A cross-country analysis of offshore wealth determinants

Abstract

In this work, I investigate what are the elements that are associated with the amount of individual financial wealth held offshore by a country. To do so, I exploit a novel dataset constructed by Alstadsæter, Johannesen and Zucman (2018) which contains cross-country estimates of financial wealth that individuals held in tax havens in 2007. The results from the static cross-country analysis show that the level of sociopolitical stability in a country and the level of its financial freedom are negatively associated with the share of wealth that its citizens hold in offshore centres. On the other hand, the level of income inequality and the level of financial openness are positively associated with a country's offshore wealth accumulation dynamics. Arab Gulf region, finally, forms a distinct cluster of countries which show peculiar offshore wealth accumulation characteristics.

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1 Introduction

In recent years, partly as a consequence of the infamous Panama Papers leak in 2016, an always increasing attention has been drawn on tax havens and on the offshore wealth accumulation phenomenon. In his recent book "The Hidden Wealth Of Nations" (2015), Professor Gabriel Zucman (University of California - Berkeley) states that, in 2015, the stock of financial wealth that was held offshore summed up to 8.5 trillions of US dollars. Such amount of financial wealth corresponded to 10% of total world GDP and to 8% of its wealth of the same year (Zucman, 2013). This simple figure gives a first insight about the dimension and the importance of this phenomenon, and such relevance becomes even more evident once we consider the fact that the real owners of most of the offshore wealth are actually unidentified, since offshore financial centres offer total secrecy on the wealth they collect from international costumers. Due to this (intentional) lack of traceability, most of the wealth stored in tax havens is not taxed[1], and this clearly leads to massive losses in tax revenues for the countries of residence of offshore wealth owners[2]. Moreover, Alstadsæter *et al.* (2019) find that 80% of such wealth is owned by the top 0.1% richest individuals, and 50% of it by the top 0.01%. Therefore, the implications of offshore accumulation dynamics are central not only in the already mentioned (and typically addressed) fiscal field, but also in the distributive one. Being able to tax such wealth (or, at least, identify its owners) would indeed have redistributive consequences, by increasing the effective taxation on the richest sectors of the population. Furthermore, as the Panama Papers have publicly shown, political elìtes, in particular the ones of developing and autocratic countries, use tax havens to hide funds that were meant to be public and that they took property of[3]. Since this hidden wealth is subtracted to the public good, and so to potential public investments in any sector in countries where such investments are particularly urgent, this evidence adds a new impelling reason to address the issue of tax havens.

The striking potentialities of tax havens for tax evasion purposes could prevent public opinion from investigating any potential additional reason why individuals could store part of their wealth in tax havens[4]. It is indeed usually accepted that tax evasion is the main purpose that pushes individuals to head part of their wealth in offshore centres. But is it so? Is every penny stored in Cayman Islands, in Switzerland, or in the British Virgin Islands hidden there in order to avoid national or international taxation? If it was the case, then why do countries such as the Arab Gulf

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[1]I say most, and not all, since financial wealth could be headed to offshore centres also for legal and transparent reasons, even though this eventuality is likely to be quite rare (Alstadsæter *et al.*, 2018).

[2]Such losses are not necessarily related to wealth taxes, since most of countries in the world do not have such kind of taxation. They are, indeed, linked also to taxes on capital gains, dividends, property, etc.

[3]The data contained in the Panama Papers are publicly available on the website of the International Consortium of Investigative Journalists - ICIJ.

[4]Please, note that I use the word "individuals" on purpose, since this work refers only to wealth stored offshore by natural persons, and not by corporations or financial institutions. The reason for this fact is linked to the characteristics of the data I use, and it will be clarified in **Section 2**.

ones, Paraguay, or Democratic Republic of Congo, where wealth-related taxation is practically null, have incredibly large shares of their GDP stored in tax havens (Alstadsæter *et al.*, 2018)? There could be other relevant elements that cause this offshore wealth accumulation phenomenon. Most of them have already been hypothesised (and sometimes identified) by journalists and researchers, for instance the creation of personal security emergency funds, the financing of terrorism, money-laundering, etc. However, to my knowledge, no comprehensive academic research has been carried out on this topic. Therefore, in this work I present the three main motivations for individuals to hold financial wealth offshore and I investigate the relations that exist between some selected elements, either naturally linked to those motivations or already identified by previous literature, and the offshore financial wealth accumulation dynamics of a country. The three motivations I am considering are the **tax evasion(/avoidance) aim**, the **safety net aim**, and the **(legal) financial gains aim**[5]. Concerning the potential determinants I am going to analyse, they are the level of fiscal freedom of a country, its sociopolitical stability, its financial openness, the relative dimension of its oil rents with respect to its GDP (interacted with the level of democracy of the country), its legal system structure, and the level of income inequality by which it is characterised. For the study, I will use a novel dataset by Alstadsæter, Johannesen and Zucman (2018), which includes the estimates of offshore financial wealth for 137 countries, to run a cross-country analysis on which of those elements are actually related to the offshore wealth accumulation dynamics of a country. The great deal of variability and heterogeneity that can be found in the just mentioned estimates is actually the main inspiration of this study. Indeed, countries with similar institutional or economic characteristics can be proved to hold remarkably different shares of their GDP offshore, while countries that are extremely far in those characteristics can show similar offshore wealth accumulation dynamics[6]. In confirmation of this heterogeneity, Figures 1 and 2 show how countries belonging to different income groups are often characterised by similar offshore wealth storage behaviours, while different regions do display differences in their offshore wealth dynamics. Finally, Gulf countries seem to constitute a cluster of countries which are characterised by peculiar offshore wealth accumulation characteristics. They have incredibly large shares of wealth stored offshore (Figure 3), and they also show extreme values for the variables I am considering as potential determinants of such offshore accumulation phenomenon[7].

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[5]For a thorough description of such aims, please see **Section 3**. Note also that list should not be considered as exhaustive, since some potential purposes are kept aside. For instance, I am not including criminal financing (be it terrorism financing, money laundering, illegal purchase of war weapons, etc.) both because data on such phenomena are actually almost impossible to gather for such a large sample and because these phenomena often involve more than a country, and this fact would had caused the results of the analysis to be potentially biased. However, by analysing the aforementioned public Panama Papers information, I considered the three motivations I am studying, and in particular the first two, to be the most relevant and internationally spread ones.

[6]The first situation is for instance the case of UK (16.3% of GDP held offshore) and Canada (4.6%), while the second one could be Portugal (21.2%) and Democratic Republic of Congo (21.3%)

[7]It is for instance the case of the level of fiscal freedom, that is almost total in Gulf countries since wealth and capital are not taxed at all.
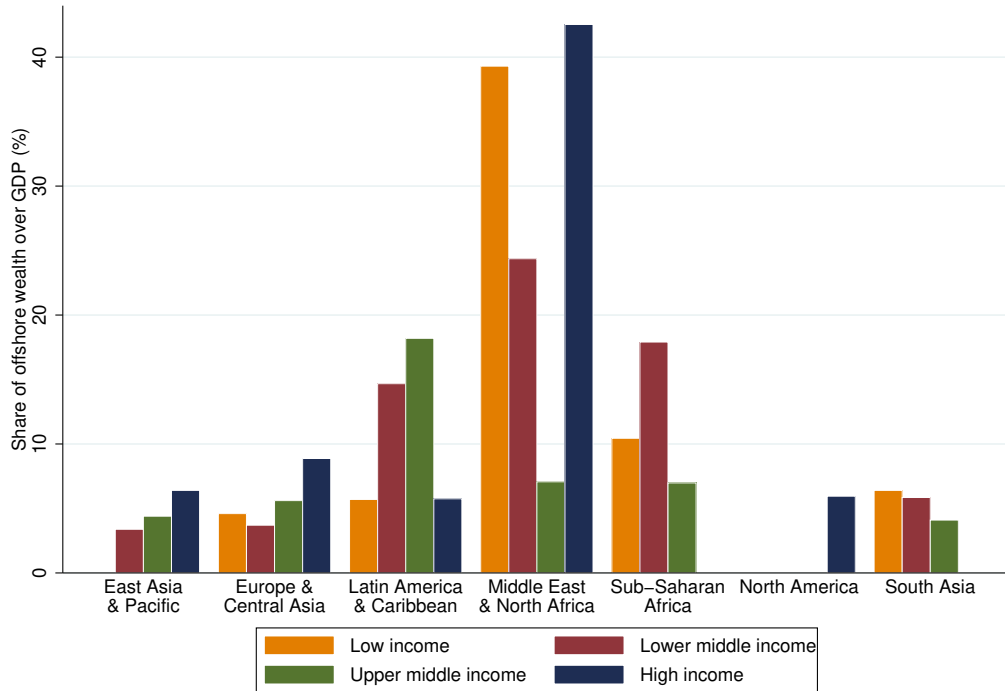
N.B. – Jordan, which is an outlier and holds 200% of its GDP offshore, has been excluded from all the Figures

Figure 1: Average shares of offshore wealth over GDP by regions and income groups
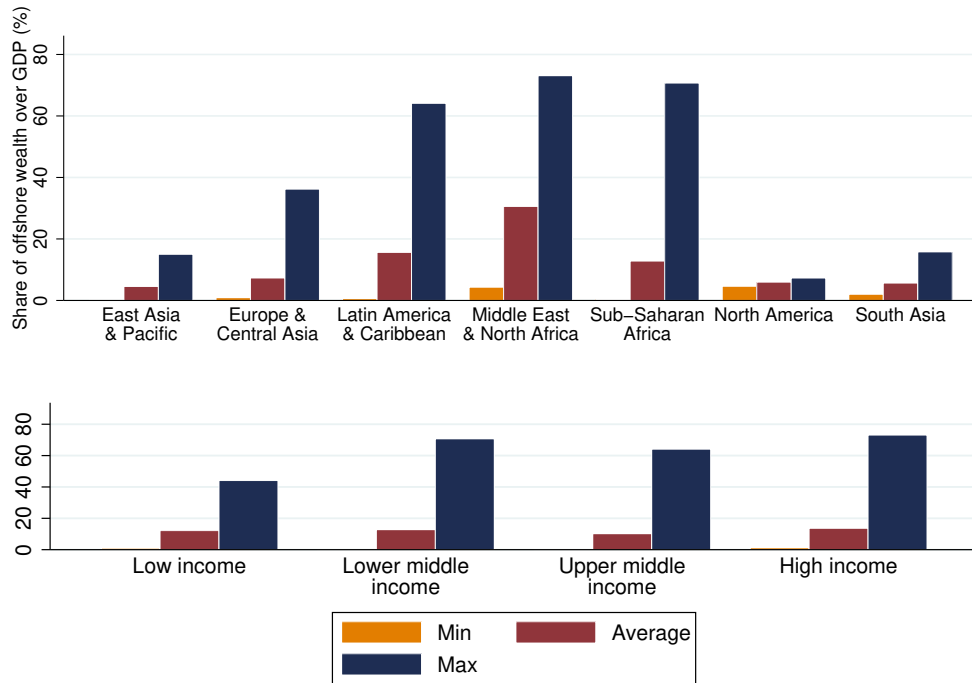
N.B. – Jordan, which is an outlier and hold 200% of its GDP offshore, has been excluded from the Figure

Figure 2: Minimum, maximum and average shares of offshore wealth over GDP by regions and income groups

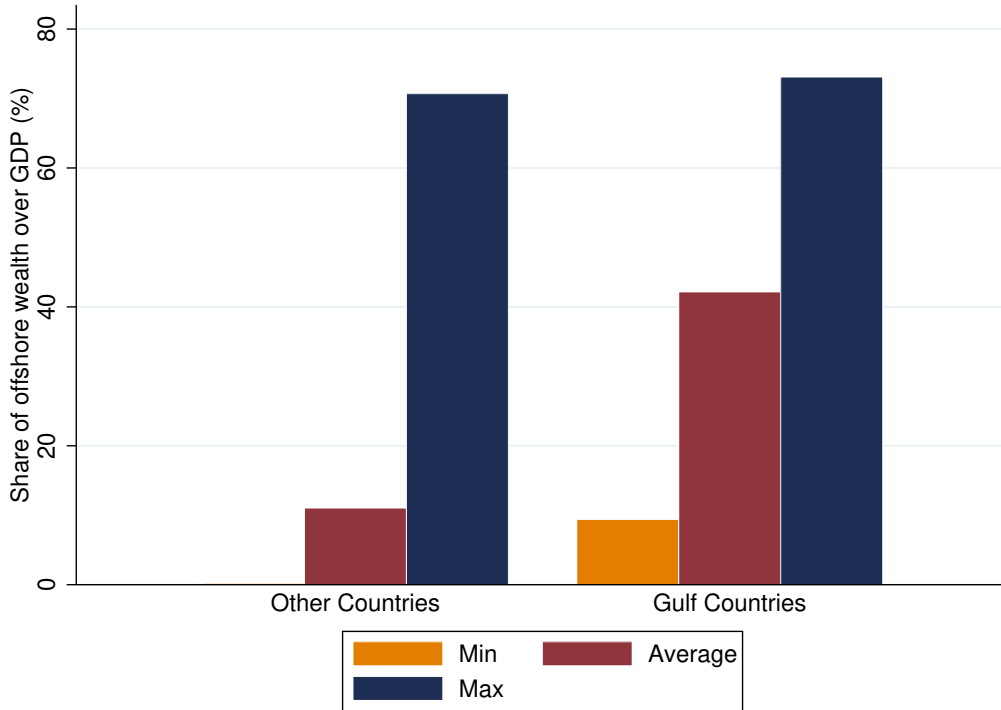Figure 3: Minimum, maximum and average shares of offshore wealth over GDP by regions: Gulf countries & Others

Having considered these evidences, it is then relevant to systematically analyse whether there are elements that are associated with the offshore wealth accumulation dynamics of a country, and this work has the objective to be a first step in this direction.

The work is divided in the following way. In **Section 2** I will present some general elements of the offshore wealth accumulation phenomenon described in previous literature, with a special focus on the paper by Alstadsæter, Johannesen and Zucman (2018), on the data they construct, and on previous findings about cross-country determinants of tax evasion. **Section 3** will deal with the three main motivations for offshore wealth storage and will present a very simple theoretical model that incorporates them. In **Section 4** I will present the data I use and I will formalise the hypotheses I am going to test. **Section 5** will describe the econometric approach and will present the results obtained, while **Section 6** will include a brief comment on the results, and the conclusions of the work. Let us now start with the previous literature analysis.

2 Literature review

The following section will mostly resemble my process of information acquisition. It will start with the main paper on which my analysis is based (the one by Alstadsæter *et al.*, 2018), then it will

review some of the most important recent works on offshore wealth accumulation dynamics. This first part is the "essential" one, since it describes the actual topic I am dealing with in this work. The second part of the literature review, on the other side, considers a specific aspect of the general topic: the determinants of tax evasion. Even though, as already anticipated and as will be better presented in **Section 3**, I do not expect tax evasion to be the only reason why individuals would hold part of their wealth offshore, it is anyway generally considered as one of the most important reasons to do so. Therefore, I decided to analyse specifically the determinants of tax evasion, with a particular focus on economic and institutional determinants in cross-country analyses, so to obtain information about possible elements which could affect wealth accumulation in tax havens. It is however essential to keep in mind that tax evasion and offshore wealth accumulation should not be considered as the same phenomenon. They are likely to intersect in top-wealth percentiles individuals that hold part of their wealth offshore with the objective of evading taxes, but this is (surely) a subset of tax evasion dynamics and (probably) also of offshore wealth accumulation[8].

2.1   Offshore wealth

The existing literature on offshore wealth and tax havens is relatively limited. This is mostly due to the lack of data that characterises this topic, which is the direct consequence of one of the main characteristics of tax havens: the secrecy (Mara, 2015). Indeed, until 2016 there was no broad official information on country-specific dimensions of wealth held in tax havens. Every offshore centre has in fact a strong incentive to keep secrecy on the information about the clients of their financial institutions, who are very likely to choose to use their services also due to the certainty that the wealth they store (under any form) in such centres is not going to be publicly reconnectable to them[9].

In 2016, however, a large number of offshore financial centres revoked the secrecy on bilateral data regarding the dimension of bank deposits that each foreign country owns (through its citizens) in their financial institutions. Such data are routinely collected by the Bank for International Settlements (BIS). These newly disclosed information were used by Alstadsæter *et al.* (2018) to estimate the individual amount of offshore wealth that 137 countries own in the most important tax havens in the world[10]. To do so, they relied on the aforementioned "BIS data", as well as on information disclosed by the Central Bank of Switzerland and on specific anomalies in global

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[8]See **Section 3** for a theoretical reasoning on the possible reasons to hold wealth in tax havens.

[9]This is true in both the case of evasion/avoidance-aim and of safety net-aim. However, it is not necessarily true in the case of financial gain-aim.

[10]Such tax havens are 21 and they attract approximately the entire stock of wealth held in offshore centres. Specifically, they are Switzerland, Cayman Islands, Panama, part of US (Delaware and Nevada), Hong Kong, Singapore, Macao, Malaysia, Bahrain, Bahamas, Bermuda, Netherlands Antilles, Cyprus, Guernsey, Jersey, Isle of Man, Luxembourg, and parts of Austria, Belgium and UK.

investment statistics. They also used the infamous "Panama Papers" to check whether their estimates were consistent with the available data. Their estimation procedure consisted in three steps. Firstly, they estimated the portion owned by each country in Switzerland using the Swiss Central Bank and the BIS data. Then, they used the BIS information to assign the additional amount of wealth held in some other tax havens[11] to each country. Third, they proportionally assigned the amount of wealth that was held in the residual offshore centres and they combined the three distributions. To avoid the problem of "shell companies"[12], which would cause a confounding effect by addressing most of the offshore wealth in other tax havens (that are actually where shell companies are based), they computed their estimates for the year 2007. In that period, indeed, the phenomenon of shell companies was not developed enough to remarkably affect the estimation results. According to their estimation, countries held on average 12-13% of their GDP in tax havens. These estimates, however, are likely to be conservative since they only take into consideration financial offshore wealth that is kept as *fiduciary bank* deposits[13] (which constitute approximately the 25% of the total offshore wealth), and such typology of financial instrument is mainly used by individuals or households (i.e. no corporations or financial institutions). Indeed, the authors remark that, since they are not accounting for physical capital[14], mutual funds, or portfolios, their estimates concern specifically *individual financial offshore wealth*. This specificity necessarily leads to conservative estimates, even though such values are considered by the authors to be representative of the distribution of total wealth[15]. Jordan seem to be the country which relies the most on offshore services (from now on, all the discussion on offshore wealth will not concern its absolute value, but it will refer to the share of GDP that a country keeps in tax havens in the form of fiduciary bank deposits). Indeed, it keeps an amount of money offshore that corresponds to more than 200% of its GDP. It is followed by the United Arab Emirates, Kenya, Venezuela, Zimbabwe, and Saudi Arabia. All of them hold more than 50% of their GDP in offshore centres. For what concerns the European countries, on average they keep approximately 15% of their wealth offshore, with the exception of the Nordic countries (Sweden, Norway, Denmark, and

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[11]Specifically, Guernsey, Hong Kong, the Isle of Man, Jersey, Luxembourg, and Macao.

[12]The U.S. *Securities & Exchange Commission* (SEC) defines as a "shell company" any company with "no or nominal operations, and with no or nominal assets or assets consisting solely of cash and cash equivalents". Usually such companies are used by individuals or other companies for purposes such as changes of domicile (potentially, to tax havens), anonymity, and fictitious transactions.

[13]According to the *Financial Services Commission* of Gibraltair, "[a] fiduciary deposit [...] is a deposit placed by a customer with a third bank (recipient bank) through an agent bank. The recipient bank pays the agent bank the interest on the deposit which is then passed onto the depositor. [...] The recipient bank treats the incoming deposit as an interbank placement, not a customer deposit". Because of its structure, it gives to the depositor the opportunity not to be fiscally liable for their value.

[14]Wealth can in fact be directly invested for instance in real estates and lands in offshore centres.

[15]For some countries, however, this approximation has a larger effect on the estimates than for others. Russian offshore wealth, for instance, once included non-financial wealth and non-residents' one steeply increases, going from slightly more than 13% to almost 60% of total GDP.

Finland[16]), whose share is about 5% or lower, and of Greece, that keeps more than 35% of its own GDP in tax havens. Finally, Laos, Equatorial Guinea, Comoros, Cuba, Albania, Chad, and Turkmenistan are the countries with the lowest share of offshore wealth (lower than 1%). Their results also show a great deal of heterogeneity in relation to the different countries, both in the amount of offshore wealth held and in the "preferred" tax havens. Indeed, the authors found that countries that differ in essential traits such as their level of democracy, their geographical position, or their levels of marginal tax rates, can easily show similar offshore behaviours. This heterogeneity and the complexity of its explanation are at the basis of my work. Thanks to the dataset of estimates that Andersen *et al.* (2018) constructed, I will try to analyse through a cross-country investigation whether this heterogeneity can be associated to some specific determinants.

Coming back to the paper by Alstadsæter *et al.* (2018), they also constructed estimates of wealth inequality in ten countries (Denmark, Finland, France, Netherlands, Norway, Russia, Spain, Sweden, the United Kingdom, and the United States), which in the 2000s accounted for approximately half of the total world GDP. To do so, they exploited the estimates of the relationship between "declared" and offshore wealth owned by Scandinavian citizens computed by Alstadsæter *et al.* (2019). They used the leaks of tax amnesties and offshore centres (HSBC Switzerland, and Mossack Fonseca) reserved costumer-specific information and they matched them with Scandinavian (Norwegian, Danish, and Swedish) administrative wealth data to build an estimated distribution of offshore wealth over declared wealth. What they found is that most of the offshore wealth is owned by the wealthiest individuals. More importantly such individuals are also the ones that own the highest percentage of their wealth offshore. The top 0.001% of the richest Scandinavian individuals, for instance, seem to hold on average the 25% of their wealth offshore, while for individuals whose wealth is lower than the $95th$ percentile the offshore tax evasion is approximately zero[17]. By applying the estimated offshore wealth distribution to the offshore wealth of the different countries, the authors found out that the inequality is remarkably higher than the commonly accepted values. About 80% of offshore wealth belongs to the top 0.1% richest households, and about 50% to the top 0.01%, and this clearly causes a greater increase in the inequality measures in those countries that own a greater stock of offshore wealth. The share of total household wealth that is owned by the top 0.01% wealth percentile in Russia, for instance, is more than doubled (from less than 6% to more than 12%) after including the estimated offshore wealth in the computation. These data confirm the importance of taxing offshore wealth in levelling inequality not just in the classic

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[16]There are no data about Iceland.

[17]This observed skewness of the distribution of offshore wealth is very likely to be linked to the supply side of offshore financial instruments. Financial institutions in tax havens, indeed, tend to be very selective when offering their financial instruments, and the selection is usually made by setting a minimum sum of investment that is usually remarkably high. It is very rare that an offshore centre accepts a one sum investment that is lower than 1 million (or, more realistically, even 10 millions).

indirect channel of broadening the tax base, but also by directly taxing larger shares of richest individuals' wealth.

Momentarily coming back to the analysis of the possible determinants of countries' offshore wealth accumulation and of their observed heterogeneity, oil rents and political instability have been addressed as very good candidates by Andersen *et al.* (2017). They exploit the same BIS data used by Alstadsæter *et al.* (2018) to assess whether windfall gains due to petroleum (measured by oil price shocks) and/or a status of high political instability (measured through the Polity IV Index and through the occurrence of coup d'états or political elections) cause an increase in offshore wealth of a country. The outcomes of their research show that the dynamics of offshore wealth accumulation that are consequences of oil prices shocks or elections are strongly dependent on the level of democracy of the considered country. Indeed, in democratic countries, there is no significant effect of such kind of shocks on the share of GDP held offshore, while in autocracies the effect is strongly significant and its magnitude is remarkable. For instance, when oil prices double, the offshore wealth of autocratic countries increases on average by the 22%. This result is strictly connected to the fact that, in autocracies, more than 50% of bank deposits is held in tax havens, while for non-autocracies the percentage is less than 25% (Andersen *et al.*, 2017). The authors explain these results by mostly referring to political elites behaviours. Indeed, in autocratic countries, oil rents are almost exclusively controlled by the State[18] and the sociopolitical tensions that are typical of such polities are a strong incentive for autocrats and dictators to store part of their wealth in secure offshore centres, in case they are overthrown or lose their power. So, while usually it is referred to offshore wealth accumulation as of a simple tax evasion or avoidance procedure, these results suggest that, as I have already mentioned and I will more extensively explain in **Section 3**, there could actually be various objectives that lead to such dynamics. Lastly, the authors also checked for some other elements which could induce economic and political elites to keep more of their wealth offshore. Such potential determinants are restrictions of cross-border financial transactions (i.e. level of financial openness), general financial development, and hyper-inflation events, but they did not prove to be significant in the analysis.

Almost no literature analyses the elements that determine a country's status of "offshore tax haven". Even though this topic is not directly related to the focus of my work, it is worth to briefly present such elements, which are likely to be helpful in giving useful insights about some possible offshore wealth determinants. Mara (2015) uses a logit regression to analyse the elements that enable a country to become a tax haven. Surely, low (or no-) wealth taxation is an essential

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[18]Actually, in most of the countries of the world, even the most traditional democracies, the political elites have a strong capability of controlling the gains obtained by oil production and sale since most of the oil companies are state owned or investee companies. The main difference between autocracies and democracies in this field is in the controls and the rules of transparency to which they are bound.

characteristic of offshore centres, but it does not seem to be a sufficient condition. As aforementioned, indeed, tax havens are also necessarily characterised by high level of financial (but not only) secrecy and a great deal of financial services that are customizable so to achieve specific goals, which are usually avoiding or evading taxation, keeping the personal identity of the owner secret, increasing financial gains by the use of "unconventional" financial instruments, laundering money, etc[19]. Other characteristics that seem to be relevant for a country to acquire the status of tax haven are the quality of government (Dharmapala *et al.*, 2009) and a narrow geographical dimension (Hansen & Kessler, 2001). Observing mere descriptive statistics, indeed, it is evident the fact that almost all the offshore centres are small countries, with a GDP per capita that is remarkably higher than the average of the rest of the world and with a population that is extremely small (usually below 1 million of inhabitants). They are also often former British colonies (and, as a consequence of that, characterised by a common law legal system), English speaking and dependent territories (protectorates, overseas departments and territories, etc.). Mara (2015) takes into consideration these elements, and adds to his analysis also the share of the services over the total GDP. He does so because, as already stated, a peculiar characteristic of tax havens is that they are obviously characterised by an highly developed bank and financial system and they provide an extremely wide and complex set of services for investments, while they are almost always poor of valuable natural resources. The results of his study partially confirm his intuition. The most important characteristic for a tax haven, indeed, seem to be the share of services over GDP, while the other variables (and, in particular, the quality of government) do not show significant coefficients. However, I think it is worth to notice a potential endogeneity issue. The estimates are indeed likely to be affected by reverse causality, since it is in the nature of offshore centres to rely strongly on (mostly legal, bank and financial) services. This characteristic could be a cause of the status, but it is almost surely also a consequence.

To sum up the most important information we obtained so far about offshore wealth accumulation, the first thing that must be noticed is that there is extreme heterogeneity either in the actual share of GDP that countries hold offshore, in the characteristics of countries that have similar offshore wealth, in the possible aims that push the individuals to store their wealth in tax havens, and in the possible determinants of the offshore wealth accumulation. In particular, concerning this latter field, some elements seem to be particularly relevant. Oil rents, sociopolitical uncertainty and level of democracy are proven to have a role in shaping the magnitude of wealth that a country holds offshore. Top marginal tax rates are also likely to affect wealth accumulation in tax havens, following the classic idea of wealth transfers offshore to avoid or evade taxation. Some institutional (for instance, the legal system), geographical (as the dimension and the proximity to Switzerland, as stated by Alstadsæter *et al.*, 2018) and cultural (as the spoken language) characteristics could

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[19]More on this in **Section 3**.

also have an effect on the accumulation dynamics, since they can make it either easier or more difficult for the citizens of a specific country to approach to tax havens frameworks.

2.2 Determinants of tax evasion

Differently with respect to tax havens and offshore wealth accumulation, the literature on tax evasion finds its origin almost 50 years ago, with seminal theoretical papers as the one by Allingham and Sandmo (1972). More recently, it evolved towards a "behavioural" (even though still strongly theoretical) direction with Andreoni *et al.* (1998). In the last 20 years, in addition to the micro-oriented traditional approach, more and more researchers attempted to study tax evasion (and, partially, tax avoidance) under a macroeconomic point of view. This has been done mostly through cross-country (cross-sectional) analysis, in which both macroeconomic (such as institutional framework and economic growth) and microeconomic (such as tax morale and perceived fairness of a fiscal system) variables are combined to assess which could be the most important determinants of tax evasion for a country[20]. Achek and Khlif (2015), in their recent literature review on the topic of cross-country determinants of tax evasion, divide such elements that could have an impact on tax compliance in four categories, namely economic determinants, legal and institutional ones, cultural and behavioural ones, and demographic ones. In this work, because of the already mentioned peculiarity of the phenomenon I am studying, I will focus on the first two categories, while I will leave for further research to include in the analysis the other possible elements. One of the reasons of this choice is that cultural and behavioural elements that affect the representative (average) individual (such as tax morale, power distance, etc.) do not necessarily have an effect on the top-income (or wealth) percentiles of the population[21], who are actually the ones that are more likely to determine a country's offshore wealth accumulation behaviour (Alstadsæter *et al.*, 2018). Therefore, I will now present economic, legal and institutional potential tax evasion determinants, while I will just list some of the behavioural, cultural and demographic ones, without commenting them.

Economic determinants   This category includes the variables that could potentially affect tax evasion in a country and that belong to the financial and economic fields. For instance, the level of economic development, of economic freedom, and of financial development could have an indirect negative effect on tax evasion rates, either through the behavioural (i.e. satisfaction, perceived fairness of taxes, etc.) or the institutional (i.e. enforceability, etc.) channel (Riahi-Belkaoui, 2004; Picur *et al.*, 2006). The level of top (either corporate or individual) marginal tax rates, on the other

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[20]In all the following of this subsection, the studies I cite, unless otherwise stated, will be cross-country cross-sectional analyses which use data regarding between 30 and 60 developed and developing countries and which belong to the period 1995-2010.

[21]Such averaged behavioural indexes, indeed, are not ment to represent the preferences of small portions of population, such as the top 0.1% richest individuals of a country.

hand, would be expected to have a direct negative impact on tax compliance rates, since higher taxes increase the cost of tax compliance. However, Richardson (2006) finds no significant effect of such variable on tax evasion rates. Another interesting possible determinant of tax evasion rates in a country is the level of income (or wealth) inequality. Indeed, as explained in Alstadsæter *et al.* (2018), it seems that the top-income (or -wealth) percentiles of the population are the ones that are characterised by the lowest tax compliance rates. A greater concentration of wealth in their hand could therefore mean a larger amount of taxes evaded. This potential determinant could also indirectly operate through the behavioural channel (i.e. perceived fairness, etc.) channel.

Legal and Institutional determinants This category of variables refer to the set of laws, administrative rules, and sociopolitical dynamics that preside over a country. Some of the most important elements that have previously proven themselves to have a role in shaping tax evasion dynamics are government and administrative corruption, and bureaucracy. They are directly related to the so-called *slippery slope framework*, a theoretical framework of tax compliance developed by Kirchler *et al.* (2008) which relates tax compliance rates to the level of power of the authorities (i.e. their capability of forcing citizens to comply to tax rules) and the trust in the authorities (i.e. the perception of fairness, benevolence and effectiveness of the administration and the government). Both these elements are likely to decrease tax evasion rates, by increasing either voluntary or forced tax compliance (Batrancea *et al.*, 2019). Under this perspective, a country characterised by low levels of corruption (which could decrease the trust in the authority) and bureaucracy (which plays against the effectiveness of the tax authority, and so against its power, and decreases the trust in such institutions), indeed, is more likely to show low levels of tax evasion (Picur *et al.*, 2006; Richardson, 2006). Another potentially relevant element, which could have an effect of tax evasion through a purely behavioural (i.e. bounded rationality) channel, is the complexity of the tax system. It is addressed by Richardson (2006) and his results show that the complexity (either when it comes to filing, audition, or enforcement procedures) seem to be a strongly relevant (positive) determinant of tax evasion. I have previously mentioned the level of democracy of the country as a potential element which affects both offshore wealth accumulation and tax evasion. In general, this variable can affect both the trust in the authorities (negatively) and, partially, their power (positively). However, both from Kirchler *et al.* (2008) and Batrancea *et al.* (2019), trust seem to play a central role in shaping tax evasion dynamics, and so it would be reasonable to expect a negative effect of an increasing level of democracy on tax evasion rates. Nonetheless, Richardson (2006) finds no significant effect of democracy of the polity on tax evasion rates. Andersen *et al.* (2017) show also that in autocratic countries the political elites are more likely to either seize oil rents which should belong to the public finances or evade taxes on (owed) oil rents through offshore transfers. This, clearly, is another (even though quite specific) channel through which the level of democracy can affect tax evasion.

Concerning specifically the legal variables, some of them that have been previously studied by researchers are the level of development of the economic and fiscal sectors of the legal system, and the type (of origin) of legal system (i.e. common law or civil law). The first potential determinant seem to have a positive effect on tax compliance rates (Riahi-Belkaoui, 2004; Richardson, 2008; however, Richardson, 2006, finds no significant effect[22]) while, for what concerns a country's legal system, common law countries seem to show greater tax compliance rates than civil law ones (Picur *et al.*, 2006)[23].

Cultural and Behavioural determinants   This category includes all the variables that describe the socio-cultural situation of a country and the relationship between the citizens and the sociopolitical, administrative, and legal framework they act in. Different studies have found significant effects on tax evasion rates of *tax morale* (Richardson, 2006), of some of Hofstede's cultural dimensions (Hofstede, 1984)[24], and religion (Richardson, 2008).

Demographic determinants   They mainly consist in gender, age, education, and income level of the population. Considering the first two variables and the last one, they are not relevant determinants on the aggregate level[25]. The average level of education of the population, on the other hand, could have a significant positive role in increasing tax compliance rates (Jackson & Milliron, 1986; Richardson, 2006). Another potential determinant of tax evasion is the share of population that is employed in the services sector. This variable has been shown to remarkably decrease tax evasion rates, mostly because of the higher controls to which those typologies of workers are subject to, and in particular due to direct withholding of dependent workers salaries (Richardson, 2006; Kleven *et al.*, 2011). To conclude, Richardson (2006) claims that there are no systematic differences between world regions in tax evasion rates.

Before concluding this *excursus* on tax evasion determinants, however, it is worth to re-express a *caveat* on the role of tax evasion determinants in this analysis and to mention some remarkable limitations that research in this field faces. Firstly, I want to stress once more on the fact that tax evasion differs from offshore wealth in various elements, of which the most important is probably its distribution among the population. While tax evasion can be a quite spread phenomenon, that can involve different sectors of the population, offshore wealth accumulation has been proven to

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[22]There are in general various inconsistencies among the different studies, which can be due to a set of reasons that I will present at the end of this subsection.

[23]This result is actually difficult to explain. Moreover, as I will explain in **Section 4**, I do expect the opposite to be true in the case of offshore wealth accumulation.

[24]In particular, individualism, power distance and uncertainty avoidance (Tsakumis *et al.*, 2007; Richardson, 2008).

[25]The income levels of the different percentiles of the population, however, are relevant in determining the level of inequality of a country, which has already been mentioned as a possible determinant of both offshore wealth accumulation and tax evasion.

be mostly perpetuated by the top-richest portion of the individuals of a country[26]. This necessarily leads to potential differences between the determinants of the two phenomena. Therefore, it is again important to keep in mind that this *excursus* on the determinants of tax evasion was essential to gather insights on possible variables which could affect offshore wealth accumulation, but it does not necessarily provide definitive or decisive information.

Concluding with the aforementioned limitations, first of all, due to the intrinsic illegal nature of the studied phenomenon, data about tax evasion and tax compliance are rare, and mostly obtained either through surveys (microeconomic approach) or national accounts computations[27] (macroeconomic approach). The first approach clearly suffers from the usual weaknesses of survey data, enhanced by the fact that agents usually have behavioural incentives to lie in this kind of surveys (i.e. guilt aversion, shame, fear of being detected, etc.). For what concerns the second one, it needs theoretical and structural hypotheses to be implemented, which are actually difficult to generate in a such a way that they remain valid for all the countries in the sample, and it gives no clues on the distribution of tax evasion (or offshore wealth) over the population. One possible strength of my analysis is that it exploits data from Alstadsæter *et al.* (2018), who used a novel (both in the process and in the primary sources of data) method which is actually a combination of micro-based information (not based on surveys but on institutional official data) and macro-oriented data management. Such data partially get rid of the main issues I presented here thanks to the official nature of the source and to the (relatively) few hypotheses they require in their management process (even though, as already mentioned, some critical hypotheses are still present in the estimation procedures).

Another problematic characteristic of cross-country analyses of tax evasion (but it also applies to offshore wealth accumulation studies), is that usually the results are not particularly robust. Little changes in the sample can lead to radical reversals of puzzling situations in the results, and the inclusion of a country in the analysis can potentially change the outcomes of the study in a way that makes incomparable the different researches. This problem is mostly due to the size of the samples used in these analyses, and probably also to the fact that some countries do have a role of outliers in the average world characteristics (for instance, oil rich countries, ex-colonies, tax havens themselves, very large or highly populated countries, etc.). However, the sample size of the dataset I am using is actually among the largest possibly obtainable in cross-country analyses, so we can expect an acceptable level of robustness in the results.

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[26]See the previous paragraph on **Offshore Wealth** for more information on this.

[27]Examples of such methods are the MIMIC (i.e. Multiple Indicators Multiple Causes) method used by Schneider (2010) for estimating the dimension of countries' shadow economies, or the *net errors and omissions* method that is usually exploited to assess countries' offshore wealth (Johannesen *et al.*, 2016).

3 Potential Reasons for Offshore Wealth Accumulation

Let us now consider the main possible objectives that push an economic agent to direct part of her wealth in offshore centres. They can, approximately, be traced back to three main reasons: tax evasion (or avoidance), security, or (legal) financial gains. Let us now briefly consider each of them, and then we will include them in a very basic utility maximisation problem.

Tax evasion (/avoidance) aim This first target is very well-known and it is widely discussed in the literature[28]. Tax evasion (or avoidance) is actually the reason why tax havens are born. Even since VI century B.C., Greek small islands and cities like Kaunos (nowadays its ruins are situated in Turkey) used very low or null taxation to attract capital (in that case, goods that merchants used to hide there to avoid taxation in Athens) and to flourish (Fawcett, 2006). Since then, the basic strategy has not substantially changed. Tax havens offer a combination of secrecy and a wide selection of legal and financial instruments (such as trusts, foundations, and the already mentioned fiduciary deposits) that enable the investors to simultaneously keep the control (and the availability) of their funds and "protect" them from taxes and/or legal actions. Under an agent's utility maximisation perspective, the agent must face some (transaction and services) costs, in addition to the expected costs of being detected while evading the taxes, not to bare the opportunity cost that comes with paying the full amount of due taxes.

Safety net aim Due to their secrecy and, in particular when it comes to Switzerland, financial stability, tax havens are likely to attract also capital from individuals whose objective is to store part to their wealth in a secure account which cannot be traced back to them and from which they can draw back the stored wealth in cases of need or emergency. This is very likely to be a motivation for individuals who live in countries or regions where either the political or economic situation is rather uncertain and this uncertainty does not affect only the general environment of the country, but also their personal status. Typical examples of this category of individuals are autocrats, oligarchs, dictators, military elites of non-democratic countries, and other individuals who can amass great amounts of wealth but that are likely to lose everything in case of changes in the national polity. Such individuals do need a "safe harbour" where to hold "safety-net" wealth that their eventual opponents cannot detect, trace back to them and, as a consequence, impair. Under a purely economic perspective, those agents face transaction costs and, in case such wealth is subject to taxation[29], expected detection costs in order not to be subject to the country- (or region-) specific probability of losing their wealth[30].

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[28]Please, refer to **Tax evasion determinants** in **Section 2** for other references to the topic.

[29]This premise is necessary since some countries have null (or quasi-null) taxation. Such countries are, for instance, most of the Arab Peninsula countries (i.e. UAE, Qatar, Kuwait, etc.).

[30]Such probability depends, for instance, on the sociopolitical stability of the country, the level of democracy, the strength of the legal system, etc.

(Legal) financial gains aim   This last potential motivation for offshore wealth accumulation is actually the least intuitive, and probably also the least spread. However, Alstadsæter, Johannesen and Zucman (2018) suggest that some tax havens could exploit their extremely developed financial system to offer financial instrument that have a higher gains/risk ratio. In this case, investors could choose to store their wealth there in order to simply maximise their expected gains. This, under a purely economic perspective, is a classic choice of international money allocation between different financial instruments. However, to be part of this category, the wealth that is stored in offshore centres should be legally detained there, and so it would be declared to the tax authorities and it would not create the typical fiscal issues related to offshore wealth. Moreover, since the data on offshore wealth I am using include information only on fiduciary deposits, which are very unlikely to be used as gains-oriented financial instruments, I will not analyse this kind of motivation. However, I considered relevant to stress the fact that tax havens could also compete on the financial international market through the "classic" channels and that, as a consequence, part of the wealth stored there could had been legally declared to the authorities before being directed offshore.

We can now combine the first two potential motivations (and, implicitly, also the third one) into a very stylised maximisation problem, in which the agent must choose how much of her wealth she will hold in tax havens, and how much she will simply keep in her country of residence (or invest in the international financial market) and declare to the authority.

Let us consider a fixed amount of wealth $\omega = \bar{\omega}$, which can be either stored in an offshore centre and not be declared to tax authority $\hat{\omega}_o$ or declared and kept in the visible financial circuit ω_k. Let us also assume that the classic assumptions of the *homo oeconomicus* hold[31], and that agent's country of residence is characterised by an *uncertainty parameter* $\theta \in [0;1]$, which coincides with the probability that the agent will lose all the money declared to the authority due to some exogenous change in the structure of the country. Let also τ and τ_d be, respectively, the marginal tax rate applied to declared wealth and the marginal tax rate that the tax authorities charge on detected undeclared offshore wealth (both of them being constant), p_d be the probability of being detected by the tax authority of not declaring offshore wealth, c_t be the marginal transaction cost (which, in this simple framework, includes also the general costs of service charged by the offshore centre), and r be the rate of return which the agent can obtain by declaring and legally investing her wealth[32]. Let us also take some additional assumptions:

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[31]In this case, the needed assumptions are that the agent is perfectly rational, there is full information, and her utility function is concave and strictly increasing in her total wealth.

[32]The interest rate variable needs a brief clarification. Since this simple model has not been constructed to obtain punctual results, but intuitive "directions" of the effects of the different variables, I decided not to include an interest rate variable for the undeclared offshore wealth. This choice is motivated by the fact that the undeclared offshore wealth in this model is related only to the first two reasons for offshore wealth accumulation, which are independent from the interest rates charged for secret fiduciary deposits. Moreover, we can (quite safely) make the assumption that the international financial market can offer interest rates at least as high as the ones granted by

A1. Agent's wealth can either be stored in the tax haven without declaration to the tax authority or be kept visible in the international financial market and declared. This translates into:

$$\bar{\omega} = \hat{\omega}_o + \omega_k, \text{ with } \bar{\omega}, \ \hat{\omega}_o, \ \omega_k \geq 0 \tag{1}$$

A2. The agent must declare at least a certain amount of wealth, both for budget constraint reasons and for credibility[33]. This translates into:

$$\omega_k \geq \alpha\bar{\omega}, \text{ with } \alpha \in (0; 1] \tag{2}$$

A3. The marginal tax rate of detected undeclared offshore wealth will include a fee, so the following relation will be true:

$$0 \leq \tau < \tau_d \leq 1 \tag{3}$$

A4. The probability of being detected depends linearly on the amount of undeclared offshore wealth[34]. This translates into:

$$p_d = \delta \cdot \hat{\omega}_o, \text{ with } \delta \in [0; 1] \tag{4}$$

where δ is what we will call *detection sensitivity*.

A5. The expected marginal tax rate of detected undeclared offshore wealth is

$$\mathbb{E}\,\tau_d = p_d \cdot \tau_d = \delta \cdot \hat{\omega}_o \cdot \tau_d \tag{5}$$

A6. The expected value of declared wealth, once considering the country-specific uncertainty parameter, is

$$\mathbb{E}\,\omega_k = \omega_k \cdot (1 - \theta) \tag{6}$$

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fiduciary deposits, since it does include instruments that are typically more gains-oriented than deposits.

[33]In this simple framework, the agent must declare at least a portion of her wealth in order for her both to achieve the level of consumption she prefers and not to arouse suspicions about her fiscal status.

[34]The fact that the probability of detection is increasing in the amount of undeclared offshore wealth is reasonable, even though the specific kind of relationship is likely to be complex and extremely context-dependent. I chose the linear relationship so to make the model the easiest possible and to obtain simple closed results.

Considering all the assumptions, the actual maximisation problem can be written down as the following:

$$\max_{\hat{\omega}_o, \omega_k} \quad \hat{\omega}_o \cdot (1 - c_t - \mathbb{E}\,\tau_d) + \mathbb{E}\,\omega_k \cdot (1 - \tau + r)$$

$$\text{s.t.} \quad \bar{\omega} = \hat{\omega}_o + \omega_k \tag{7}$$

$$\omega_k \geq \alpha\bar{\omega}$$

$$\hat{\omega}_o^* \geq 0$$

As it can be seen, equations (1) and (2) work also as constraints for the problem. The solution to this maximisation problem is:

$$\begin{cases} \hat{\omega}_o^* = 0 & \text{if } \frac{\theta - c_t + (1-\theta)(\tau - r)}{2 \cdot \delta \cdot \tau_d} < 0 \\ \hat{\omega}_o^* = \frac{\theta - c_t + (1-\theta)(\tau - r)}{2 \cdot \delta \cdot \tau_d} & \text{if } 0 \leq \frac{\theta - c_t + (1-\theta)(\tau - r)}{2 \cdot \delta \cdot \tau_d} \leq (1-\alpha) \cdot \bar{\omega} \\ \hat{\omega}_o^* = (1-\alpha) \cdot \bar{\omega} & \text{if } \frac{\theta - c_t + (1-\theta)(\tau - r)}{2 \cdot \delta \cdot \tau_d} > (1-\alpha) \cdot \bar{\omega} \end{cases} \tag{8}$$

Before considering the static analysis, a brief explanation of the results is useful. If the optimal amount of offshore wealth $(\hat{\omega}_o^*)$ is such that the optimal declared amount of wealth (ω_k^*) is non-negative and greater or equal than the minimum acceptable amount $(\alpha\bar{\omega})$, the solution of the problem will be the actual maximum of the function (which coincides with the second case of the system). On the other hand, if the optimal amount of offshore wealth is such that the declared amount is "too low", then the inequality constraint becomes binding and the solution is a corner one (the third case of the system), in which the optimal amount of offshore undeclared wealth is exactly at the level in which the optimal declared wealth is at its minimum. Clearly, since the amount of wealth stored in a tax haven cannot be negative, if the solution to the maximisation problem is negative (the first case of the system), then the amount of wealth stored in the tax haven $(\hat{\omega}_o^*)$ will be zero and all the wealth will be declared $(\omega_k^* = \bar{\omega})$.

For the brief static analysis, let us consider only the case in which the inequality constraint is not binding[35].

Marginal costs of transactions (c_t) and rate of revenue (r) The optimal amount of offshore wealth depends negatively on such parameters. The explanation is pretty intuitive, since the higher the cost of storing the wealth offshore or the opportunity cost of not keeping it in the international official financial market, the lower such amount will be.

$$\frac{\partial \hat{\omega}_o^*}{\partial c_t} < 0 \text{ and } \frac{\partial \hat{\omega}_o^*}{\partial r} < 0 \tag{9}$$

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[35]We can do so since we are focusing on the variation of the level of offshore wealth accumulation depending on the model parameters when there is the actual possibility of choice, so when the constraints do not become either upward or downward binding.

Marginal tax rates (τ and τ_d) and detection sensitivity (δ) These are the parameters related to the **tax evasion aim**, since they are the ones that measure the (certain or expected) fiscal costs related to either declaring or not the wealth. The legal marginal tax rate has a positive effect on undeclared offshore wealth, since it increases the costs of declaring, while the marginal tax rate charged on undeclared wealth and the detection sensitivity have a negative effect on $\hat{\omega}_o^*$, since they increase its expected cost.

$$\frac{\partial \hat{\omega}_o^*}{\partial \tau} > 0 \tag{10}$$

$$\frac{\partial \hat{\omega}_o^*}{\partial \tau_d} < 0 \text{ and } \frac{\partial \hat{\omega}_o^*}{\partial \delta} < 0 \tag{11}$$

Country-specific uncertainty parameter (θ) This parameter concerns the **safety net aim**. Indeed, a higher degree of uncertainty (i.e. a greater probability of losing all the declared wealth) will increase the amount of wealth that the agent holds in the tax haven without declaring it.

$$\frac{\partial \hat{\omega}_o^*}{\partial \theta} = \frac{1 - \tau + r}{2 \cdot \delta \cdot \tau_d} > 0, \forall \tau \in [0; 1) \tag{12}$$

Now that we have briefly described the possible motivations for holding part of the owned wealth offshore, we can analyse whether differences in parameters between different countries could, through these channels, explain the aforementioned variability in countries' offshore wealth accumulation dynamics. In this work, we will focus on two of the elements presented in this theoretical framework, which will capture the effects of the first two motivations of offshore wealth accumulation. The first parameter we will focus on is the marginal tax rate for on declared wealth (τ), which captures the effect of the **tax evasion aim**. The other element we will analyse is the country-specific uncertainty parameter (θ), which points out the effect of the **safety net aim**. In the next section, I will formalise testable hypotheses on the two just-mentioned parameters and I will present the data I use in the analysis.

4   Data & Research Hypothesis

The variable of interest of this analysis is the share of offshore wealth over GDP (%) that a country owns in tax havens. As already anticipated, the data I use have been collected, constructed and processed by Alstadsæter, Johannesen & Zucman (2018). They cover 137 countries, heterogeneous in all their characteristics, and they refer specifically to offshore fiduciary bank deposits[36]. The values range from 0.20% to 73.10%, once having excluded from the sample Jordan, which is characterised by an estimated offshore wealth share of 211% and, indeed, represents an outlier

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[36]See **Section 2** for a brief *excursus* on this.

in the data. Since the analysis is composed by a set of linear regressions (OLS), the distribution of the variable of interest should be Gaussian. This is not, however, the case, since the offshore wealth shares are highly concentrated between 0% and 20% and then the distribution has a long right-tale. For this reason, I use as variable of interest the logarithm of the share of offshore wealth ($y = \log[\text{offshorewealth} + 1]$) so to obtain a distribution that is normal-shaped (Figure 4).
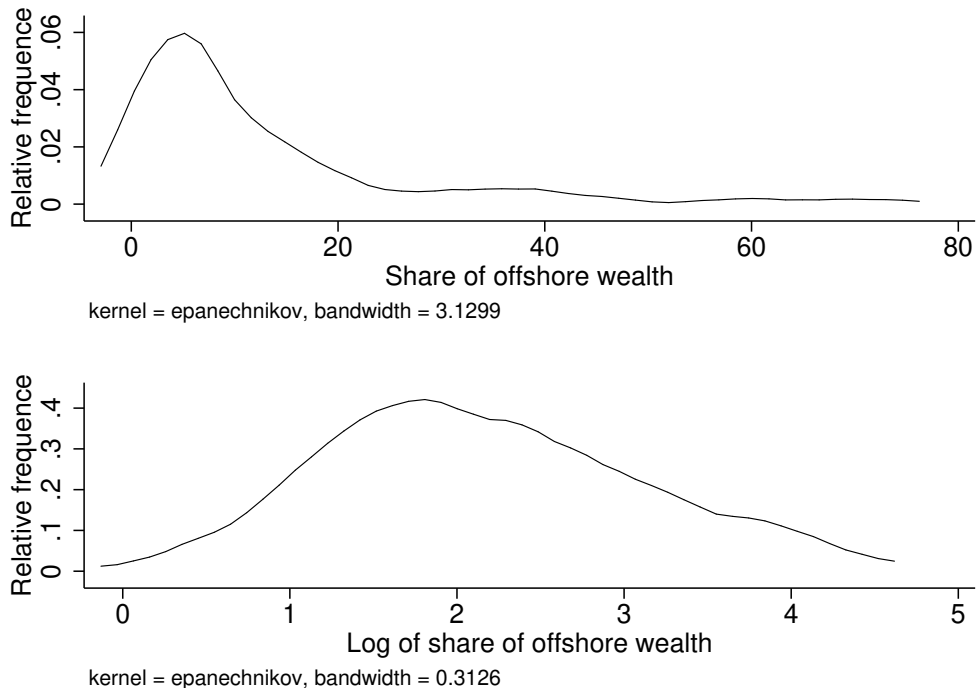
Figure 4: Density functions of share of offshore wealth and of its logarithm

Concerning the marginal tax rates, the theoretically optimal variable to use in the analysis would be the top marginal tax rate on personal wealth. However, not all countries have a wealth taxation, and most of them use, in addition to income and property taxes, indirect methods to tax wealth (taxes on capital gains, dividends, real estates, etc.). Because of this heterogeneity and complexity of the tax systems and of the consequent difficulties in obtaining data on the different tax rates for such a large sample of countries, I will use the *Fiscal Freedom Index* constructed by the Heritage Foundation[37] as a proxy for country's taxation variable. This index reflects marginal tax rates on both personal and corporate income and the overall level of taxation (including direct and indirect taxes imposed by all levels of government) as a percentage of gross domestic product (GDP) and it ranges from 0 to 100. This comprehensive measure is even more likely to capture the effect of

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[37]This index is a sub-index of the general Economic Freedom Index that the Heritage Foundation constructs each year for approximately 180 countries (depending on the specific year).

tax evasion aim in offshore wealth accumulation dynamics than a single measure of top marginal tax rates in the non-stylised real world, since it does provide more information about the overall burden that taxation causes on agents in a country.

The country-specific uncertainty parameter is a theoretical element that consists in the probability that the agent faces of losing all the declared wealth due to country-related exogenous events. Since there is no corresponding empirical data to this theoretical concept, I use country's sociopolitical stability as a proxy for its uncertainty parameter. Indeed, in this stylised framework, greater levels of sociopolitical stability coincide with lower levels of country-specific uncertainty. Luckily, large consultancy agencies, risk-analysis companies and international organisations do construct indexes which describe the sociopolitical situation of a country. I therefore decided to use the *Political Stability And Absence Of Violence/Terrorism Index*, constructed by the World Bank (WB)[38] as a measure of the sociopolitical instability of a country. It measures the perceived (un)likelihood of occurrence of events of political instability and/or politically-motivated violence, including terrorism, and it ranges from -2.5 to 2.5 (with higher values indicating lower probability of instability or violence).

Therefore, keeping in mind the obtained theoretical results, the two hypotheses I am actually testing in this work are:

H1. A greater level of country's sociopolitical stability is associated to a lower share of offshore wealth over GDP [through the channel of the **safety net aim**].

H2. A greater level of country's fiscal freedom is associated to a lower share of offshore wealth over GDP [through the channel of the **tax evasion aim**].

In addition to these two hypotheses, however, I will also analyse some additional elements which either could directly have an effect on the parameters of the model or could contribute indirectly to build a favourable or unfavourable context for offshore wealth accumulation. The transaction costs, for instance, are very likely to be affected by the level of financial openness of a country and by the level of harmonisation that exists between a country's legal system and the one of the recipient tax haven. A decrease in the financial openness of a country, for instance, could increase the transaction costs (either by increasing the actual money needed to move the wealth offshore or by requiring higher financial and legal expertise), with the possibility of even making them rise to an "infinite" value (i.e. making the transaction impossible). To assess this, I use the *Normalised Chinn-Ito Financial Openness Index* (Chinn & Ito, 2008), which ranges from 0 to 1 (with higher

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[38]Such index is part of the set of indexes called Worldwide Governance Indicators which the World Bank constructs every two year.

values indicating greater openness) and it is based on restrictions on cross-border financial transactions reported in the IMF's Annual Report on Exchange Arrangements and Exchange Restrictions (AREAER). The typology of the legal system, on the other hand, could decrease the transaction costs by increasing the similarities and the synergies between the financial and legal institutions of the two countries. In particular, since most of the 21 tax havens included in the data I am using are characterised by a common law system[39], it is reasonable to expect that countries ruled by such type of legal system could be more prone to offshore wealth accumulation[40]. However, it is relevant to keep in mind that the result of the analysis about this potential determinant is rather uncertain, since Switzerland, that as already mentioned in **Section 2** attracts a large share of offshore wealth, has a civil law legal system. To measure the possible effect of the legal system on offshore wealth accumulation, I use a binary variable based on the study by La Porta *et al.* (1999; 2008).

Finally, I add to the analysis two variables that have been indicated in the previous literature as potential determinants of offshore wealth accumulation. The first one is the share of oil rents over country's GDP. As described in **Section 2**, Andersen *et al.* (2017) find that an exogenous increase in oil rents can potentially cause a proportional increase in the share of GDP held offshore by a country. However, this result is dependent on the level of democracy of the considered country. It is in fact valid in autocratic countries, while in democratic countries higher oil rents does not translate into larger offshore wealth. To assess this, I use an interaction variable that combines data on the share of oil rents over GDP of a country and its level of democracy. In particular, data on oil rents are obtained from the World Bank, and successively transformed through the logarithm[41] ($x = \log[\text{oilrents} + 1]$), while for the democracy variable I use the *Polity Index IV* constructed by the Center for Systemic Peace (CSP)/Integrated Network for Societal Conflict Research (INSCR), which is the same that is used by Andersen *et al.* (2017). I use a modified version of the index, which ranges from -10 to 10, with higher values indicating a more autocratic (or less democratic) countries. The second "literature variable" I use is the level of inequality of a country. I have indeed already described the findings by Alstadsæter, Johannesen & Zucman

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[39]The offshore centres with a common law system are Cayman Islands, Hong Kong, USA (Delaware and Nevada), Singapore, Malaysia, Bahrain, Bahamas, Bermuda, Cyprus, Guernsey, Jersey, Isle of Man, and UK (part of). The ones with a civil law legislation are Switzerland, Panama, Macao, Netherlands Antilles, Luxembourg, Austria (part of), Belgium (part of).

[40]As mentioned in **Section 2**, Picur *et al.* (2006) find a negative effect of the status of common law legal system on tax evasion. However, such result does not consider offshore evasion.

[41]I decided to take this transformation of this variable since its density function shows a large concentration of low values and then an almost-uniform section characterised by large (and very large) values. Thanks to the logarithm, the highest values that are not outliers but form a sort of a "oil countries cluster" are mitigated in the regression, so that they do not excessively influence the results (even though they are still taken into consideration). The transformation, therefore, is to be considered as a sort of "weighting procedure" to better adapt the variable to the linear nature of the analysis.

(2018) about the fact that the very most of offshore wealth is owned by top-income (or top-wealth) percentiles of population. Since gathering information about top shares inequality for such a large sample is very difficult, I decided to use the *Gini Index* estimates constructed by the World Bank as a proxy for the top-share concentration. Moreover, due to the same reasons as for the oil rents variable, in the analysis I use the logarithmic transformation of the Gini Index as a regressor.

We can now include these additional information into the list of hypothesis I will test in this work. The first two are the main hypothesis, while the following ones could be considered as "sub-hypothesis":

H1. A greater level of country's sociopolitical stability is associated to a lower share of offshore wealth over GDP [through the channel of the **safety net aim**].

H2. A greater level of country's fiscal freedom is associated to a lower share of offshore wealth over GDP [through the channel of the **tax evasion aim**].

h1. Lower levels of transaction costs (c_t) for a country, proxied by country's financial openness and legal system, are associated to a larger share of offshore wealth over GDP.

h2. For a country, simultaneous greater level of the share of oil rents over a country's GDP and lower level of democracy are associated to a larger share of offshore wealth over GDP.

h3. A greater level of a country's general income inequality is associated to a larger share of offshore wealth over GDP.

Two caveats about the data I use in this work are necessary. Since the variable of interest is a stock variable, the lags of the potential determinants are very likely to have an influence on it. Indeed, the fiscal freedom or the level of instability of the previous years could have had an effect on the stock of offshore wealth in the year 2007, since they could have caused previous transfers of wealth in tax havens. For this reason, I decided to use five-years averaged values of the variables instead of punctual values. Therefore, the share of oil rents over GDP, the Polity Index, the Political Stability and Absence of Violence Index, the Chinn-Ito Index, and the Fiscal Freedom Index are all averaged over the period 2003-2007. Moreover, since the Gini Index had a relevant number of missing values for the period 2003-2007, I used its averaged value over the period 2001-2010, and then I also included observations from different sources and years for the remaining missing values[42]. Through this procedure, I was able to collect data on this variable

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[42]The list of the countries for which I had to use a different source or different years is the following: Equatorial Guinea (2017 - WIID) , Turkmenistan (1998 - WB), Cambodia (2013 - UNDP Human Development Reports), Algeria (2011 - WB), Haiti (2012 - WB), Suriname (1999 - WB), Zimbabwe (2017 - WB), Libya (2007 - WIID), New Zealand (2017 - OECD Income Distribution Database), Serbia (2012 - WB), Eritrea (2007 - WIID), Trinidad and Tobago (1992 - WB), Qatar (2007 - Alvaredo *et al.*, 2019), Oman (2010 - Alvaredo *et al.*, 2019), Kuwait (2007 - Alvaredo *et al.*, 2019), Saudi Arabia (2008 - Alvaredo *et al.*, 2019), UAE (2009 - Alvaredo *et al.*, 2019)

for all the countries in the sample (with the exception of Cuba). Clearly, this strategy could actually cause some measurement errors, so for these data to be acceptable, in particular since they include also values that are ahead in time with respect to the year I am analysing, I must make two strong assumptions. The first, and easier to demonstrate, one is that the level of inequality in every country has not radically changed through the considered years (at least not in ways that are systematically different across countries). While this assumption is pretty strong, the correlation coefficient between the punctual variable and the averaged one is 0.9888 and the t-test on the equality of the two different values (i.e. $H_0 : x_t = mean(x_t)$) gives a p-value of 0.2027, which makes it impossible to reject the equality hypothesis. The second assumption is that the methodology of computation of the Gini index was the same across the different sources used. Since these latter are all institutional (World Bank, World Income Inequality Database, United Nations Development Programme, OECD Income Distribution Database) or academic (Alvaredo *et al.*, 2019, which is naturally linked to the WIID since Prof. Thomas Piketty is one of the co-authors of the paper and he is also the co-director of WIID) sources, I would consider this assumption to be reasonable. However, it is still important to keep in mind this fact when analysing the results, in particular in the case of any inconsistency in their structure. Finally, also for all the other averaged variables I checked the correlation coefficients with the punctual variables and I ran the t-tests. For all the variables except for the Fiscal Freedom Index, the correlation coefficients are above 0.95% and the t-tests fail to reject the identity hypothesis. For what concerns the fiscal freedom variable, the averaged one is slightly higher than the punctual one, and this difference is highly statistically significant. The correlation coefficient, however, is 0.944 and the overall results suggest that, even if the assumption of "accumulation" that justifies the averaging procedure was false, the use of averaged data should not cause relevant measurement errors.

Table 1 summarises the variable and related data of the whole available constructed dataset. As it can be seen, some of the variables lack information on a few countries. For this reason, I decided to drop the observations on such countries, in order to have a balanced sample in which each variable describes the whole set of countries. Before doing so, however, I checked that the 7 countries that were going to be excluded did not have offshore wealth accumulation characteristics that significantly differ from the resulting sample. Indeed, I used the Wilcoxon rank-sum test (Wilcoxon, 1945) to check that the excluded countries and the ones kept in the sample had the same distribution of offshore wealth shares, and the test failed to reject the null hypothesis (i.e. the equality hypothesis) with p-value equal to 0.11[43]. Therefore, I dropped the countries that lacked information on one or more variables, and the final size of the sample used in the analysis

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[43]Moreover, even if the test is not extremely accurate due to the small size of the excluded sample, such size is exactly the reason why the exclusion should not cause relevant issues to the analysis.

decreased to 129 observations[44]. The final characteristics of the variables used in the analysis can be found in Table 2.

Table 1: Total Sample Summary Statistics

	count	mean	sd	min	max
Offshore wealth over GDP (2007)	136	12.19	14.496	0.20	73.10
Logarithm of offshore wealth over GDP (plus 1)	136	2.13	0.930	0.18	4.31
Political stability/Absence of violence (average 2003-07)	136	-0.21	0.905	-2.20	1.58
Fiscal Freedom (average 2003-07)	131	72.56	12.953	32.36	99.90
C.I. Index of Financial Openness (average 2003-07)	134	0.52	0.370	0.00	1.00
Dummy =1 if legal system is Common Law	136	0.25	0.435	0.00	1.00
Oil rents over GDP (average 2003-07)	136	6.07	12.661	0.00	58.93
Logarithm of oil rents over GDP (average 2003-07) (plus 1)	136	0.90	1.285	0.00	4.09
Polity Index (average 2003-07)	136	-3.74	6.420	-10.00	10.00
Gini Index (average 2001-10 & Other)	135	41.36	10.461	24.51	78.00
Log of Gini Index (average 2001-10 & Other)	135	3.69	0.239	3.20	4.36

Table 2: Included Sample Summary Statistics

	count	mean	sd	min	max
Offshore wealth over GDP (2007)	129	12.51	14.726	0.20	73.10
Logarithm of offshore wealth over GDP (plus 1)	129	2.16	0.918	0.18	4.31
Political stability/Absence of violence (average 2003-07)	129	-0.19	0.888	-2.08	1.58
Fiscal Freedom (average 2003-07)	129	72.69	12.865	32.36	99.90
C.I. Index of Financial Openness (average 2003-07)	129	0.53	0.371	0.00	1.00
Dummy =1 if legal system is Common Law	129	0.25	0.434	0.00	1.00
Oil rents over GDP (average 2003-07)	129	6.25	12.926	0.00	58.93
Logarithm of oil rents over GDP (average 2003-07) (plus 1)	129	0.90	1.301	0.00	4.09
Polity Index (average 2003-07)	129	-3.95	6.339	-10.00	10.00
Gini Index (average 2001-10 & Other)	129	41.24	10.575	24.51	78.00
Log of Gini Index (average 2001-10 & Other)	129	3.69	0.241	3.20	4.36

[44]The excluded countries are Bhutan, Comoros, Democratic Republic of Congo, Cuba, Eritrea, Serbia, and Sudan. They are mostly low and mid-low income countries from developing regions of the world. Their average share of offshore financial wealth is 6.2%, and it is lower than the final sample average (which is 12.51%).

Now that the variables and the related data are described, let us move to the econometric analysis and to the results of the investigation.

5   Econometric Approach & Results

The structure of this section is the following. First of all, I will present the results of some simple tests that I used to assess whether there was the necessity to include binary variables for some specific categories of countries (i.e. Gulf countries and the different income groups). After that, I will notice to the reader a potential issue of the analysis, that is multicollinearity, which however will be ruled out in the results. Then I will go through the econometric design, which will consist in a set of sequential regressions. Finally, I will present the results and briefly comment them.

As anticipated in the **Introduction**, Arab Gulf countries seem to form a distinct cluster of countries when it comes to offshore financial wealth accumulation dynamics. Indeed, their average share of wealth held in tax havens is 42.16% (sd=11.02), which is almost four times the average of the other countries, and both a t-test (modified to allow for unequal variances) and the Wicoxon test reject the null hypothesis (i.e. respectively the hypothesis of equality of means and of distributions) at levels of significance 0.05 and 0.01. Moreover, they have peculiar characteristics also when it comes to the explanatory variables. They are in the top percentiles of practically every variable included in the analysis, from oil rents and Polity index to fiscal freedom and Gini coefficient (Table 3). For these reasons, I decided to include a binary variable for the Gulf countries, so that I could both capture their peculiarity and partially polish the data from the distortions resulting from their extreme values. The countries included in the Arab Gulf cluster are Qatar, Kuwait, Saudi Arabia, Oman, and United Arab Emirates. Bahrain is excluded from the analysis because it is one of the considered tax havens.

Concerning additional cluster-effects that could be relevant to address in this analysis, I checked whether different income groups show different means or distributions of offshore wealth shares. There is in fact the possibility that, for instance, high income countries show different offshore financial wealth accumulation dynamics with respect to low income ones. However, both a t- and a Wicoxon tests fail to reject the null (i.e. the equivalence) hypotheses on means and distributions, with p-values always greater than 0.2[45]. Moreover, the sub-samples sizes are large enough for these results to be reasonably reliable. For what concerns other potential clusters and aggregations of countries, I will briefly introduce them in the **Conclusions**, leaving their analysis for future research.

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[45]This result was already graphically suggested in the **Introduction** by Figure 2

Table 3: Gulf Countries Cluster Summary Statistics

	count	mean	sd	min	max
Offshore wealth over GDP (2007)	5	42.16	24.641	9.40	73.10
Logarithm of offshore wealth over GDP (plus 1)	5	3.57	0.770	2.34	4.31
Political stability/Absence of violence (average 2003-07)	5	0.59	0.588	-0.35	1.04
Fiscal Freedom (average 2003-07)	5	98.50	2.075	94.92	99.90
C.I. Index of Financial Openness (average 2003-07)	5	0.88	0.165	0.70	1.00
Dummy =1 if legal system is Common Law	5	0.40	0.548	0.00	1.00
Oil rents over GDP (average 2003-07)	5	38.20	10.926	22.00	49.59
Logarithm of oil rents over GDP (average 2003-07) (plus 1)	5	3.63	0.313	3.14	3.92
Polity Index (average 2003-07)	5	8.60	1.342	7.00	10.00
Gini Index (average 2001-10 & Other)	5	71.20	4.970	65.00	78.00
Log of Gini Index (average 2001-10 & Other)	5	4.26	0.070	4.17	4.36

Let us now come to the potential issue of this econometric analysis. Table 4 shows the pairwise correlation coefficients for the explanatory variables. As it can be seen, most of them are (statistically significantly) different from zero, and some of them are large in absolute value. However, most of such correlations are linked to the presence of the Gulf countries in the sample, and this is actually the reason why including the Gulf countries dummy should help to manage the related potential distortions. In any case, as Table 5 shows, some correlation coefficients (in particular the ones related to the sociopolitical stability of the country, its Gini index, and its financial openness) are still quite large and significant also when excluding the Gulf countries from the sample. Even though such correlations are not extremely high, there is then still the risk of multicollinearity in the case in which, for instance, the sociopolitical stability level of a country describes "too accurately" also its fiscal freedom or financial openness levels. To partially address this potential issue, I will perform the regression analysis following a sequential structure, including explanatory variables not all together but progressively into the main regression equation. In this way, I will be able to assess whether there are radical changes in the results (either in the magnitude, the sign or the significance levels of the coefficients) once including an (or some) additional variable(s). Moreover, once obtained the empirical results, I will also check whether the VIFs (Variance Inflation Factors) are particularly high or they are low enough to rule out the multicollinearity case.

Table 4: Pairwise Correlation Coefficients of Regressors

	Sociopol. Stab.	Fisc. Freed.	Gulf	Financ. Open.	Common L.	Oil×Pol.	Gini
Sociopolitical Stability	1						
Fiscal Freedom	-0.282**	1					
Gulf country	0.177*	0.404***	1				
Financial Openness	0.439***	-0.0785	0.188*	1			
Common Law	-0.0663	0.0724	0.0706	-0.00294	1		
Oil Rents × Polity	0.00506	0.243**	0.596***	-0.105	-0.114	1	
Logarithm of Gini Index	-0.152	0.444***	0.479***	-0.135	0.184*	0.380***	1

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Table 5: Pairwise Correlation Coefficients of Regressors − No Gulf countries

	Sociopol. Stab.	Fisc. Freed.	Financ. Open.	Common L.	Oil×Pol.	Gini
Sociopolitical Stability	1					
Fiscal Freedom	-0.394***	1				
Financial Openness	0.416***	-0.171	1			
Common Law	-0.0695	0.0459	-0.0139	1		
Oil Rents × Polity	-0.112	0.00240	-0.269**	-0.193*	1	
Logarithm of Gini Index	-0.273**	0.313***	-0.258**	0.184*	0.128	1

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Let us now briefly describe the sequential regressions design. It follows the structure of the hypotheses that I presented in **Section 4** and that I am going to test. In the first regression (**REG12**), I will check the main two hypotheses (**H1** and **H2**) of the analysis, also allowing for a specific intercept for Gulf countries. Then I will add to the first regression the variables that I use to check whether transaction costs have a potential relevance in determining countries' offshore financial wealth accumulation dynamics (**h1**), obtaining the second regression, namely **REG12$_1$**. Finally, I add the literature-related variables to check whether the last two sub-hypothesis (**h2** and **h3**) are supported by the results of this framework. The last regression, namely **REG12$_{123}$**, will clearly be the most comprehensive one. Here you can find the actual econometric design:

$$\textbf{REG12}: \ \log(\text{offshorewealth}) = \beta_0 + \beta_1 \text{sociopolstabil} + \beta_2 \text{fiscalfreedom} + \beta_3 \text{gulf} + \varepsilon \qquad (13)$$

$$\textbf{REG12}_1: \ \log(\text{offshorewealth}) = \beta_0 + \beta_1 \text{sociopolstabil} + \beta_2 \text{fiscalfreedom} + \beta_3 \text{gulf}$$
$$+ \beta_4 \text{financialopen} + \beta_5 \text{commonlaw} + \varepsilon \qquad (14)$$

$$\textbf{REG12}_{123}: \ \log(\text{offshorewealth}) = \beta_0 + \beta_1 \text{sociopolstabil} + \beta_2 \text{fiscalfreedom} + \beta_3 \text{gulf}$$
$$+ \beta_4 \text{financialopen} + \beta_5 \text{commonlaw}$$
$$+ \beta_6 [\log(\text{oilrent}) \times \text{polity}] + \beta_7 \log(\text{gini}) + \varepsilon \qquad (15)$$

where *offshorewealth* is the share of offshore wealth over GDP (plus 1 in the logarithm), *sociopolstabil* is the Political Stability and Absence of Violence Index, *fiscalfreedom* is the Fiscal Freedom Index, *gulf* is the dummy variable for the Arab Gulf countries (=1 if belonging to the Gulf countries), *financialopen* is the Chinn-Ito Index of financial openness, *commonlaw* is the dummy variable for the legal system (=1 if common law), *oilrent* is the share of oil rents over GDP (plus 1 in the logarithm), *polity* is the modified Polity Index IV, and *gini* is the Gini Index. As anticipated, oilrent and polity are considered only in their interaction form, as suggested by the results by Andersen *et al.* (2017).

Table 6 shows the results of the sequential regressions. First of all, it is immediately evident the fact that the results seem to be very robust to the inclusion of the additional variables. Indeed, neither the dimension of the coefficients nor their signs and significance levels are remarkably affected by the passage from **REG12** to **REG12**$_1$ and **REG12**$_{123}$. Moreover, Table 7 shows the VIFS of each variable for **REG12**$_{123}$, and they are well below both the classic baseline of 10 for ruling out multicollinearity (James *et al.*, 2013) and the "stricter" one of 2.5 (Allison, 2012)[46]. We can then safely rule out the potential issue of multicollinearity and start the analysis of the results. Moreover, because of their robustness and persistence across the different specifications, I will analyse only the results from **REG12**$_{123}$, which are the most precise (also since they are less likely to be affected by omitted variable bias) and comprehensive.

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[46]It is worth to notice, however, that the coefficient of the binary variable for the Gulf countries has a VIF that is close to 2.5. However, as already stated, this result was actually imaginable since these correlations are the reason why I decided to include the Gulf variable itself.

Table 6: Sequential Regressions Results

Log of Offshore Wealth Share	REG12	REG12$_1$	REG12$_{123}$
Sociopolitical Stability	-0.302**	-0.381***	-0.356**
	(0.103)	(0.105)	(0.107)
Fiscal Freedom	-0.0162*	-0.0162*	-0.0212**
	(0.00783)	(0.00761)	(0.00757)
Gulf country	2.146***	2.004***	1.346*
	(0.393)	(0.377)	(0.591)
Financial Openness		0.494*	0.625**
		(0.217)	(0.222)
Common Law		0.187	0.105
		(0.153)	(0.158)
Log of oil rents × Polity Index			0.00125
			(0.0107)
Log of Gini Index			1.169***
			(0.332)
Constant	3.201***	2.882***	-1.090
	(0.563)	(0.582)	(1.239)
Observations	129	129	129
Adjusted R^2	0.155	0.183	0.233

Standard errors in parentheses

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Table 7: Variance Inflation Factors − REG12$_{123}$

	VIF	1/VIF
Sociopolitical Stability	1.48	0.68
Fiscal Freedom	1.50	0.67
Gulf Country (=1)	2.42	0.41
Financial Openness	1.47	0.68
Common Law (=1)	1.06	0.94
Log of Oil Rents × Polity Index	1.77	0.56
Log of Gini Index	1.57	0.64
Mean VIF	1.61	

Our main two hypotheses, namely **H1** and **H2**, seem to be supported by the results. Indeed, both the level of sociopolitical stability of a country and its level of fiscal freedom show a negative and significant coefficient. In particular, the stability variable is characterised by a coefficient that is actually highly significant, while the one of the fiscal freedom variable is less significant in the first two sequential regressions but extremely stable across the different specifications. For what concerns the transaction costs, **h1** seem to be only partially supported by the results. Indeed, while the financial openness index is, as expected, positively associated to the share of financial wealth that a country holds in tax havens, the legal system seem to be irrelevant in affecting such offshore wealth accumulation. Therefore, **h1** could be considered supported on the financial side of the transaction costs, while the legal side of the hypothesis is rejected. Higher shares of oil rents over a country's GDP (interacted with its level of democracy) do not seem to be associated to greater offshore financial wealth accumulation dynamics. **h2** seems then rejected by the empirical results. While this outcome could seem in conflict with the previous findings by Andersen *et al.* (2017), it is likely that the included dummy variable for the Arab Gulf countries has (at least partially) captured the effect of the oil rents variable. Moreover, since this is a static analysis, it is probably not able to capture the dynamic effects of exogenous shocks in oil rents that have been proven to affect offshore wealth accumulation behaviours. For what concerns **h3**, it can be considered supported by the results of this framework. Indeed, the level of income inequality of a country, measured through the Gini index, shows a positive and significant coefficient. Therefore, at greater levels of inequality in a country are likely to be associated larger shares of wealth stored in offshore centres. Finally, the binary variable for the Gulf countries is characterised by a robust and significant coefficient. This result was actually easy to imagine, for all the elements that I previously mentioned that characterise Gulf countries. However, it is worth to notice the decrease in both the dimension and the significance level that the coefficient of the binary variable shows when the last two variables are included in the analysis. This finding could probably be attributed to the fact that both the variables oil rents and Gini index are highly correlated with the status of being a Gulf country. Their inclusion is then likely to have decreased the coefficient of the Gulf dummy by correcting an (upward) omitted variable bias that was affecting it. As a confirmation of this insight, Table 8 in **Appendix A** shows the results of the regression **REG12**$_{123}$ when the Gulf countries dummy variable is not included[47].

So, to sum up the results of the analysis, in this framework:

H1 is *supported* by the results. A greater level of country's sociopolitical stability is associated to a lower share of offshore wealth over GDP.

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[47]**Appendix A** includes also a check of the robustness of the results to the exclusion of the Arab Gulf countries from the analysed sample.

H2 is *supported* by the results. A greater level of country's fiscal freedom is associated to a lower share of offshore wealth over GDP.

h1. is *partially supported* by the results. Lower levels of transaction costs (c_t), proxied by a country's level financial openness, are associated a greater share of offshore wealth over GDP. The legal system of the country, on the other hand, does not seem related its offshore accumulation dynamics.

h2. is *rejected*. For a country, simultaneous greater level of the share of oil rents over a country's GDP and lower level of democracy are not associated to a larger share of offshore wealth over GDP.

h3. is *supported* by the results. A greater level of a country's general income inequality is associated to a larger share of offshore wealth over GDP.

These results confirm the initial intuition of this work. Indeed, both the two potential motivations presented in **Section 3**, namely the **tax evasion (/avoidance) aim** and the **safety net aim**, seem to have an relevant role in inducing an economic agent to store part of her wealth in offshore centres.

6 Discussion & Conclusion

In this work, I analysed some of the elements that could potentially affect a country's dynamics of offshore financial wealth accumulation. To do so, I exploited a novel dataset constructed by Alstadsæter, Johannesen and Zucman (2018) on the shares of GDP that 137 countries hold in the most important tax havens of the world to perform a cross-country investigation of such potential determinants. The elements I chose to analyse are the level of fiscal freedom of a country, its sociopolitical stability, its financial openness, the relative dimension of its oil rents with respect to its GDP (interacted with the level of democracy of the country), and the level of income inequality by which it is characterised. Such variables were chosen because they are either related to previous literature specific analyses or they are naturally linked to two of the main motivations for an individual to hold part of her wealth offshore. These motivations are tax evasion (or avoidance) and the construction of a personal security emergency fund.

The results from the analysis suggest that both the just mentioned motivations do have a role in the offshore financial wealth accumulation dynamics of a country. Indeed, the level of socioeconomic stability of a country is negatively correlated with the share of wealth that its citizens hold in tax havens, and this is an evidence in favour of the **safety net aim**. Moreover, at greater levels of financial freedom are associated lower shares of financial offshore wealth, which is an

evidence for the **tax evasion (/avoidance) aim**. Additional elements that in this framework are significantly related to the offshore wealth accumulation behaviours of a country are its level of financial openness and the dimension of its income inequality (measured through the Gini index). The financial openness, indeed, reduces the (financial) transaction costs that an economic agent must face when storing part of her wealth offshore, and it is therefore positively associated with the actual dimension of the offshore wealth accumulation phenomena. On the other hand, a greater concentration of income (and, accordingly, of wealth) is positively associated with a country's share of wealth stored in offshore centres (as suggested by Alstadsæter *et al.*, 2019). The legal system of the country and its share of oil rents over GDP do not seem to be associated in either way to its dynamics of offshore wealth accumulation. Finally, the Arab Gulf region constitutes a peculiar cluster of countries, which are characterised by incredibly large shares of wealth stored in tax havens and by values for the other considered elements (i.e. fiscal freedom, Gini index, etc.) that should be considered as quasi-outliers among the countries of the world.

The analysis has some limitations. First of all, the Gini index variable for 17 countries was obtained by different sources (instead of the World Bank) and years (outside the interval 2001-10). The decision of gathering this additional data was related to the fact that a relevant portion of the countries that were missing information on the income inequality was actually also characterised by large shares of wealth stored in financial offshore centres (it is the case, for instance, of Gulf countries). The exclusion of such countries would have then potentially caused a sample selection bias that would had been, in my opinion, worse than the potential measurement error linked to the use of different sources (that are anyway institutional or academic). Moreover, the assumption about (systematic) stability of the Gini index[48] in the considered years (which range from 1992 for Trinidad and Tobago to 2017 for New Zealand) is (at least partially) confirmed by the correlation coefficients I computed and t-tests I performed between its punctual (i.e. for 2007) and averaged (i.e. over the period 1992-2017) values[49]. A second limitation of the analysis is that, since it is a static investigation, it cannot actually detect causality but only statistical correlation. This is however a feature of any cross-country analysis and, in this particular case, it is related to the availability of the data.

The last relevant limitation, which is more of a further research proposal, is that this study should be considered as a starting point, unfortunately far from being the conclusive work on this topic. Indeed, to my knowledge, this is one of the first comprehensive works that investigates the cross-country determinants of offshore wealth accumulation dynamics. For this reason, a great

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[48]To have the possibility to use values from years that are far from the interval 2001-10, it is indeed necessary to assume that the level of inequality remained constant along the whole range of included years (i.e. 1992-2017).

[49]Respectively, the correlation coefficient is 0.99 and the result of the t-test was the rejection of the null hypothesis with p-value of 0.19.

deal of research paths are still unexplored and, hopefully, will be addressed by future researchers. For instance, it would be very interesting to assess whether specific geopolitical relations have an effect on the share of wealth that a country holds in tax havens. Such connections (which could be either institutional or private, economic or cultural) could be partially responsible for the great deal of variability that countries with similar characteristics show in their offshore wealth accumulation dynamics. Moreover, as already mentioned, as more data on offshore wealth will become available, dynamic analyses could be performed (as the one by Andersen *et al.*, 2017) to search for causal relations in the correlations that I have detected in this work. Furthermore, the inclusion in the analysis of cultural and behavioural variables that could potentially be related to the offshore wealth accumulation dynamics could give useful insights on whether top-wealth individuals are affected by the values and cultural traits of their country (such as tax morale or uncertainty avoidance). Lastly, researchers with large availability of financing and funds could also obtain data by specialised institutions on fiscal and sociopolitical variables that are not aggregated and, then, they could perform a more detailed and specific analysis. However, with respect to this latter fact, I consider the data I used to be of a reasonably high quality, since they are all obtained from institutional or academic sources that are widely recognised by researchers.

To conclude, policy implications of static analyses are actually quite difficult to provide. However, I think it is quite interesting to comment on the fact that, if my analysis is correct and the stylised motivations I presented describe well enough a country's offshore wealth accumulation dynamics, as long as tax havens exist, rational economic agents will continue to use them. Moreover, as we are actually going towards an always increasing average level of financial openness in any part of the world, my study suggests that this could actually have the collateral effect of increasing the stocks of wealth that each country holds in offshore centres, since the transaction costs that any economic agent will face are going to be lower and lower. On the other hand, however, if the correlations I detected will be proved to be actual causal relations, also positive collateral effects could be identified. For instance, an increase in total world sociopolitical stability, as well as a decrease in income inequality, could have the side effect of shrinking the amount of wealth that is hidden from the authorities and stored in tax havens across the world. This is not the main reason to fight inequality and terrorism, or to avoid civil wars or dictatorships, but it surely is an additional relevant incentive to do so.

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Appendix A: Gulf Variable Robustness Checks

A large part of the significance and magnitude variation dynamics of the results of the sequential regressions are likely to be due to omitted variable biases. With the inclusion of additional variables, indeed, such biases are corrected and this fact causes the modest fluctuations of the coefficients displayed in Table 6. A clear example of this is the case of the Gulf countries dummy variable coefficient, which loses part of its significance when the Gini Index and the oil rents (and Polity index) variables are included in the analysis. This happens because both of these latter are positively correlated with the Gulf binary variable and all of them have positive coefficients. As a consequence of these correlations, when Gini and oil variables are not included in the analysis. the coefficient of the Gulf countries is upward-biased. On the other hand, when the omitted variables are included in the analysis, the bias is corrected and the coefficient of the Gulf countries dummy variable is reduced. Table 8 shows precisely the inverse of the dynamics I just described. Indeed, the second column displays the (upward) omitted variable biases that the Gini index and the oil rents coefficients suffer from when the Gulf country dummy is excluded by the analysis. Such biases are then corrected when the Arab Gulf variable is included in the analysis (first column).

Table 8: Robustness Check Gulf Dummy Exclusion Results

	$REG123_{123}$	NoGulfDummy
Sociopolitical Stability	-0.356**	-0.319**
	(0.107)	(0.103)
Fiscal Freedom	-0.0212**	-0.0169*
	(0.00757)	(0.00694)
Gulf country	1.346*	
	(0.591)	
Financial Openness	0.625**	0.803***
	(0.222)	(0.217)
Common Law	0.105	0.132
	(0.158)	(0.165)
Log of oil rents $\times$ Polity Index	0.00125	0.0135
	(0.0107)	(0.00847)
Logarithm of Gini Index	1.169***	1.490***
	(0.332)	(0.328)
Constant	-1.090	-2.642*
	(1.239)	(1.104)
Observations	129	129
Adjusted R^2	0.233	0.204

Standard errors in parentheses
* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Table 6 and Table 8 suggest also that the same reasoning can be applied to fiscal freedom and

financial openness coefficients dynamics, both with respect to the Gulf dummy (Table 8) and the Gini index variable (Table 6).

Finally, Table 9 shows the robustness of the results to the exclusion of the Gulf countries from the analysis. The first column of the table displays the last sequential regression ($\mathbf{REG12}_{123}$), while the second one shows the results of the same analysis when the five Gulf countries are not included in the investigation. As it can be seen, the results are actually very robust to this change in the sample, and the coefficients and their significance do not present remarkable variations after the exclusion of the Arab Gulf countries[50]. The presence of the Gulf dummy variable in $\mathbf{REG12}_{123}$ is very likely to be the responsible element for this outcome. Indeed, the stability of the results suggests that most of the peculiarities of this specific cluster of countries is captured by the binary variable, which "polishes" the resulting coefficients for the other variables by the influence of the Gulf countries. This is a reassuring result, since this dynamics was the actual reason for which I decided to include the binary variable in the analysis in the first place.

Table 9: Robustness Checks Gulf Countries Exclusion Results

	$\mathbf{REG123}_{123}$	GulfOut
Sociopolitical Stability	-0.356**	-0.354**
	(0.107)	(0.108)
Fiscal Freedom	-0.0212**	-0.0215**
	(0.00757)	(0.00760)
Gulf country	1.346*	
	(0.591)	
Financial Openness	0.625**	0.642**
	(0.222)	(0.221)
Common Law	0.105	0.0592
	(0.158)	(0.163)
Log of oil rents × Polity Index	0.00125	0.00227
	(0.0107)	(0.0108)
Logarithm of Gini Index	1.169***	1.217***
	(0.332)	(0.333)
Constant	-1.090	-1.236
	(1.239)	(1.242)
Observations	129	124
Adjusted R^2	0.233	0.161

Standard errors in parentheses
* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

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[50]It is worth to notice that the coefficients of the Gini index, of the binary variable for the legal system, and of the interaction variable between the oil rents and the level of autocracy do show some variations across the two econometric specifications. Such variations, however, are either very small (as in the case of the Gini Index coefficient) or they are related to non-significant coefficients.

Appendix B: List of Countries

Country	Country	Country
Angola	Ghana	Norway
Albania	Guinea	Nepal
United Arab Emirates	Guinea-Bissau	New Zealand
Argentina	Equatorial Guinea	Oman
Armenia	Greece	Pakistan
Australia	Guatemala	Peru
Austria	Honduras	Philippines
Azerbaijan	Croatia	Poland
Burundi	Haiti	Portugal
Belgium	Hungary	Paraguay
Benin	Indonesia	Qatar
Burkina Faso	India	Romania
Bangladesh	Ireland	Russian Federation
Bulgaria	Iran	Rwanda
Bolivia	Israel	Saudi Arabia
Brazil	Italy	Sudan
Bhutan	Jamaica	Senegal
Botswana	Jordan	Sierra Leone
Central African Republic	Japan	El Salvador
Canada	Kazakhstan	Serbia
Chile	Kenya	Suriname
China	Kyrgyzstan	Slovakia
Cameroon	Cambodia	Slovenia
Congo (Democratic Republic)	South Korea	Sweden
Congo	Kuwait	Swaziland
Colombia	Lao People's Democratic Republic	Syria
Comoros	Libya	Chad
Cabo Verde	Sri Lanka	Togo
Cuba	Lesotho	Thailand
Czech Republic	Lithuania	Tajikistan
Germany	Latvia	Turkmenistan
Denmark	Morocco	Trinidad and Tobago
Dominican Republic	Moldova	Tunisia
Algeria	Madagascar	Turkey
Ecuador	Mexico	Tanzania
Egypt	Macedonia	Uganda
Eritrea	Mali	Ukraine
Spain	Mongolia	USA
Estonia	Mozambique	Uzbekistan
Ethiopia	Mauritania	Venezuela
Finland	Malawi	Viet Nam
Fiji	Namibia	Yemen
France	Niger	South Africa
Gabon	Nigeria	Zambia
UK	Nicaragua	Zimbabwe
Georgia	Netherlands	