$p_i^c$  is also a function of total wealth  $W_i^c$  but the sign of the partial derivative is uncertain. Indeed, the wealthier an evader is, the more he can afford to add layers of secrecy, such as opening a sham corporation to purportedly own his funds. In that sense,  $p_i^c$  should be a decreasing function of  $W_i^c$ . However, we should also consider that the wealthier an individual is the more likely it is that his monetary flows will be under the scrutiny of his home tax administration. In that sense,  $p_i^c$  should be an increasing function of  $W_i^c$ .

- $s_i$  is a decreasing function of  $W_i^c$ . Indeed, the wealthier an evader is, the more means he has to escape the tax, either by actively managing his portfolio and switching to dividends or by opening a sham corporation. One should see switching to dividend-yielding accounts or the opening of a sham corporation as significant fixed costs that the small evaders cannot afford to pay. Therefore, we can write:

$$\frac{\partial s_i(W_i^c)}{\partial W_i^c} \leq 0 \quad (4)$$

However, we can not deduct the sign of  $\frac{\partial \Pi_i(W_i^c)}{\partial W_i^c}$  because of the uncertain impact of  $W_i^c$  on  $p_i^c$ .

- Finally, both  $F_s^c$  and  $F_d^c$  are increasing functions of  $W_i^c$ . Indeed, the wealthier an evader is the more likely he is to face penal prosecutions and to get public attention. Moreover, from the French 2013 Voluntary Disclosure Program experience, it seems that the monetary penalty rate is increasing with wealth (see Appendix Section Voluntary Disclosure Programs and the fiscal gift). But again, we can not deduct the sign of  $\frac{\partial \Pi_i(W_i^c)}{\partial W_i^c}$  because of the uncertain impact of  $W_i^c$  on  $p_i^c$ .

Another dimension to explore is temporality. While adding time in the model would make it more complex without changing the sign of the coefficients, it can help refining the distinction between the different channels. Indeed,  $\tau^s - \tau^c$  is a benefit (or a cost if  $\tau^s > \tau^c$ ) the evader gains in the current period but also in all future periods. In a dynamic game, the decision to declare in a given period would rely on the sum of the current period tax difference and all expected future period differences, discounted at the individual discount rate. In that sense, we can interpret  $\tau^s - \tau^c$  as a proxy for the long-term benefit of evasion (or the long-term cost of declaration). On the contrary, voluntary disclosure programs reduces the “one-off” payment that evaders face when they decide to self-report their offshore income. In a dynamic game, this

cost would still be incurred only in the period where the evader decides to declare. In this sense, it can be interpreted as the short-term cost of declarations.

We can summarize the different channels and their impact on  $\Pi_i$  in the following table:

Table 2 – Declaration of offshore wealth : decision channels

Parameter X	sign of $\frac{\partial \Pi_i(X)}{\partial X}$	Impact on Declarations	Impact Channel
$\tau^s - \tau^c$	-	+	long-term
$VD^c$	-	+	short-term
$T^c$	-	+	both
$W_i^c$	uncertain	uncertain	both

Finally, it is important to note that the payoff function of evasion is a continuous one but the decision to declare is binary. Therefore, we should expect some threshold effects. To illustrate this point, let us take a very simplified model where the payoff of evasion only depends on  $\tau^s - \tau^c$ , namely  $\Pi_i = \tau^c - \tau^s$ . The profit is continuously decreasing in  $\tau^s - \tau^c$ . Conversely, the evader will never decide to declare as long as  $\tau^s - \tau^c < 0$  (that is  $\Pi_i > 0$ ) and will always decide to declare if  $\tau^s - \tau^c > 0$  (that is  $\Pi_i < 0$ ).

While the model provides for the sign of the relation between the payoff of the evader and the different policies, the empirical analysis will allow us to assess the magnitude of these coefficients. Specifically, there are broadly two possible stories behind the increase in the declarations over the period 2006-2013:

- either the signature of bilateral tax treaties since the 2009 G20 summit has strongly encouraged tax evaders to come forward to their home tax administrations and is the first driver of offshore accounts declarations. A limit case would be that for a country c, the treaty is so efficient that  $p_i^c = 1$  for a given evader. In that case, the profit from evasion becomes negative and declarations independent of all other variables.
- or declarations are mostly driven by monetary incentives. In this case voluntary disclosure programs (short term incentives) and/or increasing  $\tau^s - \tau^c$  (long term incentive) would be the main drivers of declarations.

## **6 Empirical strategy**

### **6.1 Data for the regression analysis**

In order to investigate the changes in the share of interest declared out of the total interest income under the scope of the Directive, several explanatory datasets are gathered.

The first one is the interest and dividend income tax rate of the 27 countries for the 2006-2013 period. The main sources of information are the International Bureau of Fiscal Documentation (IBFD) and the OECD tax database. Official government websites as well as consulting firms' tax environment studies were also used to confirm the data. Importantly, in countries where tax rates differ between capital income derived domestically and capital income derived abroad, I selected the latter.

The OECD has made an inventory of the tax treaties signed between Switzerland and the other European countries on its Exchange of Tax Information Portal and I use this information to test the effect of tax treaties on declarations.

The last source of information I use is a unique dataset that lists all the Voluntary Disclosure Programs in each European country participating in the Directive. This dataset was constructed using OECD (2010) & OECD (2015) publications on Offshore Voluntary Disclosure as well as the annual publication of the "Tax Regularization Handbook" by Baker and Mc. Kenzie (2009-2013). The dataset provides information on the time period of the programs, the type of program (permanent or temporary) and the intensity of the program, that is how attractive are the reliefs for evaders.<sup>25</sup> For instance, a "high" intensity means that the evader who voluntarily comes forward to his home administration is relieved from nearly all monetary penalties (as well as penal prosecutions). Bulgaria, Romania and Cyprus are out of the sample because no reliable information could be found on the voluntary disclosure programs in these countries.

### **6.2 From the theoretical model to the econometric specification**

In order to empirically test which of the two possible stories behind the increase in the declarations is true, we need to adapt the model to the available data. First, while the model considers voluntary disclosure programs and treaties as continuous variables measuring in a sense the intensity of the programs, real world data are categorical. Therefore, we can only test the impact of the presence of a treaty versus the absence of a treaty. With voluntary disclosure programs, since we have more details on each country-specific program, we can assess the difference between a program that offers a high relief to evaders<sup>26</sup> versus a program that offer a low relief. Finally, the only outcome for which data are available is declarations. Therefore, the intermediary impacts, notably, the impacts of explanatory variables on

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<sup>25</sup>A detailed classification rule is provided at the end of Appendix Table 18

<sup>26</sup>The precise definitions of a high and a low relief are provided at the end of Appendix Table 18

the payoff function of tax evasion and, for treaties and VD programs, on the parameters that define this payoff function, are not observable.

Another important feature of the empirical analysis is that  $\tau^s$  and  $\tau^c$  are not the capital income tax rates but the interest income tax rates. This characteristic is not due to data limitation: I do have dividend income tax rate and I extrapolate a capital income tax rate by combining interest and dividend income tax rates using the Swiss National Bank to compute the shares of each type of investment in the offshore portfolio of tax evaders. However, after observing that declarants are at the lower end of the wealth distribution of tax evaders, my intuition is that their portfolio investment is not similar to the one of the average evader: declarants are likely the ones who mostly invested in lower-risk assets, that is interest-yielding ones. Therefore, I decided to stick to interest income tax rates in the benchmark specification and leave the analysis on the estimated capital income tax rate to the robustness checks section.

### 6.3 Econometric specification

The benchmark specification is the following:

$$FDEC_{it} = \beta_0 + \beta_1(\tau^s - \tau^c)_{it} + \beta_2SVD_{it} + \beta_3PVD_i + \beta_4SIGNED_{it} + u_i + \epsilon_{it} \quad (5)$$

where  $FDEC_{it} = [\text{declared interest income} / (\text{declared} + \text{taxed interest income})]_{it}$ ,  $(\tau^s - \tau^c)_{it} = (\text{Swiss withholding interest tax rate} - \text{home interest tax rate})_{it}$ ,  $SVD_{it}$  is a dummy equal to 1 if there is a special voluntary disclosure program in country  $i$  at time  $t$ ,  $PVD_i$  is a dummy equal to 1 if there is a permanent voluntary disclosure program in country  $i$  and  $SIGNED_{it}$  is a dummy equal to 1 if a bilateral treaty was signed between Switzerland and country  $i$  at time  $t$ .

Because we are interested in the coefficient of one time-invariant independent variable - the permanent VD programs -, we cannot use directly a fixed-effect model to account for all other time-invariant determinants of declarations  $u_i$  such as bilateral distance or residents' risk aversion. One way to get around the problem of omitted fixed effects and to still include dummy variables is to add the cluster means of all time-varying covariates as regressors in the estimated model. This method was proposed by Mundlak (1978). The cluster means are invariant within cluster (and vary between clusters) and allow for consistent estimation of time-invariant parameters just as if fixed-effects had been included. The interpretation of the coefficient of the cluster mean is then the difference in the between and within effects.

The transformed baseline equation - random effect with the Mundlak correction - is the following:

$$FDEC_{it} = \beta_0 + \beta_1(\tau^s - \tau^c)_{it} + \beta_2SVD_{it} + \beta_3PVD_i + \beta_4SIGNED_{it} + \beta_5\overline{(\tau^s - \tau^c)}_i + \beta_6\overline{SVD}_i + \beta_7\overline{SIGNED}_i + u_i + \epsilon_{it} \quad (6)$$

where  $\overline{(\tau^s - \tau^c)}_i$ ,  $\overline{SVD}_i$  and  $\overline{SIGNED}_i$  are respectively the country-clustered means of  $(\tau^s - \tau^c)_{it}$ ,  $SVD_{it}$  and  $SIGNED_{it}$

The dependent variable is a fraction. To handle these data properly, one must take into account the bounded nature of the response. Since a linear regression model on fractional data can generate predictions outside the unit interval, we need to find a transformation of FDEC that yields sensible predictions even for extreme values of the regressors. A common way to keep the predictions strictly within the unit interval is the logit transformation. Therefore, I will specify a model where :

$$Y_{it} = \log\left(\frac{FDEC_{it}}{1 - FDEC_{it}}\right) \quad (7)$$

and then

$$Y_{it} = \beta_0 + \beta_1(\tau^s - \tau^c)_{it} + \beta_2SVD_{it} + \beta_3PVD_i + \beta_4SIGNED_{it} + \beta_5\overline{(\tau^s - \tau^c)}_i + \beta_6\overline{SVD}_i + \beta_7\overline{SIGNED}_i + u_i + \epsilon_{it} \quad (8)$$

I also run equations (7) and (9) by splitting  $(\tau^s - \tau^c)$  into two subsets:  $(\tau^s - \tau^c) > 0$  and  $(\tau^s - \tau^c) < 0$ . Indeed, if tax evaders take mostly into account the long-term impact of declarations, they should start declaring when  $(\tau^s - \tau^c) > 0$ , that is when the withholding tax becomes higher than the home interest income tax rate. I also allow for a potential discontinuity in the intercept by adding a dummy variable equal to 1 if  $(\tau^s - \tau^c) > 0$ ,  $\mathbb{1}_{(\tau^s - \tau^c) > 0}$ . This specification can be referred to as the piecewise regression.

Finally, I separate voluntary disclosure into different levels of amnesty. The level denominated *PVDhigh* corresponds to amnesties under which tax evaders are strongly incentivized to declare their accounts. For permanent programs, since I include dummies for the high and low levels, the coefficients on these variables should be respectively interpreted as the differential impact of a “high” VD program compared to no VD program and of “low” VD program compared to no VD program. The same reasoning applies for temporary programs.

## 7 Results

### 7.1 Benchmark results

In Table 3, column (2) provides the results for the standard regression.<sup>27</sup> The advantage of the linear random effect (RE) model over the more accurate logit transformation is that the interpretation of coefficients is straightforward. We can first note that all the coefficients signs are in accordance with the model proposed in Section 5: The fraction declared is an increasing function of  $(\tau^s - \tau^c)$ , the signature of a treaty and the existence of a voluntary disclosure program, may it be permanent or temporary. The second important result is the magnitude of each variable. Differences in tax rates are the first driver of declarations: As a back of the envelope calculation, the increase in the effective withholding tax rate from 15% in 2005 to 35% in 2012 could have led to a  $0.87 \cdot 20 = 17.4$  percentage point change in declarations, assuming away changes in the home country tax rates. In comparison, the signature of a bilateral treaty increases the share declared by only 10 percentage points. While the coefficient is significant, the signature of treaties has way less effect on the change in declarations over the period. The logit transformation in column (5) provides better estimates for the comparison of coefficients' magnitude. From this specification, it appears that both temporary and permanent voluntary disclosure programs have higher coefficient estimate than the signature of a treaty. In particular, permanent programs have about 1.5 times the impact of treaty signature on the fraction of interest income declared in Switzerland. Permanent programs also have a higher coefficient than temporary programs<sup>28</sup>. Column (3) and (6) provide the results for the piecewise regression, both for the standard and logit transformation models. The two specifications point at the same conclusions: the coefficient for the impact of  $(\tau^s - \tau^c)$  on declarations is higher when  $(\tau^s - \tau^c) > 0$  than when  $(\tau^s - \tau^c) < 0$ . This means that an increase of 1 percentage point in  $\tau^s$  has a higher impact on declarations in countries where  $\tau^s$  is greater than  $\tau^c$ . This result illustrates the “threshold effect” mechanism described in Section 5: while the profit from evading is continuously decreasing in  $(\tau^s - \tau^c)$ , evaders start declaring only when their profit becomes negative. The latter outcome is more likely when  $(\tau^s - \tau^c) > 0$  than when  $(\tau^s - \tau^c) < 0$ . However, the fact that the coefficient is still significantly positive when  $(\tau^s - \tau^c) < 0$ <sup>29</sup> indicates that other considerations than just monetary ones enter the decision function. These considerations are incorporated in the model in  $F_d^c$ , the penalty incurred when an evader is discovered and which encompasses monetary penalties but also shame or the fear of penal prosecutions.<sup>30</sup> Finally,

<sup>27</sup>column 1 provides results for the FE model. As Mundlak (1978) predicts, the coefficients on time-variant variables are the same as the ones in the random effect model with Mundlak correction

<sup>28</sup>This result is in accordance with previous literature. For instance, Langenmayr (2015) demonstrates that a permanent voluntary disclosure program seems to have a positive impact on tax collections, in contrast to temporary tax amnesties, which were found in early time-series studies to leave tax revenues unaffected (Alm and Beck (1993))

<sup>29</sup>Even after controlling for other incentives to declare such as the signature of a treaty or a voluntary disclosure program

<sup>30</sup>It is important to keep in mind that these remarks only apply to the subset of evaders that end up declaring, who are mostly on the lower end of the wealth distribution of evaders. However if small owners are indeed fearing penal prosecutions and

Table 3 – **Benchmark results on the whole sample**

Variables	FE model (1)	RE Mundlak correction (2)	Piecewise regression (3)	VD levels (4)	Logit Transformation (5)	Piecewise Logit Transformation (6)	Logit VD levels (7)
$(\tau^s - \tau^c)$	0.87*** (0.16)	0.87*** (0.16)			8.67*** (1.38)		
$(\tau^s - \tau^c) < 0$			0.46 (0.29)	0.48* (0.27)		7.34** (2.94)	7.58*** (2.82)
$(\tau^s - \tau^c) > 0$			1.08*** (0.21)	1.09*** (0.21)		9.63*** (1.83)	9.68*** (1.83)
$\mathbb{1}_{(\tau^s - \tau^c) > 0}$			0.01 (0.03)	0.01 (0.03)		-0.00 (0.25)	-0.01 (0.25)
<i>SIGNED</i>	0.10*** (0.03)	0.10*** (0.03)	0.11*** (0.03)	0.11*** (0.03)	0.54** (0.25)	0.58** (0.26)	0.55** (0.25)
<i>SVD</i>	0.08* (0.05)	0.08* (0.05)	0.08* (0.05)		0.67** (0.27)	0.67** (0.26)	
<i>PVD</i>		0.11*** (0.03)	0.10** (0.05)		1.01*** (0.27)	0.89** (0.40)	
<i>SVDlow</i>				0.01 (0.03)			0.02 (0.11)
<i>SVDhigh</i>				0.12* (0.07)			1.00*** (0.32)
<i>PVDlow</i>				0.08* (0.05)			0.84** (0.42)
<i>PVDhigh</i>				0.15** (0.06)			1.20** (0.50)
Constant	0.18*** (0.01)	-0.02 (0.03)	-0.03 (0.09)	-0.05 (0.08)	-3.89*** (0.21)	-4.10*** (0.56)	-4.10*** (0.51)
Nb Obs	190	190	190	190	189	189	189
Nb Clusters	24	24	24	24	24	24	24
R2	0.602	0.567	0.579	0.620	0.568	0.572	0.585

Note: The R2 for the fixed effect regression is the R2 within while the R2 for the RE regression is the R2 overall. Robust standard errors in parentheses. \*\*\* p<0.01, \*\* p<0.05, \* p<0.1. The UK and Austria signed a different information exchange treaty with Switzerland that came into force in January 2013. Under this agreement, a final withholding tax is deducted by Swiss banks from interest income, dividends and other investment income. The money is then forwarded anonymously to the Swiss Federal Tax Administration (FTA), which in turn transfers the collected tax to the UK and Austrian administrations. As this agreement can have simultaneously influenced the declarations under the Savings Tax Directive, the year 2013 is removed from the sample for UK and Austria. We also remove Romania, Bulgaria and Cyprus because no reliable information on VD programs were found.

shame, it is very likely that more wealthy ones also take these parameters into account in their evasion payoff function.

columns (4) and (8) provide results when we breakdown voluntary disclosure programs in different levels in accordance with the intensity of the relief offered by the government. As for temporary programs, the only programs that have a significantly positive effect on declarations are the ones that offer high reliefs to evaders. Magnitude-wise, the coefficient on high relief special voluntary disclosure program is almost twice as high as the one on the signature of a treaty. We also find a discrepancy between the low and high relief permanent voluntary disclosure programs (the coefficient on the second is 50% higher than on the first one) but low permanent programs still have a significant effect on the fraction declared, with an impact that is in fact still higher than the signature of a treaty.

These results demonstrate that, far from declaring mostly because of international agreements' pressure, the bulk of tax evaders decide to declare their accounts in reaction to monetary incentives. Consequently, it is not surprising that declarants are mostly "small" account holders<sup>31</sup> : the potentially negative effect of  $W_i^c$  on  $\Pi_i$  through its positive effect on  $p_i^c$  is more than compensated by the negative effect of wealth on  $s_i$ ,  $F_s^c$  and  $F_d^c$ . In other words, wealthy evaders can afford to evade the withholding tax so that their effective tax rate remains 0% and, by holding their accounts through offshore corporations, they still limit  $p_i^c$ . As a consequence, there is no monetary incentive or information treaty threat that is high enough to deter them.

## 7.2 Extensions and robustness checks

We first test alternative specifications of the model. The first specification we test adds interaction terms between  $(\tau^s - \tau^c)$  and respectively the SIGNED, SVD and PVD variables. The results are reported in column (1) of Appendix Table 1. While all interaction terms have a positive coefficient, none of them are significantly different from zero. This implies that we can't find a significant differential impact of  $(\tau^s - \tau^c)$  in the presence of a treaty or a VD program than in the absence of such public policies.

The second strain of alternative specifications introduces time fixed effect or time trends in the model. The results are reported in columns (2) to (4) of Appendix Table 1. The introduction of year fixed effect cancels all of the effect of  $(\tau^s - \tau^c)$ . This is due to the fact that  $\tau^s$  is common to all countries in a given year, and changes on average every two years, which makes it highly correlated with year fixed effects. As  $\tau^c$  is not highly variable over an 8 year period<sup>32</sup>, the effect of  $(\tau^s - \tau^c)$  is absorbed by the introduction of year fixed effects. The introduction of a year trend also diminishes the coefficient on  $(\tau^s - \tau^c)$  but the

<sup>31</sup>the average account declared lies between \$ 1 and \$ 3 million over the 2006-2013 period, see Section 4

<sup>32</sup>see Appendix table 15 for more details on interest income tax rates at the country/year-level

linear constraint imposed on the time trend enables to obtain a positive and significant<sup>33</sup> impact of  $(\tau^s - \tau^c)$  on the fraction declared. In the third specification including time related variables, I introduce 2 different trends, before and after 2009. The motivation behind this specification is that 2009 is simultaneously the year of the financial crisis<sup>34</sup> and the year of the “G20 crackdown on tax evasion”<sup>35</sup>. The results show no differential trend before and after 2009. Therefore, the crisis and the 2009 G20 crackdown have had no structural break on the outcome variable.

While this study focuses mainly on the declaration of accounts that stay in Switzerland, we should also keep in mind that tax evaders have the possibility to come forward to their home tax authorities, settle their bill and bring their money back in their home country. In other words, while we focus on declarants that keep their money in Switzerland even after they self-report it to their home country, we should not forget the evaders who end up repatriating their wealth in their home country. Because the second type of evaders leaves Switzerland, they are not in the statistics of the Swiss Fiscal Administration, and therefore not in the sample. As a consequence, a possible confounding scenario would be the following: treaty signed affect moderately the declaration of offshore accounts in Switzerland, but they are at the origin of important repatriations that we do not account for. If that were the case then the statement that monetary incentives are the first drivers of the decision to self-report would be erroneous. In order to test this scenario, we can estimate the following equation:

$$\log(deposit_{it}) = \beta_0 + \beta_1(\tau^s - \tau^c)_{it} + \beta_2SVD_{it} + \beta_3PVD_i + \beta_4SIGNED_{it} + \beta_5\overline{(\tau^s - \tau^c)}_i + \beta_6\overline{SVD}_i + \beta_7\overline{SIGNED}_i + u_i + \epsilon_it \quad (9)$$

The results are reported in column (5) of Appendix Table 1. Let us first note that the deposits considered here are the ones held directly by EU citizens. Therefore, a decrease in deposits held directly by evaders in Switzerland does not necessarily imply that evaders repatriate their account: it can also be that evaders decide to open a sham corporation in an offshore center such as Panama, through which they hold their account in Switzerland, or that they shift their accounts in offshore centers that did not abide by the Directive. The Savings Directive has indeed triggered such reactions, which have been thoroughly documented in Johannesen (2014). Therefore, the negative coefficient on  $(\tau^s - \tau^c)$  does not necessarily mean that people repatriate more when the difference in tax increases. It could also be that a higher difference in

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<sup>33</sup>at the 10 % confidence level

<sup>34</sup>which can have impact differently the numerator and denominator of the fraction declared. We can for instance think that it has decreased the total wealth taxed or declared under the Directive because of an overall decrease in assets but that it has increased the declarations because smaller accounts owners are more prone to declarations.

<sup>35</sup>which could have entailed a surge in declarations if evaders strongly believed that tax havens were about to disappear.

tax rate incentivize evaders to move their fund in another offshore center or add a further layer of secrecy by opening a dummy company.

Conversely, the fact that the coefficient on SIGNED is not statistically different from zero implies that signing a treaty does not entail a higher decrease in deposits held by evaders. So the only configuration in which signing a treaty could still have a differential impact on repatriation from Switzerland would be that while evaders from countries that signed a treaty repatriate, the others escape the Swiss tax by moving their tax residence (or funds) to other offshore centers.<sup>36</sup>

Another source of concern is reverse causality bias.  $(\tau^s - \tau^c)$  should not be an issue: top interest income tax rates in home countries,  $\tau^c$ , cannot realistically be influenced by the fraction of interest income declared in Switzerland. Furthermore, the tax rate schedule for the Savings Tax Directive,  $\tau^s$ , was decided in 2003 and was not re-adjusted after the policy started so that the fraction declared cannot have influenced it.

Johannessen and Zucman (2014) show<sup>37</sup> that, prior to the signature of treaties starting in 2009, there was no significant difference in fraction declared between countries that end up signing a treaty with Switzerland and countries that do not. Therefore, reverse causality is ruled out for the SIGNED variable as well. Finally, we want to test that there is no strong difference in declarations, ex ante, between countries that launch temporary voluntary disclosure programs and countries that do not. Indeed, one could worry that voluntary disclosure programs are launched in reaction to under-performance, in terms of declarations, compared to other countries.

Figure 9 reports the levels of fraction declared separately for two groups: countries that do not launch a Voluntary Disclosure program over the entire period versus countries that do. Before 2009, that is before most VD programs were launched, the levels are very similar. If anything, the fraction declared for countries that end up launching a special VD program is higher. The difference between the two groups kicks off starting in 2009 where we observe a surge in fraction declared for countries that decide to implement special VD programs.<sup>38</sup> Because permanent VD programs are time-invariant over the period we observe, we cannot reject that a lack of declarations motivated these programs. However, there is little evidence that permanent voluntary disclosure programs are launched on different grounds than temporary ones in this respect.

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<sup>36</sup>This scenario is highly unlikely. If anything, evaders from countries which signed a treaty should have more incentives to add a layer of secrecy and open a sham corporation.

<sup>37</sup>Figure 7 of the paper

<sup>38</sup>the same test was performed on the share of offshore wealth declared rather than the fraction declared and the conclusions are similar, see Appendix Figure 3

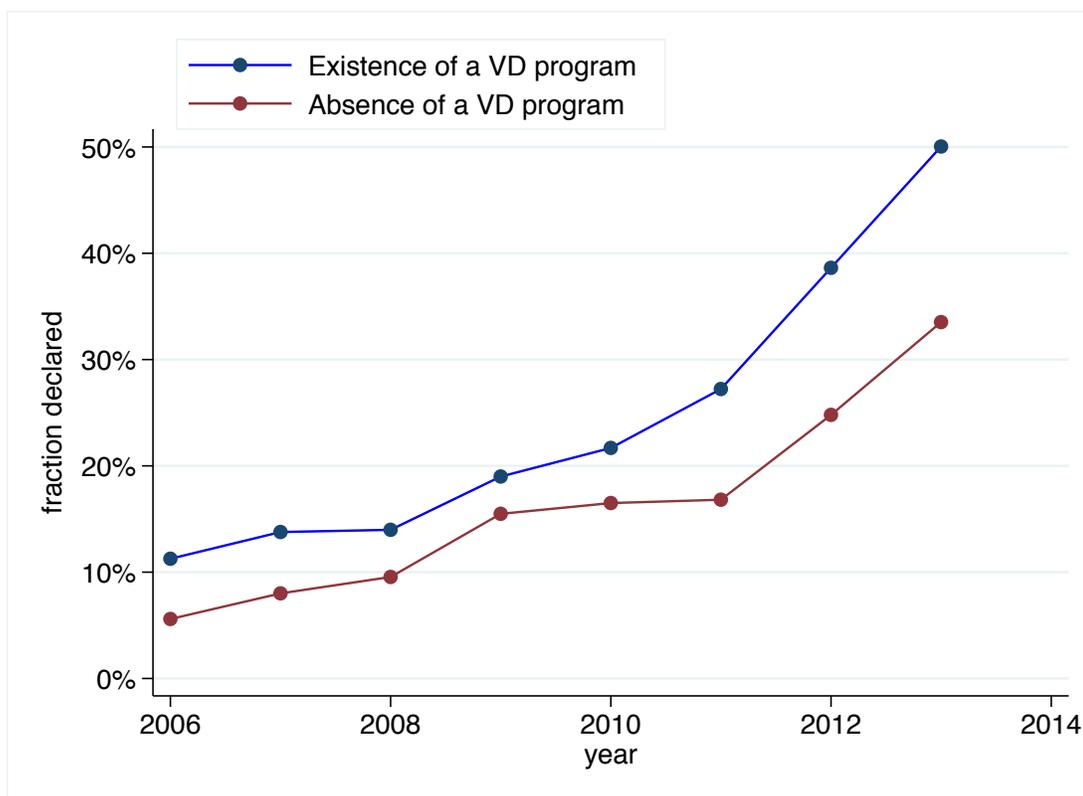


Figure 9 – Evolution of the fraction declared by special VD program status

The next robustness check modifies the size of the sample on which the regressions are ran.<sup>39</sup> Results are reported in Appendix Table 2 to 4. The first restriction is to remove countries that are suspected of offshore activities. Indeed, these countries could be the tax residencies of evaders that are not their citizens<sup>40</sup>. Therefore, a significant share of offshore wealth taxed under the Directive could be wrongly attributed to these countries, which would bias the results. Therefore, I remove Luxembourg, Malta and Ireland, which are well-known for their offshore activities. Removing these countries leaves the sign and magnitude of the results unchanged but for one characteristic: the difference in the coefficient between  $(\tau^s - \tau^c) < 0$  and  $(\tau^s - \tau^c) > 0$  soars. Indeed, the coefficient on  $(\tau^s - \tau^c) > 0$  becomes roughly twice as high (both in the basic and logit transformed regressions) as the one on  $(\tau^s - \tau^c) < 0$ . This feature comforts us in the idea that declarations are mostly driven by long-term cost/benefit computations: evaders declare substantially more when it becomes costly in the long-run to be in a tax haven.

A second sample variation takes out all the countries that were not in the EU before 2004. Indeed, new member states adopted important agreements between the EU and Switzerland almost simultaneously

<sup>39</sup>Because of the initially small size of the sample (less than 200 observations) I decided to use the full sample in the benchmark regression. However, the restrictions provide an interesting insight on coefficients when removing all potential confounding countries.

<sup>40</sup>for instance,IMF (2000) lists Luxembourg, Malta and Ireland as offshore centers.

with the implementation of the Savings Directive, notably agreements on free trade, free movement of persons and free movement of capital. Since these changes in legislation could have directly affected the countries' offshore wealth in the tax haven, as well as declarations, we should make sure that the results still hold if we exclude these countries from the sample. We run this test alternatively including and excluding Luxembourg, Malta and Ireland. The results show that removing these countries leaves coefficients almost unchanged. There are however two interesting variations in the magnitude. First, permanent voluntary disclose programs seem to have an even larger impact on the restricted sample, second there is an even more important cut between  $(\tau^s - \tau^c) < 0$  and  $(\tau^s - \tau^c) > 0$ : in the most restricted sample (Appendix Table 4),  $(\tau^s - \tau^c) < 0$  is not even significantly different from zero.

I also display results using the share of offshore wealth declared under the Directive as a dependent variable in Appendix Table 5.<sup>41</sup> The sign of coefficients is the same as for the fraction declared variable. However, the effect of  $(\tau^s - \tau^c)$  seems to predominate even more on the share of offshore wealth declared than on the fraction of interest income declared. A possible explanation for this outcome is that the nominator of this variable is the “offshore wealth declared under the Directive”, which includes both interest and dividend income declared. Indeed, when an evader decides to declare under the Directive, he cannot declare partially his accounts: he needs to declare both the ones that would have been taxed (interest-yielding) and the ones that were out of the reach of the withholding tax.<sup>42</sup> This implies that every interest-yielding account declared is multiplied by 2 to obtain the total wealth declared. Declarations therefore have a stronger impact on the numerator here than with the fraction declared.

A final robustness check that I operate replaces  $(\tau^s - \tau^c)$  by  $(\tau_w^s - \tau_w^c)$  that is the difference in the capital income tax rate. This specification implies that we regress on a weighted tax rate of both interest and dividend income<sup>43</sup>. The intuition behind this specification is that maybe declarants are also sensitive to top dividend tax rates since they cannot declare their offshore portfolio partially: they have to declare their dividend income simultaneously. Results are reported in Appendix Table 6. Column (1) has similar results as the specification with interest income tax rates. More interestingly, we see on Column (2) and (3) that the coefficient on  $(\tau_w^s - \tau_w^c) > 0$  is lower than the one on  $(\tau_w^s - \tau_w^c) < 0$ . However, if I change the split point to -0.05 (Column (4) and (5)) I obtain similar results as with  $(\tau^s - \tau^c) > 0$  and  $(\tau^s - \tau^c) < 0$ .

<sup>41</sup>While the paragraph “Discrepancies in the declarations under the Directive: empirical evidence and methodological choices” in Section 4 explains why I use the fraction declared in the benchmark regressions, the share of wealth declared is a more straightforward variable to study.

<sup>42</sup>Here, we assume that the evolution of the share of interest yielding investments in the portfolio of evaders who declare is the same as the one of non-EU evaders from 2006 to 2013 -for more details on the reason for this choice, see Section 4 -, which revolves around 40-50 %.

<sup>43</sup>again, assuming the share of interest yielding accounts in declarants' offshore portfolio is the one of the average non-EU evader.

Two interpretations are possible: either  $(\tau_w^s - \tau_w^c) > -0.05$  is just a noisy proxy for  $(\tau^s - \tau^c) > 0$ <sup>44</sup> because declarants in fact mostly invest in interest-yielding accounts. Or declarants have investment choices similar to other EU evaders, in which case we should interpret the fact that the split point is at -0.05 as a further evidence of the existence of extra-monetary incentives, encompassed in the model in the variable  $F_d^c$  and  $F_s^c$ . I have no robust way to disentangle the two explanations, even if empirical evidence on the average account declared by declarants tend to support the first proposition.

### 7.3 Policy implications

The regression analysis shows that declarants are mostly driven by monetary incentives when deciding to come forward to their home tax administration. In the light of these results, one may fall for the idea that public policies should focus on increasing these incentives and push tax treaties in the background. The policy implications of this paper are in fact the exact opposite.

First, what the paper shows is not that tax treaties in general are inefficient but that the ones that were implemented were not highly credible threats to tax evaders, particularly the most wealthy ones. Conversely, treaties that would enforce automatic exchange of information looking through sham corporations would certainly have allowed to trigger way more declarations. We can make a quick back of the envelop computation in the event that automatic exchange of information was implemented: all European countries would then be able to apply penalties at the full legal rate on all offshore accounts in Switzerland as well as bring back these accounts in their tax base for the current and future periods.<sup>45</sup>

We are going to focus on the last year of the program in the data, the year 2013, and compute the tax revenues lost that year and the possible gains from imposing penalties on tax evaders. Table 4 reports the results of this computation.

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<sup>44</sup>The overall R2 of the specification with capital income tax rate is always lower than the one with interest income tax rates

<sup>45</sup>These computations do not account for general equilibrium effects such as evaders switching their accounts to other offshore centers. However, we can imagine that automatic exchange of information would be implemented not only in Switzerland but also in all other offshore centers. As the book by Zucman (2015) shows, if the political will to end bank secrecy was strong enough, it would be possible to make offshore centers yield by imposing trade embargos or tariff barriers. For instance, he argues that an agreement between France, Germany and Italy to tax Swiss exportations at a 30% rate would be sufficient to make Bern yield. Another general equilibrium effect that is harder to account for is labor supply elasticities: some evaders could decide that if the revenues from their capital are taxed at their home country's tax rate then they will decrease their labor supply and therefore their income taxed. However, as Piketty shows in figure 8.4 of his book "Capital in the twenty-first century", revenues from capital exceed revenues from labor for the top 0.01% in France. Therefore, labor adjustments are likely to have limited impacts on the total taxable income for the subgroup of very high net wealth profiles that tax evaders are. A final general equilibrium effect we do not consider is investment adjustment: maybe tax evaders invested the revenue from their wealth in high-growth companies and taxing this revenue will consequently decrease investment and growth. Therefore, the back of the envelop computation I report here is an upper-bound for the actual static annual revenue gains that states could derive from automatic exchange of information with Switzerland. From a dynamic perspective however, one could think that the reduction in mobility of capital induced by automatic exchange of information could allow countries to bail out from the international tax competition that has led to tremendous decreases in capital taxes (Piketty (2014)) and therefore increase their tax revenues. Also note that, while annual tax revenues may be overstated from a static perspective, the penalties are computed using very conservative estimates so that they are a lower-bound for the true penalties evaders will have to pay.

Table 4 – Simulation of the revenues assuming automatic exchange of information with Switzerland in 2013

	Hidden offshore wealth in Switzerland in bn \$	Offshore revenues in mn \$	Top capital tax rates	Unpaid income tax, interest and penalties in bn\$	Inheritance and wealth unpaid taxes in bn\$	Annual income tax revenue in mn\$	Annual inheritance and wealth tax revenue in mn\$	Total one-off payments as a share of hidden offshore wealth
Austria	15,3	915	25%	4,2	0,0	166	0	27,5%
Belgium	68,8	4129	25%	14,8	6,9	707	673	31,5%
Czech Republic	5,7	342	15%	0,5	0,0	47	0	9,1%
Denmark	5,8	349	46%	2,9	0,4	68	18	57,3%
Estonia	1,1	63	5%	0,03	0,0	3	0	2,7%
Finland	2,3	136	25%	0,2	0,1	29	18	14,2%
France	146,6	8798	47%	45,0	46,1	1563	1190	62,1%
Germany	99,9	5992	26%	20,6	14,3	1029	928	34,9%
Greece	87,6	5255	16%	11,0	2,1	699	355	15,0%
Hungary	2,1	128	16%	0,2	0,1	18	16	12,7%
Ireland	16,0	961	44%	2,5	1,0	333	197	21,8%
Italy	185,9	11154	20%	28,3	1,8	1870	297	16,2%
Lithuania	0,4	25	19%	0,03	0,0	4	0	6,6%
Netherlands	88,5	5308	30%	46,8	10,1	568	300	64,3%
Poland	6,2	373	19%	1,6	0,1	52	15	26,8%
Portugal	38,1	2284	28%	4,2	0,0	569	0	11,1%
Slovak Republic	2,4	141	5%	0,1	0,0	7	0	2,6%
Slovenia	0,5	28	25%	0,1	0,03	5	2	30,7%
Spain	88,3	5296	27%	13,8	15,2	960	1152	32,9%
Sweden	9,9	596	30%	2,4	0,0	136	0	24,1%
Total (or average)	871,2	52274	25%	199,3	98,1	8832	5161	25,2%

Note: The offshore wealth in Switzerland is computed using the methodology in Zucman(2013). I then deduct from this total offshore wealth the share that is already declared under the Directive. Indeed, these accounts would not be subject to penalties as they are already compliant with the tax administration. The offshore revenue is computed using a 6% return on investment. This is a conservative estimate for the effective return on investment for high-net-worth people. Indeed, as evidenced in the annual publication of the World Wealth Report by Cap Gemini, the annual returns on investment for high-net-worth individuals is 7-8 %. The expected annual tax revenue is computed using a capital income tax rate that combines interest and dividend income tax rates to reflect the investment portfolios of European investors in Switzerland, as described by the SNB data. In countries where there is little variability in the tax rate (< 5% over the period), I assume that the 2013 tax rate is applied to all periods. Otherwise I adjust the tax rate applied to previous years in order to match the true tax rate. The expected revenue from penalties is computed using the information from the 2010 and 2015 OECD reports on disclosure programs. Indeed, the reports also provide details on the sanctions in the event that the evader gets caught. Specifically, I compile the number of years for which countries look back and apply the tax rate. For instance, in France, tax authorities make evaders pay the tax for the past 10 years. The wealth in Switzerland is likely to be fairly stable in terms of owners, therefore most accounts that are there were likely opened more than 10 years ago. Also, even if the amounts fluctuate on the accounts, tax administration usually take the maximum wealth to compute the taxes due. However, to remain conservative and account for wealthy families that opened their offshore accounts less than 10 years ago, I deflate the total penalty by 20% (and if the authorities only look back 5-7 years I deflate it by 10 %). I also compile the level of the penalty that comes on top of the tax, as well as the interest rate. In most countries, the fine is proportional to the amount of unpaid taxes. In some countries, the fine is computed in proportion of the total wealth. It is for instance the case in Italy where the penalty amounts to 10% of the hidden wealth. For countries with missing interest rates I assume a 5% rate. I also cap the penalty at 100% the amount of unpaid taxes due, even if there are countries in which the penalty can “go up to” 200% of the unpaid tax. For annual inheritance tax, I use data collected in the IBFD annual publication of “The European Tax Handbooks”. Following a presentation by Raj Chetty at the Summer Institute 2015 on “the relationship between Life Expectancy and Income in the United States, 2001-2014”, I assess that the top 1% in the US lives until around 90 year-old. Given that the average age of declarants under the French Voluntary Disclosure program is 69, I assume that accounts in Switzerland are inherited on average every 21 years. I also assume that the average inherited wealth is the same as the average wealth in Switzerland and that all transmission is made to the closest relative so that I take the lowest tax rate. Then, the unpaid tax is computed using the same number of years covered as for the income tax. Since it is unclear whether the penalty rates I gathered also apply to inheritance, I choose exempt inheritance from penalties (other than the refund of unpaid taxes). I removed the countries for which the computation of the share of offshore wealth in Switzerland is not possible, that is the countries that entered the EU after 2004 and countries that are offshore centers such as Luxembourg. Because of the non-dom rule, under which foreign residents in the UK are exempt from taxes on their international income under certain conditions, it is unclear which share of UK offshore wealth should actually be taxed. I therefore remove the country from my sample. The third and last column provide unweighted averages in the last line while the other columns provide sums.

I find that \$ 297 bn could be collected in penalties in the 20 countries that I study. This represents, on average, 25% of each country's undeclared offshore wealth in Switzerland<sup>46</sup>. Using data from Eurostat, we can assess that this represented more than 50% of the aggregated public deficits of the countries in 2013. The penalties also amount to the total public Research and Development expenditures in the same year for these countries<sup>47</sup>. Considering that Switzerland concentrates about half of European total offshore wealth<sup>48</sup>, implementing automatic exchange of information worldwide would have allowed to cover fully the public deficit this year, as well as 2 times the public spendings in R&D. Furthermore, the benefits of ending tax dodging are not limited to a one-off revenue. It also allows to increase the tax base for the future periods. Let us take the example of France: taxing offshore wealth in Switzerland would bring \$ 2.7 bn annually and extending this measure to all offshore centers would allow the state to collect \$ 5.6 bn every year. This makes up for 8.3% of the income tax, "impôt sur le revenu des ménages", collected that year<sup>49</sup>. Let us keep in mind that, in comparison, the Savings Tax Directive only enabled France to collect \$ 136 mn in 2013. Table 5 provides an inventory of the annual revenue from the Directive, compared to what automatic exchange of information could yield to governments. On average, the Directive only allows to cover 4.2% of the tax revenues that worldwide automatic exchange of information could induce. Therefore, an important policy implication of this paper is the implementation of worldwide automatic exchange of information that tracks the final owner of the account.

The regression results also show that voluntary disclosure programs have a significant impact on declarations. A policy maker could therefore advocate for their expansion, insisting that the ones offering high reliefs are the most effective. In fact, what I find is a partial equilibrium result. Indeed, as Langenmayr (2015) shows using empirical data on the 2009 U.S voluntary disclosure programs, these policies encourage tax evasion in the longer run. A more theoretical paper, Konrad and Stolper (2015), proves that, in a general equilibrium setting, reducing penalties for tax evaders who self-report their offshore wealth makes haven countries more robust against international pressure. Finally, even from a static perspective, offering evaders a fiscal gift<sup>50</sup> is not the best way to maximize tax revenues: it would actually be more effective to have an efficient information exchange system that would allow governments to clamp down on evaders and make them pay the full penalty for their illegal activity.

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<sup>46</sup>This is an unweighted average of all the countries. The weighted average is 34%

<sup>47</sup>This statistic was computed using the OECD Research and Development Statistics (RDS) database

<sup>48</sup>Zucman(2013) shows that total offshore wealth is \$ 5.9 tr. at the end of 2008 so that Switzerland concentrates about one third of offshore wealth. Since Europeans are the first beneficiaries of the Swiss bank secrecy I assume that half of their hidden wealth is in Switzerland

<sup>49</sup>Source: Cour des comptes, rapport sur les recettes de l'Etat 2013

<sup>50</sup>see Appendix section Voluntary Disclosure Programs and the fiscal gift: Evidence from the French 2013 Voluntary Disclosure Program

**Table 5 – Comparison of the revenues from the Directive and the potential revenues from “the end of bank secrecy” in 2013**

	Annual fiscal revenues from automatic exchange in mn\$	Annual income tax generated by the Directive in mn\$	<i>as a % of expected tax revenues from automatic ex. with Switzerland</i>	<i>as a % of expected tax revenues from automatic ex. worldwide</i>
Austria	166	31,0	18,7%	9,3%
Belgium	1380	52,9	3,8%	1,9%
Czech Republic	47	5,7	12,2%	6,1%
Denmark	86	4,7	5,4%	2,7%
Estonia	3	0,3	7,9%	4,0%
Finland	47	2,2	4,8%	2,4%
France	2753	135,7	4,9%	2,5%
Germany	1957	469,7	24,0%	12,0%
Greece	1054	30,2	2,9%	1,4%
Hungary	34	5,4	15,8%	7,9%
Ireland	530	5,9	1,1%	0,6%
Italy	2167	103,5	4,8%	2,4%
Lithuania	4	0,7	16,0%	8,0%
Netherlands	868	45,2	5,2%	2,6%
Poland	67	8,8	13,1%	6,5%
Portugal	569	57,4	10,1%	5,0%
Slovak Republic	7	1,0	13,7%	6,9%
Slovenia	7	0,8	11,9%	5,9%
Spain	2112	199,9	9,5%	4,7%
Sweden	136	19,2	14,2%	7,1%
Total (or average)	13993	1180,2	8,4%	4,2%

Note: Same computational assumptions as in Table 4. Zucman(2013) shows that Switzerland concentrates about one third of offshore wealth. Since Europeans are the first beneficiaries of the Swiss bank secrecy we assume that half of their hidden wealth is in Switzerland. The fiscal revenues in column (1) encompass both income, inheritance and wealth taxes. For column (1) and (2) the total is provided, while for column (3) and (4) it is a weighted average.

The final element that I study in the regression analysis is  $(\tau^s - \tau^c)$ . I show that it is the first driver of declarations: the higher  $(\tau^s - \tau^c)$ , the higher the fraction declared. However, the two tax rates should be assessed separately when considering public policy implications. Indeed, the home country tax rate  $\tau^c$  does not only apply to tax evaders but to the entire tax base. Therefore, decreasing this tax rate could be in fact harmful to the countries' total tax revenues. Additionally, since the most wealthy evaders find ways to avoid paying the tax in Switzerland, the home tax rate should be set at a very low level to make them return to their home country. Conversely,  $\tau^s$  could be increased at no cost to the home country tax revenue as it only applies to tax evaders. Therefore, it is surprising that this tax rate was implemented at such a low rate (15%) in 2005. Setting it at least at the maximum top capital tax rate of all participant countries<sup>51</sup> would likely have triggered more declarations.

<sup>51</sup>and also applying it to all capital income

## 8 Concluding remarks

In the first part of the paper, I described how tax evaders reacted strategically to the introduction of a tax on offshore wealth in Switzerland. I identified three loopholes in the Savings Tax Directive: the taxation of interest-yielding accounts only, the tracking of accounts only when they are owned directly by Europeans and the absence of control mechanisms to ensure compliance from the banks. Then, using macro data from the Swiss National Bank and the Swiss Fiscal Administration, I demonstrate how tax evaders took advantage of each of these shortfalls to dodge taxation. The second part was motivated by the observation that the scope of the Directive has almost tripled between 2006 and 2013. This evolution is mostly due to declarations. With a simple model, I showed the mechanisms through which different public policies can impact declarations, then the empirical analysis provided the magnitude of each effect. I find that declarations are mostly driven by monetary incentives while bilateral treaties, that were praised as a way to end bank secrecy, happen to have the least impact of all studied policies on declarations. The rest of the paper is dedicated to the policy implications of these findings. Except the upfront tax in Switzerland, the monetary incentives we study are costly to countries and mostly targeted at small evaders so that they have little impact on very high-net-worth households. Therefore, they are not an efficient solution to bring tax evasion to a definitive end. Conversely, treaties based on automatic exchange of information would allow to clamp down on the entire panel of tax dodgers. The new dataset I have gathered on capital tax rates and penalties allows to compare the yield of the Directive to the yield of automatic exchange of information with Switzerland, and more generally with all offshore centers. I estimated that, for 20 European countries, efficient treaties would enable to obtain \$ 297 bn in penalties and annual revenues of \$ 14 bn, only considering the taxation of the offshore wealth in Switzerland. The amount would be twice as high if we take into account countries' wealth hidden in all offshore centers.

After ten years of statu quo on the Directive, on May 27th 2015, the European Union and Switzerland signed a Protocol amending their existing Savings agreement and transforming it into an agreement on automatic exchange of financial account information based on the Common Reporting Standard (CRS) set by the OECD. The new agreement will only be effective in 2018. While this agreement is a step forward in the fight against tax evasion, it is hardly providing for an ideal set-up. Most importantly, it does not resolve the problem of tax residency. Indeed, the standard for automatic exchange of information is based on tax residency, not citizenship. Therefore, evaders will still be able to escape taxes by opening sham corporations in offshore centers: we are still far from the heralded "end of bank secrecy".

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## 9 Appendix

### 9.1 Voluntary Disclosure Programs and the fiscal gift: Evidence from the French 2013 Voluntary Disclosure Program

Since November 2013, France has adopted a law on the fight against tax evasion that gives the opportunity to evaders to come forward to French tax authorities and pay lower penalties than if they were caught hiding their money. The law distinguishes between passive<sup>52</sup> and active evaders. The first category will have to pay the taxes they have avoided at a rate inflated by 15%, and a penalty of 1.5% of the total assets while the second category will have to pay the taxes they have avoided at a rate inflated by 30%, and a penalty of 3% of the total assets. A report from the French administrative service that processes the declarations allows us to learn more about the characteristics of declarants under this program. The total amount that was declared in the year 2014 was 14 billion euros, which represents about 10% of French offshore wealth in Switzerland. From the files that were processed by the fiscal administration, the average wealth declared is 880000 euros and the median is 350000 euros. If we look at Figure 10, we can also observe that 90% of the evaders declare assets below 1 million euro and that the average for the top decile of declarants is only 1.7 million, which is still below the top 1% of the French financial wealth distribution. Therefore, it appears that the profile of declarants under this voluntary disclosure program is similar to the one under the Savings Directive : the bulk of the declarants are small evaders. The report also provides information on the source of asset declared: it appears that 75% are derived from inheritance or donation. The majority of the people that benefited from this amnesty are therefore passive evaders who were waiting for a window of opportunity to come forward to tax authorities, rather than active evaders who initiated their fiscal evasion.

Another interesting question is: how punitive are voluntary disclosure programs? In other words: are evaders paying for their non-compliance? From the official statement it seems that they indeed have to pay an inflated tax rate as well as a penalty, may they be active or passive declarants. The effective tax rates are displayed in Figure 11.

From this figure, we can compute an average tax rate on wealth declared, which is 36%<sup>53</sup>. In order to grasp how punitive this tax rate is we can look at the composition of wealth declared in Figure 12 and try to compute a rough average tax rate for the overall wealth declared.

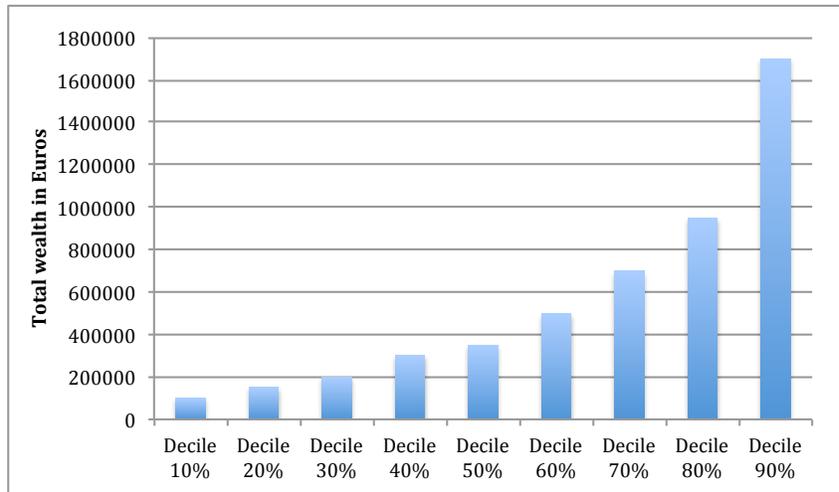
Taking the very conservative assumptions that inherited wealth was taxable only at 30%<sup>54</sup>, that donations

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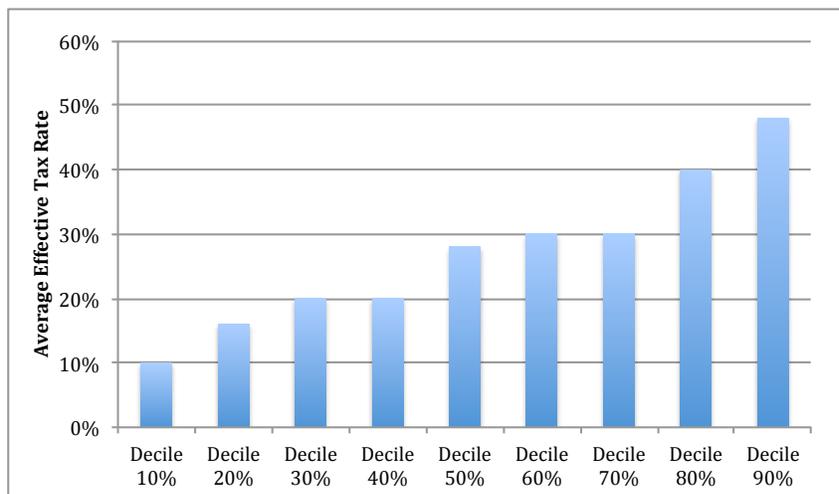
<sup>52</sup>that is evaders who inherited or were donated wealth hidden in offshore centers

<sup>53</sup>This average is computed by using the average tax rates and average wealth of each decile so it is an approximation and relies on a small variance of tax rates and wealth within each group

<sup>54</sup>tax rate applied to taxable inherited wealth below 1 million



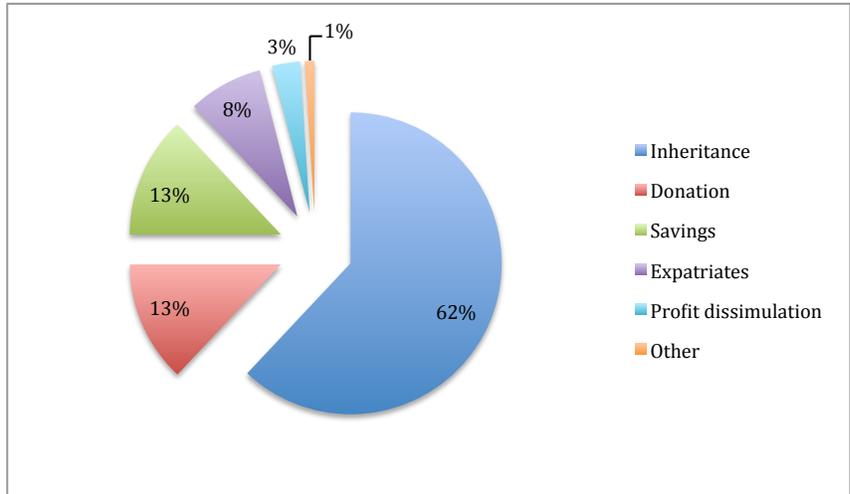
Repatriation of wealth declared in France under the 2013 VD program



Average effective tax rate ( as a % of total wealth declared)

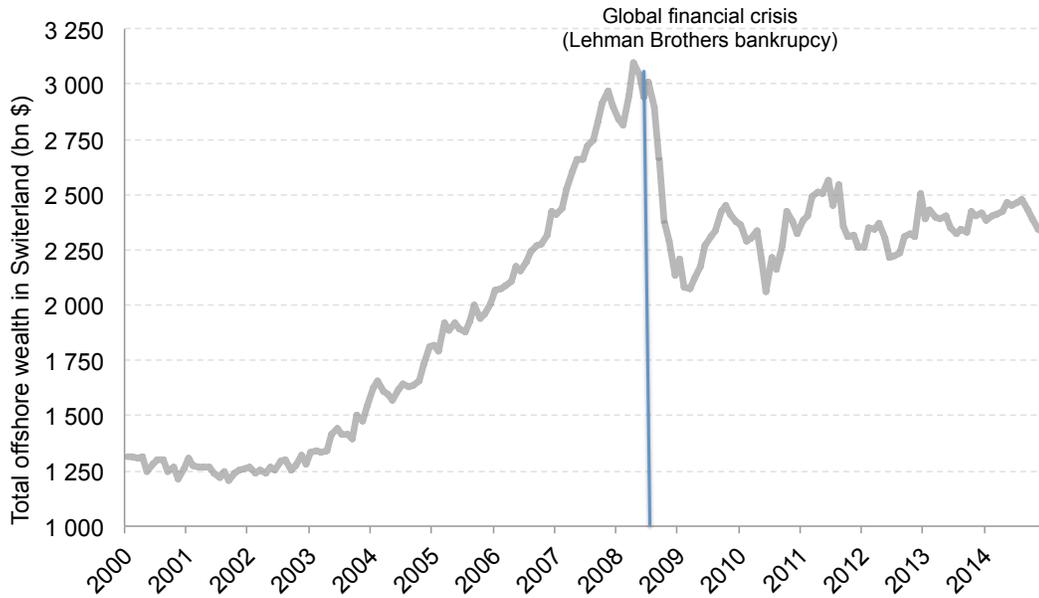
were taxed at 45%, that 30% of the accounts should have paid the ISF (wealth tax)<sup>55</sup> and that the returns on their assets over the 2006-2013 period was 3.5%, we still obtain an average tax rate of 39% that is higher than the average tax rate effectively paid by evaders. If these policies allow to bring short term resources to government they can also, in the longer run, incentivize people to evade taxes if they realize they literally have nothing lose and everything to gain.

<sup>55</sup>taking the second bracket as a reference



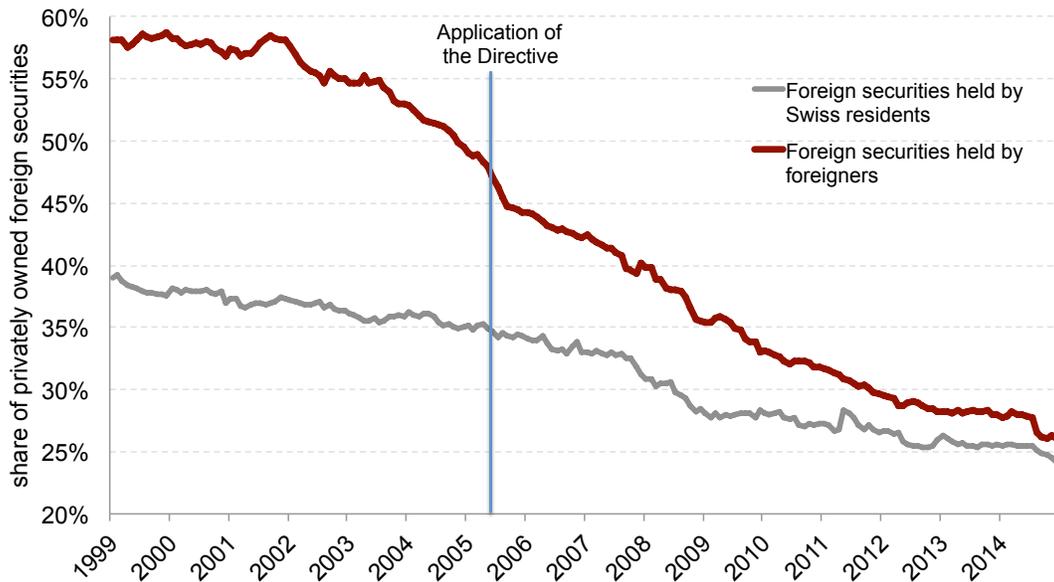
Type of Declared assets

## 9.2 Appendix Figures



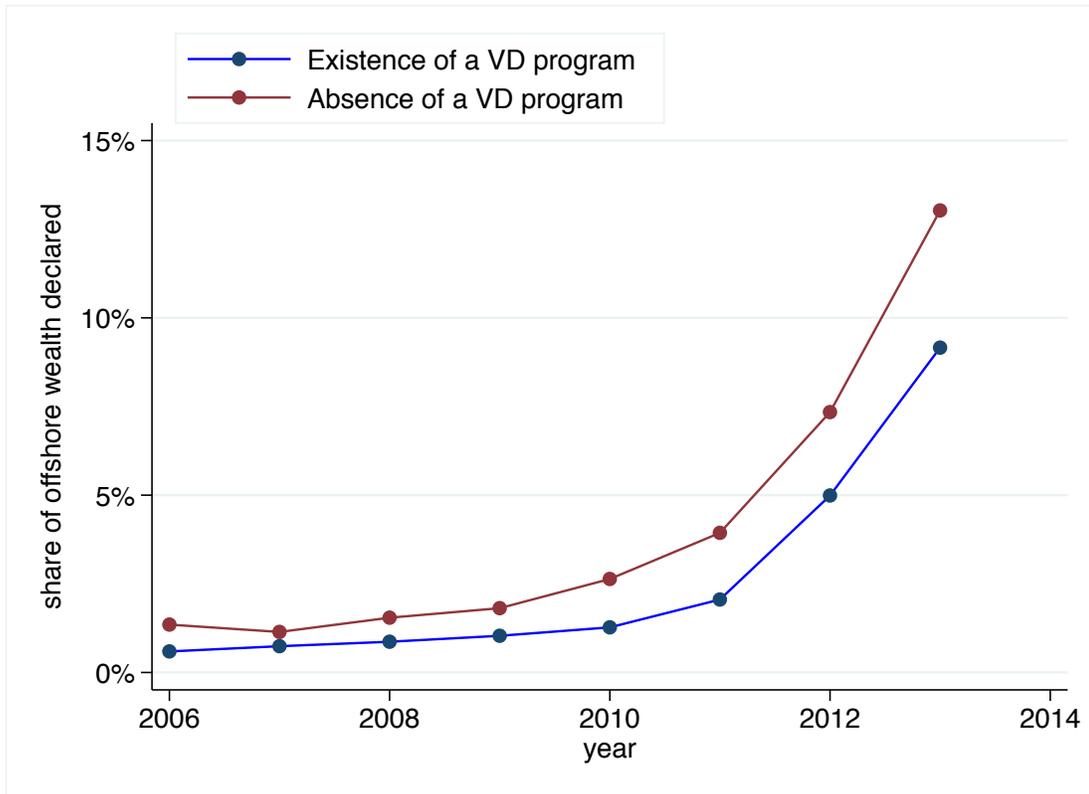
Notes: The figure reports monthly data and the date displayed on the x-axis are January of each year. Source: author's computations using SNB data.

Appendix Figure 1: Evolution of the total offshore wealth in Switzerland



Notes: The figure reports monthly data and the date displayed on the x-axis are January of each year. Source: author's computations using SNB data.

Appendix Figure2 : The change in the share of interest income in total capital income for foreigners



Appendix Figure 3: Evolution of the share of wealth declared by special VD program status

### 9.3 Appendix Tables

**Appendix Table 1: Robustness checks: interaction term, time trends and deposits**

Variables	Interaction term	year FE	year trend	Different trend b/a 2009	log(deposit)
	(1)	(2)	(3)	(4)	(5)
$(\tau^s - \tau^c)$	6.93*** (1.91)	0.45 (1.66)	1.96** (0.86)	1.52* (0.90)	-6.54*** (1.50)
<i>SIGNED</i>	0.49** (0.24)	-0.07 (0.23)	-0.06 (0.23)	-0.10 (0.22)	-0.14 (0.23)
<i>SVD</i>	0.94** (0.41)	0.48** (0.24)	0.37 (0.23)	0.41* (0.22)	0.02 (0.25)
<i>PVD</i>	0.79** (0.32)	1.01*** (0.28)	1.00*** (0.27)	1.01*** (0.27)	-0.02 (0.82)
2007.year		0.56** (0.22)			
2008.year		0.76*** (0.26)			
2009.year		1.13*** (0.26)			
2010.year		1.20*** (0.31)			
2011.year		1.67*** (0.31)			
2012.year		2.44*** (0.40)			
2013.year		2.80*** (0.42)			
$(\tau^s - \tau^c) \times SVD$	3.96 (2.67)				
$(\tau^s - \tau^c) \times PVD$	2.80 (2.29)				
$(\tau^s - \tau^c) \times SIGNED$	-1.18 (1.65)				
year			0.34*** (0.05)		
year trend < 2009				0.41*** (0.06)	
year trend > 2009				0.41*** (0.06)	
Constant	-3.74*** (0.16)	-5.22*** (0.39)	-680.78*** (103.52)	-832.90*** (126.77)	4.68*** (0.83)

Note: The R2 for the fixed effect regression is the R2 within while the R2 for the RE regression is the R2 overall. Regressions provide results for the logit transformation. Robust standard errors in parentheses. \*\*\* p<0.01, \*\* p<0.05, \* p<0.1

**Appendix Table 2: Robustness check, changing the sample: removing potential offshore centers**

Variables	RE Mundlak correction (1)	Piecewise regression (2)	VD levels (3)	Logit Transformation (4)	Piecewise Logit Transformation (5)	Logit VD levels (6)
$(\tau^s - \tau^c)$	0.86*** (0.17)			8.60*** (1.42)		
$(\tau^s - \tau^c) < 0$		0.50 (0.32)	0.53* (0.31)		6.03* (3.12)	6.35** (3.04)
$(\tau^s - \tau^c) > 0$		1.17*** (0.22)	1.17*** (0.22)		10.87*** (1.78)	10.91*** (1.79)
$\mathbb{1}_{(\tau^s - \tau^c) > 0}$		-0.01 (0.03)	-0.01 (0.03)		-0.08 (0.27)	-0.09 (0.26)
<i>SIGNED</i>	0.10*** (0.03)	0.12*** (0.03)	0.11*** (0.03)	0.58** (0.28)	0.67** (0.28)	0.63** (0.27)
<i>SVD</i>	0.07 (0.06)	0.06 (0.06)		0.60* (0.32)	0.59* (0.30)	
<i>PVD</i>	0.11*** (0.03)	0.12** (0.05)		0.92*** (0.27)	0.76* (0.41)	
<i>SVLow</i>			0.01 (0.03)			0.04 (0.09)
<i>SVDhigh</i>			0.11 (0.09)			1.01** (0.44)
<i>PVDlow</i>			0.12*** (0.05)			0.88* (0.46)
<i>PVDhigh</i>			0.14* (0.07)			0.83 (0.61)
Constant	-0.00 (0.02)	0.02 (0.07)	0.03 (0.08)	-3.76*** (0.22)	-4.12*** (0.61)	-3.92*** (0.73)
Nb Obs	166	166	166	165	165	165
Nb Clusters	21	21	21	21	21	21
R2	0.541	0.558	0.562	0.520	0.533	0.537

Note: The R2 for the RE regression is the R2 overall. Robust standard errors in parentheses. \*\*\* p<0.01, \*\* p<0.05, \* p<0.1

**Appendix Table 3: Robustness check, changing the sample: keeping only countries that entered the EU before 2004**

Variables	RE Mundlak correction (1)	Piecewise regression (2)	VD levels (3)	Logit Transformation (4)	Piecewise Logit Transformation (5)	Logit VD levels (6)
$(\tau^s - \tau^c)$	0.83*** (0.20)			7.43*** (1.77)		
$(\tau^s - \tau^c) < 0$		0.36 (0.32)	0.40 (0.32)		5.99* (3.08)	6.35** (2.98)
$(\tau^s - \tau^c) > 0$		1.35** (0.67)	1.34** (0.67)		11.40*** (2.89)	11.25*** (2.79)
$\mathbb{1}_{(\tau^s - \tau^c) > 0}$		0.04 (0.04)	0.05 (0.04)		-0.09 (0.26)	-0.08 (0.26)
<i>SIGNED</i>	0.11*** (0.04)	0.11*** (0.04)	0.10*** (0.04)	0.68** (0.30)	0.73** (0.29)	0.68** (0.28)
<i>SVD</i>	0.08 (0.05)	0.08 (0.05)		0.65** (0.30)	0.64** (0.28)	
<i>PVD</i>	0.16*** (0.03)	0.19*** (0.06)		1.42*** (0.27)	1.44*** (0.48)	
<i>SVLow</i>			0.01 (0.04)			0.04 (0.08)
<i>SVDhigh</i>			0.13* (0.08)			1.01*** (0.36)
<i>PVDlow</i>			0.16*** (0.03)			1.43*** (0.32)
<i>PVDlow</i>			0.26*** (0.06)			2.01*** (0.46)
Constant	0.03 (0.03)	0.17 (0.11)	0.20 (0.15)	-3.51*** (0.30)	-3.15*** (1.00)	-2.10* (1.23)
Nb Obs	118	118	118	118	118	118
Nb Clusters	15	15	15	15	15	15
R2	0.557	0.604	0.667	0.610	0.621	0.710

Note: The R2 for the RE regression is the R2 overall. Robust standard errors in parentheses.\*\*\* p<0.01, \*\* p<0.05, \* p<0.1

**Appendix Table 4: Robustness check, changing the sample: removing potential offshore centers and keeping only countries that entered the EU before 2004**

Variables	RE Mundlak correction (1)	Piecewise regression (2)	VD levels (3)	Logit Transformation (4)	Piecewise Logit Transformation (5)	Logit VD levels (6)
$(\tau^s - \tau^c)$	0.83*** (0.21)			6.88*** (1.82)		
$(\tau^s - \tau^c) < 0$		0.39 (0.38)	0.44 (0.37)		4.60 (3.26)	5.09 (3.21)
$(\tau^s - \tau^c) > 0$		1.53** (0.66)	1.51** (0.65)		12.31*** (2.84)	12.16*** (2.72)
$\mathbb{1}_{(\tau^s - \tau^c) > 0}$		0.01 (0.04)	0.01 (0.03)		-0.10 (0.27)	-0.11 (0.26)
<i>SIGNED</i>	0.11*** (0.04)	0.12*** (0.04)	0.12*** (0.04)	0.71** (0.34)	0.77** (0.31)	0.72** (0.30)
<i>SVD</i>	0.06 (0.06)	0.06 (0.05)		0.59* (0.32)	0.57* (0.30)	
<i>PVD</i>	0.16*** (0.03)	0.17*** (0.06)		1.25*** (0.29)	1.05** (0.41)	
<i>SVLow</i>			0.01 (0.03)			0.06 (0.10)
<i>SVDhigh</i>			0.10 (0.09)			0.96** (0.43)
<i>PVLow</i>			0.17*** (0.04)			1.36*** (0.34)
<i>PVDhigh</i>			0.29*** (0.11)			1.65** (0.83)
Constant	0.02 (0.03)	0.03 (0.17)	0.24 (0.28)	-3.45*** (0.35)	-4.64*** (1.46)	-2.66 (2.10)
Nb Obs	102	102	102	102	102	102
Nb Clusters	13	13	13	13	13	13
R2	0.546	0.575	0.629	0.565	0.597	0.662

Note: The R2 for the RE regression is the R2 overall. Robust standard errors in parentheses. \*\*\* p<0.01, \*\* p<0.05, \* p<0.1

**Appendix Table 5: Robustness check, regression on the share of wealth declared in the total offshore wealth in Switzerland**

Variables	RE Mundlak correction (1)	Piecewise regression (2)	VD levels (3)	Logit Transformation (4)	Piecewise Logit Transformation (5)	Logit VD levels (6)
$(\tau^s - \tau^c)$	0.28*** (0.07)			10.41*** (1.79)		
$(\tau^s - \tau^c) < 0$		0.02 (0.07)	0.02 (0.06)		5.79* (3.37)	6.08* (3.27)
$(\tau^s - \tau^c) > 0$		0.44*** (0.07)	0.44*** (0.07)		14.51*** (2.39)	14.52*** (2.41)
$\mathbb{1}_{(\tau^s - \tau^c) > 0}$		0.00 (0.01)	0.00 (0.01)		-0.14 (0.26)	-0.14 (0.26)
<i>SIGNED</i>	0.03** (0.01)	0.04*** (0.01)	0.04*** (0.01)	0.70** (0.32)	0.86*** (0.30)	0.82*** (0.28)
<i>SVD</i>	0.02 (0.02)	0.02 (0.02)		0.55* (0.32)	0.52* (0.29)	
<i>PVD</i>	0.03** (0.01)	0.03* (0.02)		0.93*** (0.34)	0.84* (0.48)	
<i>SVLow</i>			0.00 (0.01)			-0.05 (0.10)
<i>SVDhigh</i>			0.03 (0.03)			0.88** (0.39)
<i>PVLow</i>			0.02 (0.01)			0.62 (0.51)
<i>PVDhigh</i>			0.04* (0.03)			1.18** (0.52)
Constant	0.00 (0.01)	0.02 (0.03)	0.01 (0.03)	-5.93*** (0.36)	-6.18*** (0.73)	-6.14*** (0.89)
Nb Obs	174	174	174	173	173	173
Nb clusters	22	22	22	22	22	22
R2	0.368	0.417	0.444	0.526	0.549	0.576

Note: The R2 for the RE regression is the R2 overall. Robust standard errors in parentheses. \*\*\* p<0.01, \*\* p<0.05, \* p<0.1

**Appendix Table 6: Robustness check, tax on wealth instead of tax on interest**

Variables	logit regression	logit piecewise regression	logit VD level breakdown	piecewise splitpoint -0.5	VD level breakdown splitpoint -0.5
	(1)	(2)	(3)	(4)	(5)
$(\tau_w^s - \tau_w^c)$	9.86*** (2.29)				
$(\tau_w^s - \tau_w^c) < 0$		8.12*** (2.41)	8.19*** (2.34)		
$(\tau_w^s - \tau_w^c) > 0$		7.63 (5.71)	7.74 (5.80)		
$\mathbb{1}_{(\tau_w^s - \tau_w^c) > 0}$		0.54** (0.23)	0.54** (0.23)		
$(\tau_w^s - \tau_w^c) < -0.05$				6.43*** (2.40)	6.50*** (2.26)
$(\tau_w^s - \tau_w^c) > -0.05$				15.63** (7.25)	15.85** (7.31)
$\mathbb{1}_{(\tau_w^s - \tau_w^c) > -0.05}$				0.43 (0.40)	0.43 (0.41)
<i>SIGNED</i>	1.11*** (0.23)	0.95*** (0.23)	0.94*** (0.22)	1.10*** (0.23)	1.09*** (0.22)
<i>SVD</i>	0.57* (0.30)	0.61** (0.29)		0.61** (0.30)	
<i>PVD</i>	1.32*** (0.28)	0.61 (0.38)		1.28*** (0.28)	
<i>SVDlow</i>			0.05 (0.12)		0.06 (0.14)
<i>SVDhigh</i>			0.90** (0.38)		0.89** (0.40)
<i>PVDlow</i>			0.57 (0.36)		1.11*** (0.31)
<i>PVDhigh</i>			0.98* (0.51)		1.66*** (0.44)
Constant	-3.71*** (0.25)	-4.81*** (0.56)	-4.79*** (0.53)	-3.41*** (0.57)	-3.49*** (0.74)
Nb Obs	189	189	189	189	189
Nb Clusters	24	24	24	24	24
R2	0.453	0.524	0.537	0.478	0.505

Note: The R2 for the RE regression is the R2 overall. Robust standard errors in parentheses. \*\*\* p<0.01, \*\* p<0.05, \* p<0.1

**Appendix Table 7: EU Offshore wealth as a share of household financial wealth in 2013**

	households net financial wealth (in bn \$)	offshore wealth in Switzerland (in bn \$)	share of households financial wealth in Switzerland
	mid-2013	mid-2013	mid-2013
Austria	472	19	4%
Belgium	1047	73	7%
Czech Republic	136	6	4,7%
Denmark	433	6	1,4%
Estonia	17	1	6,1%
Finland	135	2	1,8%
France	3750	147	3,9%
Germany	4494	157	3,5%
Greece	199	90	45%
Hungary	104	3	2,5%
Ireland	193	16	8,3%
Italy	3693	185	5%
Latvia	20	1	4,2%
Lithuania	22	1	2,3%
Netherlands	1495	91	6,1%
Poland	263	7	2,8%
Portugal	296	45	15,3%
Slovak Republic	35	2	6,8%
Slovenia	32	0	1,6%
Spain	1127	114	10,1%
Sweden	821	12	1,4%
United Kingdom	4720	335	7,1%
All countries	23451	1314	5,6%

Source: Crédit Suisse Global Wealth Databook (2014) and Charalampidis (2015). I removed the countries for which the computation of the share of offshore wealth in Switzerland is not possible, that is the countries that entered the EU after 2004 and countries that are offshore centers such as Luxembourg.

**Appendix Table 8: Interest income taxed under the Directive (million \$)**

	Taxed interest income (million \$)								
	2005	2006	2007	2008	2009	2010	2011	2012	2013
Austria	37,6	71,4	90,2	86,3	49,8	52,5	47,6	45,8	26,1
Belgium	92,7	152,9	159,2	163,0	89,5	89,4	74,0	58,3	56,1
Bulgaria	0,0	0,0	6,3	5,1	2,2	1,8	2,0	1,5	1,8
Croatia	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	3,0
Cyprus	8,6	12,0	15,1	8,8	3,6	3,0	2,8	3,4	2,5
Czech Republic	13,3	22,0	29,0	31,0	12,7	10,7	12,4	8,3	8,6
Denmark	5,8	10,6	15,0	14,9	8,4	6,6	5,7	4,9	4,9
Estonia	1,1	2,0	2,0	2,6	1,1	0,6	0,6	0,7	0,7
Finland	3,3	5,5	6,7	7,7	4,8	4,5	3,5	2,9	3,5
France	222,4	367,4	455,7	465,4	288,4	258,9	241,1	225,0	243,3
Germany	354,3	760,8	960,7	880,5	603,2	595,4	529,5	453,6	342,9
Greece	81,2	113,5	119,3	96,9	43,9	43,2	49,3	42,2	40,2
Hungary	4,5	9,7	12,7	13,3	9,7	10,2	10,3	9,8	9,8
Ireland	6,3	7,7	9,6	11,4	5,3	3,6	3,9	3,4	2,7
Italy	465,6	757,8	920,0	919,0	678,8	315,0	285,6	257,8	234,7
Latvia	2,0	2,7	3,6	3,5	1,6	0,7	0,8	0,7	0,8
Lithuania	0,7	1,1	1,3	1,2	1,3	1,6	2,7	0,7	0,8
Luxembourg	7,6	10,8	14,5	13,7	8,0	7,2	7,3	6,3	6,1
Malta	4,1	5,9	6,1	4,8	2,8	2,2	2,5	1,8	2,6
Netherlands	44,7	92,9	93,0	128,3	72,9	56,6	45,8	40,6	36,3
Poland	8,9	16,1	22,8	26,5	13,5	12,0	13,1	11,8	8,5
Portugal	33,6	45,7	52,6	53,6	35,1	30,7	29,5	22,7	17,3
Romania	0,0	0,0	9,5	11,0	4,3	3,5	4,2	3,9	4,0
Slovak Republic	2,6	4,7	6,5	6,2	2,2	2,0	2,2	2,2	2,5
Slovenia	1,1	1,9	3,1	3,2	2,0	2,0	2,3	1,6	1,7
Spain	150,7	222,5	248,1	276,1	145,3	148,8	151,9	147,3	88,9
Sweden	16,5	30,3	46,8	51,8	26,6	24,4	24,0	20,5	19,4
United Kingdom	176,7	217,1	274,1	260,1	89,8	93,9	85,9	72,3	34,5
All countries	1745,8	2945,1	3583,5	3545,7	2206,8	1781,0	1640,6	1450,1	1204,1

Source: Administration fédérale des contributions and author's computations.

Note that all values are converted from CHF to \$ using the constant 2006 exchange rate

**Appendix Table 9: Interest income Declared under the Directive (million \$)**

	Declared interest income (million \$)							
	2006	2007	2008	2009	2010	2011	2012	2013
Austria	5,5	11,4	13,9	12,6	10,5	12,4	28,9	30,1
Belgium	14,3	24,8	26,8	18,5	25,1	26,9	30,6	45,7
Bulgaria	0,0	1,5	0,8	1,2	1,7	0,7	0,3	4,1
Croatia	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,2
Cyprus	2,7	4,0	3,6	7,3	2,8	2,2	2,7	2,7
Czech Republic	1,2	2,4	4,7	2,5	2,3	4,0	5,7	6,1
Denmark	0,7	1,0	0,9	0,8	0,7	0,7	1,4	2,2
Estonia	0,0	0,1	0,1	0,0	0,0	0,0	0,0	0,0
Finland	0,4	0,6	0,5	0,5	0,4	0,5	1,0	1,4
France	9,2	14,1	14,9	11,6	23,8	27,5	31,5	36,4
Germany	543,4	433,3	418,5	360,0	412,3	347,8	390,7	456,6
Greece	0,7	1,1	3,2	1,4	2,8	10,0	32,7	35,2
Hungary	0,2	0,3	0,7	0,8	0,5	1,3	1,8	4,0
Ireland	1,1	3,1	2,7	3,1	3,9	4,0	4,3	3,9
Italy	8,2	9,6	13,4	14,9	13,7	13,7	25,3	35,1
Latvia	0,0	0,1	0,1	0,1	0,1	0,0	0,1	0,1
Lithuania	0,0	0,0	0,0	0,0	0,1	0,2	0,2	0,8
Luxembourg	0,1	0,1	0,2	0,2	0,2	0,4	1,1	1,4
Malta	3,8	4,1	4,3	2,7	2,7	4,4	5,0	4,8
Netherlands	24,5	30,4	37,1	25,6	29,2	28,8	37,5	37,3
Poland	0,5	1,7	3,7	3,3	2,5	3,7	9,0	10,5
Portugal	2,6	4,2	3,8	5,2	4,4	16,6	24,4	63,4
Romania	0,0	0,5	1,4	0,9	1,1	0,5	1,0	1,1
Slovak Republic	0,1	0,2	0,1	0,1	0,2	0,3	0,7	0,8
Slovenia	0,0	0,0	0,1	0,1	0,0	0,1	0,3	0,3
Spain	2,8	6,7	6,4	6,5	8,3	15,4	36,7	215,8
Sweden	1,8	3,9	5,6	4,6	6,9	11,4	11,2	14,3
United Kingdom	91,4	121,9	111,4	71,0	53,0	56,7	79,6	83,1
All countries	715,1	681,2	679,2	555,5	609,1	590,4	763,7	1097,4

Source: Administration fédérale des contributions and author's computations.

Note that all values are converted from CHF to \$ using the constant 2006 exchange rate

**Appendix Table 10 : Average interest-yielding account declared (thousand \$)**

Average interest-yielding account declared (thousand \$)								
	2006	2007	2008	2009	2010	2011	2012	2013
Austria	393	405	638	847	780	705	1422	595
Belgium	626	789	853	665	849	727	828	773
Bulgaria	0	4914	1736	2031	3021	1261	345	4245
Croatia	0	0	0	0	0	0	0	213
Cyprus	375	433	416	1068	515	343	412	421
Czech Republic	467	611	836	519	518	810	1108	1021
Denmark	255	329	274	283	271	244	527	711
Estonia	285	538	570	278	33	77	246	125
Finland	182	226	193	160	161	209	521	668
France	171	210	223	198	366	346	386	329
Germany	226	148	258	373	438	349	437	416
Greece	232	297	974	497	221	237	345	353
Hungary	297	407	857	742	446	782	522	898
Ireland	279	937	673	817	787	648	658	761
Italy	395	391	488	625	625	481	347	349
Latvia	10	352	628	211	248	144	306	255
Lithuania	0	159	250	145	266	471	437	1429
Luxembourg	87	89	110	158	147	198	565	556
Malta	302	270	391	323	395	766	989	1061
Netherlands	478	491	607	470	505	465	675	707
Poland	151	315	564	624	569	571	1510	1465
Portugal	585	684	656	942	535	571	517	949
Romania	0	911	1307	740	984	331	638	518
Slovak Republic	337	368	255	144	221	273	644	698
Slovenia	21	113	287	140	61	274	702	488
Spain	207	366	327	343	401	493	593	833
Sweden	465	732	853	759	1195	1216	1018	940
All countries	263	205	334	417	466	402	498	523

Source: Administration fédérale des contributions and author's computations.

Vanguard interest rates were used to scale up interest income to wealth data. Note that all values are converted from CHF to \$ using the constant 2006 exchange rate

**Appendix Table 11: Total wealth taxed or declared (million \$ - including dividend yielding accounts)**

Total wealth taxed or declared (million \$)								
	2006	2007	2008	2009	2010	2011	2012	2013
Austria	1682	2182	2254	1800	2098	2290	4427	4221
Belgium	3707	4030	4275	3049	3955	4019	5095	7169
Bulgaria	0	180	134	110	141	108	86	490
Croatia	0	0	0	0	0	0	0	155
Cyprus	357	444	299	421	236	227	376	386
Czech Republic	495	654	800	429	433	642	846	1010
Denmark	243	329	343	242	229	226	321	450
Estonia	42	42	56	29	17	20	34	35
Finland	126	151	179	140	152	144	207	300
France	7861	9367	10266	7656	8839	9422	12068	14976
Germany	38144	35159	31684	31228	39503	38247	52986	61533
Greece	2339	2352	2141	1149	1411	2196	4604	5387
Hungary	207	260	301	274	321	409	562	861
Ireland	201	305	323	275	316	371	516	515
Italy	15760	18189	19768	17457	9937	10009	12876	14441
Latvia	55	73	76	43	25	28	40	46
Lithuania	22	28	26	33	53	102	47	114
Luxembourg	223	286	295	208	221	259	352	428
Malta	279	275	236	192	211	351	518	602
Netherlands	2911	2962	3867	2962	3220	3232	4962	5409
Poland	348	508	675	482	484	644	1276	1445
Portugal	1038	1180	1247	1102	1134	1965	3073	7128
Romania	0	204	276	146	159	164	254	293
Slovak Republic	100	131	132	59	72	91	153	199
Slovenia	39	62	71	52	59	83	92	112
Spain	4646	5062	6014	3886	4794	5820	9306	25671
Sweden	691	1056	1267	866	1084	1465	1826	2325
United Kingdom	8586	10392	9416	5616	5808	6442	10207	10027
All countries	90104	95863	96422	79907	84912	88976	127111	165729

Source: Administration fédérale des contributions, Swiss National Bank and author's computations. Vanguard interest rates were used to scale up interest income to wealth data. The share of dividend in the portfolio of declarants was defined using the evolution of non-EU portfolio evolution over the period. The reason for this is described in the section "The profile of declarants". In short, it accounts for the fact that declarants under the Directive are the least wealthy of evaders and did not necessarily try to actively circumvent the rules. Note that all values are converted from CHF to \$ using the constant 2006 exchange rate

**Appendix Table 12: Interest income declared as a fraction of declared and taxed interest income**

	fraction of interest income declared							
	2006	2007	2008	2009	2010	2011	2012	2013
Austria	7%	11%	14%	20%	17%	21%	39%	54%
Belgium	9%	13%	14%	17%	22%	27%	34%	45%
Bulgaria	0%	20%	14%	36%	48%	26%	16%	70%
Croatia	0%	0%	0%	0%	0%	0%	0%	5%
Cyprus	18%	21%	29%	67%	48%	44%	45%	52%
Czech Republic	5%	8%	13%	17%	17%	24%	41%	42%
Denmark	6%	6%	6%	8%	9%	11%	22%	31%
Estonia	1%	4%	3%	4%	1%	2%	5%	4%
Finland	6%	8%	6%	9%	8%	12%	26%	28%
France	2%	3%	3%	4%	8%	10%	12%	13%
Germany	42%	31%	32%	37%	41%	40%	46%	57%
Greece	1%	1%	3%	3%	6%	17%	44%	47%
Hungary	2%	3%	5%	7%	4%	11%	15%	29%
Ireland	12%	25%	19%	37%	52%	51%	56%	59%
Italy	1%	1%	1%	2%	4%	5%	9%	13%
Latvia	0%	1%	3%	5%	7%	4%	13%	10%
Lithuania	0%	3%	3%	3%	7%	8%	26%	49%
Luxembourg	1%	1%	1%	3%	3%	5%	15%	19%
Malta	39%	40%	48%	49%	56%	63%	73%	65%
Netherlands	21%	25%	22%	26%	34%	39%	48%	51%
Poland	3%	7%	12%	19%	17%	22%	43%	55%
Portugal	5%	7%	7%	13%	13%	36%	52%	79%
Romania	0%	5%	11%	17%	24%	10%	21%	21%
Slovak Republic	2%	2%	1%	4%	10%	13%	24%	25%
Slovenia	0%	1%	4%	3%	1%	6%	15%	17%
Spain	1%	3%	2%	4%	5%	9%	20%	71%
Sweden	6%	8%	10%	15%	22%	32%	35%	42%
United Kingdom	28%	29%	28%	42%	34%	38%	50%	69%
Average	8%	10%	11%	16%	17%	21%	31%	40%
Weighted Average	19%	16%	16%	20%	25%	26%	34%	48%

Source: Administration fédérale des contributions and author's computations.

**Appendix Table 13: Share of EU offshore wealth in Switzerland taxed under the Directive**

	Share of EU offshore wealth taxed							
	2006	2007	2008	2009	2010	2011	2012	2013
Austria	6,7%	6,9%	9,7%	5,9%	8,1%	8,2%	10,5%	8,5%
Belgium	3,9%	3,2%	4,8%	3,1%	4,2%	4,2%	3,9%	4,7%
Bulgaria	NA	NA	NA	NA	NA	NA	NA	NA
Croatia	NA	NA	NA	NA	NA	NA	NA	NA
Cyprus	NA	NA	NA	NA	NA	NA	NA	NA
Czech Republic	4,5%	6,5%	9,4%	4,5%	4,4%	7,4%	6,5%	8,3%
Denmark	5,6%	6,1%	8,7%	6,1%	6,1%	6,3%	5,8%	5,1%
Estonia	3,4%	3,2%	5,7%	2,5%	1,7%	2,4%	3,5%	4,1%
Finland	3,8%	3,3%	6,2%	3,9%	5,5%	5,5%	5,7%	9,0%
France	4,7%	4,8%	7,3%	5,4%	6,2%	7,1%	7,8%	10,1%
Germany	8,8%	8,8%	11,9%	9,9%	13,3%	13,8%	14,3%	13,4%
Greece	2,7%	2,3%	2,8%	1,4%	1,6%	2,3%	2,3%	2,7%
Hungary	5,1%	7,0%	9,7%	8,0%	10,7%	12,5%	16,0%	23,1%
Ireland	1,5%	1,5%	2,2%	1,3%	0,6%	1,0%	1,7%	1,0%
Italy	7,1%	7,0%	10,2%	9,5%	5,8%	6,3%	6,8%	7,8%
Latvia	4,9%	6,2%	7,1%	4,4%	3,0%	3,8%	4,4%	5,7%
Lithuania	2,5%	1,5%	2,6%	3,2%	8,6%	16,6%	5,9%	9,8%
Luxembourg	NA	NA	NA	NA	NA	NA	NA	NA
Malta	NA	NA	NA	NA	NA	NA	NA	NA
Netherlands	3,2%	2,5%	5,0%	3,2%	3,2%	2,4%	2,5%	2,4%
Poland	5,0%	5,9%	10,1%	5,8%	6,3%	7,8%	7,0%	7,0%
Portugal	3,4%	3,1%	4,9%	3,9%	4,3%	4,5%	4,3%	2,3%
Romania	NA	NA	NA	NA	NA	NA	NA	NA
Slovak Republic	6,7%	7,2%	10,6%	4,1%	5,2%	6,1%	7,4%	6,4%
Slovenia	7,5%	8,6%	12,5%	9,5%	11,5%	13,8%	16,6%	20,5%
Spain	3,7%	3,4%	5,5%	3,4%	4,6%	5,5%	6,4%	4,8%
Sweden	4,5%	5,3%	9,9%	6,6%	7,1%	8,4%	7,9%	10,3%
United Kingdom	1,4%	1,4%	1,9%	0,8%	1,0%	1,2%	1,2%	0,7%
Weighted Average	4,4%	4,4%	6,4%	4,7%	4,8%	5,3%	5,6%	5,6%

Source: Administration fédérale des contributions, Swiss National Bank and author's computations. Vanguard interest rates were used to scale up interest income to wealth data. The methodology to compute total offshore wealth is the same as in Zucman (2013).

**Appendix Table 14: Share of EU offshore wealth in Switzerland declared under the Directive**

	Share of EU offshore wealth taxed							
	2006	2007	2008	2009	2010	2011	2012	2013
Austria	1,1%	1,7%	2,3%	2,7%	3,0%	4,1%	14,1%	21,0%
Belgium	0,7%	1,0%	1,2%	1,2%	2,2%	2,9%	4,3%	8,2%
Bulgaria	NA	NA	NA	NA	NA	NA	NA	NA
Croatia	NA	NA	NA	NA	NA	NA	NA	NA
Cyprus	NA	NA	NA	NA	NA	NA	NA	NA
Czech Republic	0,5%	1,1%	2,1%	1,6%	1,7%	4,5%	9,5%	12,6%
Denmark	0,7%	0,8%	0,8%	1,0%	1,2%	1,4%	3,4%	4,8%
Estonia	0,1%	0,3%	0,3%	0,2%	0,0%	0,1%	0,4%	0,4%
Finland	0,5%	0,6%	0,6%	0,7%	0,9%	1,4%	4,2%	7,5%
France	0,2%	0,3%	0,4%	0,4%	1,0%	1,5%	2,3%	3,2%
Germany	12,9%	7,8%	8,5%	10,8%	16,9%	17,2%	26,0%	38,1%
Greece	0,0%	0,0%	0,1%	0,1%	0,2%	0,9%	3,7%	5,1%
Hungary	0,2%	0,4%	0,8%	1,2%	0,9%	2,9%	6,2%	20,3%
Ireland	0,4%	1,0%	0,8%	1,4%	1,2%	2,0%	4,5%	3,2%
Italy	0,2%	0,1%	0,2%	0,4%	0,5%	0,6%	1,4%	2,5%
Latvia	0,0%	0,2%	0,3%	0,4%	0,4%	0,3%	1,4%	1,4%
Lithuania	0,0%	0,1%	0,1%	0,2%	1,2%	2,7%	4,4%	19,8%
Luxembourg	NA	NA	NA	NA	NA	NA	NA	NA
Malta	NA	NA	NA	NA	NA	NA	NA	NA
Netherlands	1,7%	1,6%	2,2%	2,0%	3,1%	2,9%	4,8%	5,4%
Poland	0,3%	0,9%	2,1%	2,6%	2,3%	4,2%	11,2%	18,6%
Portugal	0,4%	0,5%	0,5%	1,0%	1,1%	4,8%	9,7%	18,3%
Romania	NA	NA	NA	NA	NA	NA	NA	NA
Slovak Republic	0,3%	0,3%	0,2%	0,3%	1,1%	1,8%	5,0%	4,5%
Slovenia	0,0%	0,3%	0,8%	0,6%	0,3%	1,7%	6,3%	8,8%
Spain	0,1%	0,2%	0,2%	0,3%	0,5%	1,1%	3,4%	24,8%
Sweden	0,6%	0,9%	1,6%	2,1%	3,7%	7,6%	9,1%	16,2%
United Kingdom	1,1%	1,1%	1,1%	1,0%	1,0%	1,3%	2,5%	3,2%
Weighted Average	2,2%	1,6%	1,8%	2,1%	3,0%	3,6%	6,3%	10,9%

Source: Administration fédérale des contributions, Swiss National Bank and author's computations. Vanguard interest rates were used to scale up interest income to wealth data. The methodology to compute total offshore wealth is the same as in Zucman (2013). When a person declares his interest revenues under STD, he also has to declare his dividend revenues. Therefore, when computing the total accounts declared under STD, we add the estimated dividend yielding accounts of the declarant. In this table, we take into account that declarants under STD have a specific profile: they are "small" account holders who likely did not try to actively circumvent the Directive. Therefore, instead of taking the yearly average of the share of interest yielding accounts to scale up the declarations, we use the average of non-EU evaders after 2005. Another scenario that applies the share of dividends in EU evaders portfolio finds that declarations go up to 20% in 2013.

**Appendix Table 15: Top interest income tax rates**

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Top interest income tax rates on foreign capital

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	2006	2007	2008	2009	2010	2011	2012	2013
Austria	25%	25%	25%	25%	25%	25%	25%	25%
Belgium	15%	15%	15%	15%	15%	15%	25%	25%
Bulgaria	24%	24%	10%	10%	10%	10%	10%	10%
Croatia	35%	35%	35%	35%	40%	40%	40%	40%
Cyprus	10%	10%	10%	10%	10%	12%	15%	25%
Czech Republic	15%	15%	15%	15%	15%	15%	15%	15%
Denmark	48%	48%	48%	49%	48%	48%	47%	46%
Estonia	23%	22%	21%	21%	21%	21%	21%	21%
Finland	28%	28%	28%	28%	28%	28%	32%	32%
France	27%	29%	27%	30%	30%	32%	39%	61%
Germany	26%	26%	26%	26%	26%	26%	26%	26%
Greece	40%	40%	40%	40%	45%	45%	45%	33%
Hungary	0%	20%	20%	20%	20%	16%	16%	16%
Ireland	20%	20%	20%	23%	25%	27%	30%	33%
Italy	27%	27%	27%	27%	27%	27%	20%	20%
Latvia	25%	25%	25%	23%	26%	25%	25%	24%
Lithuania	15%	15%	15%	15%	15%	15%	15%	15%
Luxembourg	38%	38%	38%	38%	38%	39%	39%	40%
Malta	15%	15%	15%	15%	15%	15%	15%	15%
Netherlands	30%	30%	30%	30%	30%	30%	30%	30%
Poland	19%	19%	19%	19%	19%	19%	19%	19%
Portugal	20%	20%	20%	20%	22%	22%	27%	28%
Romania	16%	16%	16%	16%	16%	16%	16%	16%
Slovak Republic	19%	19%	19%	19%	19%	19%	19%	22%
Slovenia	15%	15%	20%	20%	20%	20%	20%	25%
Spain	15%	18%	18%	18%	21%	21%	27%	27%
Sweden	30%	30%	30%	30%	30%	30%	30%	30%
United Kingdom	40%	40%	40%	40%	50%	50%	50%	45%

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Source: International Bureau of Fiscal Documentation (IBFD). When different from the domestic interest/dividend income tax, we take the tax rate for foreign-source interest/dividend income.

**Appendix Table 16: Top dividend income tax rates on foreign capital**

Top dividend income tax rates								
	2006	2007	2008	2009	2010	2011	2012	2013
Austria	25%	25%	25%	25%	25%	25%	25%	25%
Belgium	25%	25%	25%	25%	25%	25%	29%	25%
Bulgaria	15%	7%	5%	5%	5%	5%	5%	5%
Croatia	0%	0%	0%	0%	0%	0%	10%	12%
Cyprus	15%	15%	15%	15%	15%	16%	20%	20%
Czech Republic	15%	15%	15%	15%	15%	15%	15%	15%
Denmark	48%	48%	48%	49%	48%	48%	47%	46%
Estonia	0%	0%	0%	0%	0%	0%	0%	0%
Finland	20%	20%	20%	20%	20%	20%	22%	22%
France	35%	35%	30%	31%	31%	31%	35%	43%
Germany	21%	21%	21%	26%	26%	26%	26%	26%
Greece	40%	40%	40%	10%	45%	21%	25%	10%
Hungary	25%	25%	25%	25%	25%	16%	16%	16%
Ireland	42%	42%	41%	44%	44%	48%	48%	48%
Italy	13%	13%	13%	13%	13%	13%	20%	20%
Latvia	0%	0%	0%	0%	10%	10%	10%	10%
Lithuania	15%	15%	15%	20%	20%	20%	20%	20%
Luxembourg	19%	19%	19%	19%	19%	20%	20%	20%
Malta	15%	15%	15%	15%	15%	15%	15%	15%
Netherlands	30%	30%	30%	30%	30%	30%	30%	30%
Poland	19%	19%	19%	19%	19%	19%	19%	19%
Portugal	20%	20%	20%	20%	22%	22%	27%	28%
Romania	16%	16%	16%	16%	16%	16%	16%	16%
Slovak Republic	0%	0%	0%	0%	0%	0%	0%	0%
Slovenia	20%	20%	20%	20%	20%	20%	20%	25%
Spain	15%	18%	18%	18%	21%	21%	27%	27%
Sweden	30%	30%	30%	30%	30%	30%	30%	30%
United Kingdom	33%	33%	33%	33%	43%	43%	43%	38%

Source: International Bureau of Fiscal Documentation (IBFD). When different from the domestic interest/dividend income tax, we take the tax rate for foreign-source interest/dividend income.

**Appendix Table 17: Weighted Shares Fiduciary Deposits in Swiss Banks, 2002-2013**

Weighted Shares Fiduciary Deposits in Swiss Banks												
	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013
STD countries	52,8%	52,8%	54,8%	55,3%	55,9%	58,2%	58,3%	58,0%	58,2%	57,3%	56,0%	56,2%
Austria	0,9%	0,8%	0,8%	0,9%	0,9%	0,9%	0,9%	1,0%	1,0%	1,1%	0,9%	0,8%
Belgium	4,2%	4,2%	3,6%	3,4%	3,3%	3,5%	3,6%	3,5%	3,4%	3,3%	3,3%	3,1%
Bulgaria	NA											
Croatia	NA											
Cyprus	NA											
Czech Republic	0,1%	0,1%	0,2%	0,3%	0,4%	0,3%	0,3%	0,3%	0,4%	0,3%	0,3%	0,3%
Denmark	0,1%	0,2%	0,2%	0,2%	0,2%	0,2%	0,2%	0,2%	0,2%	0,2%	0,2%	0,3%
Estonia	0,0%	0,0%	0,0%	0,1%	0,0%	0,0%	0,0%	0,1%	0,1%	0,0%	0,0%	0,0%
Finland	0,1%	0,1%	0,1%	0,1%	0,1%	0,1%	0,1%	0,2%	0,1%	0,1%	0,1%	0,1%
France	7,4%	7,1%	6,7%	6,5%	6,5%	6,7%	6,6%	6,5%	6,6%	6,3%	6,3%	6,3%
Germany	6,5%	6,7%	6,6%	6,9%	7,2%	7,7%	7,7%	7,5%	7,0%	7,1%	6,9%	6,7%
Greece	3,3%	3,4%	4,0%	3,7%	3,6%	3,7%	3,6%	3,8%	4,1%	4,0%	4,0%	3,8%
Hungary	0,1%	0,1%	0,1%	0,1%	0,2%	0,1%	0,1%	0,1%	0,1%	0,2%	0,1%	0,1%
Ireland	0,3%	0,3%	0,3%	0,3%	0,4%	0,5%	0,5%	0,5%	0,9%	0,7%	0,4%	0,7%
Italy	9,6%	9,1%	9,5%	9,1%	9,0%	9,3%	9,4%	8,7%	8,5%	8,3%	8,1%	7,9%
Latvia	0,0%	0,0%	0,0%	0,0%	0,0%	0,0%	0,1%	0,0%	0,0%	0,0%	0,0%	0,0%
Lithuania	0,0%	0,0%	0,0%	0,0%	0,0%	0,1%	0,0%	0,0%	0,0%	0,0%	0,0%	0,0%
Luxembourg	NA											
Malta	NA											
Netherlands	1,6%	2,1%	2,1%	2,3%	2,5%	2,6%	2,7%	2,8%	2,7%	3,5%	3,6%	3,9%
Poland	0,2%	0,2%	0,2%	0,2%	0,3%	0,3%	0,3%	0,3%	0,3%	0,3%	0,4%	0,3%
Portugal	1,1%	1,1%	1,1%	1,2%	1,1%	1,2%	1,1%	1,1%	1,1%	1,2%	1,2%	1,9%
Romania	NA											
Slovak Republic	0,1%	0,1%	0,1%	0,1%	0,1%	0,1%	0,1%	0,1%	0,1%	0,1%	0,1%	0,1%
Slovenia	0,0%	0,0%	0,0%	0,0%	0,0%	0,0%	0,0%	0,0%	0,0%	0,0%	0,0%	0,0%
Spain	5,4%	5,8%	5,3%	5,1%	5,0%	5,2%	5,2%	5,2%	5,1%	5,1%	5,0%	4,9%
Sweden	0,5%	0,5%	0,5%	0,5%	0,6%	0,6%	0,5%	0,5%	0,5%	0,5%	0,6%	0,5%
United Kingdom	11,4%	11,0%	13,3%	14,2%	14,5%	14,9%	15,1%	15,4%	15,6%	14,8%	14,4%	14,3%
Other Europe	0,8%	0,7%	0,7%	0,8%	0,9%	0,8%	0,7%	0,7%	0,7%	0,7%	0,7%	0,6%
Africa	4,5%	4,6%	4,5%	4,1%	3,9%	3,9%	4,0%	4,0%	3,8%	3,8%	3,6%	3,5%
Asia	12,6%	14,1%	13,0%	12,3%	12,5%	12,0%	12,9%	13,4%	13,9%	13,6%	14,5%	14,7%
Caribbean	0,1%	0,1%	0,0%	0,0%	0,0%	0,1%	0,1%	0,1%	0,1%	0,1%	0,0%	0,4%
Latin America	13,0%	11,7%	11,6%	11,3%	11,0%	11,0%	10,8%	11,0%	10,9%	9,8%	9,6%	9,2%
Middle East	10,3%	10,3%	9,8%	10,9%	10,0%	8,7%	7,8%	8,8%	8,2%	11,0%	11,8%	11,6%
North America	5,8%	5,7%	5,4%	5,3%	5,7%	5,4%	5,4%	4,0%	4,2%	3,7%	3,8%	3,8%
Total non-STD	47,2%	47,2%	45,2%	44,7%	44,1%	41,8%	41,7%	42,0%	41,8%	42,7%	44,0%	43,8%

Source: Swiss National Bank and author's computation. We attribute 70 % of wealth from sham corporations to STD countries because it allows to keep constant the share of STD countries' wealth in Switzerland before and after the Directive in 2005. In this table, the "splitting rule" of sham corporations' wealth across STD countries is the following: each country gets a share of sham corporation wealth that is proportional to the share of wealth it owned directly in the year before the Directive, that is in 2004. Because residents of different countries likely reacted differently to the fall in deposits' interest rate (reallocating to a different extent their wealth in other assets), we consider that keeping the same repartition of sham corporations as before the Directive is the best way to ensure comparability across years, the downside is that it removes from the analysis the countries that enter the EU after 2005.

**Appendix Table 18: Voluntary Disclosure Programs**

Voluntary Disclosure Programs									
Country	Year	Existence of a Permanent VD program	Criminal Prosecution	Level of Monetary Relief	Existence of a Special VD program	Date	Criminal Prosecution	Level of Monetary Relief	Number of years covered
Austria	2006	yes	yes	high	no	NA	NA	NA	10
Austria	2007	yes	yes	high	no	NA	NA	NA	10
Austria	2008	yes	yes	high	no	NA	NA	NA	10
Austria	2009	yes	yes	high	no	NA	NA	NA	10
Austria	2010	yes	yes	high	no	NA	NA	NA	10
Austria	2011	yes	yes	high	no	NA	NA	NA	10
Austria	2012	yes	yes	high	no	NA	NA	NA	10
Austria	2013	yes	yes	high	yes	01/13	.	.	10
Belgium	2006	yes	yes	medium	no	NA	NA	NA	7
Belgium	2007	yes	yes	medium	no	NA	NA	NA	7
Belgium	2008	yes	yes	medium	no	NA	NA	NA	7
Belgium	2009	yes	yes	medium	no	NA	NA	NA	7
Belgium	2010	yes	yes	medium	no	NA	NA	NA	7
Belgium	2011	yes	yes	medium	no	NA	NA	NA	7
Belgium	2012	yes	yes	medium	no	NA	NA	NA	7
Belgium	2013	yes	yes	medium	no	NA	NA	NA	7
Bulgaria	2006	.	.	.	.	.	.	.	.
Bulgaria	2007	.	.	.	.	.	.	.	.
Bulgaria	2008	.	.	.	.	.	.	.	.
Bulgaria	2009	.	.	.	.	.	.	.	.
Bulgaria	2010	.	.	.	.	.	.	.	.
Bulgaria	2011	.	.	.	.	.	.	.	.
Bulgaria	2012	.	.	.	.	.	.	.	.
Bulgaria	2013	.	.	.	.	.	.	.	.
Croatia	2006	.	.	.	.	.	.	.	.
Croatia	2007	.	.	.	.	.	.	.	.
Croatia	2008	no	NA	NA	no	NA	NA	NA	6
Croatia	2009	no	NA	NA	no	NA	NA	NA	6
Croatia	2010	no	NA	NA	no	NA	NA	NA	6
Croatia	2011	no	NA	NA	no	NA	NA	NA	6
Croatia	2012	no	NA	NA	no	NA	NA	NA	6
Croatia	2013	no	NA	NA	no	NA	NA	NA	6
Cyprus	2006	.	.	.	.	.	.	.	.
Cyprus	2007	.	.	.	.	.	.	.	.
Cyprus	2008	.	.	.	.	.	.	.	.
Cyprus	2009	.	.	.	.	.	.	.	.
Cyprus	2010	.	.	.	.	.	.	.	.
Cyprus	2011	.	.	.	.	.	.	.	.
Cyprus	2012	.	.	.	.	.	.	.	.
Cyprus	2013	.	.	.	.	.	.	.	.
Czech Republic	2006	yes	yes	low	no	NA	NA	NA	10
Czech Republic	2007	yes	yes	low	no	NA	NA	NA	10
Czech Republic	2008	yes	yes	low	no	NA	NA	NA	10
Czech Republic	2009	yes	yes	low	no	NA	NA	NA	10
Czech Republic	2010	yes	yes	low	no	NA	NA	NA	10
Czech Republic	2011	yes	yes	low	no	NA	NA	NA	10
Czech Republic	2012	yes	yes	low	no	NA	NA	NA	10
Czech Republic	2013	yes	yes	low	no	NA	NA	NA	10

**Appendix Table 13 (continued 1) : Voluntary Disclosure Programs**

Voluntary Disclosure Programs									
Country	Year	Existence of a Permanent VD program	Criminal Prosecution	Level of Monetary Relief	Existence of a Special VD program	Date	Criminal Prosecution	Level of Monetary Relief	Number of years covered
Denmark	2006	yes	no	low	no	NA	NA	NA	10
Denmark	2007	yes	no	low	no	NA	NA	NA	10
Denmark	2008	yes	no	low	no	NA	NA	NA	10
Denmark	2009	yes	no	low	no	NA	NA	NA	10
Denmark	2010	yes	no	low	no	NA	NA	NA	10
Denmark	2011	yes	no	low	no	NA	NA	NA	10
Denmark	2012	yes	no	low	no	NA	NA	NA	10
Denmark	2013	yes	no	low	yes	07/12-07/13	yes	low	10
Estonia	2006	no	NA	NA	no	NA	NA	NA	5
Estonia	2007	no	NA	NA	no	NA	NA	NA	5
Estonia	2008	no	NA	NA	no	NA	NA	NA	5
Estonia	2009	no	NA	NA	no	NA	NA	NA	5
Estonia	2010	no	NA	NA	no	NA	NA	NA	5
Estonia	2011	no	NA	NA	no	NA	NA	NA	5
Estonia	2012	no	NA	NA	no	NA	NA	NA	5
Estonia	2013	no	NA	NA	no	NA	NA	NA	5
Finland	2006	no	NA	NA	no	NA	NA	NA	5
Finland	2007	no	NA	NA	no	NA	NA	NA	5
Finland	2008	no	NA	NA	no	NA	NA	NA	5
Finland	2009	no	NA	NA	no	NA	NA	NA	5
Finland	2010	no	NA	NA	no	NA	NA	NA	5
Finland	2011	no	NA	NA	no	NA	NA	NA	5
Finland	2012	no	NA	NA	no	NA	NA	NA	5
Finland	2013	no	NA	NA	no	NA	NA	NA	5
France	2006	no	NA	NA	no	NA	NA	NA	10
France	2007	no	NA	NA	no	NA	NA	NA	10
France	2008	no	NA	NA	no	NA	NA	NA	10
France	2009	no	NA	NA	yes	04/09-12/09	yes	low	10
France	2010	no	NA	NA	no	no	NA	NA	10
France	2011	no	NA	NA	no	no	NA	NA	10
France	2012	no	NA	NA	no	no	NA	NA	10
France	2013	no	NA	NA	no	no	NA	NA	10
Germany	2006	yes	yes	high	no	NA	NA	NA	10
Germany	2007	yes	yes	high	no	NA	NA	NA	10
Germany	2008	yes	yes	high	no	NA	NA	NA	10
Germany	2009	yes	yes	high	no	NA	NA	NA	10
Germany	2010	yes	yes	high	no	NA	NA	NA	10
Germany	2011	yes	yes	high	no	NA	NA	NA	10
Germany	2012	yes	yes	high	no	NA	NA	NA	10
Germany	2013	yes	yes	high	no	NA	NA	NA	10
Greece	2006	yes	.	low	no	NA	NA	NA	5
Greece	2007	yes	.	low	no	NA	NA	NA	5
Greece	2008	yes	.	low	no	NA	NA	NA	5
Greece	2009	yes	.	low	no	NA	NA	NA	5
Greece	2010	yes	.	low	no	NA	NA	NA	5
Greece	2011	yes	.	low	yes	04/10-01/11	yes	high	5
Greece	2012	yes	.	low	no	NA	NA	NA	5
Greece	2013	yes	.	low	no	NA	NA	NA	5

**Appendix Table 13 (continued 2) : Voluntary Disclosure Programs**

Voluntary Disclosure Programs									
Country	Year	Existence of a Permanent VD program	Criminal Prosecution	Level of Monetary Relief	Existence of a Special VD program	Date	Criminal Prosecution	Level of Monetary Relief	Number of years covered
Denmark	2006	yes	no	low	no	NA	NA	NA	10
Denmark	2007	yes	no	low	no	NA	NA	NA	10
Denmark	2008	yes	no	low	no	NA	NA	NA	10
Denmark	2009	yes	no	low	no	NA	NA	NA	10
Denmark	2010	yes	no	low	no	NA	NA	NA	10
Denmark	2011	yes	no	low	no	NA	NA	NA	10
Denmark	2012	yes	no	low	no	NA	NA	NA	10
Denmark	2013	yes	no	low	yes	07/12-07/13	yes	low	10
Estonia	2006	no	NA	NA	no	NA	NA	NA	5
Estonia	2007	no	NA	NA	no	NA	NA	NA	5
Estonia	2008	no	NA	NA	no	NA	NA	NA	5
Estonia	2009	no	NA	NA	no	NA	NA	NA	5
Estonia	2010	no	NA	NA	no	NA	NA	NA	5
Estonia	2011	no	NA	NA	no	NA	NA	NA	5
Estonia	2012	no	NA	NA	no	NA	NA	NA	5
Estonia	2013	no	NA	NA	no	NA	NA	NA	5
Finland	2006	no	NA	NA	no	NA	NA	NA	5
Finland	2007	no	NA	NA	no	NA	NA	NA	5
Finland	2008	no	NA	NA	no	NA	NA	NA	5
Finland	2009	no	NA	NA	no	NA	NA	NA	5
Finland	2010	no	NA	NA	no	NA	NA	NA	5
Finland	2011	no	NA	NA	no	NA	NA	NA	5
Finland	2012	no	NA	NA	no	NA	NA	NA	5
Finland	2013	no	NA	NA	no	NA	NA	NA	5
France	2006	no	NA	NA	no	NA	NA	NA	10
France	2007	no	NA	NA	no	NA	NA	NA	10
France	2008	no	NA	NA	no	NA	NA	NA	10
France	2009	no	NA	NA	yes	04/09-12/09	yes	low	10
France	2010	no	NA	NA	no	no	NA	NA	10
France	2011	no	NA	NA	no	no	NA	NA	10
France	2012	no	NA	NA	no	no	NA	NA	10
France	2013	no	NA	NA	no	no	NA	NA	10
Germany	2006	yes	yes	high	no	NA	NA	NA	10
Germany	2007	yes	yes	high	no	NA	NA	NA	10
Germany	2008	yes	yes	high	no	NA	NA	NA	10
Germany	2009	yes	yes	high	no	NA	NA	NA	10
Germany	2010	yes	yes	high	no	NA	NA	NA	10
Germany	2011	yes	yes	high	no	NA	NA	NA	10
Germany	2012	yes	yes	high	no	NA	NA	NA	10
Germany	2013	yes	yes	high	no	NA	NA	NA	10
Greece	2006	yes	.	low	no	NA	NA	NA	5
Greece	2007	yes	.	low	no	NA	NA	NA	5
Greece	2008	yes	.	low	no	NA	NA	NA	5
Greece	2009	yes	.	low	no	NA	NA	NA	5
Greece	2010	yes	.	low	no	NA	NA	NA	5
Greece	2011	yes	.	low	yes	04/10-01/11	yes	high	5
Greece	2012	yes	.	low	no	NA	NA	NA	5
Greece	2013	yes	.	low	no	NA	NA	NA	5

**Appendix Table 13 (continued 3) : Voluntary Disclosure Programs**

Country	Year	Voluntary Disclosure Programs							
		Existence of a Permanent VD program	Criminal Prosecution	Level of Monetary Relief	Existence of a Special VD program	Date	Criminal Prosecution	Level of Monetary Relief	Number of years covered
Malta	2006	yes	yes	high	no	NA	NA	NA	6
Malta	2007	yes	yes	high	no	NA	NA	NA	6
Malta	2008	yes	yes	high	no	NA	NA	NA	6
Malta	2009	yes	yes	high	no	NA	NA	NA	6
Malta	2010	yes	yes	high	yes	09/09-10/10	yes	high	6
Malta	2011	yes	yes	high	no	NA	NA	NA	6
Malta	2012	yes	yes	high	no	NA	NA	NA	6
Malta	2013	yes	yes	high	no	NA	NA	NA	6
Netherlands	2006	yes	yes	medium	no	NA	NA	NA	12
Netherlands	2007	yes	yes	medium	no	NA	NA	NA	12
Netherlands	2008	yes	yes	medium	no	NA	NA	NA	12
Netherlands	2009	yes	yes	low	no	NA	NA	NA	12
Netherlands	2010	yes	yes	low	yes	01/09-07/10	yes	high	12
Netherlands	2011	yes	yes	low	no	NA	NA	NA	12
Netherlands	2012	yes	yes	low	no	NA	NA	NA	12
Netherlands	2013	yes	yes	low	no	NA	NA	NA	12
Poland	2006	yes	yes	high	no	NA	NA	NA	5
Poland	2007	yes	yes	high	no	NA	NA	NA	5
Poland	2008	yes	yes	high	no	NA	NA	NA	5
Poland	2009	yes	yes	high	no	NA	NA	NA	5
Poland	2010	yes	yes	high	no	NA	NA	NA	5
Poland	2011	yes	yes	high	no	NA	NA	NA	5
Poland	2012	yes	yes	high	no	NA	NA	NA	5
Poland	2013	yes	yes	high	no	NA	NA	NA	5
Poland	2013	yes	yes	high	no	NA	NA	NA	5
Portugal	2006	yes	yes	medium	no	NA	NA	NA	4
Portugal	2007	yes	yes	medium	no	NA	NA	NA	4
Portugal	2008	yes	yes	medium	no	NA	NA	NA	4
Portugal	2009	yes	yes	medium	no	NA	NA	NA	4
Portugal	2010	yes	yes	medium	no	NA	NA	NA	4
Portugal	2011	yes	yes	medium	yes	01/10-01/11	yes	high	4
Portugal	2012	yes	yes	medium	no	NA	NA	NA	4
Portugal	2013	yes	yes	medium	no	01/11-07/12	yes	high	4
Romania	2006	.	.	.	.	.	.	.	.
Romania	2007	.	.	.	.	.	.	.	.
Romania	2008	.	.	.	.	.	.	.	.
Romania	2009	.	.	.	.	.	.	.	.
Romania	2010	.	.	.	.	.	.	.	.
Romania	2011	.	.	.	.	.	.	.	.
Romania	2012	.	.	.	.	.	.	.	.
Romania	2013	.	.	.	.	.	.	.	.
Slovak Republic	2006	yes	yes	low	no	NA	NA	NA	5
Slovak Republic	2007	yes	yes	low	no	NA	NA	NA	5
Slovak Republic	2008	yes	yes	low	no	NA	NA	NA	5
Slovak Republic	2009	yes	yes	low	no	NA	NA	NA	5
Slovak Republic	2010	yes	yes	low	no	NA	NA	NA	5
Slovak Republic	2011	yes	yes	low	no	NA	NA	NA	5
Slovak Republic	2012	yes	no	low	no	NA	NA	NA	5
Slovak Republic	2013	yes	no	low	no	NA	NA	NA	5

**Appendix Table 13 (continued 4) : Voluntary Disclosure Programs**

Country	Year	Voluntary Disclosure Programs							
		Existence of a Permanent VD program	Criminal Prosecution	Level of Monetary Relief	Existence of a Special VD program	Date	Criminal Prosecution	Level of Monetary Relief	Number of years covered
Slovenia	2006	yes	no	high	no	NA	NA	NA	10
Slovenia	2007	yes	no	high	no	NA	NA	NA	10
Slovenia	2008	yes	no	high	no	NA	NA	NA	10
Slovenia	2009	yes	no	high	no	NA	NA	NA	10
Slovenia	2010	yes	no	high	no	NA	NA	NA	10
Slovenia	2011	yes	no	high	no	NA	NA	NA	10
Slovenia	2012	yes	no	high	no	NA	NA	NA	10
Slovenia	2013	yes	no	high	no	NA	NA	NA	10
Spain	2006	yes	yes	medium	no	NA	NA	NA	5
Spain	2007	yes	yes	medium	no	NA	NA	NA	5
Spain	2008	yes	yes	medium	no	NA	NA	NA	5
Spain	2009	yes	yes	medium	no	NA	NA	NA	5
Spain	2010	yes	yes	medium	no	NA	NA	NA	5
Spain	2011	yes	yes	medium	no	NA	NA	NA	5
Spain	2012	yes	yes	medium	no	NA	NA	NA	5
Spain	2013	yes	yes	medium	yes	03/12-12/12	yes	high	5
Sweden	2006	yes	yes	low	no	NA	NA	NA	10
Sweden	2007	yes	yes	low	no	NA	NA	NA	10
Sweden	2008	yes	yes	low	no	NA	NA	NA	10
Sweden	2009	yes	yes	low	no	NA	NA	NA	10
Sweden	2010	yes	yes	low	no	NA	NA	NA	10
Sweden	2011	yes	yes	low	no	NA	NA	NA	10
Sweden	2012	yes	yes	low	no	NA	NA	NA	10
Sweden	2013	yes	yes	low	no	NA	NA	NA	10
United Kingdom	2006	yes	yes	low	no	NA	NA	NA	20
United Kingdom	2007	yes	yes	low	yes	04/07-06/07	no	medium	20
United Kingdom	2008	yes	yes	low	no	NA	NA	NA	20
United Kingdom	2009	yes	yes	low	no	NA	NA	NA	20
United Kingdom	2010	yes	yes	low	yes	09/09-01/10	no	low	20
United Kingdom	2011	yes	yes	low	no	NA	NA	NA	20
United Kingdom	2012	yes	yes	low	no	NA	NA	NA	20
United Kingdom	2013	yes	yes	low	yes	01/13	.	.	2

Source: This dataset was constructed using two OECD publications on “Offshore Voluntary Disclosure” (2010 & 2015) as well as the annual publication of the “Tax Regularization Handbook” by Backer & McKenzie. The determination of the “intensity” of VD programs is done on the following criteria. low : penalties only “mitigated” or remain  $\geq 30\%$  of unpaid taxes or “depends on the case” or interest per year higher than 15%. medium: penalties remain  $\geq 10\%$  of unpaid tax. high: all penalties waived and sometimes tax as well. I choose not to take the “imprisonment” variable into consideration when computing the categories because in most cases self-reporters cannot be prosecuted and when the risk still exists, prison charges still only effectively concern evaders that actively hid money from criminal activities or who hid tremendously large amounts, which is not the case of the declarants through the STD (average accounts declared below 3 million \$). In the regression, levels medium and low are grouped together under the “low” level label. For the temporal attribution of the VD programs, I consider that if the deadline is before the 01/07 of a given year then the program is attributed to that year, otherwise it is attributed to the following year. The reason behind this choice is that people usually wait until the last couple of weeks before the end of a program to start declaring and that administrations have a processing time of 6 months or more (evidenced in the report of the French 2013 voluntary disclosure program) so that the bulk of declarations are effectively witnessed in the data more than 6 months after the deadline of the program.