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Tax havens, personal tax evasion and inequality: The empirical literature

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Andreas Økland

Norwegian University of Life Sciences

This review is based on a chapter originally prepared for the Research Handbook on Tax Havens, edited by Arjan Lejour and Dirk Schindler. Note that the content of this review deviates somewhat from the published handbook chapter. The author thanks the editors and Annette Alstadsæter, Julie Brun Bjørkheim, Wouter Leenders, Marie Bjørneby, Jakob Miethe for invaluable input and help with this review.

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Tax havens, personal tax evasion and inequality: The empirical literature

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Abstract: Individuals' use of tax havens has recently moved to the forefront of the agenda. The best estimates quantify individuals' financial wealth in tax havens to around 10 percent of world GDP, although with marked heterogeneity among countries and regions. There are also important differences within countries. The wealth in tax havens primarily belongs to the richest segments of society. Research from different countries yields varying evidence on how concentrated the tax haven wealth is, but all evidence points toward a strong upward wealth gradient: The richer you are, the more likely are you to use tax havens. The research also shows that tax haven wealth is mainly not reported for tax purposes, at least not before the latest developments of global enforcement initiatives. The concealment of assets means that the wealth in tax haven has not been included in inequality statistics, and that wealth concentration is larger than previously believed.

Affiliations: Skatteforsk - Center for Tax and Behavioral Research, School of Economics and Business, Norwegian University of Life Sciences (NMBU). Atlas of the Offshore World/EU Tax Observatory. Email: andreas.okland@nmbu.no

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1 Introduction

U.S. President Franklin D. Roosevelt, famous for the "New Deal", publicly warned about tax evasion through tax havens as early as the 1930s. Tax haven use has undercut tax revenue in non-havens since then, and even before that. Personal capital taxes (i.e., capital income taxes, inheritance taxes and wealth taxes) are almost impossible to enforce effectively without information about the wealth held through tax havens.[1] But the extent to which tax havens are used by individuals and how this affects tax revenues is only documented recently.

The primary objective of this review is to give an overview of the empirical evidence on the use of tax havens by individuals. Secretive Swiss banks and small, paradise-like tax haven islands are well-established stereotypes in the political discourse and popular culture. But our comprehension of the role and importance of different tax havens, and not least our policy responses, cannot be based on cultural tropes and eye-grabbing news stories. Recent findings in the economic literature help us grasp the magnitude of individuals' use of tax havens, apprehend the relative importance of Switzerland to blissful islands in the Caribbean and other tax havens, and to understand how the use of tax havens by individuals has developed over time.

The literature also, importantly, establishes a strong link between holding wealth offshore in tax havens and tax evasion. This allows us to say something about the consequences of tax haven use for tax revenue and inequality measures. The empirical evidence shows that tax evasion through tax havens is severely concentrated among the most well-off in society, something which is not the case for the types of tax evasion that we normally observe in random audits and from other low-cost enforcement measures. When the concealed income and wealth is heavily concentrated, and the traditional measures of income and wealth concentration do not include concealed income and wealth, this leads to a divergence between real and observed inequality.

The second aim of this review is to shed light on the data sources that makes it possible to investigate individuals' use of tax havens. The study of (mostly) illegal behaviour involves different data limitations than other research avenues. The available data is often the result of enforcement measures, like random audits, and may suffer from selection issues due to differences in the level of concealment. Other data sources, like leaked material, may entail significant ethical considerations. Using indirect methods is an alternative, but these come

[1] Zucman (2017) estimates the total global tax loss due to offshore tax evasion in 2016. This amounts to at least USD 180 billion: USD 110 billion lost in personal income taxes, USD 60 billion lost in inheritance taxes and USD 10 billion lost in wealth taxes. Other types of illicit financial activity involving tax havens add to this loss but is not quantified.

with significant margin of error and limited clear-cut evidence of tax evasion.

Three types of data are central in the recent literature. The first is macroeconomic statistics detailing the cross-border financial positions of residents in different countries. This includes the International Investment Positions recorded by the IMF, the bilateral banking statistics collected and disseminated by the Bank of International Settlements (BIS) and data on securities and deposits held in Swiss banks published by the Swiss National Bank (SNB). This data is predominantly used to indirectly measure the extent of tax haven use and tax evasion. The two latter types of data allow for direct investigation of tax evasion and tax haven use. The first of these is administrative micro data from tax authorities. This type of data is increasingly shared with researchers in anonymised/de-identified form. The first wave of research on this data is based on data from tax amnesties, formally known as voluntary disclosure schemes. A second wave of research on data stemming from the automatic exchange of financial information between countries is now emerging. The last central data source is leaked data from financial institutions, law firms, internal registries of secretive jurisdictions and the like. The "Swiss Leaks", "Panama Papers" and "Dubai Uncovered" are high-profile examples of these kind of leaks.

This review covers the empirical literature and will try to highlight how this literature has been enabled by the aforementioned data sources. It is to my knowledge the most comprehensive survey of the literature on individuals' use of tax havens. Examples of shorter summaries are Genschel and Schwarz (2011), who do a review of the broader literature on tax competition within the social sciences, and Reck and Bomare (2022), who reviews the most recent research on tax evasion by high-income and high-wealth individuals. Slemrod (2019) also visits the most important contributions in a broader review of the tax evasion literature.[2]

This review spans five sections. In the next section, I briefly summarise early empirical literature on tax haven use by individuals. Section 3 is the main section of the paper. It discusses the research frontier on offshore financial wealth in tax havens, tax evasion and the implications for inequality. In section 4, I discuss the scope for the literature going forward and the recent research on other offshore asset classes and on shell companies. In the last section, I conclude.

[2]There is a voluminous literature that survey what we know about tax evasion in general: Alm (1999), Andreoni, Erard, and Feinstein (1998), and Slemrod and Yitzhaki (2002) and Slemrod (2007).

2 Early literature on individuals' use of tax havens

The economic literature on tax evasion originates with Allingham and Sandmo (1972). Their theoretical analysis of what drives individuals' tax evasion decisions is the foundation for the voluminous literature on tax evasion and tax noncompliance. But pre-2010 empirical work on individuals' use of tax havens to evade taxes is scarce.[3] The early empirical tax haven literature is mostly concerned with multinational corporations' use of tax havens.[4]

The pioneering research into individuals' use of tax havens use data on cross-border bank deposits. One example is statistics on inward cross-border deposits. Grilli (1989) find a positive correlation between the level of foreign deposits in countries and the level of secrecy in the same countries. And conversely: A negative correlation between the level of foreign deposits in countries and the capital income taxes in the countries. This research, although only indicative, is the first that empirically establishes the attraction of low-tax countries for individuals. The data, published by the OECD, importantly covered Switzerland and Belgium and Luxembourg.

Bilateral data on cross-border bank deposits allows for more granular investigations than the total inward deposits Grilli (1989) uses. The main collector and disseminator of this type of statistics is the Bank for International Settlements (BIS), who publishes the Locational Banking Statistics (LBS). This statistic consists of time-series with the gross international financial claims and liabilities of banks resident in a given country, for each counterparty country. Today, the part of the BIS bilateral banking statistics that is publicly available includes the claims and liabilities of banks in around 50 countries, and an even higher number of counterparty countries.[5] Alworth and Andresen (1992) use bilateral bank deposit data in a gravity model. They find that both the level of withholding taxes and the level of bank secrecy seem to partly explain the cross-border positions of deposits. Huizinga and Gaëtan (2004) use the BIS bilateral data on cross-border deposits and find further indications that the tax level at home drives offshore deposits in tax havens.

[3]The theoretical literature investigating the use of offshore tax havens was somewhat larger than the empirical literature, see for instance Bacchetta and Espinosa (1995), Bacchetta and Espinosa (2000), Janeba and Peters (1999), Huizinga and Nielsen (2000), Huizinga and Nielsen (2003), Rose and Spiegel (2007), and Picard and Pieretti (2011). Alstadsæter, Johannesen, and Zucman (2019) and Guyton, Langetieg, Reck, Risch, and Zucman (2021) also include a theoretical model.

[4]Notably, the seminal tax haven list presented in Hines Jr and Rice (1994) is a list of countries and regions that are identified as "tax havens for the purposes of U. S. businesses".

[5]The data was for a long time only accessible for a limited number of researchers. These researchers were barred from publishing the country-by-country numbers.

3 Offshore financial wealth in tax havens

3.1 Global estimate of financial wealth in tax havens

The modern literature on individuals' tax haven use starts with Zucman (2013). The seminal paper outlines the first academically recognised methodology for estimating financial wealth in tax havens, a methodology which is still leading in the literature.[6]

The starting point of the estimate is the International Investment Positions (IIP). This is the foreign financial assets and liabilities of countries. These data series show the size of the outward and inward cross-border financial positions of households, corporations and governments and are the stock equivalent of the financial account in the balance of payments statistics. The production of these macroeconomic statistics is relatively new. The common principles for IIP reporting were first introduced by the IMF in 1993. In 2002, only 78 countries reported their international investment positions, according to Lambert and Paul (2002). The External Wealth of Nations dataset, collected and developed by Lane and Milesi-Ferretti (2007), is the first with global coverage. They amend the official IIP when values are missing or may be incomplete or imprecise. The dataset has been shared with other researchers since its initiation, and it is now publicly available and regularly updated.

There is a striking discrepancy between total recorded assets and liabilities in the IIP: There are more reported cross-border liabilities than cross-border assets. Zucman (2013) explains this anomaly with the offshore wealth management industry and how it interferes with how the statistics are made. The statistical guidelines says that when a French resident owns a portfolio of American stocks, this requires France to report the value of the portfolio as external assets and the U.S. to report its value as external liabilities. But this does not happen in practice when the portfolio is owned through a Swiss bank account. This is where the discrepancy arises. The U.S. statistical agency observes that the U.S. stocks are foreign-owned and duly report their value as external liabilities. But the portfolio is invisible to the French statistical agency, and it is thus not reported as French external assets, while the Swiss see this as a France-U.S. position and do not report it either. The value of the portfolio is thus not reported as external assets for IIP purposes, only as external liabilities.

The external liabilities exceed external assets by USD 4.5 trillion at the end of 2008, according to the External Wealth of Nations data. This represents Zucman (2013)'s estimate of the value of securities (stocks and bonds and mutual fund shares) held in tax havens. The

[6]Early estimates include those made in annual industry reports like Merrill Lynch/Capgemini's 'World Wealth Report', which has produced estimates since the 1980's, and later the Boston Consulting Group's 'Global Wealth Report'. Tax Justice Network has commissioned and published two pioneering estimates, namely Christensen and Murphy (2005) and Henry (2012).

global level of deposits in tax havens, the other composite of financial wealth, can be imputed using data from the Swiss National Bank (SNB) on the cross-border portfolios in Swiss banks. The SNB, the Swiss central bank, has published the value of the offshore portfolios in Swiss banks since 1998. But it was first compiled and used for research purposes by Zucman (2013). The data reveals that nearly 25 percent of cross-border wealth in Swiss banks were deposits, while 75 percent were securities. The paper assumes that this is representative for tax havens globally and thus estimates that global offshore wealth in tax havens amounts to USD 5.9 trillion at the end of 2008, USD 4.5 trillion in securities and USD 1.4 trillion in bank deposits.

The most up to date estimate using this methodology is for 2016 and is presented in Zucman (2017). During the years from 2008 to 2016, offshore financial wealth increased to USD 8.7 trillion. This is equivalent to 8 percent of households' financial wealth and more than 11 percent of world GDP in 2016.[7]

Table 1: Estimates of offshore financial wealth in tax havens

	Year	USD (trillions)	Share of world GDP
Zucman (2013)	2008	5.9	9.2
Pellegrini, Sanelli, and Tosti (2016)	2008	5.0-6.2	7.8-9.7
Zucman (2017)	2016	8.7	11.4
ECOPA and CASE (2019)	2016	7.8	10.2
Boston Consulting Group (2017)	2016	10.3	13.5
ECORYS (2021)	2018	9.8	11.3
Boston Consulting Group (2022)	2021	11.7	12.1

Notes: The Boston Consulting Group (2022) estimate is calculated by summarising numbers for the countries that are published in the report, and then scaling for their share of total offshore wealth reported in the 2019 report, the last year BCG published the aggregate number. The title and author list for the papers are detailed in the reference list.

Zucman's estimate is not the only one in the literature. Table 1 compares the results from different papers and reports that estimate offshore financial wealth in tax havens. Pellegrini, Sanelli, and Tosti (2016) find that USD 3.7 trillion in securities and between USD 1.3 and 2.5 trillion in bank deposits is undeclared in 2008. This amounts to somewhere between USD 5.0 and 6.2 trillion, which is not far off the Zucman (2013) estimate of USD

[7]The paper include a thorough and data driven discussion of the validity of the proposition. For instance, a striking similarity between the relative composition of stocks, bonds and mutual fund shares held by foreigners in Switzerland and the stocks, bonds and mutual fund shares that constitute the gap between external liabilities and assets globally. The Swiss statistics imply that around one third of offshore tax haven wealth was held in Swiss banks at the end of 2008.

5.9 trillion. The estimate is the result of a combination and refinement of the work in Sanelli (2008) and Pellegrini and Tosti (2012). Sanelli (2008) shows how the bilateral banking data from BIS can be used to estimate the amount of bank deposits hidden in tax haven bank accounts. Pellegrini and Tosti (2012) develop an alternative approach to estimating the value of securities in tax havens belonging to residents of non-havens, using the same type of macroeconomic investment statistics as Zucman (2013).

Boston Consulting Group (2017), the first Boston Consulting Group (BCG) estimate, is based on interviews with bankers in offshore havens. Boston Consulting Group (2022), the most recent Boston Consulting Group estimate, is based on a more extensive methodology, which complements data from the Bank of International Settlements and national monetary and financial authorities with "BCG project experience". Both ECOPA and CASE (2019) and ECORYS (2021) follow closely the same methodology as Zucman (2013), and both also find similar estimates of global offshore financial wealth in tax havens.[8]

The overall picture is that the magnitude of hidden financial wealth is relatively stable across different approaches. It is also relatively stable across time, but with a slight upwards trend, as also indicated by the time series presented in Alstadsæter, Johannesen, and Zucman (2018).

3.2 Country distributions among owners of offshore accounts

The first country-by-country breakdown of how much each country own of the financial wealth in tax havens is presented in Alstadsæter, Johannesen, and Zucman (2018).[9] This research is made possible by the open publication of the BIS bilateral banking statistics.

The first step in the procedure is to attribute the estimate of global offshore financial wealth to the different tax havens. The Swiss share of the global estimate is retrieved from the Swiss National Bank statistics of offshore financial wealth in Switzerland. The Swiss share of global offshore financial wealth is more than 45 percent of all household financial wealth held in tax havens in 2007 (although falling to 26 percent by 2015).[10] The respective shares of offshore financial wealth for the remainder of tax havens are calculated based on the tax havens' respective shares of total cross-border deposits as observed in the BIS bilateral

[8]These are reports commissioned by the European Commission's Directorate General Taxation and Customs Union and produced by consultancies.

[9]Zucman (2014) and Zucman (2015), as well as Pellegrini, Sanelli, and Tosti (2016) presents rough breakdowns by continents, as well as for a couple of larger economies. Roine and Waldenström (2009) use balance of payments anomalies to estimate the foreign wealth of Swedes.

[10]The historical dominance of Switzerland as tax haven is also evident from studies of wealth disclosed to tax authorities through tax amnesties, see for instance Leenders, Lejour, Rabaté, and van 't Riet (2022) and Alstadsæter, Johannesen, Le Guern Herry, and Zucman (2022).

banking statistics. The other large tax havens in 2007 are Cayman Islands (8 percent), Jersey (7 percent) and Luxembourg (7 percent).

The second step is to distribute the wealth in each tax haven to the owners of this wealth. The wealth in Switzerland is distributed using another Swiss National Bank data source. The Swiss National Bank publishes a country-by-country breakdown of owners of so-called fiduciary deposits. Each non-haven's share of these deposits in 2003 and 2004 is used as representative for the total foreign wealth in Switzerland.[11] Likewise, the wealth in the remaining tax havens is distributed based on the share each non-haven holds of the deposits in the respective tax haven, as observed in the BIS data.

The estimates display large disparities in the amount of wealth held in tax havens by the residents of different countries. The top owners of offshore financial wealth in terms of GDP are, according to Alstadsæter, Johannesen, and Zucman (2018), the residents of Jordan, who hold financial wealth equivalent to 211 percent of Jordanian GDP in tax havens. Residents of the United Arab Emirates, Kenya, Venezuela, Zimbabwe, and Saudi-Arabia hold between 55 and 75 percent of their home countries' GDP in tax havens. Other notable top countries are Israel, Argentina, and Greece, in the range between 35 and 45 percent of GDP. The Scandinavian countries, Finland and Poland are notably at the other end of the distribution, with the wealth in offshore havens accounting to only a few percent of GDP. The same holds true for major Asian economies like Korea, China, Japan, India, and Indonesia. The major continental Europe economies (France, Germany, Italy, and Spain) are all somewhat above the global estimate of 9.8 percent of GDP, in the range between 11 and 16 percent. The same goes for the United Kingdom, at 16 percent, while the U.S., at 7 percent, are just below the global average.

A caveat from the country-by-country results is that investment through tax havens not only seems to be motivated by taxes, but also by political instability in the home country, circumvention of capital controls, and concealment of proceeds from corruption and other criminal activities. Andersen, Lassen, Johannesen, and Paltseva (2017) and Andersen, Johannesen, and Rijkers (2022) looks closer at complementary reasons for using tax havens. Both papers use the BIS bilateral banking statistics. They show respectively that increased petroleum income in weak institution countries and increased foreign aid are associated with increased deposits in tax havens from the countries in question.

The estimates in Alstadsæter, Johannesen, and Zucman (2018) cover the period before the introduction of Automatic Exchange of Information (AEOI) agreements between countries. These agreements mandate the exchange of information about cross-border financial

[11] They use the 2003-2004 shares as the most representative for foreign shares because the European Savings Directive led to an apparent increase in shell company use by Europeans from 2005 and onwards.

positions between financial institutions and tax administrations. This means that previously concealed tax haven wealth is now reported through these agreements. Data from this exchange can be used to cross-check the macro estimates of tax haven wealth.

The U.S. pioneered automatic exchange of financial information with the Foreign Account Tax Compliance Act, better known as FATCA. Evidence on offshore wealth based on information collected in the automatic exchange of information is now emerging. Johannesen, Guyton, Langetieg, Reck, Risch, and Slemrod (2023) are the first to use the information obtained through FATCA. They find that U.S. residents hold financial assets worth 10 percent of GDP in tax havens in 2018. This is somewhat higher than the 7 percent of GDP that Alstadsæter, Johannesen, and Zucman (2018) find for 2007.

The finding seems to support the estimates in Alstadsæter, Johannesen, and Zucman (2018) and thus in Zucman (2013). The most recent evidence points to a slight upwards trend since then, which may explain the higher U.S. tax haven wealth for 2018 than in 2007. This suggests that the 2007 estimate is fairly accurate. But there are also factors that suggest that the FATCA reporting shows that Alstadsæter, Johannesen, and Zucman (2018) actually underestimate the total tax haven wealth of Americans. First, the increase in enforcement and transparency implies that the real level of offshore financial assets owned by Americans should be lower in 2018 than in 2007. At least if we expect ownership of offshore assets to be more costly and at least some of the newly disclosed assets to be repatriated. Second, the Alstadsæter, Johannesen, and Zucman (2018) estimate covers both undisclosed and disclosed wealth, while the Johannesen, Guyton, Langetieg, Reck, Risch, and Slemrod (2023) estimate only cover disclosed wealth. This suggests that the Johannesen, Guyton, Langetieg, Reck, Risch, and Slemrod (2023) estimate of disclosed U.S. tax haven wealth in 2018 should be lower than the Alstadsæter, Johannesen, and Zucman (2018) estimate of all U.S. tax haven wealth in 2007 if Americans still hold some undisclosed financial wealth in tax havens.

3.3 The level of tax evasion through offshore accounts

The emerging literature on the financial wealth reported under the Automatic Exchange of Information schemes gives us unique insights into the now reported offshore financial wealth. But the most accurate picture of individuals' use of tax havens, on the micro level, is obtained by analysing both disclosed and undisclosed assets. This can be done by analysing the bank accounts of individuals in tax havens directly. But the data from these bank accounts is also extremely sensitive and confidential, which means that it is seldomly explored for research purposes. And when it is made available for researchers, the data is likely to only cover one

bank.

This is the case for Alstadsæter, Johannesen, and Zucman (2019). This paper analyses, among other things, the "Swiss Leaks", a leak of the internal records of the Swiss bank HSBC Switzerland. The leak happened in 2006 and 2007 and gives a precise and unbiased overview of holdings in the Swiss bank at that moment in time. The analysis is made possible by an extensive collaboration between the authors and journalists and tax administrations in the Scandinavian countries (Norway, Sweden, Denmark). The collaboration gives the authors access to a subset of the "Swiss Leaks" consisting of all the individuals in the leak that the Scandinavian tax authorities were able to identify as nationals or residents of their countries.

The Danish and Norwegian tax authorities found that 90-95 percent of the Danish and Norwegian account holders in HSBC Switzerland according to the "Swiss Leaks" did not declare their accounts on their tax returns. This confirms that nearly all the accounts in question were actually concealed from the tax authorities. The magnitude is corroborated by other studies. Johannesen and Zucman (2014) and Roussille (2020) explore Swiss official statistics and find that around 10 percent of interest earned in Switzerland by residents of EU countries are disclosed in the home country under the EU Savings Directive in the years 2006 and 2007, the years of the leak from HSBC Switzerland. Two U.S. Senate reports (Senate (2008); US Senate (2014)) find that only 5-15 percent of US-owned accounts at UBS and Credit Suisse are declared in 2007–2008.

Little is known about how this disclosure rate has evolved since the 2006-2008 period. Numerous tax amnesties, information exchange agreements and public awareness is likely to have affected the disclosure rate. Roussille (2020)'s findings indicate that it increased to around 25 percent in 2013 for Europeans' interest income in Switzerland. And Johannesen, Guyton, Langetieg, Reck, Risch, and Slemrod (2023) show that the disclosed tax haven wealth of Americans in 2018 exceeds the estimate of Americans total tax haven wealth in 2007, even compared to GDP.

3.4 Tax evasion across the wealth distribution

The "Swiss Leaks" data serves as a building block for the larger literature on individuals' use of tax havens. The matching between the leaked bank records and the administrative tax records lets Alstadsæter, Johannesen, and Zucman (2019) investigate how the owners of undisclosed Swiss bank accounts (and thus tax evasion) are spread across the wealth distribution.

The authors first construct the pan-Scandinavian wealth distribution, and then place the account holders in the corresponding wealth bins. They find that evasion through HSBC

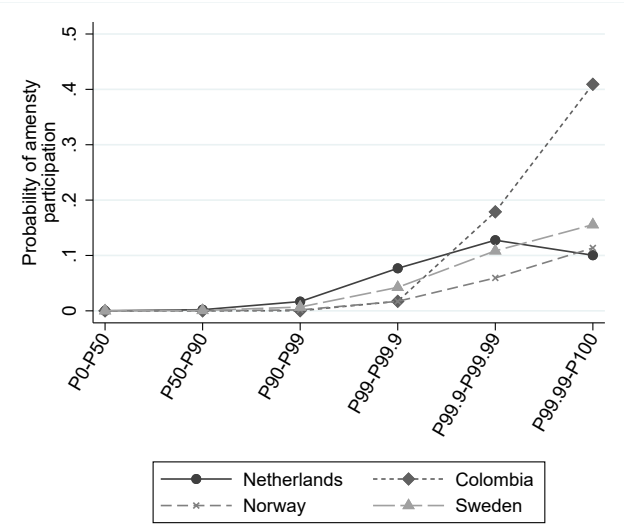
accounts has a clear wealth gradient. The likelihood of owning an undisclosed HSBC account is minuscule among the bottom 99 percent. It reaches 0.2 percent in the group between the bottom 99.5 percent and top 0.1 percent, and it continues to increase as the wealth bins gets closer to the top of the distribution. Among the top 0.01 percent, the likelihood is almost 1 percent. Conditional on owning an account, the wealth hidden at HSBC as share of total wealth is stable around 40 percent across wealth groups.

The authors then show that this is not restricted to one bank in Switzerland. They reproduce the same relative wealth gradient using microdata on previously concealed wealth from the voluntary disclosure schemes in Sweden and Norway. These programs, often referred to as tax amnesties, are set up to incentives taxpayers to disclose their unreported income and assets. The schemes are to this date undertaken in more than 50 countries. They take numerous different forms, where some are real amnesties, while others include punitive measures for the disclosers OECD (2015). There is now growing evidence on tax haven use from tax data in the residence country of the evader due to data from these tax amnesties.

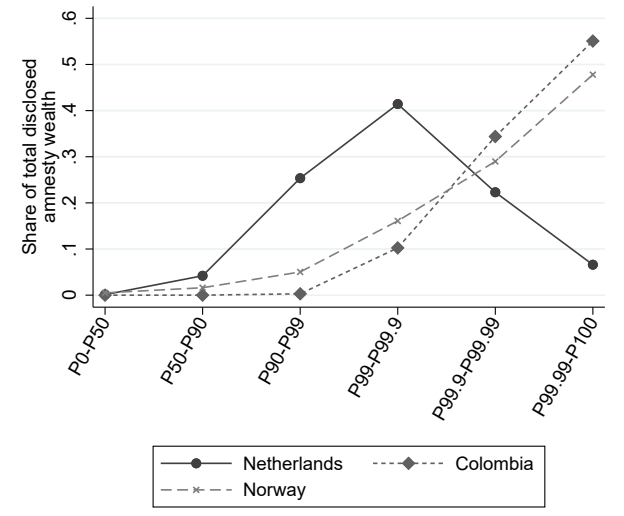
The gradient among the participants in the Norwegian tax amnesty program resembles the gradient among HSBC owners, although with a higher rate of probability for all wealth groups. The likelihood of participating is minuscules among the bottom 95 percent, but it is close to 1 percent among the group between the bottom 95 percent and top 1 percent. From there, the likelihood of declaring hidden wealth increases strongly with wealth. It reaches 4 percent for those just outside the top 0.1 percent, doubles to 8 percent among those in the bottom half of the top 0.1 percent and is almost 14 percent among the top 0.01 percent.

Figure 1: The distribution of financial real estate wealth disclosed in tax amnesties.

(a) The probability to disclose wealth in tax amnesty, by wealth bin.



(b) Share of the total disclosed wealth, by wealth bin.



Notes: This figure compares the results from Alstadsæter, Johannesen, and Zucman (2019) Appendix J table 1 and Appendix G table 2, Londõno-Vélez and Ávila-Mahecha (2021) table A.1 and Leenders, Lejour, Rabaté, and van 't Riet (2022) figure 3a and 4b. Panel (a) shows the propensity by each bin in the wealth distribution to participate in the voluntary disclosure program. Panel (b) shows how the wealth disclosed in the program is distributed among the different wealth bins. The figures are based on figures first produced in Leenders, Lejour, Rabaté, and van 't Riet (2022).

Tax amnesties in other countries are also used to shed light on tax evasion across the wealth distribution. Figure 1 panel (a) compares the wealth gradient of the likelihood of participating in the Norwegian tax amnesty with the likelihood of participating in the Dutch and the Colombian amnesty.

The Dutch wealth gradient is from Leenders, Lejour, Rabaté, and van 't Riet (2022), who analyse the participants in the Dutch tax amnesty that ran from 2002 to 2018.[12] They show that although evasion is concentrated at the top, as seen in Norway and Sweden, there are also key differences. The top 1 percent of the wealth distribution in the Netherlands have generally higher likelihood of participating in the amnesty, but this propensity is slightly lower among the top 0.01 percent.

The Colombian wealth gradient is from Londõno-Vélez and Ávila-Mahecha (2021), who analyse the participation in the 2015-2017 Colombian tax amnesty. The participation in this tax amnesty is primarily prevalent among those in the top 0.1 percent, who in turn show a much higher likelihood to disclose wealth than the equivalently wealthy in the European countries.

The differences in wealth gradients between countries translates into differences in the contribution by each wealth bin to the total wealth disclosed between countries. Figure 1 panel b) shows this. For Colombia and Norway, it is concentrated among the top 0.1 percent and especially the top 0.01 percent. For the Netherlands it is concentrated in the top 10 percent of the wealth distribution, with notably truly little among the top 0.01 percent.

The U.S. does not systematically collect wealth statistics. Work on the distribution of offshore financial wealth of Americans is thus limited to ranking households by income and not wealth. Guyton, Langetieg, Reck, Risch, and Zucman (2021) analyse the offshore wealth disclosed in tax records in the wake of the U.S. tax amnesty programs between 2009 and 2015.[13] They find a gradient similar to those seen in Scandinavia, although for a lower general prevalence of disclosure. The distribution of the disclosed wealth is also somewhere in between the Colombian and Scandinavian distributions and the Dutch distribution. 50 percent of the disclosed wealth is disclosed by the top 0.1 percent in the income distribution, of which close to half is disclosed by those in the top 0.01 percent.

[12]Complemented with minor data sets on evaders caught by the Dutch tax authorities through different enforcement measures.

[13]The U.S. ran four separate tax amnesties during the period 2009-2018, all under the header "Offshore Voluntary Disclosure program". The programs are typical in that they involved fixed penalties for the tax evaded, but an amnesty from criminal prosecution. Separate, "quiet" voluntary disclosures of offshore wealth are also observed in the U.S. These are individuals that file the FBAR (Report of Foreign Bank and Financial Accounts) for the first time in the wake of stronger enforcement. (This data source was first used by Johannesen, Langetieg, Reck, Risch, and Slemrod (2020), who focus on the effect of enforcement, not distributional effects.)

Johannesen, Guyton, Langetieg, Reck, Risch, and Slemrod (2023) are able to observe the disclosed offshore wealth of all U.S. taxpayers, due to the FATCA records (as discussed in subsection 3.2). They find that more than 30 percent of the disclosed wealth in tax havens is owned by the top 0.01 percent, while the remaining top 0.1 percent disclosed almost 20 percent of the disclosed wealth. It is thus even more concentrated at the top than the wealth observed by Guyton, Langetieg, Reck, Risch, and Zucman (2021).

Londõno-Vélez and Tortarolo (2022) use indirect methods to investigate the wealth gradient among disclosers of offshore wealth. They investigate the remarkably successful 2016 tax amnesty in Argentina. Following the amnesty, the reported value of individuals' foreign assets jumps from 4 percent of GDP in 2015 to 17 percent of GDP in 2016 and 21 percent of GDP in 2019. This is mainly offshore wealth: The newly reported foreign wealth is close to 80 percent all newly reported wealth. Because they do not have microdata at hand, they instead back out the total wealth reported by the different wealth bins from official statistics. These calculations show that in the same years as foreign assets increase dramatically, the total wealth of the top 0.5 percent of individuals jumps more than 50 percent. The total wealth of the top 0.05 percent more than doubles. While the growth is negligible in the lower wealth bins. This indicates a comparable concentration of offshore wealth among the richest in society in Argentina as seen in Scandinavia, the U.S. and Colombia.

3.5 Distributional tax gap

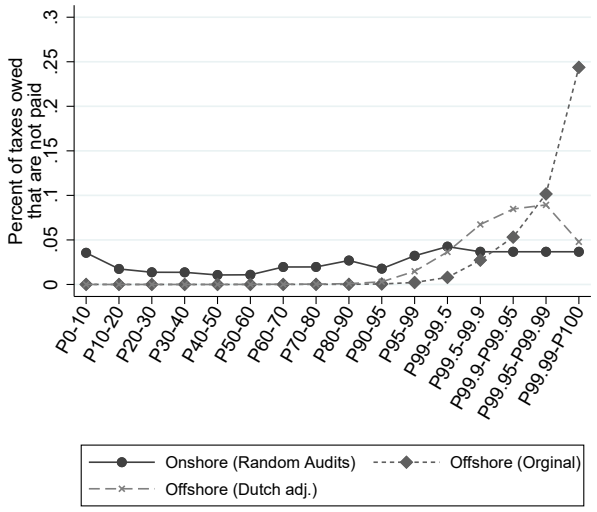
The estimates discussed in prior subsections can be used to calculate distributional tax gaps. Alstadsæter, Johannesen, and Zucman (2019) distribute the total tax haven wealth held by Scandinavians according to Alstadsæter, Johannesen, and Zucman (2018) to the different wealth bins based on the wealth distribution observed in "Swiss Leaks" and the Norwegian tax amnesty program.[14] They then apply a fixed rate of return to the hidden wealth to obtain the annual income from the hidden wealth. The authors at last produce the share of total potential tax burden that is evaded using tax havens by applying the relevant marginal tax rates for the different wealth bins using a tax simulator.

They find a steep wealth gradient in average tax evasion. The share evaded is basically insignificant outside the top 1 percent. It then increases for each wealth group. At the top, they find that the top 0.01 percent of households evade 25 percent of their true tax liability using tax havens. The authors contrast this to the results of random audits in Denmark, which shows a relative flat wealth gradient. The random audits find an average evasion rate of around 2 percent among the bottom 99 percent, 7 which increases to 4 percent among the

[14] And assumes that 90 percent of the wealth is evaded.

top 1 percent.

Figure 2: Estimates of average evasion rates, by wealth bins.



Notes: This figure compares the baseline estimates of onshore and offshore tax evasion from Alstadsæter, Johannesen, and Zucman (2019) Appendix J table 5 with estimates of offshore tax evasion assumes that the offshore financial wealth of Scandinavians is a large as Dutch offshore financial wealth and is distributed like the in the Dutch tax amnesty, as shown in Leenders, Lejour, Rabaté, and van 't Riet (2022).

The estimate of the distributional tax gaps relies on estimates of Scandinavians' wealth in tax havens, on the distribution of the evaded wealth observed among Scandinavian tax evaders and on the Scandinavian tax system. The results change if these assumptions are modified. This is shown in figure 2. The figure compares the estimates of onshore and offshore tax evasion reported in Alstadsæter, Johannesen, and Zucman (2019) to the same type of estimates of offshore tax evasion, with slight modifications. The first modification is that it uses the Dutch distribution of offshore wealth instead of the Scandinavian. Dutch offshore wealth is relatively more prevalent among the merely rich, as seen in figure 1 panel (b). The second modification is that the aggregate level of offshore wealth is slightly higher for Dutch taxpayers than for Scandinavian taxpayers. The result of the adjustments is that offshore evasion is now more important than onshore evasion for all groups in the top 0.5 percent, which is not the case in Scandinavia. But the gradient is on the other hand flatter at the top, and the average evasion rate within a wealth group peaks at just below 10 percent.

3.6 Implications for wealth inequality estimates

Skewed official statistics is one of the byproducts of tax evasion. Tax evasion can for instance thwart inequality estimates, and especially those estimates that are based on tax returns.

When the level of tax evasion, and thus underreporting of income and wealth, increases with income and wealth, this means that official statistics will underestimate the actual inequality in income and wealth.

Alstadsæter, Johannesen, and Zucman (2018) calculate top wealth shares that include the financial wealth hidden offshore, following a similar approach as Alstadsæter, Johannesen, and Zucman (2019) use to produce distributional tax gaps. They use their estimates of the offshore financial wealth held by residents of ten major economies, assume that 90 percent of this is not disclosed and thus not included in inequality measures, and then distribute the undisclosed wealth to each bin along the wealth distribution based on the bins' shares of the wealth seen in the HSBC Switzerland leak and the Norwegian tax amnesty program. The largest effect of accounting for offshore wealth is seen in Russia, where the share of wealth held by the top 0.01 percent increase from 5 to 12 percent. France and the UK also see markedly larger wealth inequality after adding offshore financial wealth, while the U.S. and Scandinavia only see slight increases.

The alternative inequality estimates depend on patterns observed in the Scandinavian data, just like the distributional tax gaps discussed above. This means that they may change markedly if the assumptions are altered. Take the Netherlands as an example. Leenders, Lejour, Rabaté, and van 't Riet (2022) find that tax haven wealth is more evenly distributed within the top 10 percent of the wealth distribution in the Netherlands than it is in Scandinavia and Colombia. This means that the effect of adding tax haven wealth to the top 0.1 percent and the top 0.01 percent's share of total wealth is smaller when using the Dutch distribution instead of the Scandinavian. While Alstadsæter, Johannesen, and Zucman (2018) estimate that the top 0.1 percent's wealth share in the Netherlands increase from 8.8 percent to 10.1 percent when adding offshore financial wealth, Leenders, Lejour, Rabaté, and van 't Riet (2022) find that the top 0.1 percent's total wealth share only increases by 0.6 percentage points, from 8.7 percent to 9.3 percent.

4 Further literature on wealth in tax havens

4.1 Other classes of wealth

There are two main limitations of the literature to date. The first is that it mostly relies on data from the period before the implementation of Automatic Exchange of Information (AEOI) agreements, the leading international tax compliance program from individuals. FATCA and the CRS became operational in 2015 and 2017 and their implications for how individuals use tax havens are yet to be understood. A growing literature investigates the

effect of the AEOI agreements.

The second limitation is that the literature (much like the AEOI agreements) only cover financial wealth, meaning stocks, bonds, fund shares and bank deposits. Tax evaders and others may as well invest in real estate, crypto[15], art, yachts etc. and unlisted corporations through tax havens. These asset classes are not covered by the current automatic exchange of information agreements and there is no established methodology to measure the extent of these investments. The future literature on individuals' use of tax havens will have to deepen our understanding of who owns these assets and to what extent the income and wealth related to these assets are reported to the tax administration at home.

A literature that considers offshore real estate is now emerging. Alstadsæter, Planterose, Zucman, and Økland (2022) is most closely aligned to the work on offshore financial wealth discussed in the above sections. They use leaks on property ownership in Dubai to quantify the total size of the real estate market and the foreign share. The authors estimate that more than 25 percent of the secretive Dubai property market is owned by foreign owners. Through a cooperation with a journalist, they also find that individuals that are resident in Norway own 227 properties, of which 70 percent is not reported to the Norwegian tax authorities. This is not as high as the 90-95 percent noncompliance rate among Scandinavian HSBC bank customers around 2006 and 2007, but still high. They also find a marked wealth gradient among the Norwegian owners of real estate in Dubai, although not as strong as for the hidden financial wealth that Alstadsæter, Johannesen, and Zucman (2019) examines.

4.2 The role of shell companies

Shell companies, trusts and foundations in secretive jurisdictions will also become important as the international tax compliance rules become stricter. These types of vehicles add obfuscation and secrecy to the financial positions of individuals and families. Still, the relationship between shell companies and tax evasion is fuzzier than for instance the relationship between an undeclared bank account revealed in a data leak and tax evasion. This is also why the ICIJ (International Consortium of Journalists) can make the ownership information from the "Panama Papers" and other leaks from secretive company registers and legal and advisory firms available to the public.

Several papers have already used this data source to investigate the link between shell company ownership and tax evasion. Alstadsæter, Johannesen, and Zucman (2018) shows this link at the country level. They find a strong correlation between the numbers of shell company shareholders from each country and the level of offshore financial wealth in tax

[15]See Baer, Mooij, Hebous, and Keen (2023) for a comprehensive review of the literature and relevant taxation issues.

havens held by the residents of the same country. There is also evidence that shows that the number of active shell companies increases when taxes increase at home. Londõno-Vélez and Ávila-Mahecha (2022) find that the number of new shell companies opened by Colombians increased sharply after a substantial increase in the Colombian wealth tax. Hanlon, Maydew, and Thornock (2015) show that investments in stocks and mutual funds in the U.S. from entities in tax havens increase when the capital income tax in the U.S. increase, while they fall when tax havens sign information exchange agreements with the U.S.

The literature also documents how shell company ownership is something that is mainly available to the richest in society. Alstadsæter, Johannesen, and Zucman (2019) find, among Norwegians and Swedes, that the ownership of shell companies revealed by the Panama Papers is even more concentrated at the top of the wealth distribution than undisclosed bank accounts in HSBC Switzerland. The shell company ownership is minuscules outside the top 0.1 percent, just below 0.2 percent above and reaches 1.2 percent among the top 0.01 percent. Londõno-Vélez and Ávila-Mahecha (2022) find the same wealth gradient, when they link the "Panama Papers" to Colombian tax records. They also find a generally higher prevalence of shell companies opened by Colombians than what Alstadsæter, Johannesen, and Zucman (2019) find in Norway and Sweden.

Future research needs to go more into detail on how shell companies are used for tax evasion. These evasion strategies may for instance involve the combination of offshore and onshore structures, which means that the coupling of data from different jurisdictions will be key to gain new insights. It may also mean that researchers will have to employ methods and data collection processes more common in sociology and law. One example would be to interview shell company providers and their clients, as well as tax enforcement officials, to identify the different channels through which shell companies aids tax evasion and how this may show in data. A second example would be to investigate how different legal frameworks allows for sham corporations and obfuscation of wealth and the importance of different legal structures worldwide.

5 Conclusion

Our understanding of individuals' use of tax havens has rapidly expanded over the past 15 years, as detailed in this review. We now have reliable estimates that quantify households' financial wealth in tax havens to around the equivalent of 10 percent of world GDP. We also know that there are major differences in tax haven use between countries and regions. We know that this wealth is mainly undisclosed. And we know that tax haven use is concentrated among the most well-off, which has implications for inequality measures.

But unanswered questions remain. The literature must shed light how the use of tax havens by individuals has evolved in response to heightened public awareness and subsequent policy responses. The estimates presented in this review need to be updated to more current years. And new paths of research, like quantifying investments in alternative asset classes and exploring rich individuals' use of shell companies, has to be pursued.

Note: This review was prepared prior to the October 2023 release of The Atlas of Offshore World and the EU Tax Observatory's Global Tax Evasion Report 2024. These resources and their underlying documentation present new evidence on the matters discussed in this review. See the website atlas-offshore.world for more.

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