THE EFFECTS OF AUTOMATIC EXCHANGE OF INFORMATION ON EVADED WEALTH

Alice Chiocchetti

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Supervisor : Pr. Thomas Piketty

Referee : Pr. Gabriel Zucman

Paris School of Economics

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Abstract

The Common Reporting Standard (CRS) is a worldwide policy launched by the OECD in 2014 which carries out automatic exchange of information on foreign financial accounts between participating countries. It represents a substantial step towards international cooperation on tax matters, by increasing the means of fiscal administrations to detect evaded wealth. After presenting the measure and its loopholes in details, the results presented in this paper are twofold : first, relying on public corporate registries for various haven and non-haven countries, this paper gives descriptive evidence on the increase of the use of shell corporations. In a second part, this paper provides an early evaluation of CRS based on two kinds of liquid assets : bank deposits and portfolio investments, during a period ranging from 2009 to 2019. Controlling for a number of variables not previously used in the literature, looking at assets held both by haven and non-haven countries and after performing robustness tests, we do not find a significant effect of CRS on cross-border deposits, but we find robust evidence of a significant effect of CRS on foreign portfolio investments held by tax havens.

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Chapter 1

Introduction

If international cooperation on tax purpose is not new (Gadzo and Klemencic, 2017 [1]; Zucman, 2015 [2]), the 2008 financial crisis has been a milestone in the deepening of efforts towards international fiscal cooperation, as sovereign debts massively increased and social acceptance of tax evasion grew even more fragile. Willingness to "crackdown" on tax evasion, asserted during the April 2009 summit of the G20, first resulted in the implementation of exchange of information upon request in 2009. Studies evaluating its impact on evaded wealth have found mixed results, as tax evaders could shift their assets towards less compliant countries (Johannesen and Zucman, 2014 [3]), or resort to new manners to "disguise" their offshore wealth (Menkhoff and Miethe, 2019 [4]).

The international community, under the auspices of the OECD, has taken a new step in 2014 by launching an agreement on automatic exchange of financial information, coined "Common Reporting Standards". It follows two regional initiatives on automatic exchange, the first taken by the United States through the Foreign Account Tax Compliance (FATCA) adopted in March 2010, which only concerns wealth held by American citizens abroad. The European Union had also developed its own exchange of information under the Administrative cooperation in direct taxation policy (DAC), which first version was adopted in 2011 ("DAC1") and first exchanges on financial account information took place in September 2017 ("DAC2").

Automatic Exchange of Information consists in the yearly sending of information on the amounts held cross-border by residents of participating countries in financial institutions, mostly banks. Since 2017, France is sending information to the fiscal authorities of say Argentina, on the amounts of wealth held by Argentinians in French banks or investment funds, and receives in exchange information on French holders of financial wealth in Argentina. 49 countries began to exchange information in 2017, and the number went up to 107 in 2020, including all OECD countries at the exception of the United

States, as well as most tax havens, including Switzerland who joined in 2018, but excluding most African countries. Information on 47 million financial accounts were exchanged for 2018, amounting to five trillion euros, a number that grew up to 84 million accounts for a total amount of 11.2 trillion euros for 2019. As a comparison, Zucman (2013, [5]) estimated the amount of missing portfolio liabilities to 4.5 trillion US$.

Compared to exchange upon request, the wide international scale of this measure as well as the limited time window of its implementation (all participating countries started exchanging between 2017 and 2020) should have prevented shifting behaviours observed under bilateral exchange treaties. CRS also theoretically increases the probability to efficiently detect tax evaders due to the automatic nature of the exchange : no prior suspicion is needed for a fiscal administration to obtain evidence of tax evasion. Moreover, a relatively low number of requests were effectively sent under bilateral treaties, and the responses to those requests could take several months.

On the other hand, evidence show that wealth held offshore has increased with the further development of the offshore wealth management industry (Harrington, 2016 [6]). This phenomenon became public knowledge following a number of leaks, the largest one being the Panama Papers in 2016, along with other public scandals (Offshore leaks in 2013, Paradise papers in 2017, Luxleaks in 2014, Swissleaks in 2015). If Common Reporting Standards enjoins participating countries to recover the beneficial owner of wealth held in their domestic financial institutions and not the direct owner (which may well be an offshore vehicle), the complex offshore structures elaborated by professional wealth managers, which may involve several types of vehicles in multiple offshore countries, can blur the link between financial assets and their true owner.

Against this background, the aim of this paper is to investigate the effects of Common Reporting Standards on offshore wealth following two steps.

After detailing the functioning of exchange of information and review its background, we first give evidence on the use of sham corporations in tax havens using a corporate database based on public corporate registries so far not used in the literature. We find a significant increase of yearly sham incorporations since the 1990s, both in the United States, where their number can exceed 200 000 per year, and in smaller European and Asian tax havens. These results, by uncovering a small

part of the structures behind ownership hiding, casts new light on the issue of what has been coined the "custodial bias", namely the wrong attribution of wealth to tax havens by official statistics.

Secondly, this thesis tests whether automatic exchange of information has had an effect on the amounts of wealth held by tax haven countries using publicly available cross-border statistics published by the Bank for International Settlements and the International Monetary Fund. More specifically, we study the evolution of two kinds of liquid assets which could be affected by the measure as they are often held by households : bank deposits and portfolio investment.

Chapter 2

Automatic exchange of Information : a state of play of international fiscal cooperation

This section presents the Common Reporting Standard policy in more details by exploring the improvements it allows relative to previous international cooperation initiatives, its functioning, as well as the loopholes that may harm its effectiveness.

2.1 From exchange upon request to automatic exchange of information

The Common Reporting Standard was first introduced in 2014, after the implementation of bilateral treaties which gave to involved countries the possibility to send requests on cross-border financial accounts owned by its residents. Automatic exchange of information represents a sizeable improvement in tax cooperation compared to exchange upon request as no prior suspicion is needed for a tax administration to obtain evidence of undeclared assets. Data published in OECD peer reviews indeed show that bilateral exchange treaties led way to a relatively small number of sent requests, as shown in table 6.4. Between 2014 and 2017, 2309 requests were sent to Luxembourg in total. Under AEOI, information exchange reaches another scale : between September 2017 and March 2018, Luxembourg has sent to European countries information about 1.5 million financial accounts, which makes up nearly 2500 billion euros, by far the largest overall amount among European countries[1].

Studies evaluating the effects of exchange treaties have given evidence on significant behavioral responses, but found mixed results on their effectiveness in curbing overall evaded wealth. Using data on cross-border bank liabilities held by non-banks, (Johannesen and Zucman, 2014 [3]) find a

[1]Report from the commission to the European parliament and the Council, "An overview and assessment of the statistics and information on the automatic exchanges in the field of direct taxation" (17/12/2018)

shifting effect towards less cooperative tax havens. According to their results, deposits in involved tax havens have decreased without triggering a repatriation of funds towards non-haven countries. Using the same data from the Bank of International Settlements, (Menkhoff and Miethe, 2019 [4]) also find significant effects of treaties signed before 2010 on deposits held by residents of non-haven countries in tax havens ("outbound" deposits), as well as deposits held by havens in non-haven countries ("inbound" deposits). Their effectiveness dissipates when they are signed after 2010, with no significant wealth repatriation effect due to voluntary disclosure programs. The authors conclude that exchange treaties have made tax evaders resort to new techniques to disguise their wealth held offshore. Adopting a different econometric specification on the same data by taking into account two different time fixed effects for haven and non-haven countries (see table 6.1), Beer, Coelho and Leduc (2019 [7]) find no significant effect of exchange of information upon request.

2.1.1 Overcoming the custodial bias in the evaluation of EOI

Several studies have taken into account the fact that the evaded wealth of households often goes through multiple offshore vehicles, which can blur the link between offshore assets and their ultimate owner. As official statistics on cross-border wealth published by international organizations (IMF, BIS) do not refer to the nationality of the ultimate owner of wealth but rather to the direct owner (which can be an offshore corporation, trust, foundation...), researchers have developed strategies to recover the evolution of actual amounts of wealth held offshore by non-haven countries.

One can overcome the custodial bias by studying investments or deposits held by tax havens rather than only considering wealth held by non-haven offshore (which we will refer to as "outbound" deposits). Heckermeyer and Hemmerich (2020 [8]) show that inbound foreign portfolio investments (FPI) from tax havens to non-haven countries is more responsive to information exchange treaties than outbound FPI (from non haven countries to haven countries), and thus that evaded wealth held as foreign investment is more likely to go through offshore vehicles than to be held directly. They find a negative effect of exchange treaties on havens' foreign portfolio investments in OECD countries, using Coordinated Portfolio Statistics from the IMF. Along with Johannesen and Zucman (2014 [3]) on outbound deposits, they also give evidence of a shifting effect towards havens which signed less treaties with OECD countries. Their study is a direct continuation and extension of the work made by Hanlon, Maydew and Thornock (2015 [9]) on the effects of bilateral treaties

on investments in US securities markets coming from tax havens. Hanlon et al (2015 [9]) results rely on the fact that tax havens mostly serve as intermediaries in the international financial system (Lane and Milesi-Ferretti, 2011 [10]), and wealth held through offshore vehicles, which can not be absorbed by the small economies of offshore havens, is reinvested in countries displaying dynamic investment facilities, typically the United States and the United Kingdom. They give evidence of "round tripping" of wealth to the United States, namely the fact that American evaders have a "home bias" (Cœurdacier and Rey, 2013 [11]) in their investment choices and thus choose to "roundtrip" their offshore wealth back to the US.

Johannesen and Zucman (2014 [3]) investigate the evolution of bank deposits held in tax havens by other havens to account for the use of shell corporations, and find a negative effect of treaties on such deposits. Similarly, Menkhoff and Miethe (2019 [4]) study the evolution of deposits held by tax havens in non-haven countries to account for so-called "round tripping" of wealth through offshore vehicles. Also using the BIS locational banking statistics, Beer et al (2019 [7]) find a negative effect of exchange of information treaties on deposits held by haven countries in non-havens.

A second way to overcome the custodial bias is to study the evolution of offshore vehicles creation. The main issue with this method is the lack of available data, especially when we want to consider trusts and foundations which are not officially registered. To our knowledge, no such evaluation has been carried out for exchange treaties. However, we will see in the following section that researchers have used leaked corporation data to assess the effects of automatic exchange.

In the next section, we will describe in more detail the functioning of the Common Reporting Standard which makes up a further significant step in the international fight against tax evasion, and review the early studies on its effects and how they account for the custodial bias.

2.2 The Common Reporting Standard

2.2.1 Participating countries

Table 2.1 displays the countries which made their first exchanges between 2017 and 2020, which includes almost all countries considered tax havens. Over the large list of 61 havens compiled by Menkhoff and Miethe (2019 [4]) based on the reunion of haven lists used in the literature, only six do not participate in the CRS, namely Jordan, Liberia, Maldives, Tonga, US British Virgin Island

and the Netherlands Antilles, which only represent a negligible share of cross-border wealth. For instance, in late 2019, cross-border wealth held by Jordan, Liberia, Maldives and the Netherlands Antilles makes up only 0.45% of total cross border deposits held by non-banks located in countries belonging to the total list of tax havens[2].

2.2.2 Functionning

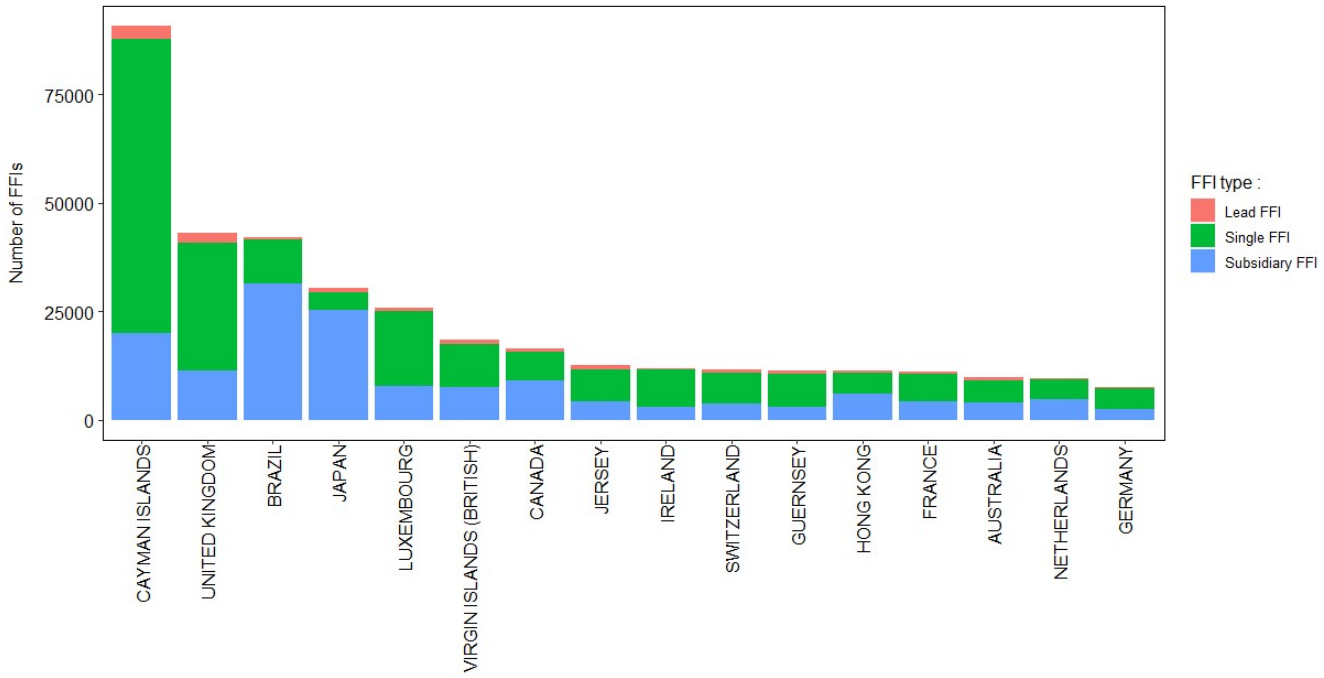
Participating countries gather information every year from their reporting national financial institutions. Reporting Financial Institutions (RFIs) include mainly depository institutions (mainly banks, but also credit unions) and custodial institutions, which are legal entities whose main activity is to hold financial assets on behalf of others (entities must report if more than 20% of their gross income comes from custodial activity). They also include Investment entities, which gather institutions whose primary activity (representing more than 50% of their revenues) is either to trade money market instruments, manage portfolio investments on behalf of others (investment advisors for instance), or financial assets trading. Some insurance companies also have to report when they issue cash value or annuity insurance contracts. As of now, no information has been published on the characteristics of reporting financial entities, even though we can suspect that they are mostly banks and investment funds. However, the United States Internal Revenue Service (IRS) publishes a list of entities which must report under FATCA. As the criteria to define a Financial Institution under FATCA are similar to those applicable to CRS (a CRS implementation handbook even recommends participating countries to take the FATCA entities list as a baseline[3]), we provide a graph of the location of reporting FATCA entities (figure 6.14).

Unsurprisingly, reporting FFIs are mainly located in countries hosting substantial financial activities, such as the United Kingdom, and a sizeable share of haven countries (Jersey and Guernsey

[2]Using Locational Banking Statistics from the Bank of International Settlements.
$0.0045 = (6209.027 + 9222.245 + 333.647 + 12.488)/3494354$

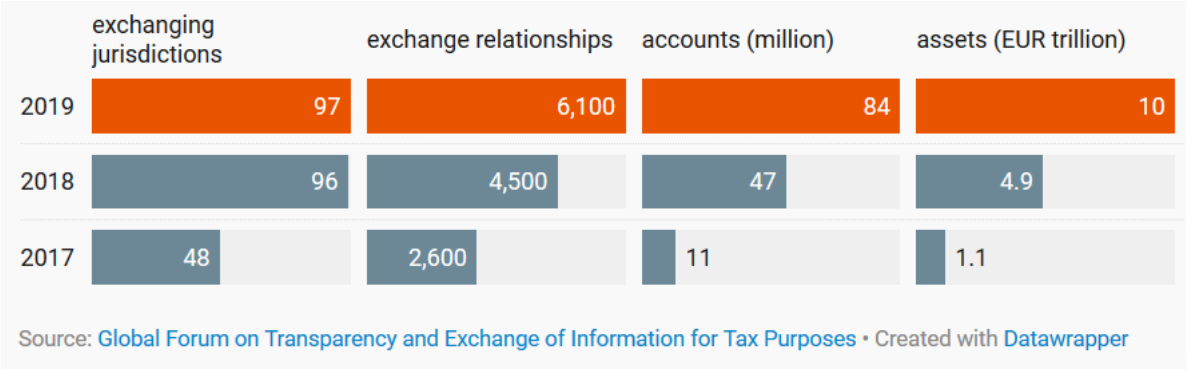
[3]Second edition of the Implementation Handbook of the Standard for Automatic Exchange of Financial Information in Tax Matters, OECD, p.34 $54

Figure 2.1: Reporting Foreign Financial Institutions under FATCA



Source : IRS FFI public list.
Note : Lead FI = FI controling other entities/ Subsidiary FI = controled FI

Figure 2.2: Reporting Foreign Financial Institutions under FATCA



appear before France, despite the relatively small size of their economy). We can expect this distribution to vary depending on the receiving country, as Cayman Islands have a special link with the United States.

As for CRS, we only have access to aggregated data on the amounts exchanged. They have increased sizeably since its first implementation, as shown in figure 2.2 taken from the OECD website.

2.2.3 Loopholes

Three main loopholes of the CRS are worth mentioning. First of all, the non participation of the United States is to be pointed out as they now host a large part of the financial activity as well as at least three low-tax jurisdictions (namely Delaware, Nevada and Wyoming). Due to the large scale of its financial sector and their lack of transparency, the United States has attained the second highest Financial Secrecy Index produced by the Tax Justice Network, after the Cayman Islands. Casi, Spengel and Stage (2019 [12]) found that the Common Reporting Standard has increased the amounts of cross-border deposits held in the United States relative to offshore countries by performing a difference-in-differences analysis. They also find that deposits in the US increased relatively more than in offshore countries having the same secrecy index (produced by the Tax Justice Network) as the US, which would indicate that the United States are becoming more attractive due to their sole non participation in CRS. Their third result concerning the United States is that deposits held by the US in non-haven countries have increased since the adoption of CRS. This would indicate that the use of shell companies incorporated in the US could have increased. In 2017, the OECD has taken steps to counter asset shifting towards US banks by including in reporting FIs the entities that advise their clients to open a bank account in non-reporting jurisdictions, and continue to advise these clients.

Secondly, tax evaders could obtain citizenship in tax havens through "golden visa" programs. Desimone, Lester and Markle (2020 [13]) estimate that FATCA triggered a significant increase of the number of expatriation from the U.S., which was multiplied by six between 2006 and 2015. CRS could be affected by the same loophole, as the OECD has identified a number of jurisdictions which deliver such schemes, mainly small tax havens such as Antigua and Barbuda, Bahamas, Cyprus or Malta[4].

Finally, tax evaders could circumvent automatic reporting by investing in non-reporting entities or non-financial assets offshore.

Desimone, Lester and Markle (2020 [13]) find evidence of an increase of investments in "Collective Investments in Transferable Securities" (UCITS) which were not compelled to report to American

[4]Antigua and Barbuda, Bahamas, Barbados, Cyprus, Dominica, Grenada, Malta, Qatar, Saint Kitts and Nevis, Saint Lucia, Seychelles, Turks and Caicos Islands, UAE, Vanuatu.

fiscal authorities. In the case of CRS, countries are allowed to add some financial institutions to a list of non-reporting institutions if they are not likely to be used for tax evasion purposes. Hong Kong authorities had first included on their list their Occupational retirement schemes (ORSE)[5], and Mandatory Provident Funds (MPF), which are also pension funds for Hong Kong residents. MPF and ORSE schemes have become reporting institutions since 2020.

Non-financial assets such as real estate or pieces of art are not subject to automatic reporting. For the case of FATCA, Desimone, Lester and Markle (2020 [13]) find that countries without foreign buyer restrictions have seen their housing price increase, controlling for the habitual determinants of housing prices (level of housing rents, population, GDP...). They also find an increase in imports of works of art in Swiss cantons where they are stored in freeports.

2.3 Early evaluations of CRS

Given that the Common Reporting Standard is relatively recent, with a major part of countries starting to exchange their information in 2018, a limited but growing number of evaluations have been carried out. They give evidence of a negative effect of AEOI on offshore wealth.

Using the Locational Banking Statistics, O'Reilly, Ramirez and Stemmer (2019 [14]) find robust evidence of the effectiveness of AEOI announcement (both FATCA and CRS) in curbing overall deposits held in tax havens. They estimate that CRS triggered a reduction of around 25% of deposits held offshore, including time and jurisdiction-pair fixed-effects (see table). Interestingly, they find that CRS early announcement by a number of International Financial Centers triggered a relative decline of their foreign deposits compared to late comers, again pointing towards a behavioral response of tax evaders. Using the same data, Beer et al (2019 [7]) and Menkhoff and Miethe (2019 [4]) also find a negative effect of AEOI on deposits held by non-haven countries in haven countries. Beer, Coelho and Leduc (2019 [7]) however do not find a significant effect of AEOI on deposits held by offshore countries in non-offshore banks.

Casi, Spengel and Stage (2019 [12]) perform a difference-in-difference analysis taking non-haven countries deposit stocks as a control group. They find evidence of a decrease of deposits held in haven countries due to AEOI, that they estimate to be between 14 and 36%. Ahrens and Bothner

[5]"How becoming a Hong Kong pensioner can save you tax", The Economist, 25/2017

(2019 [15]) find a significant negative impact both of the signature and of the endorsement of AEOI on deposits performing a difference-in-differences specification, but do no observe the same effects on foreign portfolio investments. They do not find significant shifting behavior towards the US or non compliant tax havens. Their econometric specifications can be found in table 6.2 (Appendix A). So far, to our knowledge, only Beer et al (2019 [7]) have estimated the effects of AEOI on round-tripping. This paper aims to provide a more comprehensive econometric specification to evaluate the scale of this practice, both on bank deposits and portfolio investment.

A few studies have evaluated the effects of automatic information exchange on the amount of offshore vehicles created, which is an interesting way to assess whether individuals respond by increasing the complexity of their offshore structures to evade wealth. However, to our knowledge, no studies using corporate data have been published on CRS. Using leaked corporate data, Caruana-Galizia and Caruana-Galizia (2016 [16]) give evidence that the European Savings Directive, a measure which implemented automatic exchange of information on interest income in 2003, has triggered a decline in the growth of EU-owned corporations in favor of other tax havens. Labro, Land and Omartian (2019 [17]) shows that FATCA has decreased the use of offshore corporations by US investors as foreign fiscal administrations are supposed to provide information on the beneficial owner of the wealth held in financial institutions.

In the next chapter, we provide descriptive statistics on the evolution of offshore yearly incorporations in tax havens in comparison to non-offshore countries.

Table 2.1: Years of CRS first exchanges

2017	**Anguilla**, Argentina, **Belgium**, **Bermuda**, **British Virgin Islands**, Bulgaria, **Cayman Islands**, Colombia, Croatia, **Cyprus**, Czech Republic, Denmark, Estonia, Faroe Islands, Finland, France, Germany, **Gibraltar**, Greece, **Guernsey**, Hungary, Iceland, India, **Ireland**, **Isle of Man**, Italy, **Jersey**, Korea, Latvia, **Liechtenstein**, Lithuania, **Luxembourg**, **Malta**, Mexico, **Montserrat**, **Netherlands**, Norway, Poland, Portugal, Romania, **San Marino**, **Seychelles**, Slovakia, Slovenia, South Africa, Spain, Sweden, **Turks and Caicos Islands**, United Kingdom
2018	**Andorra**, **Antigua and Barbuda**, **Aruba**, Australia, **Austria**, Azerbaijan, **Bahamas**, **Bahrain**, **Barbados**, **Belize**, Brazil, Brunei, Canada, **Chile**, China, **Cook Islands**, **Costa Rica**, **Curacao**, **Dominica**, Greenland, **Grenada**, **Hong Kong SAR**, Indonesia, Israel, Japan, **Lebanon**, **Macao SAR**, **Malaysia**, **Marshall Islands**, **Mauritius**, **Monaco**, **Nauru**, New Zealand, **Niue**, Pakistan, **Panama**, Qatar, Russia, Saint Kitts and Nevis, Saint Lucia, St. Vincent and the Grenadines, **Samoa**, Saudi Arabia, **Singapore**, **Sint Maarten**, **Switzerland**, **Trinidad and Tobago**, Turkey, United Arab Emirates, **Uruguay**, **Vanuatu**
2019	Ghana, Kuwait
2020	Kazakhstan, Ecuador, Nigeria, Oman, Peru
	Note : Countries in bold have been considered tax havens in the tax evasion literature. For a detail of the sources, see Menkhoff and Miethe (2019 [4])

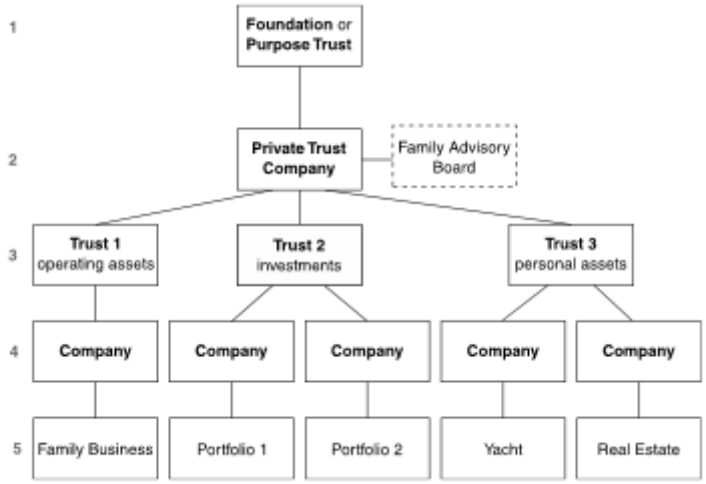
Chapter 3

Descriptive statistics on shell incorporations patterns

Especially when held offshore for tax evasion purposes, wealth can go through a number of vehicles such as trusts, offshore corporations, foundations, most of the time created by professional wealth managers in order to separate clients from their asset's ownership (Allred et al, 2017 [18]). Labro et al (2019 [17]), exploiting the Panama Papers leak, shows that banks have played the role of adviser for the creation of offshore structures. Such financial arrangements became public knowledge following a number of corporation leaks, such as Offshore Leaks in 2013, Panama papers and Bahamas Leaks in 2016, Paradise papers in 2017. Allred et al (2017 [18]) show, performing a randomized experimental study, that creating a shell corporation through an incorporation agency is relatively easy. According to their results, 25% of incorporation firms do not require any photo identification documents to set up a corporation or only require non certified photo identification, allowing the opening of completely anonymous shell companies. Incorporation agencies located in OECD countries, especially agencies located in the United States and the United Kingdom, prove more non-compliant or partially compliant (27.4%) than those located in tax havens (23.4%) which tend to abide more by international standards.

The development of incorporation agencies is relatively recent, as it went along with the financialization of wealth, the opening of barriers to capital movements, and the concentration of wealth since the 1990s. In a field study among professional offshore wealth managers, the sociologist Harrington (2016 [6]) documents the rise of a specific profession in the late 1980s, which strengthened around the creation of the London-based Society of Trust and Estate Practitioners (STEP) in 1991 and various university degrees such as the first B.Sc specialized in management of trusts and estates opened in 2011 in Manchester. Wealth managers design complex offshore structures, often involving multiple vehicle types and offshore jurisdictions. A well-known example is the offshore structure

Figure 3.1: Example of an offshore structure



Source : Brook Harrington, 2016

developed for the Pritzker family, whose $15 billion wealth is held through 60 companies and 2500 trusts (Harrington, 2016 [6]). An example of an offshore structure involving trusts and offshore corporations dedicated to a wealthy family is provided in figure3.1, taken from Harrington (2016 [6]). Wealth is separated between multiple entities and controlled through a number of vehicles in order to disseminate the risks and blur the property links between the assets and the ultimate owner of wealth.

This section aims to give evidence on the existence of such structures, by first looking at the pattern of creation of offshore corporations since the 1970s using data from public corporate registries of a number of haven and non-haven countries. In a second part, we will point out the amounts of evaded wealth that one might be missing by only considering cross-border deposits. To do so, we will study the evolution of local and cross-border deposits in haven and non-haven countries.

3.1 Offshore vehicles : a study on the evolution of the creation of offshore corporations

Recent leaks have given evidence that there exists an industry for offshore incorporations led by wealth management companies such as Mossack Fonseca or Appleby who offer incorporation services providing an identity for company officers. As we can see on table6.5, the directors of the companies leaked in the Panama papers and Offshore leaks are indeed often registered in tax havens, where

incorporation agencies are located (Mossack Fonseca has its offices in Panama, Appleby has offices in Bermuda, British Virgin Islands, Cayman Islands, Guernsey, Jersey, Hong Kong, Isle of Man, Seychelles, Shanghai, Mauritius).

It is important to note that offshore corporations are not the only entity one can create in order to hide her true country of residency. Trusts, which are entities specific to Common Law countries, are often involved in tax evasion schemes as they offer a greater level of secrecy by not being publicly registered. There exists a specialization in certain kinds of vehicles across offshore jurisdictions (Zucman, 2013 [5]), as national laws have created specific legal entities : Cayman Islands host a large number of hedge funds, while Liechtenstein has specialized in foundations with their so-called "Anstalt" and British islands (Channel islands, Isle of Man) have further developed the use of offshore corporations.

It is also important to recall that offshore corporations are not only used for tax purposes (Harrington, 2016 [6]), but can serve to hide assets in cases of political instability, family disputes, or for money laundering purposes. We however believe that it is informative for our analysis of tax evasion to estimate the patterns of offshore vehicles creations, even though a further study on their exact purpose should be conducted in the future.

Due to serious data limitations on other kinds of vehicles, we concentrate in this section on offshore corporations. Many countries have adopted corporate registries available online. These registries vary across countries in their exhaustiveness and the types of information given. For instance, France public company registry gives free information on the address, date of incorporation and dissolution of the company, and registration is mandatory to be legally considered a company. Many tax havens give such free information on the companies created under their jurisdictions, even though the list provided may be incomplete. For instance, we can see on Table 3.1 that none of the 149 corporations included in various leaks hosted by the United Kingdom were found in our database of publicly registered corporations. All the UK leaked corporations were Limited Liability Partnerships, which is a legal structure created in 2000 that is not subject to corporation tax or capital gains tax as partners are taxed through their individual taxation obligations. They do not require a writing

agreement, and can choose not to be publicly registered.

3.1.1 Data presentation

To study the evolution of the use of offshore corporations, we rely on corporate data coming from corporate public registries gathered in the open database â€œOpenCorporatesâ€ available online[6]. It provides information on the incorporation dates, the names of the companies, and, for some countries, the addresses of publicly registered corporations. Comparing the database we obtained with two leaked corporation lists published by the International Consortium of Investigative Journalists (see table 3.1, we can see that the database we obtain is far from exhaustive for some countries such as Singapore (where only 16% of the leaked corporations are publicly registered), Guernsey, the United Kingdom, or Wyoming. However, other jurisdictions such as Hong Kong, Panama, Cyprus or the Isle of Man display a match rate of over 70% (only taking into account companies registered before the leaks). Our estimated numbers of offshore incorporations is hence a lower bound to the true amounts.

Table 3.1: Comparison of leaked and public registry datasets

Country	Leaked	Publicly registered	Leaked/registered	Match rate	Share of leaked in registered
Hong Kong	488	1 825 530	0.03%	70.08%	0.02%
Singapore	691	1 204 383	0.06%	16.5%	0.01%
United Kingdom	149	660 015	0.02%	0%	0%
Panama	38 313	658 231	5.82%	79.93%	4.65%
Cyprus	89	351 757	0.03%	75.28%	0.02%
Wyoming	37	143 692	0.03%	40.54%	0.01%
Isle of Man	1 142	115 777	0.99%	73.73%	0.73%
Jersey	792	86 653	0.91%	65.91%	0.6%
Malta	73 366	66 209	110.81%	59.26%	65.66%
Guernsey	58	45 529	0.13%	37.93%	0.05%

Note:

[1] Only corporations created after 1990 are included in both leaked and registered corporations;

[2] Only corporations added before the leaks on OpenCorporates are taken into account in the match section

[6]I was granted an API key giving me a broad access to the data provided on the website.

We focus on the total number of corporations, contrary to other business databases such as the World Bank's Entrepreneurship Survey which only take into account Limited Liability companies. The main drawback of our dataset is that comparison across countries is limited, as the legal definition of a corporation may differ across countries depending for instance on their regimes for micro-companies, and on the conditions for a company to be publicly registered. However, the exhaustiveness of our dataset allows us to embrace a larger number of vehicles for tax evasion.

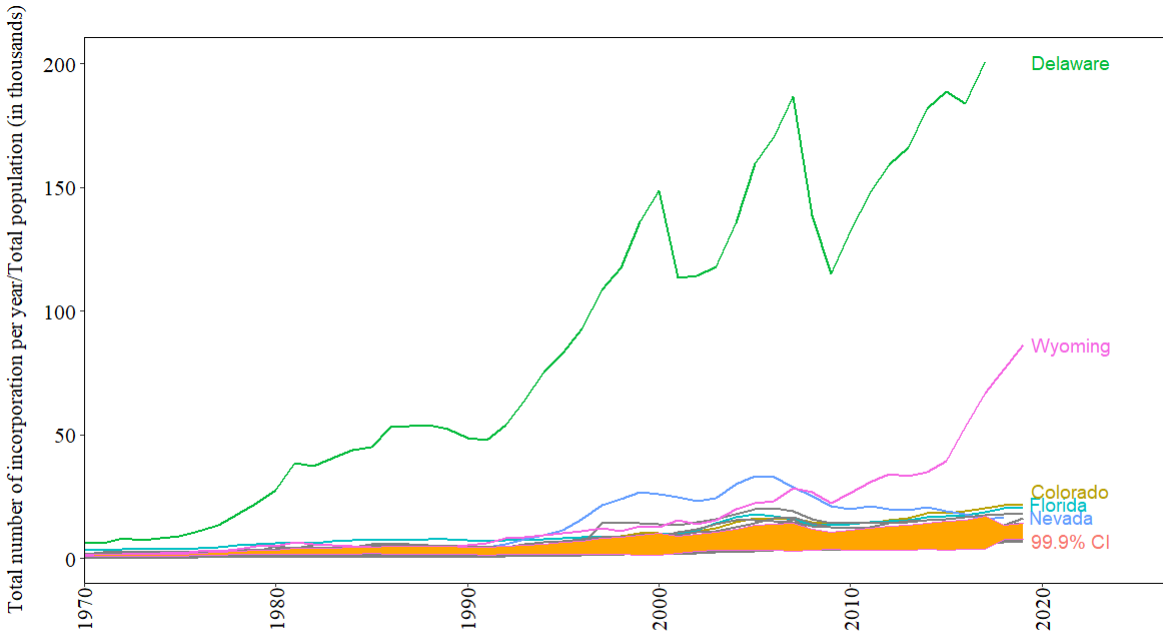
3.1.2 Patterns of incorporation : the case of the United States

The federal nature of the United States makes it convenient to compare yearly incorporation rates and detect anomalies, as the legal definition of a corporation tends to be the same across states. The Model Business Corporation Act was created in 1950 in order to reduce legal disputes and uncertainties linked to differing criteria defining a company across states. It has been adopted at least partially by 31 states as a basis for states' corporate legislation. However, each state has its own corporation code that may differ in the extent of shareholder interests protection, relatively high in Delaware, or the adoption of protectionist anti-trust laws which may deter corporation creation. Corporate law is indeed a channel through which states attract companies on their soil in order to increase their revenues (Eldar and Magnolfi, 2020). We plot yearly incorporations per 1000 inhabitants since 1970 in all US states, as well as the 99.9% confidence interval weighted by the population (figure 3.2). The weighted confidence interval gives an idea of the â€œnormalâ€ regime of incorporation per 1000 inhabitants in the US : between 3.8 and 17.3 companies should be created per 1000 inhabitants in 2017, if there was a geographically harmonious distribution of corporations across states.

When only retaining "abnormal" incorporations (ie the amount that exceeds the upper bound of the confidence interval) from total corporations created and removing very small numbers of fake incorporations in a matter of lisibility, we obtain the results displayed on Figure 3.3.

Our estimation of the number of sham corporations created per year has grown substantially over the period, mostly driven by the state of Delaware which hosts 60% of corporations based in the United States (Eldar and Magnolfi, 2020).

Figure 3.2: Number of yearly incorporations in US states per 1000 inhabitants



Note : Confidence interval weighted by the population of each state

Figure 3.3: Total estimated number of yearly created shell corporations in US states

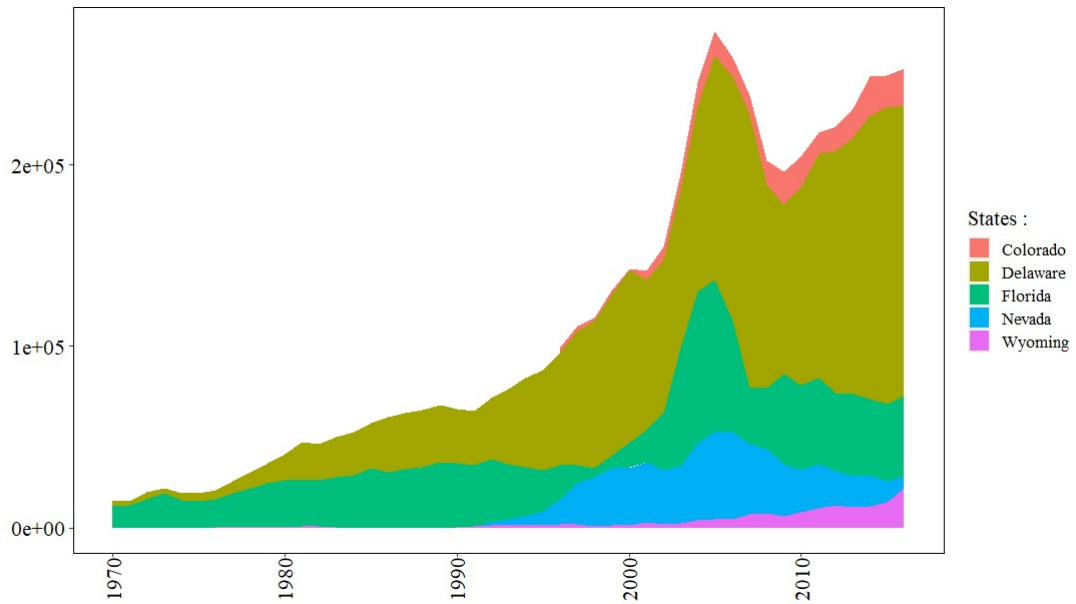
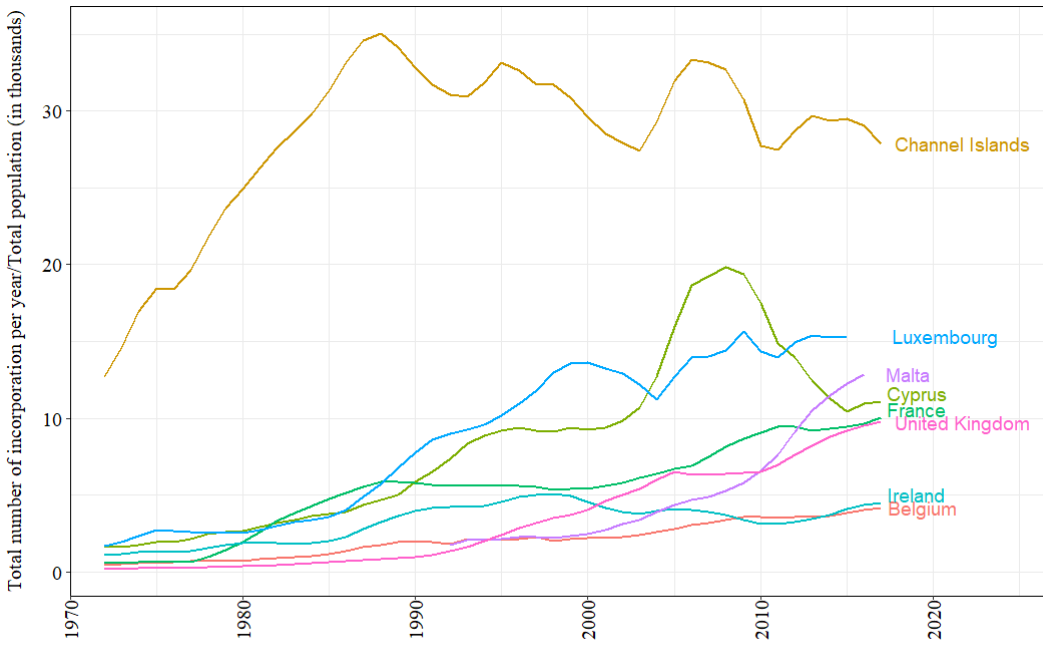


Figure 3.4: Number of yearly incorporations per 1000 inhabitants (five years moving average)

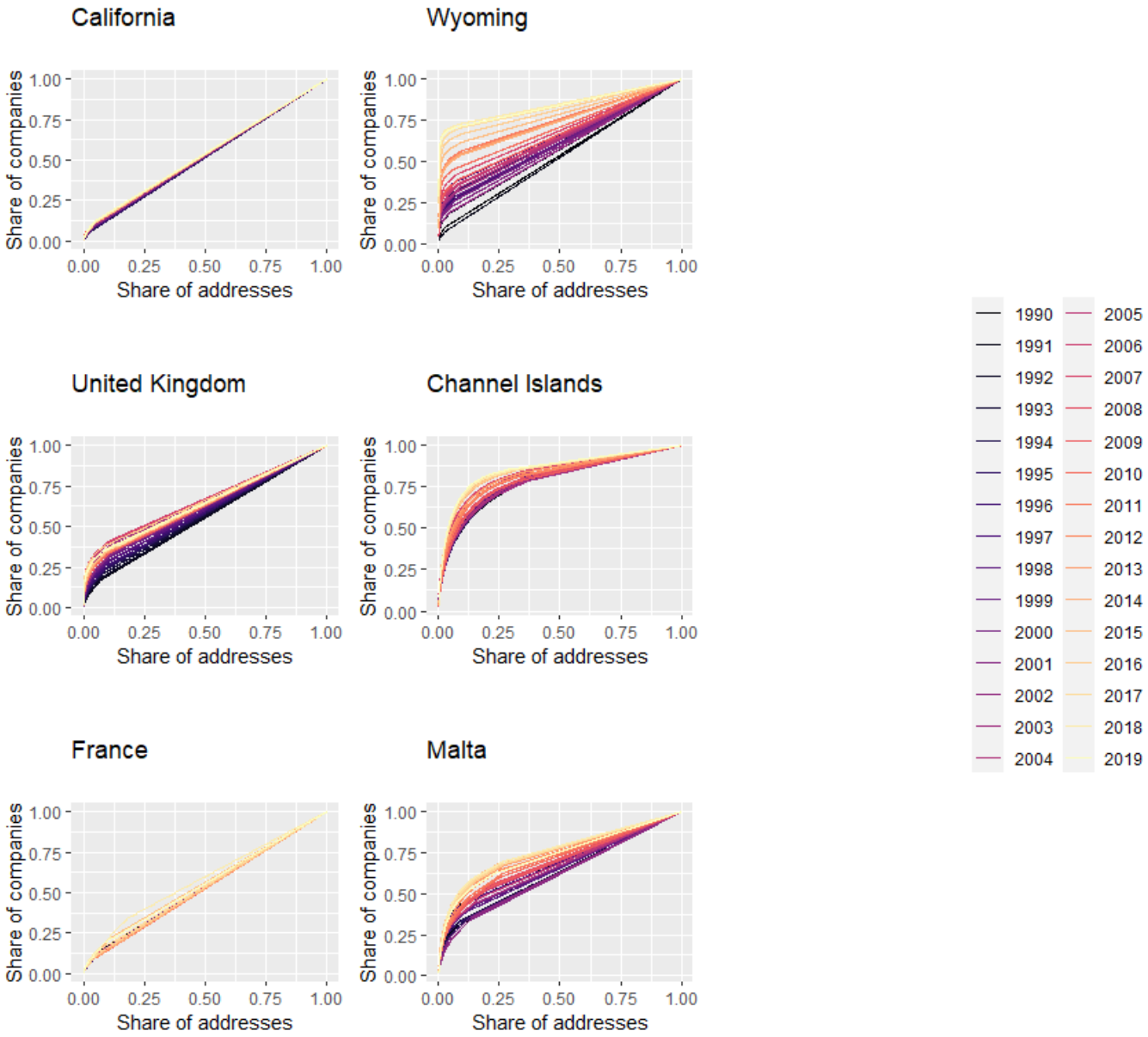


The use of such a criterion to identify sham corporations is more problematic when analyzing countries which do not have such federal ties. As we can see from the graph below, tax havens seem to generate more corporations per inhabitants than non-haven countries. Due to the lack of data for major European countries (Germany, Spain, Italy) and a lack of a harmonized legal system, one cannot draw final conclusions on the pattern of sham incorporations at a global level, only based on the number of companies.

3.1.3 Geographical concentration of companies

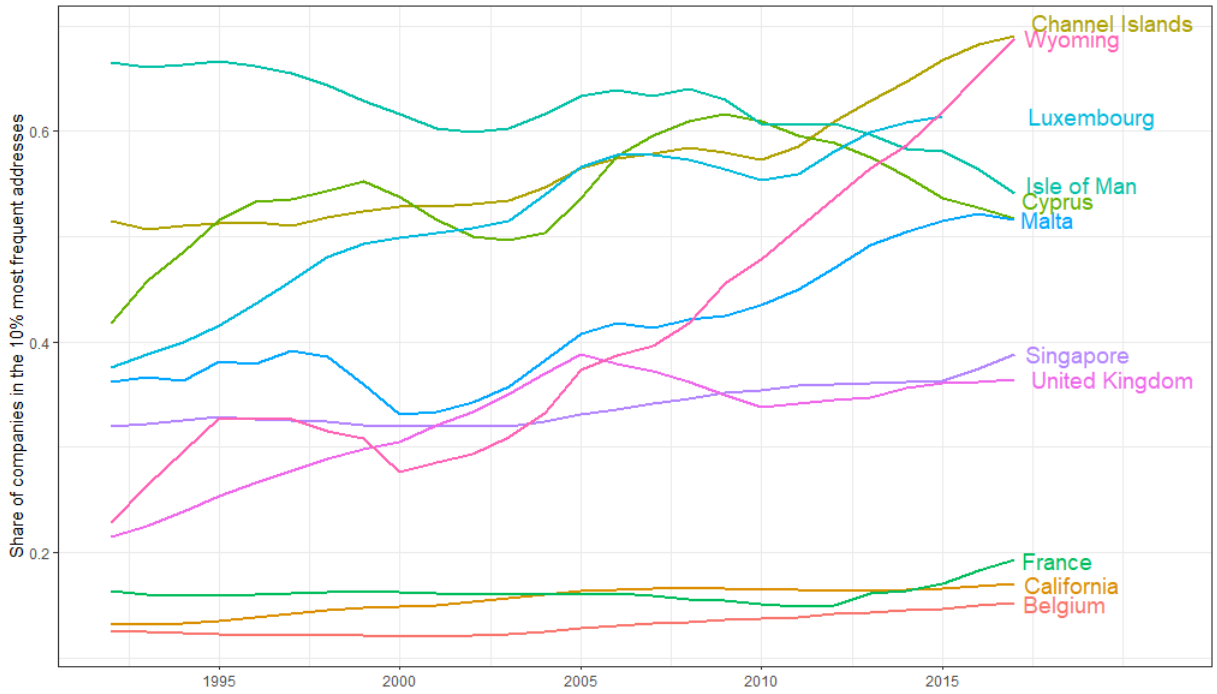
In order to estimate the number of sham corporations in these countries, we may resort to another indicator which is the number of companies created at each postal address. Firms specialized in offshore incorporation usually choose their own address as companies registered address, which triggers an abnormal number of corporations created in a given address. On the other hand, if a company is registered at the address where the activity actually takes place, we should not find too many corporations created in this address each year. Figure 3.5 shows the difference in the geographic concentration of offshore corporations between tax havens and non-haven countries. To obtain this result, we computed the frequency of yearly incorporations per address on which at

Figure 3.5: Share of companies by share of addresses



least one corporation was created in a given year. If several corporations were registered on an incomplete address (lack of street number), we took the conservative hypothesis of considering that each company was located at a different address. We can see that offshore countries display a higher concentration of companies than non-offshore countries. For instance, in the Channel Islands (Jersey and Guernsey), more than 75% of companies are registered in 25% of addresses, while it is 50% in the United Kingdom, which is still high compared to France or California, for which the curb is close to a 45 degree line.

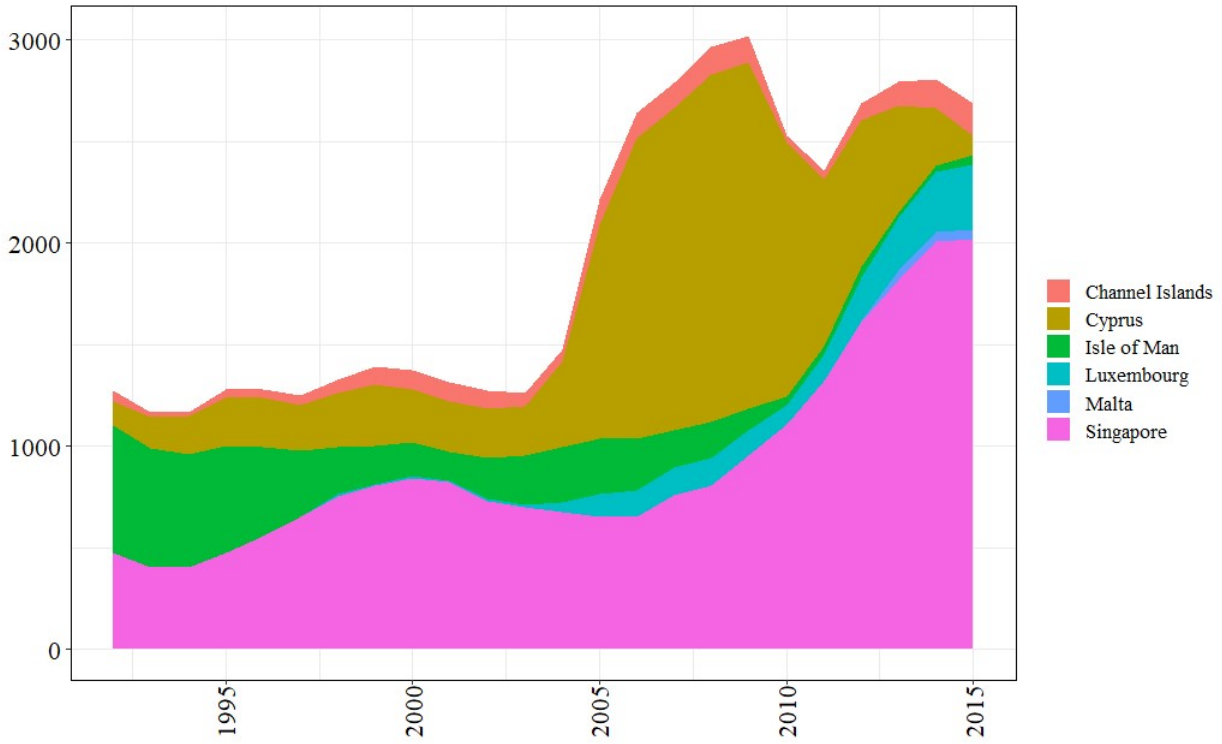
Figure 3.6: Share of companies in the 10% most frequent addresses



We obtain the following graph when we plot the share of corporations created yearly in 10% of addresses where at least one corporation was created that year (Figure 3.6). We can see a clear difference between countries considered haven and non haven countries. Our result concerning the United Kingdom confirms the findings of Allred et al (2017 [18]), according to which the United Kingdom and the United States hosted a large shell incorporation activity.

Next, we estimate the number of shell corporations based on the frequency of incorporations per address. We make the assumption that one address can not host more than a hundred companies per year. We choose this number arbitrarily, and further studies would be needed to refine the analysis. However, the intuition behind this number is that a corporation should not go bankrupt and be reincorporated more than twice a year. If we consider that one address can host fifty companies at a time, then a hundred seems a reasonable, even though conservative threshold. Figure 3.7 displays the results we obtain for small tax havens. The volatility across time makes it difficult to give a final interpretation on the incorporation pattern, but we can see that some tax havens have seen their number of shell corporations increase sensibly : Singapore, Luxembourg, and to a lesser extent Malta. Among our selected havens, Isle of Man is the only one displaying a clear downward trend.

Figure 3.7: Estimated number of yearly created shell corporations in selected tax havens



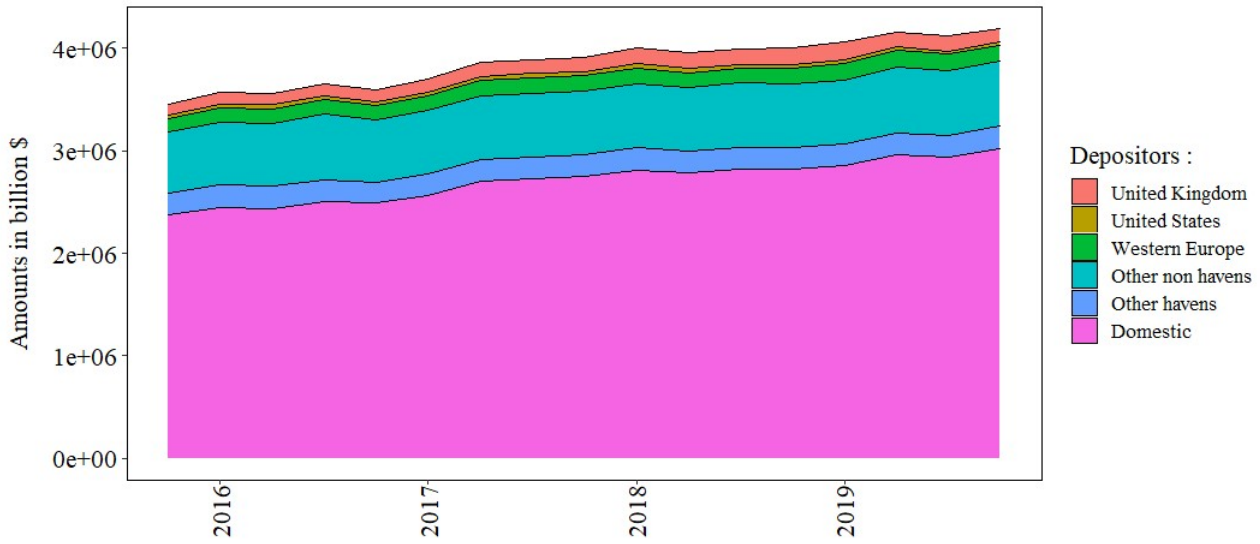
Note : Five years moving average

3.2 Locally-held deposits in tax havens : wealth evaded through offshore vehicles ?

Due to a lack of harmonized data, evaluations of information exchange on tax evasion did not consider the evolution of locally-held deposits in tax havens. The BIS recently published data on bank deposits held locally since 2015. Such a small amount of data unfortunately does not allow us to integrate local deposits in our regression analysis (chapter 4). However, it is informative to see that locally held deposits make up a sizeable share of deposits held in tax havens, as shown in Figure 3.8.

If the share of cross-border deposits held by tax havens has been decreasing since the 2000s, we can see an upward pattern of locally-held deposits in tax havens since 2016. In total, deposits held by tax havens (either local or cross-border) have grown from 18.55% to 19.27% of total deposits held by reporting countries between 2015-Q4 and 2019-Q4 (see Figure 3.9). We can then suspect an increase in the use of offshore vehicles to hold assets in havens. Unfortunately, data on locally held deposits in the United States is not published by the BIS, but all relevant bank locations are included (see the "Held in" part of the footnote).

Figure 3.8: Total deposits in reporting tax havens



Data : Locational Banking Statistics, Bank of International Settlements

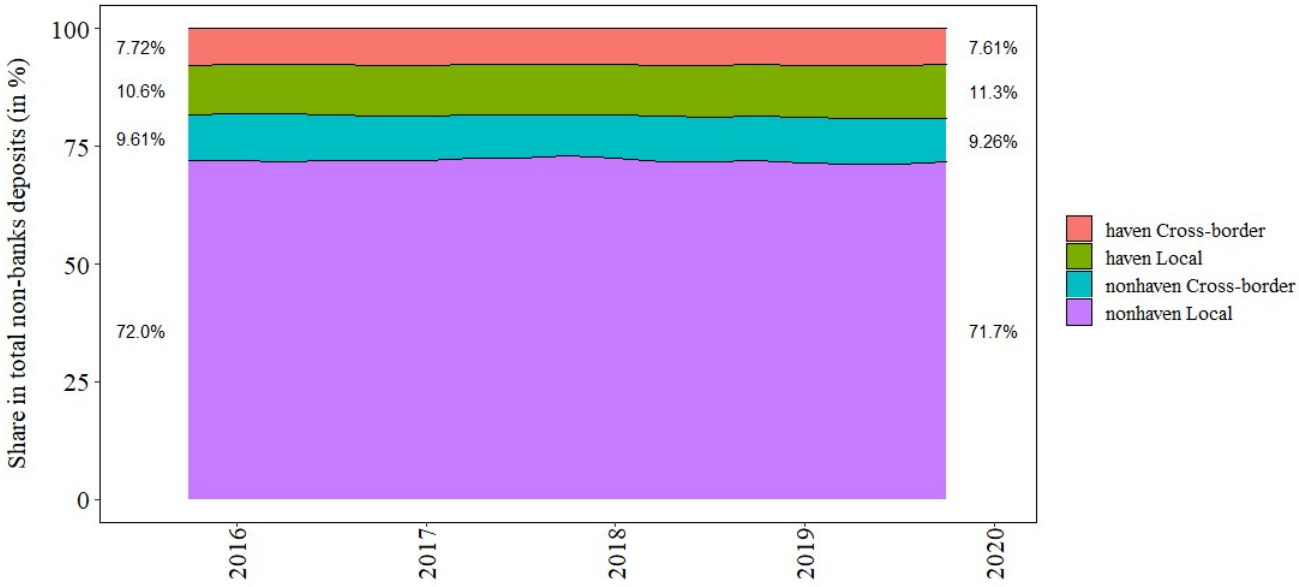
Reporting havens : Hong Kong SAR, Isle of Man, Jersey, Guernsey, Switzerland, Luxembourg

Haven depositors : Bahrain, Bermuda, Bahamas, Curacao, Cyprus, Guernsey, HongKong SAR, Isle of Man, Jersey, Cayman Islands, Luxembourg, Malaysia, Panama, Singapore, Switzerland

Western Europe : Austria, Belgium, Denmark, Finland, France, Germany, Italy, Spain, Sweden

Other non-haven : 191 countries

Figure 3.9: Share of deposits held (by country type)



Data : Locational Banking Statistics, Bank of International Settlements

Havens : Isle of Man, Singapore, Bahrain, Bahamas, Bermuda, Cayman Islands, Curacao, Cyprus, Guernsey, Hong Kong SAR, Jersey, Luxembourg, Macao SAR, Malaysia, Panama, Switzerland

Non-havens : Australia, Austria, Belgium, Brazil, Canada, Chile, Chinese Taipei, Curacao, Denmark, Finland, France, Germany, Greece, India, Indonesia, Ireland, Japan, Mexico, Netherlands, Portugal, South Africa, South Korea, Sweden, Turkey, United Kingdom

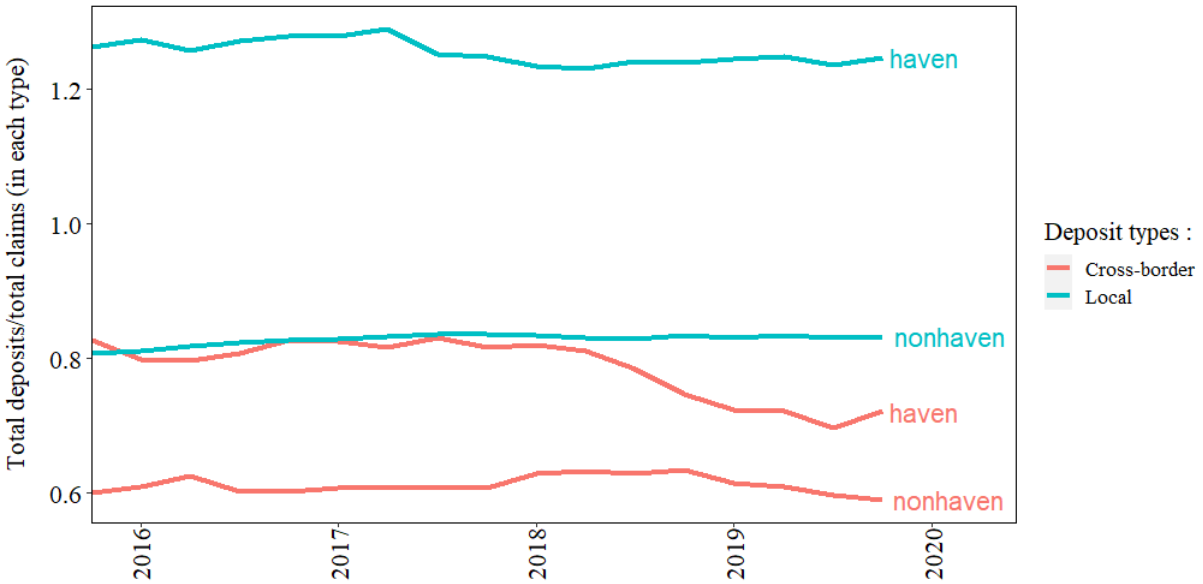
Held in : Netherlands Antilles, Austria, Australia, Belgium, Bahrain, Bermuda, Brazil, Bahamas, Canada, Switzerland, Chile, China, Denmark, Spain, Finland, France, United Kingdom, Guernsey, Greece, Hong Kong SAR, Indonesia, Ireland, Isle of Man, India, Italy, Jersey, Japan, South Korea, Cayman Islands, Luxembourg, Macao SAR, Mexico, Malaysia, Netherlands, Norway, Panama, Philippines, Portugal, Russia, Saudi Arabia, Sweden, Singapore, Turkey, Chinese Taipei, United States, South Africa

One could argue that the large amounts of deposits held in tax havens reflect financial activities hosted by those countries, which are often international financial centers. Delatte, Capelle-blancard and Bouvatier (2017 [19]) show indeed that some European havens such as Luxembourg and Monaco host abnormal levels of banking activity.

The following graph displays the links between claims and deposits held by non-banks in haven and non-haven countries, depending on whether they are held locally or internationally. Claims on banks include loans, reimbursement obligations from the borrower (interests, guaranties...), and hence do not have a direct link with tax evasion purposes. Menkhoff and Miethe (2019 [4]) use bank claims as a counterfactual in order to check that the effect of treaties on cross border bank deposits they obtain is not driven by an overall decline in offshore banking activity, but by a genuine decline in tax evasion. Claims do reflect the banking activity of a country and so the amounts of deposits they host, but are not directly linked to tax evasion.

A stylized fact that we can draw from this graph is that amounts of deposits are higher relative to bank claims in haven countries than in non-haven countries, whether they are held locally or internationally. This gap is wider when we consider local deposits, which is a sign that local banks are more used as deposit devices than as lending devices in havens than in non-haven countries. Wealth held as cross-border deposits is relatively higher when held by a tax haven than by a non-haven. These two results seem to indicate that bank deposits held by non-banks located in havens is abnormally high with regard to their overall banking activity.

Total deposits/total claims held by non-banks



Data : Locational Banking Statistics, Bank of International Settlements

Havens : Isle of Man, Singapore, Bahrain, Bahamas, Bermuda, Cayman Islands, Curacao, Cyprus, Guernsey, Hong Kong SAR, Jersey, Luxembourg, Macao SAR,Malaysia, Panama, Switzerland

Non-havens : Australia, Austria, Belgium, Brazil, Canada, Chile, Chinese Taipei, Curacao, Denmark, Finland, France, Germany, Greece, India, Indonesia, Ireland, Japan, Mexico, Netherlands, Portugal, South Africa, South Korea, Sweden, Turkey, United Kingdom

Held in : Netherlands Antilles, Austria, Australia, Belgium, Bahrain, Bermuda, Brazil, Bahamas, Canada, Switzerland, Chile, China, Denmark, Spain, Finland, France, United Kingdom, Guernsey, Greece, Hong Kong SAR, Indonesia, Ireland, Isle of Man, India, Italy, Jersey, Japan, South Korea, Cayman Islands, Luxembourg, Macao SAR, Mexico, Malaysia, Netherlands, Norway, Panama, Philippines, Portugal, Russia, Saudi Arabia, Sweden, Singapore, Turkey, Chinese Taipei, United States, South Africa

Chapter 4

Regression based analysis of the effects of AEOI

In this section, we perform a number of panel regressions in order to assess the effects of AEOI on the amounts of cross-border assets held offshore. We focus on two kinds of assets : bank deposits held by non banks (either households or other kinds of corporations), and foreign portfolio investment. Compared to other kinds of assets such as foreign direct investment, these are more likely to be held by tax evaders, who seek to invest in liquid assets. For both assets, we rely on comprehensive data : the Locational Banking Statistics published by the Bank of International Settlements for bank deposits, and the Coordinated Portfolio Survey published by the International Monetary Fund for portfolio investments. So far, few studies have evaluated the effects of CRS (see Table 6.2), and to our knowledge, only one has used the CPIS. We aim to add more control variables than in the existing literature. We focus on a limited time span, from 2009 to 2019, which allows to focus on CRS rather than on exchange treaties and is sufficiently long to detect a changing pattern in cross-border assets holding.

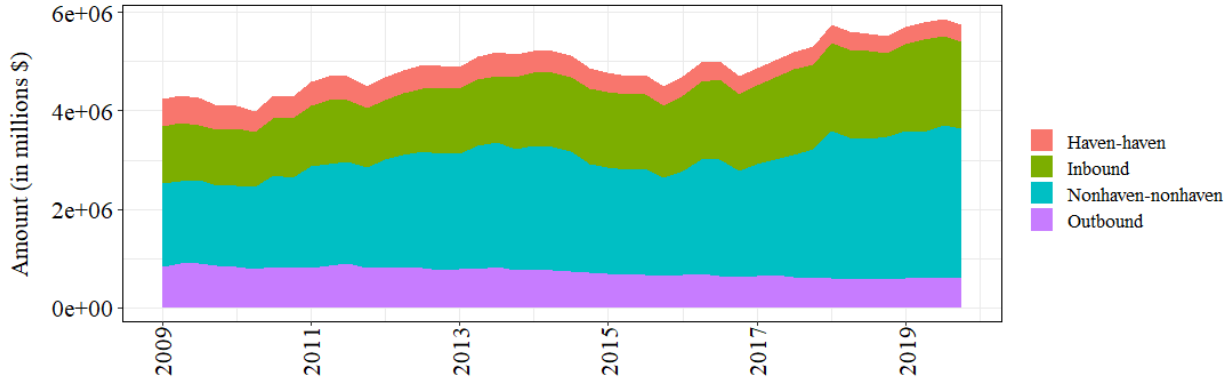
4.1 The effects of CRS on cross-border deposits

4.1.1 Definition of tax havens and final data composition

In this paper, we choose to keep an extensive list of all tax havens used in the literature, and test the robustness of our results on a more restricted list of havens. We rely on the comprehensive work made by Menkhoff and Miethe (2019 [4]), who identified all countries defined in the literature as tax havens.

We choose a time span ranging from 2009 to 2019 Q2 in order to focus on the effects of CRS rather than exchange treaties and have a larger number of cross-sectional data. After adding our control variables, balancing our panel data and removing all missing values, we obtain a dataset of

Figure 4.1: Cross-border deposits held by non-banks



Data from the BIS; Inbound = held by havens in non-haven banks; Oubound = held by non-havens in haven banks;

Reporting havens (location of the banks) : Austria, Belgium, Chile, Guernsey, Ireland, Isle of Man, Jersey, Luxembourg, Switzerland;

Counterparty havens (residency of the holders) : Andorra, Aruba, Austria, Bahamas, Bahrain, Belize, Bermuda, Cayman Islands, Chile, Costa Rica, Cyprus, Dominica, Gibraltar, Grenada, Guernsey, Hong Kong SAR, Isle of Man, Jersey, Jordan, Lebanon, Liberia, Liechtenstein, Luxembourg, Macao SAR, Malaysia, Maldives, Malta, Marshall Islands, Mauritius, Panama, Samoa, San Marino, Seychelles, Singapore, St. Lucia, St. Vincent and the Grenadines, Switzerland, Trinidad and Tobago, Turks and Caicos Islands, Uruguay, Vanuatu;

Reporting non-havens : Australia, Brazil, Canada, Denmark, Finland, France, Greece, Japan, Mexico, Netherlands, South Korea, Sweden, United Kingdom, United States;

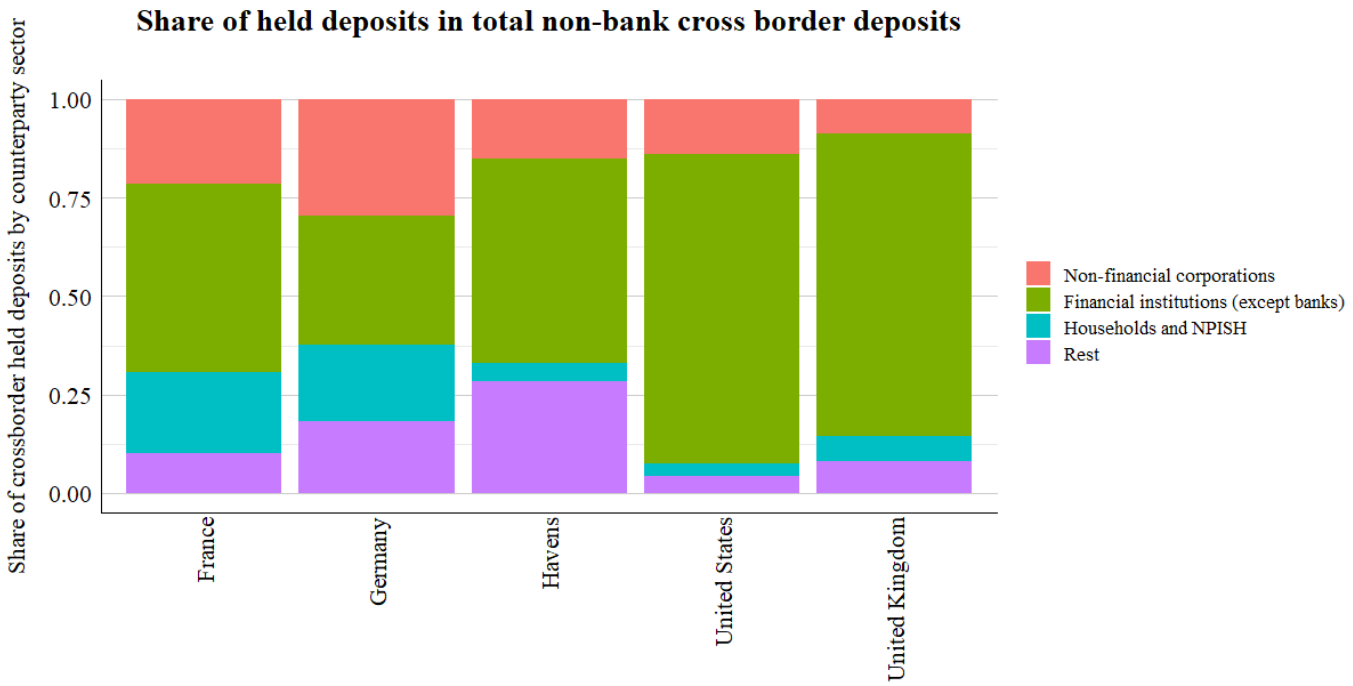
Counterparty non-havens : 139 countries.

1311 country pairs, with 23 different deposit destinations among which nine are considered as tax havens, and 183 holder countries, among which 41 are tax havens (see Table 7.1 and Table 7.2). Figure 4.1 displays the evolution of deposits depending on their type. Overall, we can first note a reduction in deposits held by non-havens in haven banks, and a relative increase of "inbound" deposits, *ie* deposits held by havens in non-haven banks.

4.1.2 The Non-bank sector

The Locational Banking Statistics gives quaterly bilateral information on the amounts of cross-border deposits held, and offers an interesting breakdown by type of holder. For our purpose, we will focus on the "non-bank" sector, which includes households and corporations other than banks. It is convenient as it removes all inter-bank operations which are not in the scope of the Common Reporting Standard. Figure 4.2 gives us an idea of what is included in the BIS "non-banks" sector across countries. Such a breakdown being only available for 2018-Q4 to 2020-Q1, we can not use it in our regressions. Unsurprisingly, we can see that bank deposits are often held through financial institutions in haven countries, the United States and the United Kingdom where the financial sector

Figure 4.2: Non-bank deposits by holder type



Note : Raw values are computed as a mean of six periods from 2018-Q4 to 2020-Q1

Havens: Aruba, Malta, Cayman Islands, Andorra, Belize, Costa Rica, Austria, Singapore, Macao SAR, Curacao, Netherlands, Ireland, Mauritius, Cyprus, Jersey, MarshallIslands, Grenada, Luxembourg, Bahrain, Lebanon, Tonga, Chile, Vanuatu, Belgium, Jordan, Seychelles, Guernsey, Malaysia, Liberia, Gibraltar, Uruguay, Samoa, San Marino, St.Lucia, Bahamas, Isle of Man, HongKong SAR, Panama, Liechtenstein, Sint Maarten, Dominica, Switzerland, Barbados, Bermuda

is especially developed. On the opposite, they are more likely to be held directly by households in European countries such as France or Germany.

4.1.3 Control variables

The aim of our regression is to detect changes in cross-border deposits amounts due to automatic exchange of information. To account for changes due to other factors, we select a number of control variables.

We first add to our model dummy variables indicating other exchange of information measures, namely FATCA (which only concerns US holders) and exchange treaties. We choose to weight the treaties dummy by the rate of reply within one year of the country where wealth is held, so that we take into account the effectiveness of the treaty (see Table 6.4). For both measures, the corresponding dummy variable is equal to one when the exchange upon request treaty enters into force (year of first exchange). Permanent and special Voluntary Disclosure programs, which are temporary measures that give incentives for tax evaders to declare their wealth are also included in the model. Such programs should indeed have a negative effect on evaded wealth. We identified a large number

of such programs in various sources (OECD publication, O'reilly et al (2019 [14]), Menkhoff and Miethe (2019 [4]), Roussille (2015 [20])), see Table 7.5 for the complete list. Along Roussille (2015 [20]), we differentiate permanent programs according to the level of the penalty given for wealth declared under the program. If there is no penalty, we consider that a program strongly incentivizes tax evaders to declare their wealth.

We add a number of control variables which aim to isolate changes in cross-border deposits due to common economic shocks, or an overall change in the economic activity of a country. The log GDP of both countries in a bilateral relationship is commonly used in gravity models to explain cross-border investments and financial links (Delatte, Guillin and Vicard, 2020 [21]). It allows us to control for part of the overall economic changes at the country level. We hence add annual GDP data from the World Bank to our model.

In order to control for changes at the bilateral level, we add the logarithm of bilateral bank claims held by non-banks along with Menkhoff and Miethe (2019 [4]), even though we use the raw level of claims rather than the share in total claims of the counterparty country, as it takes into account the overall change and not only the relative change of the amounts of claims. Claims are a useful indicator for cross-border banking activity not related to tax evasion, as it includes instruments that are not commonly used for such purposes (mostly indebtedness obligations). Finally, we add year and country-pair fixed effects to account for other changes at the bilateral and world level.

4.1.4 Econometric specification and results

We perform the following benchmark econometric specification :

$$log(deposits)_{ijt} = \beta_1 CRS_{ijt} + \beta_2 TREATY_{ijt} + \beta_3 FATCA_{ijt} + \beta_4 PVD_{ijt} + \beta_4 SVD_{ijt}$$

$$+\beta_5 log(GDP_{it}) + \beta_6 log(GDP_{jt}) + log(CLAIMS_{ijt}) + \omega_t + \alpha_{ij} + \epsilon_{ijt}$$

With CRS and $FATCA$ a dummy equal to one six months before the actual implementation of automatic exchange of information, $TREATY$ a dummy equal to one if an exchange upon request treaty has been signed between two countries, PVD a dummy equal to one if there exists a permanent voluntary disclosure program in the holder country j. In the last specification, we differentiate between "high" ($PVDh$) and "low" ($PVDl$) depending on their intensity, as explained above. SVD

is a dummy accounting for "special" or temporary disclosure programs. We choose a fixed effects estimation rather than random effects after performing a Hausman test. Our number and explanatory power of our control variables is indeed limited, and we may fear an omitted variable issue. Fixed effects model allows to correct for time invariant country pair characteristics that may affect their level of deposit holding (financial development, language, currency...).

As CRS concerns a large number of countries in our final data frame, its effects could be confounded in the time fixed effect variable. Since we include variables that account for time-varying economic patterns not directly related to tax evasion (the logarithms of GDP and claims), we run this regression with and without time fixed effects. However, after performing a F test for individual effects and a Breusch-Pagan test (with the null hypothesis being the insignificance of time fixed effects), we conclude that the best model is the time and country pair fixed effects model.

Following Menckhoff and Miethe (2019 [4]) we consider both outbound deposits (deposits directly held by residents of non-haven countries in haven countries) and inbound deposits. The idea is that inbound deposits could be held indirectly by non-haven countries through offshore vehicles and reinvested either in their home country ("roundtripping") or in other non-haven economies that may be more adapted to absorb such funds. We add a third category which is deposits held by haven countries regardless of their destination. Wealth held through offshore vehicles can indeed be invested in banks located in other tax havens.

Results can be found in Table 4.1. Columns (1) to (6) display the coefficients without time fixed effects, and columns (7) to (12) include time FE. Only controlling for claims, exchange of information has a significant negative effect on deposits held directly in tax havens by non haven countries, but this result is not significant when we add additional control variables or time fixed effects.

Interestingly, without controlling for time fixed effects and additional variables, the coefficient associated to CRS is positive and significant, which could mean that individuals respond to exchange of information by resorting more to "round-tripping" to non-haven countries. However, as for outbound deposits, this result is not robust.

Columns (11) and (12) indicate that controlling for time fixed effects, CRS has a negative effect on the overall amount of deposits held by tax havens.

Table 4.1: Effects of CRS implementation - bank deposits

	Dependent variable:											
	log(deposits)											
	outbound	outbound	inbound	inbound	haven	haven	outbound	outbound	inbound	inbound	haven	haven
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
CRS	−0.142***	−0.028	0.222***	0.099	0.006	−0.024	0.008	0.043	−0.002	0.080	−0.044	−0.050
	(0.045)	(0.049)	(0.074)	(0.086)	(0.052)	(0.071)	(0.054)	(0.059)	(0.102)	(0.109)	(0.078)	(0.100)
FATCA	−0.651***	−0.387**					−0.471***	−0.252				
	(0.165)	(0.152)					(0.169)	(0.162)				
treaty	−0.230**	−0.128	0.196	0.028	−0.150	−0.087	−0.111	−0.066	−0.047	−0.026	−0.216	−0.096
	(0.093)	(0.122)	(0.223)	(0.240)	(0.140)	(0.205)	(0.097)	(0.126)	(0.232)	(0.237)	(0.150)	(0.206)
special		−0.057		−0.076		−0.131		−0.039		−0.088		−0.129
		(0.045)		(0.147)		(0.109)		(0.044)		(0.153)		(0.113)
GDP		−0.590**		0.885**		−0.133		−0.767**		0.935**		−0.241
		(0.244)		(0.370)		(0.370)		(0.368)		(0.398)		(0.402)
GDPcount		−0.071		0.545**		0.457**		−0.127		0.280		0.388
		(0.106)		(0.245)		(0.225)		(0.124)		(0.296)		(0.285)
VDPh		0.099		0.069		−0.082		0.139		0.029		−0.080
		(0.250)		(0.137)		(0.125)		(0.255)		(0.156)		(0.139)
VDPl		−0.016		−0.082		−0.023		0.013		−0.097		−0.027
		(0.087)		(0.100)		(0.099)		(0.094)		(0.133)		(0.121)
rawclaims	0.079***	0.079***	0.184**	0.163**	0.208***	0.227***	0.075***	0.076***	0.173**	0.160*	0.205***	0.225***
	(0.014)	(0.015)	(0.079)	(0.081)	(0.060)	(0.082)	(0.014)	(0.014)	(0.079)	(0.082)	(0.060)	(0.082)
countrypair f.e.	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
year-qtr f.e.	No	No	No	No	No	No	Yes	Yes	Yes	Yes	Yes	Yes
Observations	21,516	18,388	6,116	5,368	11,572	8,788	21,516	18,388	6,116	5,368	11,572	8,788
R^2	0.038	0.038	0.072	0.109	0.060	0.078	0.059	0.054	0.100	0.124	0.067	0.082
Adjusted R^2	0.015	0.015	0.050	0.086	0.038	0.054	0.035	0.029	0.072	0.094	0.042	0.054
Note:												*p<0.1; **p<0.05; ***p<0.01

4.2 Portfolio investment

4.2.1 Data

Foreign Portfolio investments are the second kind of assets susceptible to be affected by automatic exchange of information due to their liquidity. They are equity and debt instruments that allows to hold shares in companies without total control as they cannot grant more than 10% of voting rights (which differentiates them from direct investments). It is of primary importance to consider such types of assets to have a broader picture of reactions to CRS since wealth held by top income earners is essentially made of financial assets other than deposits (Garbinti, Goupille-Lebret and Piketty, 2017 [22]), and tax evasion is over represented among the top wealth share (Alstadsaeter, Johannesen and Zucman, 2018 [23]).

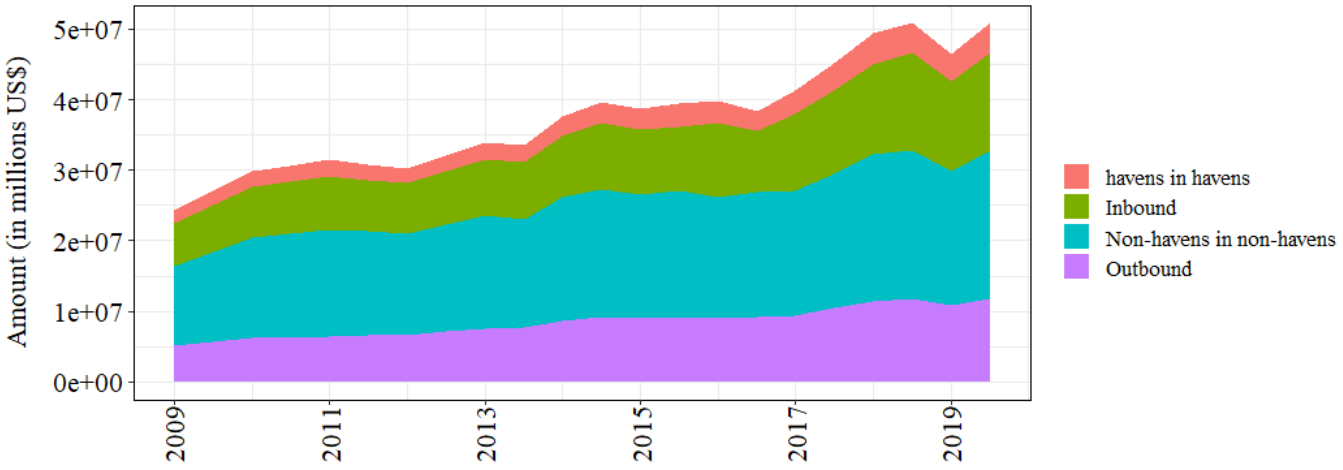
We use the Coordinated Portfolio Investment Survey published by the IMF, which provides bi-annual data on cross-border portfolio holdings for a large number of countries. We choose the same time span as for deposit data, ranging from 2009 to 2019 Q2.

After including our control variables, removing missing values and balancing our panel data frame, our final data is composed of 65 investor countries among which 20 are considered tax havens and 166 locations for investments among which 43 are considered tax havens, which makes up a total of 5313 country-pairs. Details for the names of the countries can be found in the appendix B (see Table 7.3 and Table 7.4). We display in Figure 4.3 the aggregated amounts of cross-border portfolio investments obtained in our final data.

4.2.2 Specification and results

For comparability, we use sensibly the same specification as for bank deposits except that we remove the "claims" variables. This choice was made for two reasons : first, drivers of portfolio investments are different than for bank deposits. Cross-border deposits may be affected by overall banking relationship, but portfolio investments may depend on the presence of investment funds and the financial activity of a country, the presence of a dynamic stock market for instance. The second reason is that BIS data does not retain exactly the same countrypairs as the IMF, which would make us loose some information. Instead, we add the Financial Market Indices published by the IMF. It

Figure 4.3: Total portfolio investments by types



Data from the IMF Coordinated Portfolio Survey

Note : Inbound = from haven countries to non-haven countries, Outbound = from nonhaven countries to haven countries.

Lecture : Non-haven countries hold 4 million US$ in portfolio invested in tax taxhavenslarge (purple area)

Havens : Austria, Barbados, Belgium, Bermuda, Cayman Islands, Chile, Costa Rica, Cyprus, Gibraltar, Guernsey, Ireland, Isle of Man, Jersey, Lebanon, Liberia, Luxembourg, Malaysia, Malta, Mauritius, Panama, Singapore, Switzerland, Uruguay;

Non-havens : Albania, Argentina, Australia, Bangladesh, Bolivia, Brazil, Bulgaria, Canada, Colombia, Denmark, Finland, France, Germany, Greece, Honduras, Hungary, Iceland, India, Indonesia, Israel, Italy, Japan, Kuwait, Latvia, Lithuania, Mexico, Mongolia, New Zealand, Norway, Pakistan, Philippines, Portugal, Romania, Russian Federation, Saudi Arabia, South Africa, Spain, Sweden, Thailand, Turkey, Ukraine, United Kingdom, United States, West Bank and Gaza.

is an aggregate index going from 0 (undeveloped financial markets) to 1, taking into account various variables such as the stock market capitalization, the amounts of stocks traded, and the stock market turnover ratio. For instance, in 2018, Switzerland had the highest financial market index of 0.91.

We hence perform the following specification :

$$log(portfolio)_{ijt} = \beta_1 CRS_{ijt} + \beta_2 TREATY_{ijt} + \beta_3 FATCA_{ijt} + \beta_4 PVD_{jt} + \beta_4 SVD_{jt}$$

$$+\beta_5 log(GDP_{it}) + \beta_6 log(GDP_{jt}) + FMindex_{it} + FMindex_{jt} + \omega_t + \alpha_{ij} + \epsilon_{ijt}$$

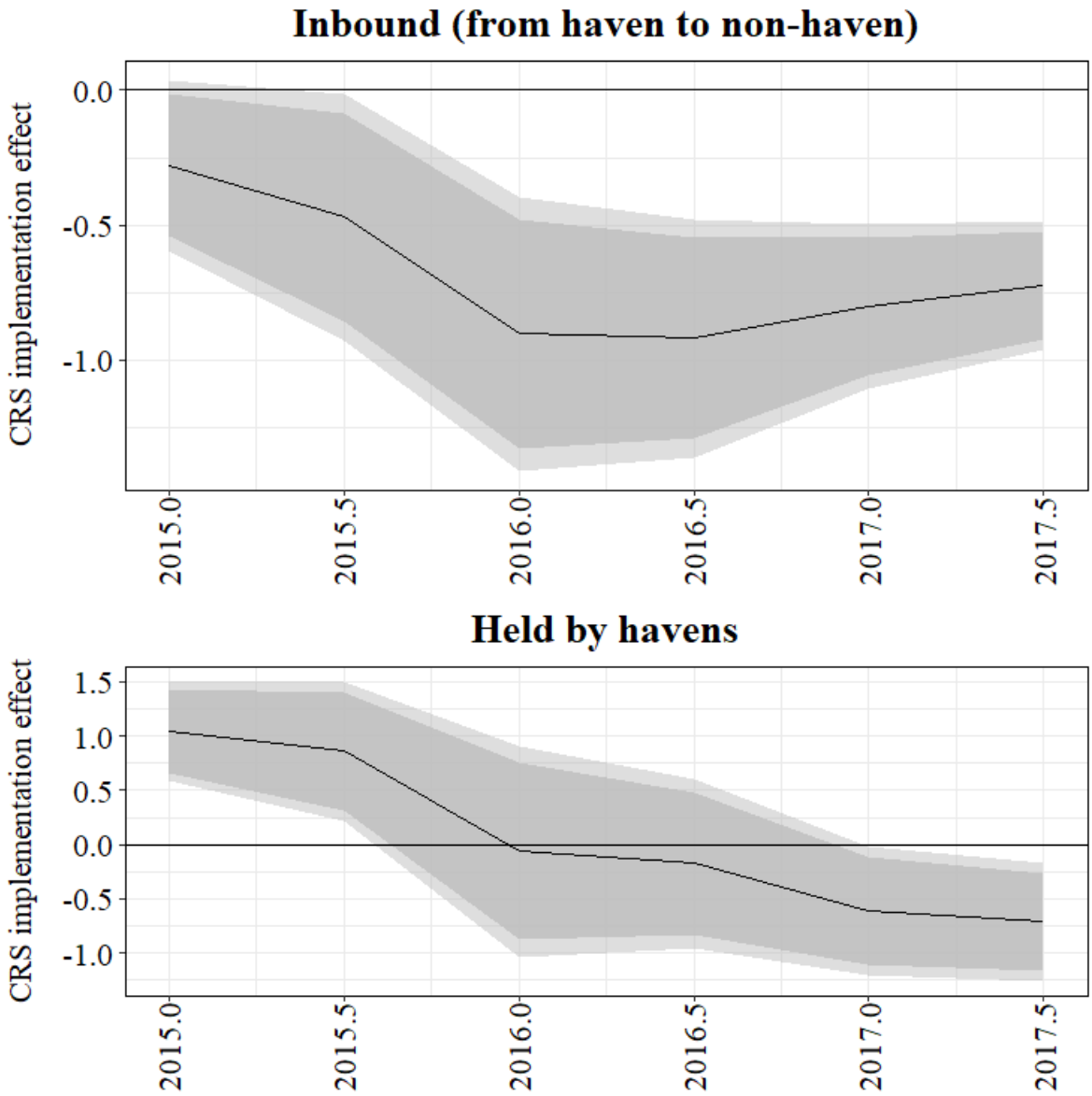
Table 4.2 displays the results obtained with country-pair and year fixed effects, a choice we made after performing a F test for individual effects and a Breusch-Pagan test which both rejected the hypothesis of time fixed effects insignificance. Just like for deposits data, we have divided our sample between outbound, inbound, and held by haven portfolio investments. We can see that the coefficients associated to CRS are significantly negative when we include all our control variables, year and country pair fixed effects for all kinds of cross-border portfolio investments.

Interestingly, FATCA has a significant negative effect on deposits held by US residents in haven countries.

Table 4.2: Effects of CRS implementation - portfolio investments

	Dependent variable:					
	log(FPI)					
	outbound	outbound	inbound	inbound	th	th
	(1)	(2)	(3)	(4)	(5)	(6)
CRS	−0.417	−0.265	−1.616***	−1.669***	−1.349***	−1.391***
	(0.342)	(0.328)	(0.277)	(0.281)	(0.263)	(0.262)
FATCA	−0.789***	−0.574*				
	(0.293)	(0.322)				
treaty	0.970*	0.783	0.058	0.176	0.224	0.258
	(0.552)	(0.544)	(0.411)	(0.403)	(0.338)	(0.329)
special		0.140		0.272		0.306
		(0.299)		(0.260)		(0.235)
GDP		4.092***		0.813		1.040**
		(0.848)		(0.557)		(0.510)
GDPcount		−0.993		0.830		1.055*
		(0.784)		(0.728)		(0.617)
FMD		−0.464		2.887		2.280
		(2.157)		(1.878)		(1.616)
FMDcount		−2.399		−2.428		−1.980
		(2.575)		(1.892)		(1.693)
VDPh		−0.040		−1.902***		−1.449***
		(0.514)		(0.495)		(0.440)
VDPl		−0.857**		−1.745***		−1.668***
		(0.351)		(0.285)		(0.249)
countrypair f.e.	Yes	Yes	Yes	Yes	Yes	Yes
year-qtr f.e.	Yes	Yes	Yes	Yes	Yes	Yes
Observations	15,575	15,435	24,954	24,922	32,318	32,218
R^2	0.033	0.045	0.047	0.054	0.040	0.047
Adjusted R^2	−0.016	−0.004	0.001	0.007	−0.007	0.0001
Note:						*p<0.1; **p<0.05; ***p<0.01

Figure 4.4: CRS coefficient accross time



Note : Each half year, the CRS coefficient is computed with all control variables, year and country pair fixed effects on a four years time window (two before, two after a given date)
The darker area shows significancy at the 0.1 level, while the light grey area shows significancy at the 0.05 level

Figure 4.4 display the evolution of the coefficient associated to the CRS dummy variable across time for inbound and haven cross-border portfolio investments. As expected, the coefficient decreases over time for both types of deposits (we do not include outbound deposits as they were not significant). CRS effects on deposits held by havens however seems fragile, as the CRS coefficient is not significant for years post CRS implementation.

4.2.3 Robustness tests

We test our results by using a restrictive list of 18 tax havens[7], selected by O'Reilly et al (2019 [14]). Results can be found in Table 4.3. We obtain similar results as with our extended list, except that the effects of CRS on outbound deposits is now significantly negative. We also test whether the timing of the measure changes the results we obtain. Instead of taking six month prior to the first exchanges, we extend to one year before the first exchanges take place in order to account for early reactions. We still find significant negative effects of CRS on FPI holding by tax haven, overall and in non-haven countries.

[7]Marshall Island, Bahrain, Bahamas, Bermuda, Cayman Islands, Netherlands Antilles, Curacao, Cyprus, Guernsey, Hong Kong SAR, Isle of Man, Jersey, Luxembourg, Macau SAR, Malaysia, Panama, Singapore, Switzerland)

Table 4.3: Robustness test havens list - portfolio investments

	Dependent variable:					
	log(FPI)					
	outbound	outbound	inbound	inbound	th	th
	(1)	(2)	(3)	(4)	(5)	(6)
CRS	0.145	0.145	−1.905***	−1.865***	−1.778***	−1.783***
	(0.348)	(0.338)	(0.317)	(0.315)	(0.300)	(0.298)
FATCA	−0.640**	−0.523				
	(0.323)	(0.343)				
treaty	0.160	−0.160	0.103	0.082	0.317	0.268
	(0.607)	(0.610)	(0.396)	(0.380)	(0.369)	(0.349)
special		0.008		0.438		0.492*
		(0.369)		(0.291)		(0.265)
GDP		4.071***		0.738		0.681
		(1.006)		(0.616)		(0.573)
GDPcount		−1.191		2.435***		2.706***
		(0.755)		(0.803)		(0.721)
FMD		−0.067		1.919		1.799
		(2.490)		(2.030)		(1.841)
FMDcount		−3.811		−3.937*		−3.038
		(2.850)		(2.101)		(1.966)
VDPh		0.521		−1.541***		−1.199***
		(0.477)		(0.469)		(0.441)
VDPl		−0.471		−1.417***		−1.363***
		(0.403)		(0.306)		(0.271)
countrypair f.e.	Yes	Yes	Yes	Yes	Yes	Yes
year-qtr f.e.	Yes	Yes	Yes	Yes	Yes	Yes
Observations	10,506	10,506	22,377	22,301	25,792	25,716
R^2	0.044	0.056	0.051	0.058	0.049	0.056
Adjusted R^2	−0.005	0.008	0.005	0.011	0.002	0.009
Note:						*p<0.1; **p<0.05; ***p<0.01

Table 4.4: Robustness test implementation date - portfolio investments

	Dependent variable:					
	log(FPI)					
	outbound	outbound	inbound	inbound	th	th
	(1)	(2)	(3)	(4)	(5)	(6)
CRS	−0.302	−0.090	−1.504***	−1.562***	−1.241***	−1.286***
	(0.337)	(0.321)	(0.283)	(0.288)	(0.267)	(0.267)
FATCA	−0.756**	−0.487				
	(0.305)	(0.328)				
treaty	0.967*	0.777	0.080	0.199	0.240	0.275
	(0.552)	(0.544)	(0.410)	(0.402)	(0.337)	(0.328)
special		0.145		0.274		0.307
		(0.300)		(0.260)		(0.235)
GDP		4.140***		0.787		1.025**
		(0.848)		(0.558)		(0.510)
GDPcount		−0.991		0.837		1.051*
		(0.785)		(0.730)		(0.618)
FMD		−0.615		2.895		2.312
		(2.158)		(1.879)		(1.617)
FMDcount		−2.400		−2.494		−2.004
		(2.575)		(1.891)		(1.694)
VDPh		−0.022		−1.908***		−1.447***
		(0.514)		(0.498)		(0.442)
VDPl		−0.844**		−1.757***		−1.671***
		(0.351)		(0.285)		(0.249)
countrypair f.e.	Yes	Yes	Yes	Yes	Yes	Yes
year-qtr f.e.	Yes	Yes	Yes	Yes	Yes	Yes
Observations	15,576	15,436	24,955	24,923	32,319	32,219
R^2	0.033	0.045	0.047	0.054	0.040	0.047
Adjusted R^2	−0.016	−0.004	0.0004	0.007	−0.007	−0.0001
Note:						*p<0.1; **p<0.05; ***p<0.01

Chapter 5

Conclusion

In this paper, we have given evidence of an increase of the use of offshore corporations since the 1990s, through the rise of shell incorporations in some US states and tax havens such as Singapore and Cyprus. These results shed light on the structures behind what has been coined the custodial bias of official statistics. Further research should be conducted to include more types and vehicles and countries. We also give evidence of the importance to consider not only cross-border wealth but also local wealth held in tax havens to have a fuller picture of evaded wealth.

According to our regression results, the implementation of Common Reporting Standards did not have a significant effect on cross-border deposits, but did have a negative effect on cross-border portfolio investments held by tax havens. This result can be interpreted by the fact that wealth held by tax havens is more sensitive to tax evasion policies than when held directly by non-haven in haven countries, and thus that evaded wealth is more often held through offshore structures. Interestingly, we find a significant effect of FATCA on FPI held directly by US residents in haven countries.

An ambitious step toward increased international fiscal cooperation would be to create a comprehensive global financial register as proposed by Piketty (2013 [24]) and Zucman (2015 [2]), including mandatory participation for tax havens. This would remedy the issue of misattribution of wealth to tax havens by official statistics.

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Chapter 6

Appendix A (chapters 2 and 3)

Table 6.1: Literature review - Exchange upon request

Article and Dataset	Baseline specification	Control variables
Johannesen and Zucman (2014), LBS (BIS)	$log(Deposit_{ijt}) = \alpha + \beta * T_{ijt} + \mu_{ij} + \omega_t + \epsilon_{ijt}$	Treaty coverage (nb of treaties signed with other havens) - Savings Tax Directive
Menkhoff and Miethe (2019), LBS (BIS)	$log(Deposits_{ijt}) = \alpha_{ij} + \omega_t + \sum_{k=-2}^{K} \beta_k * T_{ijt}^k + \Omega * X_{ijt} + \epsilon_{ijt}$	Financial weight variable based on claims - Placebo treaties, Amnesty and VDP
Beer, Coelho, Leduc (2019), LBS (BIS)	$log(Deposits_{ijt}) = \beta_1 * T_{ijt} * Off_i + \omega_t^{Non-haven} + \omega_t^{haven} + \mu_{ij} + \epsilon_{ijt}$	(GDP) of both counterparts - Exchange rates - UN membership - Language - Corporate and top marginal income tax rate - Financial secrecy index (TJN) - Trade/GDP - FDI stocks, Imports/exports
Heckemeyer and Hemmerich (2018), CPIS (IMF)	$log(FPI_{ijt}) = \alpha + \beta_1 * T_{it} + \beta_2 * Off_i * T_{it} + X_{it} + Z_{jt} + \omega_t + \mu_{ij} + \epsilon_{ijt}$	log GDP - log GDP/capita of both counterparts
Hanlon, Maydew and Thornock (2015), Fed and US Treasury	$log(FPI_{it}) = \alpha_i + \omega_t + \beta_1 * Off_i * Taxrate_t + \epsilon_K * X_{i,t} + \epsilon_{i,t}$	log GDP - log(Population) - Local tax rates - Phone coverage - Foreign Exchange rates

Table 6.2: Literature review - Automatic exchange

O'Reilly, Ramirez and Stemmer (2019), LBS (BIS)	$log(Deposits_{ijt}) = \alpha + \beta * T_{i,j,t} + \mu_{ij} + \beta_2 * AEOIAnnounce_{i,j,t} + \beta_3 * AEOICommencement_{ijt} + \epsilon_{ijt}$	
Casi, Spengler and Stage (2019), LBS (BIS)	$log(Deposits_{ijt}) = \alpha + \beta_1 * AEOI_{j,t} + \beta_2 * AEOIj, t * Off_j + \omega_{it}$ÂřΩ$_{i,j} + \epsilon_{ijt}$	
Menkhoff and Miethe (2019), LBS (BIS)	$log(Deposits_{ijt}) = \alpha_{ij} + \omega_t + \sum_{k=-2}^{K} \beta_k * AEOI_{ijt}^k + \Omega * X_{ijt} + \epsilon_{ijt}$	Financial weight variable based on claims - Placebo treaties, Amnesty and VDP
Arhens and Bothner (2019), LBS (BIS) and CPIS (IMF)	$log(deposits/FPI_{ijt}) = \alpha_{ij} + \omega_t + \beta_1 * AEOI_{ijt} * Off_j + \epsilon_{ijt}$	Two AEOI variables : endorsment and signature

Table 6.3: Number of requests sent under OECD bilateral treaties

Country	Nb of requests received in a three years span	Rate of reply in less than a year
Aruba	9	89%
Austria	1534	93%
Bahamas	88	60%
Barbados	27	52%
Belgium	1850	94%
Bermuda	77	94%
Cayman Islands	161	97%
Chile	40	95%
Costa Rica	52	92%
CuraÃ¸ao	138	20%
Guernsey	136	78%
Ireland	573	95%
Isle of Man	291	87%
Jersey	262	89%
Lebanon	77	87%
Liechtenstein	275	66.9%
Luxembourg	2309	84%
Malaysia	155	74%
Mauritius	479	97.5%
Monaco	329	98.4%
Netherlands	2241	95.5%

Table 6.5: Most frequent countries of origin in the leaks database

	Panama		BVI		Hong Kong		Nevada		Singapore		Wyoming	
Origin	Freq	Share	Freq	Share	Freq	Share	Freq	Share	Freq	Share	Freq	Share
Switzerland	11 590	24.03%	19 649	12.96%	33	2.03%	149	11.64%	3	0.39%	-	-
Panama	5 925	12.29%	4 788	3.16%	108	6.65%	81	6.33%	-	-	5	8.62%
Luxembourg	5 584	11.58%	3 081	2.03%	39	2.4%	29	2.27%	-	-	1	1.72%
Uruguay	2 653	5.5%	1 467	0.97%	5	0.31%	68	5.31%	-	-	7	12.07%
Bahamas	2 255	4.68%	1 760	1.16%	6	0.37%	291	22.73%	-	-	15	25.86%
Jersey	2 127	4.41%	10 467	6.9%	64	3.94%	3	0.23%	-	-	1	1.72%
United Kingdom	1 666	3.45%	5 425	3.58%	3	0.18%	15	1.17%	-	-	1	1.72%
Monaco	1 402	2.91%	1 035	0.68%	1	0.06%	6	0.47%	-	-	-	-
Colombia	1 356	2.81%	261	0.17%	1	0.06%	10	0.78%	-	-	-	-
Ecuador	1 100	2.28%	252	0.17%	2	0.12%	199	15.55%	-	-	-	-
United Arab Emirates	921	1.91%	3 511	2.32%	2	0.12%	1	0.08%	-	-	-	-
Guernsey	705	1.46%	4 714	3.11%	2	0.12%	-	-	-	-	-	-
Hong Kong	609	1.26%	27 228	17.96%	917	56.43%	43	3.36%	3	0.39%	-	-
British Virgin Islands	92	0.19%	36 980	24.39%	1	0.06%	2	0.16%	-	-	-	-
Singapore	67	0.14%	3 621	2.39%	2	0.12%	-	-	693	91.06%	-	-

Table 6.4: Number of requests sent under OECD bilateral treaties (2)

Panama	302	75%
Samoa	16	38%
Seychelles	162	73%
Singapore	167	95%
Switzerland	1898	83%
United States	2633	76.5%
United Kingdom	5206	85.7%
Note: Data from OECD peer review reports; The three years spans are included between 2013 and 2018; Each request can concern multiple accounts		

Figure 6.1: Number of companies per address in California

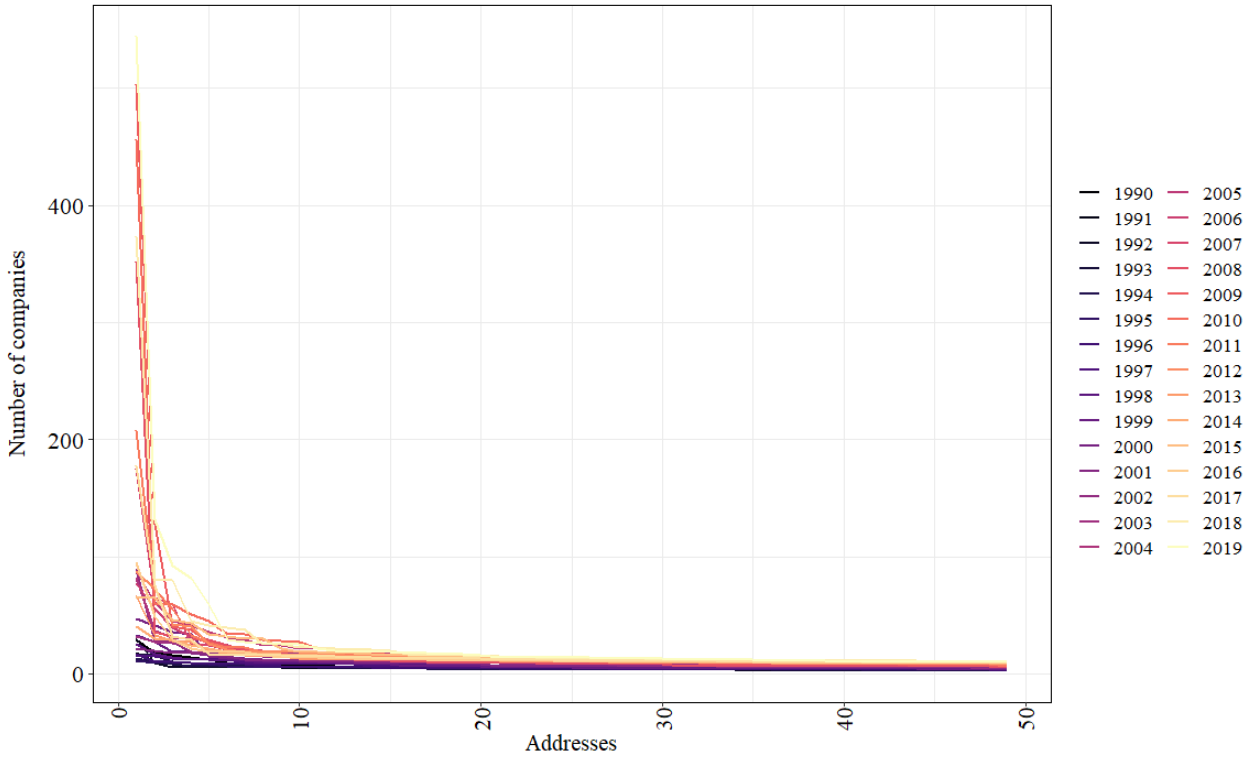


Figure 6.2: Number of companies per address in Wyoming

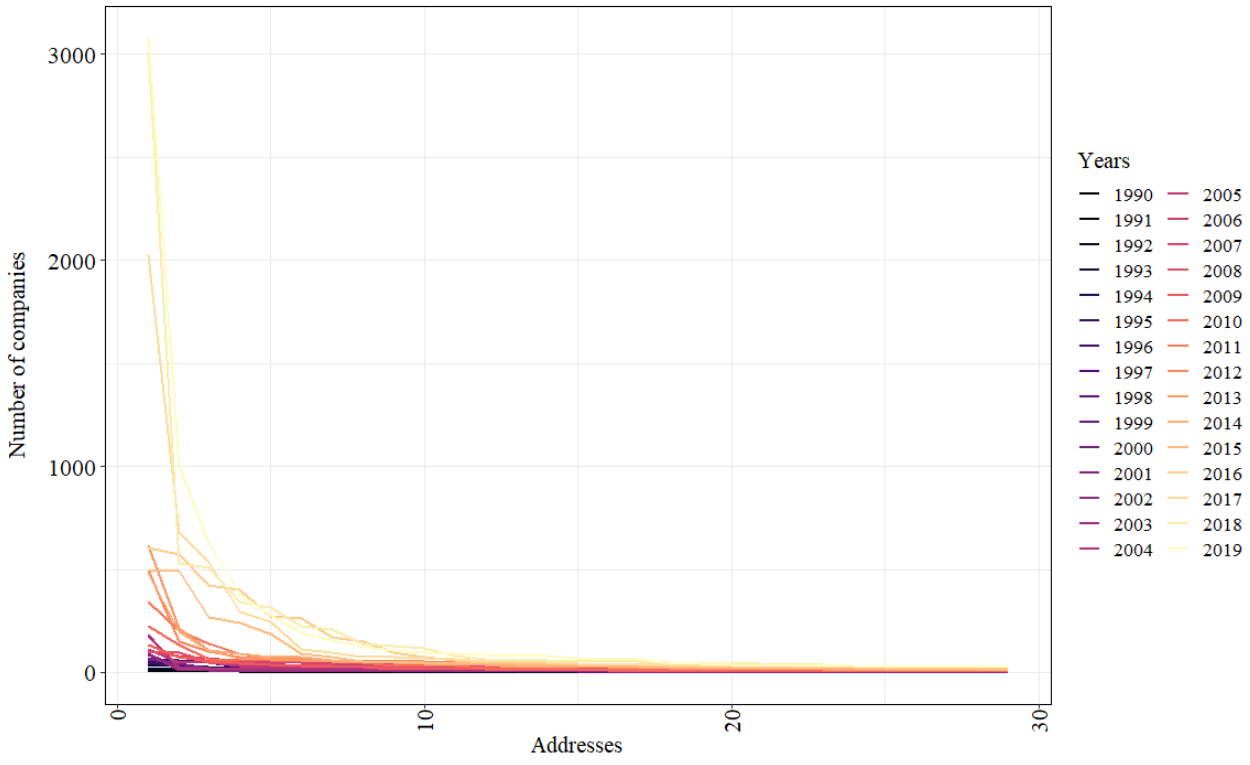


Figure 6.3: Number of companies per address in Singapore

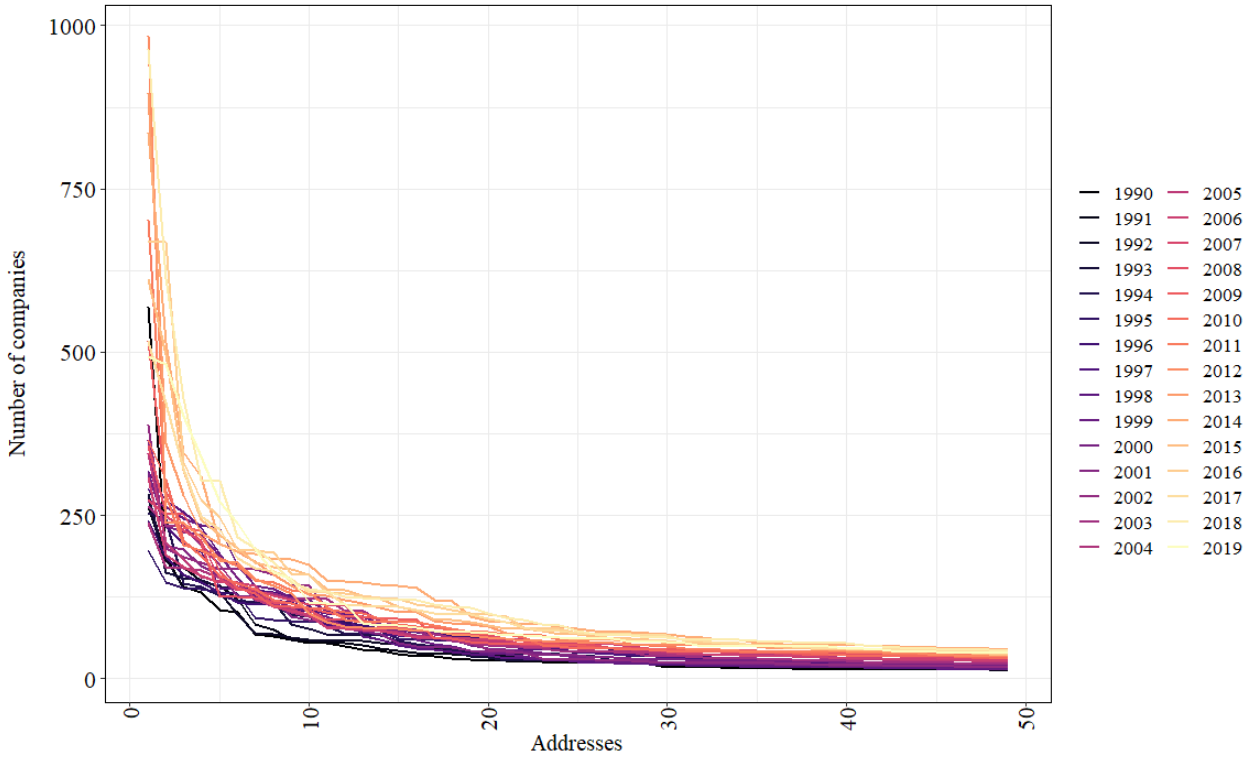


Figure 6.4: Number of companies per address in the UK

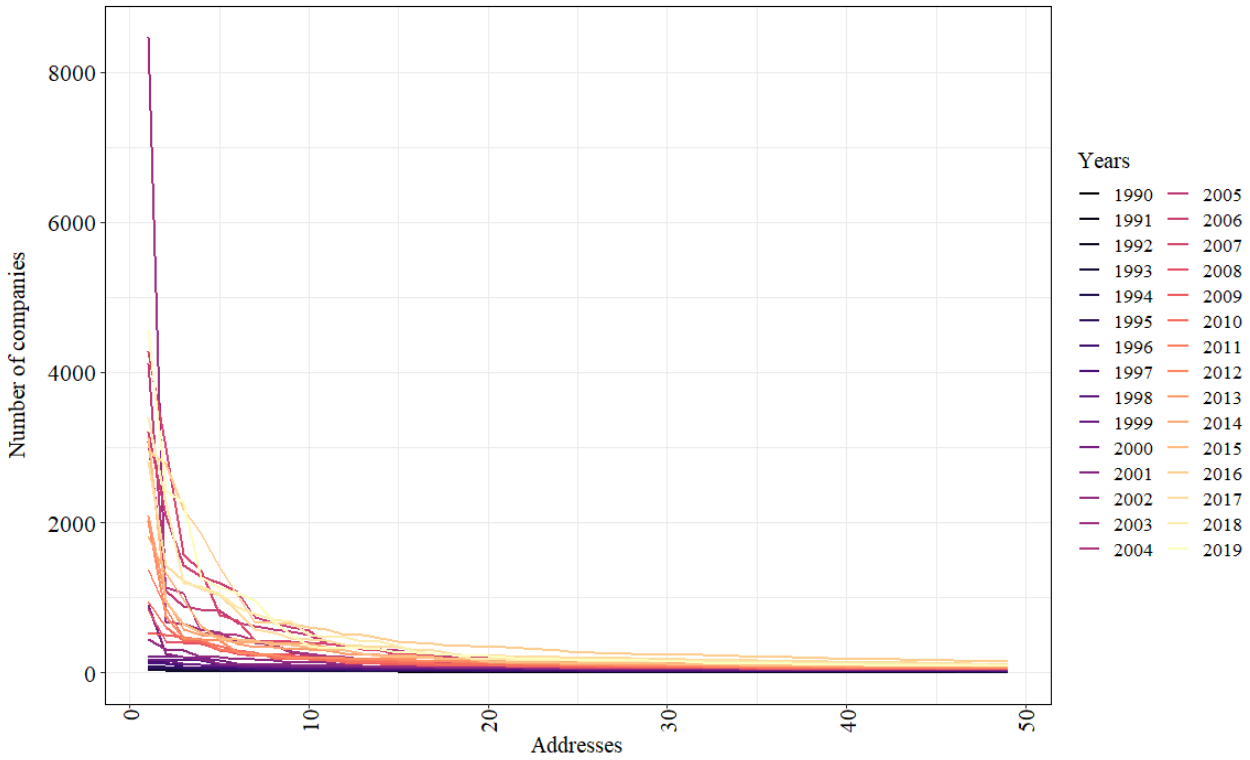


Figure 6.5: Number of companies per address in Channel Islands (Jersey + Guernsey)

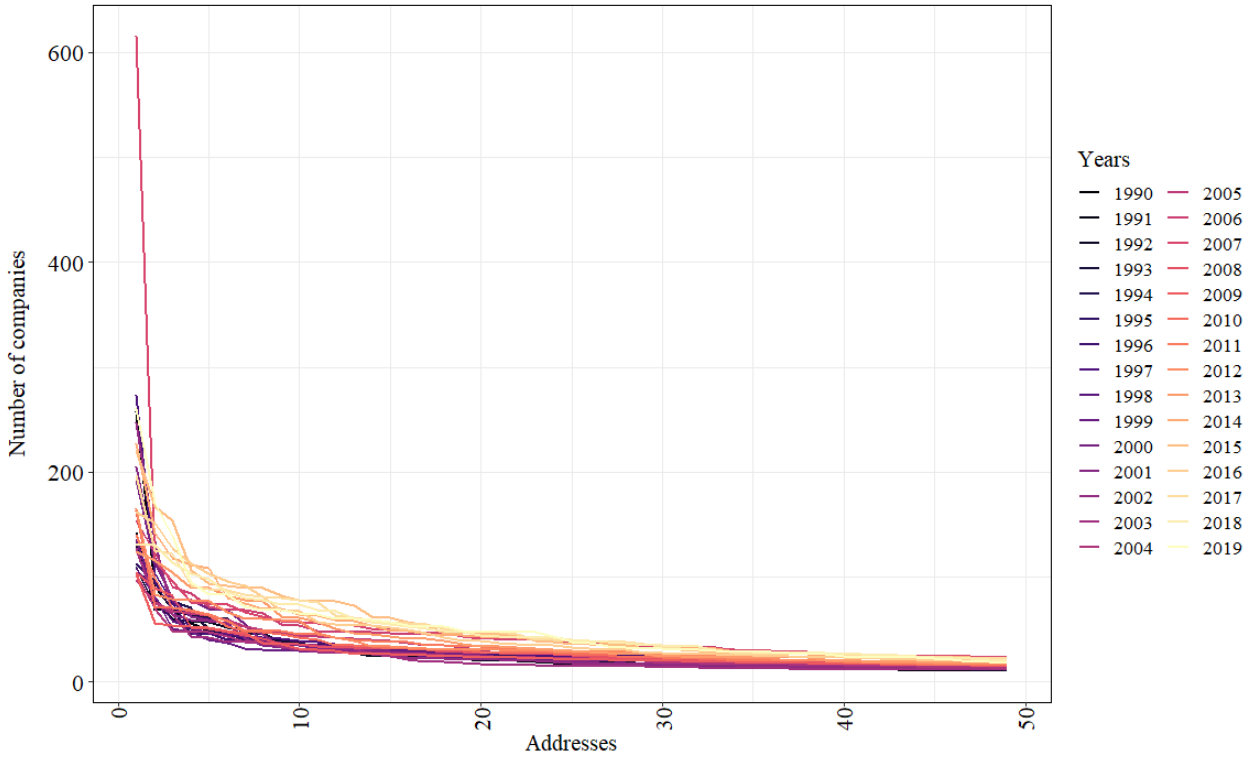


Figure 6.6: Number of companies per address in France

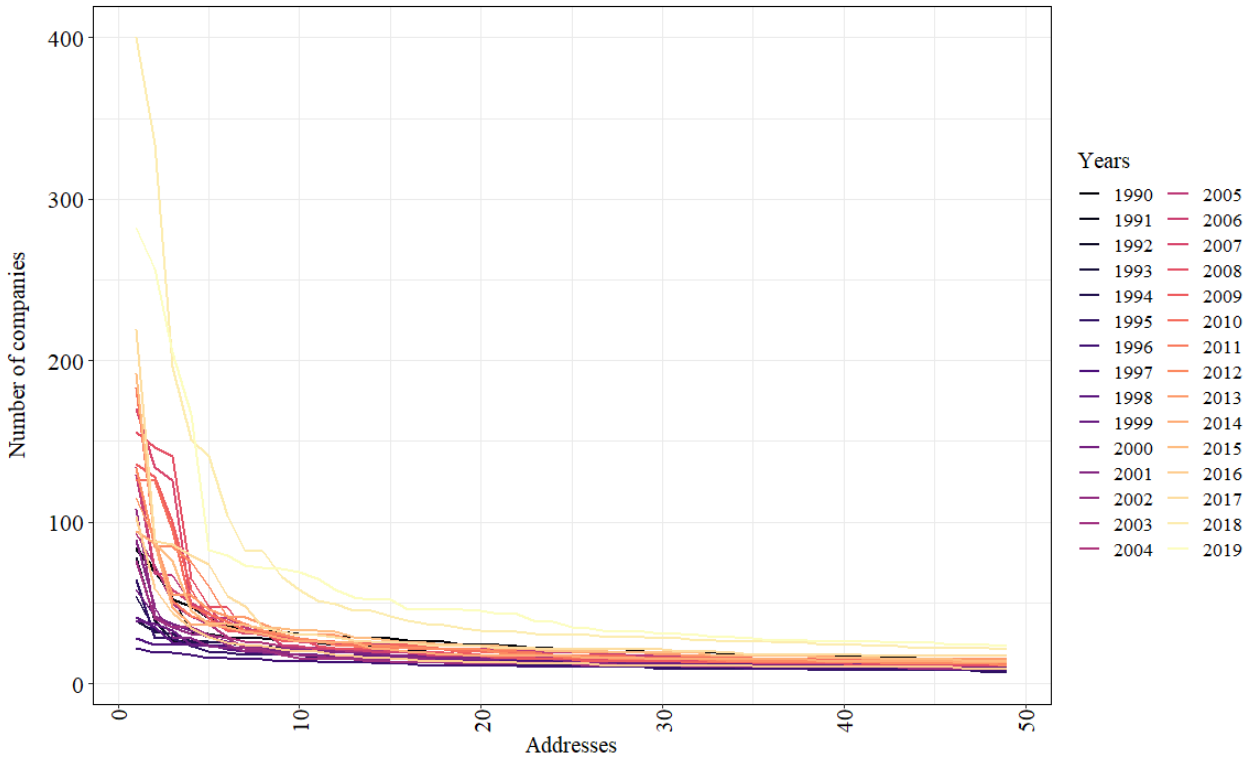


Figure 6.7: Number of companies per address in Luxembourg

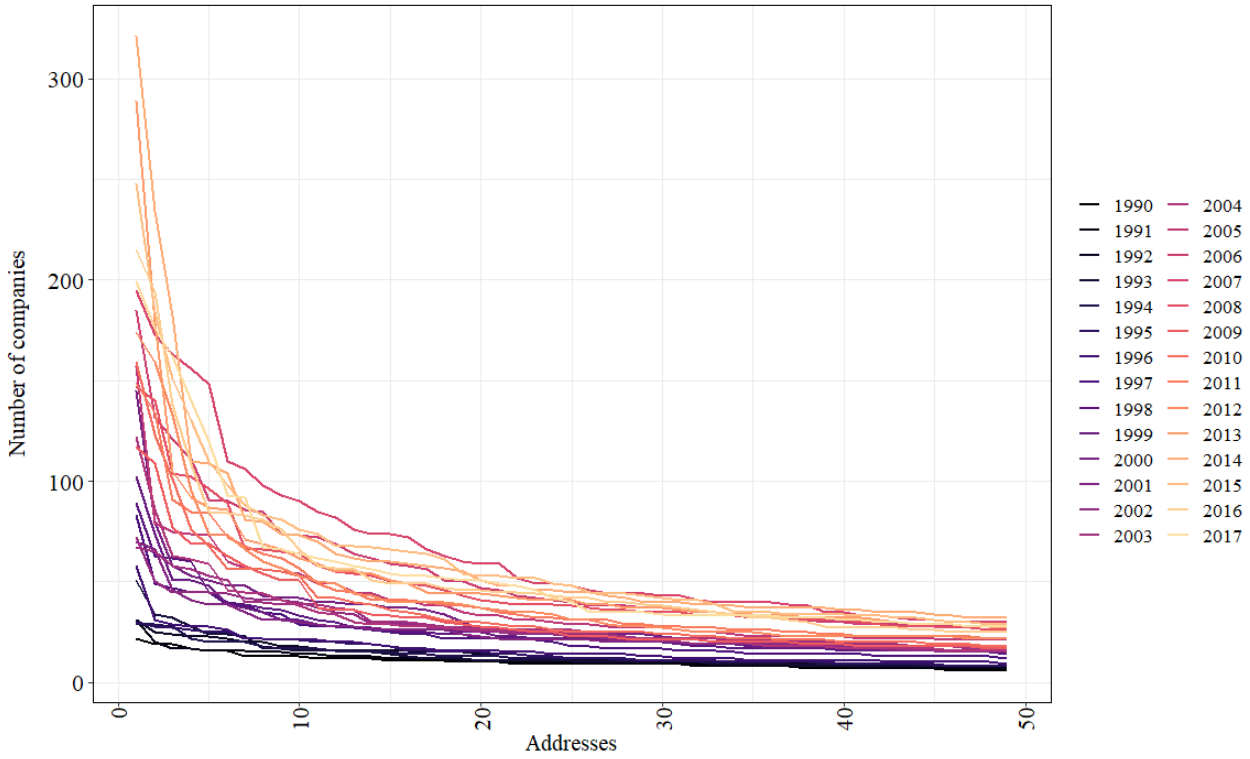


Figure 6.8: Number of companies per address in Malta

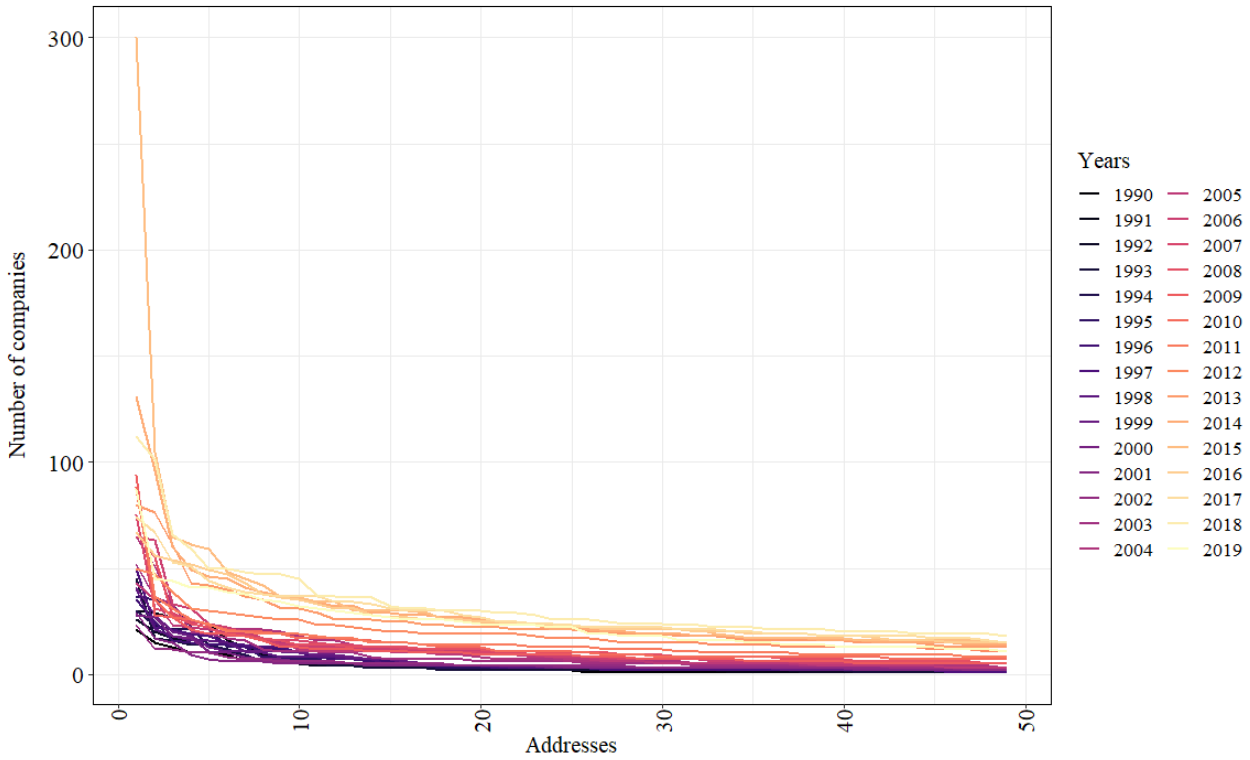


Figure 6.9: Deposits by holder in Guernsey

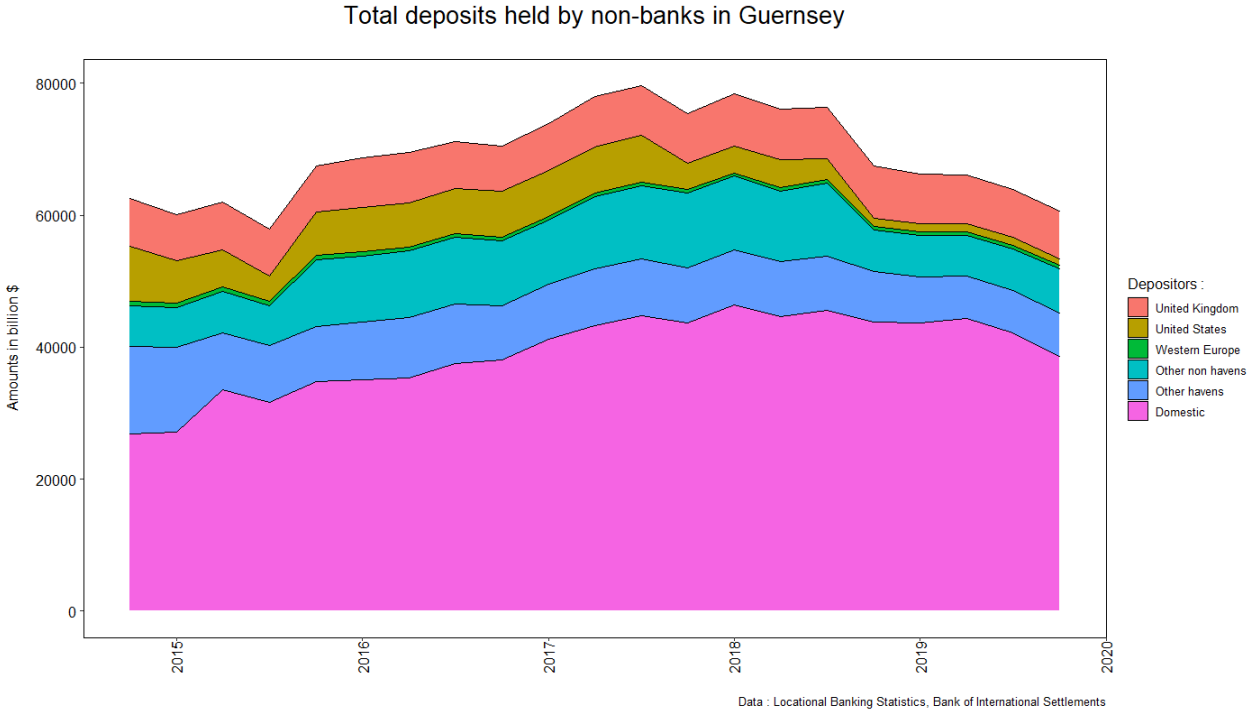


Figure 6.10: Deposits by holder in Jersey

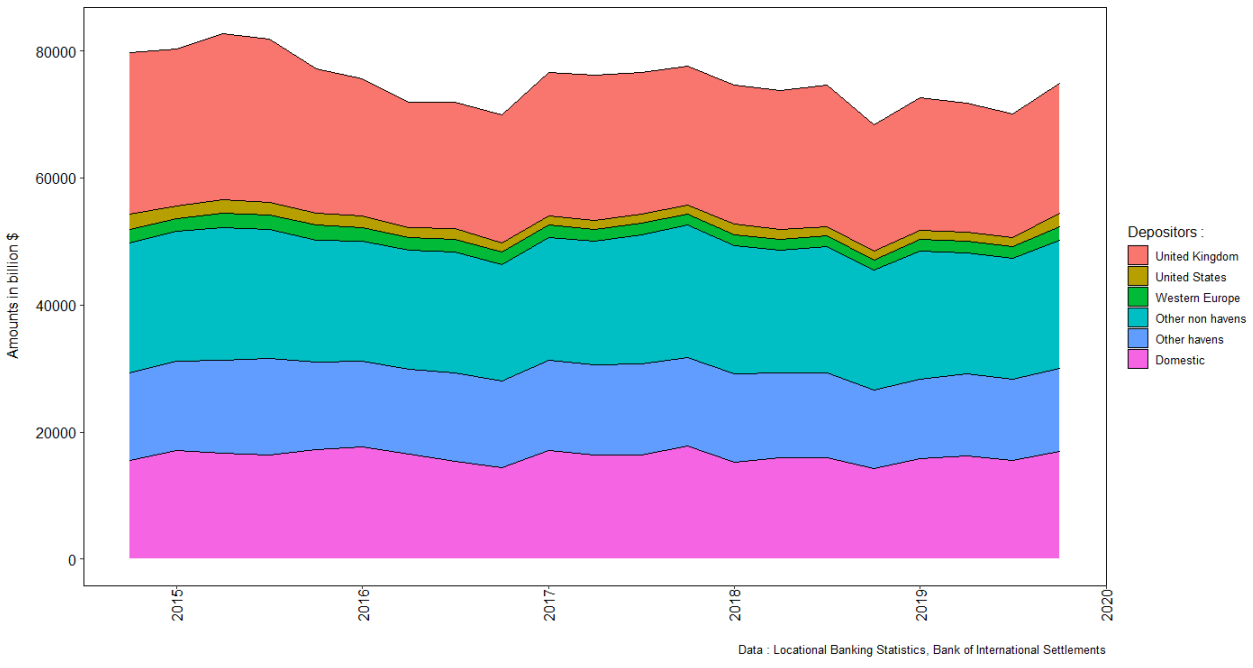


Figure 6.11: Deposits by holder in Isle of Man

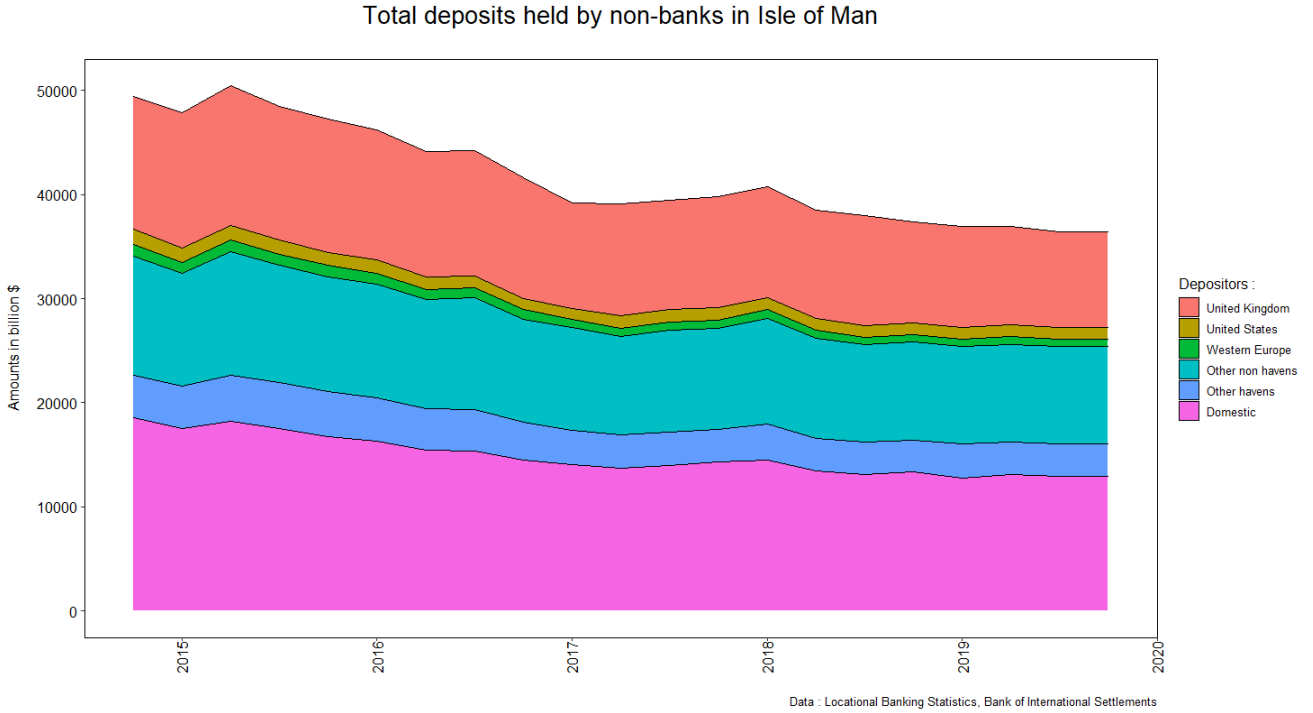


Figure 6.12: Deposits by holder in Luxembourg

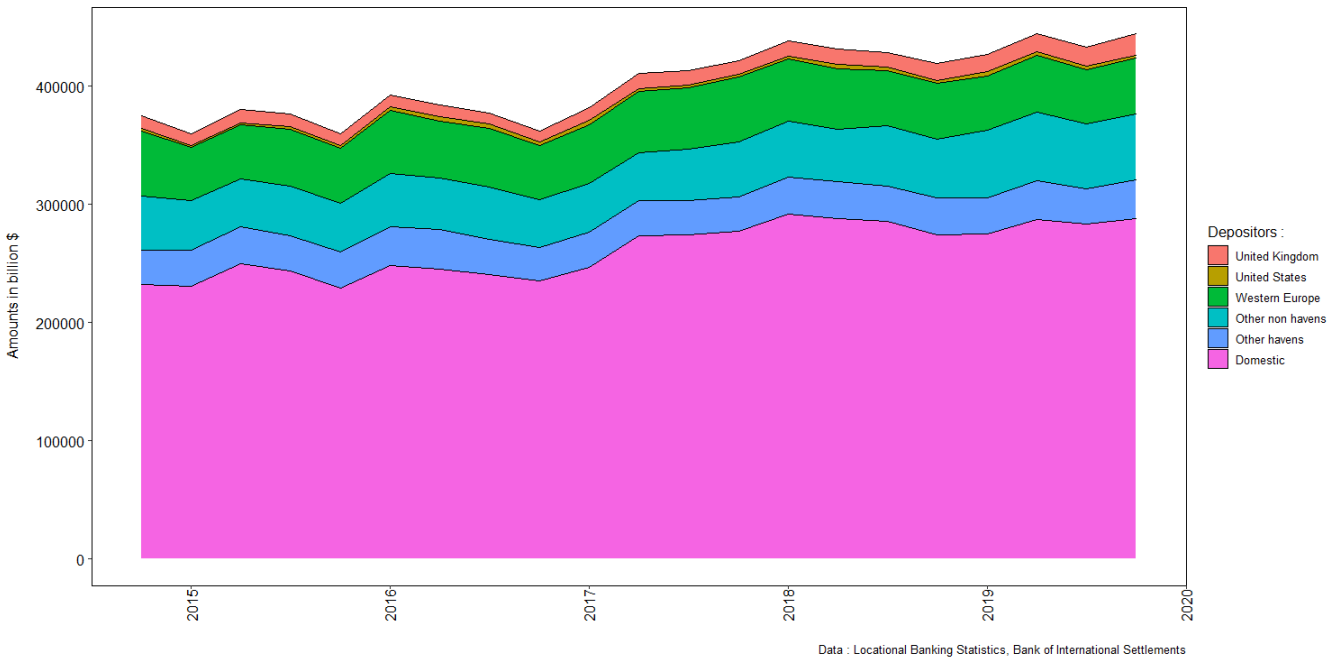


Figure 6.13: Deposits by holder in Hong Kong

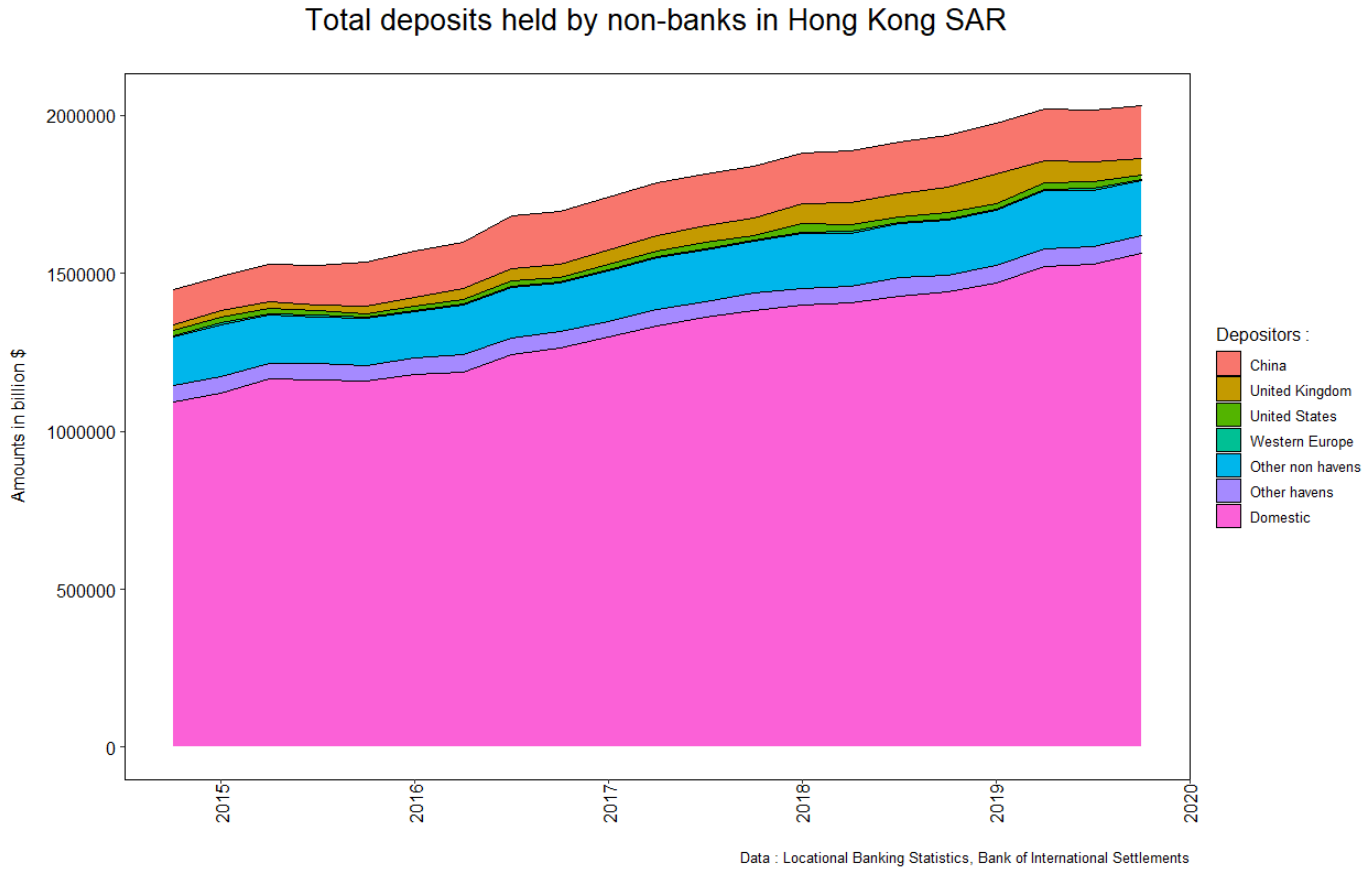
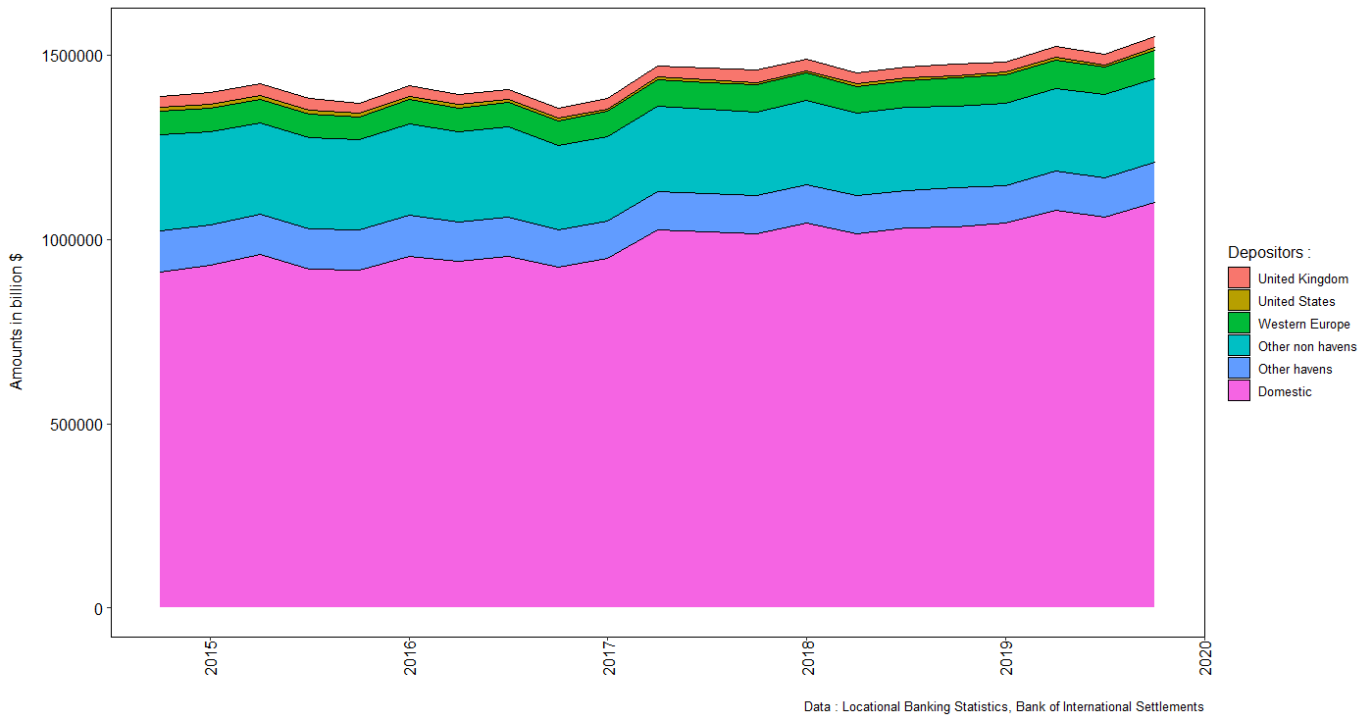


Figure 6.14: Deposits by holder in Switzerland



Chapter 7

Appendix B (section 3)

Table 7.1: List of counterparty countries in final BIS dataset (residency of holders)

Non-havens	**Havens**
Afghanistan, Albania, Algeria, Angola, Argentina, Armenia, Australia, Azerbaijan, Bangladesh, Belarus, Benin, Bolivia, Bosnia and Herzegovina, Botswana, Brazil, Brunei, Bulgaria, Burkina Faso, Burundi, Cambodia, Cameroon, Canada, Cape Verde, Central African Republic, Chad, China, Colombia, Comoros, Congo, Congo Democratic Republic, Cote d'Ivoire, Croatia, Cuba, Czech Republic, Denmark, Djibouti, Dominican Republic, Ecuador, Egypt, El Salvador, Equatorial Guinea, Estonia, Eswatini, Ethiopia, Fiji, Finland, France, French Polynesia, Gabon, Gambia, Georgia, Germany, Ghana, Greece, Greenland, Guatemala, Guinea, Guyana, Haiti, Honduras, Hungary, Iceland, India, Indonesia, Iran, Iraq, Israel, Italy, Jamaica, Japan, Kazakhstan, Kenya, Kuwait, Kyrgyz Republic, Latvia, Libya, Lithuania, Madagascar, Malawi, Mali, Mauritania, Mexico, Mongolia, Montenegro, Morocco, Mozambique, Namibia, Nepal, Netherlands, New Caledonia, New Zealand, Nicaragua, Niger, Nigeria, North Macedonia, Norway, Oman, Pakistan, Papua New Guinea, Paraguay, Peru, Philippines, Poland, Portugal, Qatar, Romania, Russia, Rwanda, Saudi Arabia, Senegal, Serbia, Sierra Leone, Slovakia, Slovenia, Solomon Islands, South Africa, South Korea, Spain, Sri Lanka, Sudan, Sweden, Syria, Tanzania, Thailand, Togo, Tunisia, Turkey, Turkmenistan, Uganda, Ukraine, United Arab Emirates, United Kingdom, United States, Uzbekistan, Venezuela, Vietnam, Yemen, Zambia, Zimbabwe	Andorra, Aruba, Austria, Bahamas, Bahrain, Belize, Bermuda, Cayman Islands, Chile, Costa Rica, Cyprus, Dominica, Gibraltar, Grenada, Guernsey, Hong Kong SAR, Isle of Man, Jersey, Jordan, Lebanon, Liberia, Liechtenstein, Luxembourg, Macao SAR, Malaysia, Maldives, Malta, Marshall Islands, Mauritius, Panama, Samoa, San Marino, Seychelles, Singapore, St. Lucia, Switzerland, Trinidad and Tobago, Turks and Caicos Islands, Uruguay, Vanuatu, St. Vincent and the Grenadines;

Table 7.2: List of reporting countries countries in final BIS dataset (location of banks)

Australia, Brazil, Canada, Denmark, Finland, France, Greece, Japan, Mexico, Netherlands, South Korea, Sweden, United Kingdom, United States;	Austria, Belgium, Chile, Guernsey, Ireland, Isle of Man, Jersey, Luxembourg, Switzerland

Table 7.3: Residency of holders in final porftolio data frame

Non-havens	**Havens**
Argentina, Australia, Belarus, Brazil, Bulgaria, Canada, Colombia, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, India, Indonesia, Israel, Italy, Japan, Kazakhstan, Kuwait, Latvia, Lithuania, Mexico, Pakistan, Philippines, Poland, Portugal, Republic of Korea, Romania, Russia, Saudi Arabia, Slovenia, South Africa, Spain, Sweden, Thailand, Turkey, Ukraine, United Kingdom, United States	Austria, Barbados, Belgium, Bermuda, Cayman Islands, Chile, Costa Rica, Cyprus, Guernsey, Hong Kong, Ireland, Isle of Man, Lebanon, Luxembourg, Macao, Malaysia, Malta, Mauritius, Netherlands, Panama, Singapore, Switzerland;

Table 7.4: Locations of investments in final portfolio data frame

Albania, Algeria, Angola, Antigua and Barbuda, Argentina, Australia, Azerbaijan, Bangladesh, Benin, Bhutan, Bolivia, Bosnia and Herzegovina, Botswana, Brazil, Bulgaria, Burkina Faso, Burundi, Cambodia, Cameroon, Canada, Chad, China, Colombia, Croatia, Cuba, Czech Republic, Denmark, Djibouti, Ecuador, Egypt Arab Rep of, El Salvador, Estonia, Faroe Islands, Finland, France, French Polynesia, Gabon, Georgia, Germany, Ghana, Greece, Greenland, Guam, Guatemala, Guinea, Guinea-Bissau, Guyana, Haiti, Honduras, Hungary, Iceland, India, Indonesia, Iraq, Israel, Italy, Jamaica, Japan, Kenya, Kiribati, Kuwait, Latvia, Libya, Lithuania, Malawi, Mali, Mexico, Mongolia, Montenegro, Morocco, Myanmar, Namibia, Nepal, New Caledonia, New Zealand, Nicaragua, Niger, Nigeria, Norway, Oman, Pakistan, Papua New Guinea, Paraguay, Peru, Philippines, Poland, Portugal, Puerto Rico, Qatar, Republic of Korea, Romania, Russia, Rwanda, Saint Kitts and Nevis, Saint Vincent and the Grenadines, Saudi Arabia, Senegal, Sierra Leone, Slovenia, Solomon Islands, Somalia, South Africa, Spain, Sri Lanka, Sudan, Suriname, Sweden, Thailand, Togo, Trinidad and Tobago, Tunisia, Turkey, Turkmenistan, Turks and Caicos Islands, Tuvalu, Uganda, Ukraine, United Arab Emirates, United Kingdom, United States, Vietnam, West Bank and Gaza, Zambia, Zimbabwe;	Andorra, Aruba, Austria, Bahamas, Bahrain, Barbados, Belgium, Belize, Bermuda, British Virgin Islands, Cayman Islands, Chile, Costa Rica, Cyprus, Dominica, Gibraltar, Grenada, Guernsey, Ireland, Isle of Man, Jersey, Jordan, Lebanon, Liberia, Liechtenstein, Luxembourg, Macao, Malaysia, Maldives, Malta, Marshall Islands, Mauritius, Monaco, Nauru, Netherlands, Panama, Samoa, San Marino, Seychelles, Singapore, Switzerland, Tonga, Uruguay, Vanuatu;

Table 7.5: Voluntary disclosure programs

Country	Intensity of Permanent VDP	Special VDP
Argentina	-	2012-Q1 : 2014-Q2 & 2016-Q2 : 2018-Q1
Australia	low	2010-Q2 & 2014-Q2 : 2014-Q4
Austria	high	2013-Q1 : 2013-Q4
Belgium	medium	-
Brazil	-	2016-Q2 : 2016-Q3 & 2017-Q2 : 2017-Q4
Canada	low	-
Chile	low	2015-Q1 : 2015-Q4
Costa Rica	medium	-
Czech Republic	low	-
Denmark	low	2012-Q2 : 2013-Q2
France	-	2009-Q2 : 2009-Q4
Germany	high	-
Greece	low	2013-Q2 : 2011-Q1
India	-	2016-Q2 : 2017-Q1
Indonesia	low	2016-Q3 : 2017-Q1
Ireland	low	2009-Q4
Israel	-	2015-Q2 : 2016-Q4 & 2017-Q4
Italy	low	2015-Q1 : 2015-Q3
Japan	low	-
Jersey	low	-
Korea	low	-
Malaysia	low	-
Malta	high	2009-Q4 : 2010-Q4
Mexico	-	2017-Q1 : 2017-Q3
Netherlands	medium	2009-Q1 : 2010-Q2 & 2013-Q4 : 2014-Q2
New Zealand	low	-
Norway	low	-
Poland	high	-
Portugal	medium	2010-Q1 : 2011-Q1
Russia	low	2015-Q2 : 2017-Q4
Singapore	low	-
Slovak Republic	low	-
Slovenia	high	-
South Africa	low	2010-Q4 : 2011-Q4 & 2016-Q4 : 2017-Q3
Spain	medium	2012-Q2 : 2015-Q1
Sweden	low	-
Switzerland	low	-
Turkey	low	2011-Q2 & 2016-Q3 : 2017-Q2
United Kingdom	low	2007-Q2 & 2010-Q4 & 2013-Q1
United States	low	2009-Q1 & 2011-Q1 : 2012-Q1 & 2014-Q3

Note: Data from OECD (Update on voluntary disclosure programs, 2015) until end 2015, Menckoff and Miethe (2019) between 2016 and 2017, and government websites from 2018 to 2019