THE MARKET FOR TAX HAVENS*

Sébastien Laffitte†

Link to the latest version

November 10, 2022

JOB MARKET PAPER

Abstract

I investigate the determinants of the development of tax havens using a novel database that tracks the building of offshore institutions in 48 tax havens. By tracking offshore regulations in tax havens, this is the first database to identify when tax havens became so. After describing the development of tax havens in the 20th century and several key empirical patterns, I explore their causal determinants. Building on a theoretical framework and on the idea that tax havens are the suppliers in the market for offshore services, I explore two types of market shocks. First, I show that demand shocks, identified through changes in tax rates in neighboring countries, explain why countries become tax havens. Second, I find that competition shocks, identified through changes in the number of tax havens in neighboring countries, explain why tax havens update their regulations. This reaction is facilitated by the diffusion of legal technologies between tax havens. Finally, I show that becoming a tax haven generates GDP per capita gains for countries adopting this status. My results suggest that high-tax countries' policymakers should anticipate the responses of tax havens to international tax reforms by making their potential legal innovations costly.

Keywords: Tax Havens, Taxation, Market, Regulatory Competition, International Taxation, Tax Avoidance, Tax Evasion.

JEL codes: H26, H73, H87, F39, N40

*I would like to thank Pierre Boyer, Sébastien Guex, Niels Johannesen, Isabelle Méjean, Vanessa Ogle, Mathieu Parenti, Nadine Riedel, Emmanuel Saez, Jose de Sousa, Juan Carlos Suárez-Serrato, Farid Toubal, Guo Xu and Gabriel Zucman for their helpful comments and discussion. I also wish to thank seminar participants at UC Berkeley, ENS Paris-Saclay and ECARES (Université Libre de Bruxelles) and conference participants at the Lausanne Conference on Tax Evasion, at the 2022 ASSA meetings, and at the 9th Mannheim Taxation Conference for useful comments and feedback. I thank the Booster program of the ENS Paris-Saclay and the Fulbright commission for financial support, and UC Berkeley for its hospitality during the writing of this project.

†ECARES, Université Libre de Bruxelles, Email address: sebastien.laffitte@ulb.be.

1 Introduction

Despite being generally perceived as detrimental to other countries, tax havens have flourished during the last century. From none in the 19th Century, there are now more than 40 of them, including a wide range of countries and territories, from small islands in the Caribbean, Indian and Pacific Oceans to larger countries such as Ireland, Switzerland, the Netherlands, or wealthy city-states such as Singapore or Hong Kong.[1] These small countries, primarily located at the periphery of large markets, offer opacity and low tax rates. If several papers have studied the consequences of the existence of tax havens on tax systems, little is known about their determinants.[2] While many countries and international organizations aim at regulating the use of tax havens, knowing their determinants is necessary to better understand tax havens and design effective regulations.

In this paper, I investigate the determinants of the birth and development of tax havens. To do so, I build on two main ideas. First, tax havens result from the building of a *legal architecture*, *i.e.*, legal, political and economic institutions that enable their use for offshore activities.[3] The concept of legal architecture is useful to illustrate that enacting a set of offshore regulations is a necessary condition to be a tax haven, beyond having low tax rates. The second main idea is that tax havens can be studied through the lens of market forces. They are the key suppliers in the offshore services market. On the other side of this market, the demand comes from tax evaders in non-haven countries that seek low tax rates, advantageous regulations, and secrecy. The market environment, such as demand shocks, supply shocks or competition, will therefore affect the incentives of countries to enter this market by becoming tax havens.

A challenge faced when studying tax havens lies in the unobserved nature of transactions in the market for offshore services. I circumvent it by focusing on the construction of tax havens' legal architectures, which allow them to participate in this market. I build a new dataset that tracks the moment when today's tax havens became tax havens and when they have updated their legal architecture. To become a tax haven, a country must pass new regulations through legal reforms to supply offshore services. These reforms are diverse and implement several legal technologies, that my dataset tracks. Legal technologies are defined as types of regulations that enable different uses of a tax havens and then determine their different specializations. Among other, banking secrecy, tax-exempt companies, or offshore trusts are widespread. Once a country is a tax haven, its legal architecture can be updated to attract more demand or to adapt to new regulations in non haven countries.

1. Figure A.1 in Appendix shows a map of the tax havens studied in this paper.

2. For instance, it has been shown that tax havens affect the tax revenues collected from both individuals (Zucman, 2013 and Alstadsæter, Johannesen, and Zucman, 2018) and firms (Hines and Rice, 1994, Torslov, Wier, and Zucman, 2022, Garcia-Bernardo and Janský, 2022 or Ferrari, Laffitte, Parenti, and Toubal, 2022). In addition, the use of tax havens by firms and individuals also affects the measurement of macroeconomic aggregates (Zucman, 2013, Guvenen, Mataloni Jr., Rassier, and Ruhl, 2018), of portfolio holdings (Coppola, Maggiori, Neiman, and Schreger, 2021) and allows the avoidance of financial risk regulation (Alfaro, Faia, Judson, and Schmidt-Eisenlohr, 2020). They are also used by elites to capture revenues (Andersen, Johannesen, Lassen, and Paltseva, 2017, Andersen, Johannesen, and Rijkers, 2022) or avoid regulations (see for instance Kollewe, 2022 on sanctions against Russia), thereby generating detrimental effects on the perception of government and elites in many countries (Louis-Sidois and Mougin, 2020 and Guriev, Melnikov, and Zhuravskaya, 2021).

3. The term legal architecture has also been used by Ogle (2017).

When updating its legal architecture, a tax haven can reinforce its current regulations or diversify its offshore activity by targeting different types of income.

To my knowledge, this dataset is the first to provide a time-varying account of the existence of tax havens, while the literature generally relies on a constant tax haven indicator variable (Dharmapala and Hines, 2009, Slemrod, 2008). To construct it, I use the information provided by tax lawyers in tax havens guidebooks. These books advise potential offshore users (firms or individuals) about the opportunities offered by each tax haven. Importantly, their authors carefully describe the legal technologies used by tax havens to supply offshore services. I cross-check and complete the information about the timing and type of reforms provided by these guidebooks with other sources such as academic papers, policy reports, books, and offshore firms' websites to provide a global picture of the legal architecture developed by tax havens.

Throughout the paper, I adopt a comprehensive definition of tax havens. I define them as countries that deliberately set up a specific *legal architecture* characterized by secrecy and low tax rates to attract foreign assets and revenues generated elsewhere. I consider the use of tax havens both by firms and by individuals. Individuals tend to look for low tax rates and secrecy, while corporations look for low tax rates and advantageous regulations. Tax havens seek to generate revenues by attracting offshore users in both cases. In the case of individuals, revenues arise directly through the fees paid for the use of secretive legal structures or indirectly through spillovers on the domestic economy, particularly in the legal and tourism industries. [4] The mechanism is similar for firms. Direct benefits arise from tax and fees collection, and indirect benefits arise from residual real activity or through spillovers to the domestic economy. As described later, some tax havens might also provide offshore services to both types of users.

Using the new database, I first provide key facts about the development of tax havens. I proceed in three steps. First, I portray the long-term development of tax havens. I describe different patterns of tax havens' expansion. Beginning in Europe during the interwar, the offshore world quickly spread to small countries, often (current and former) U.K. colonies, in the wake of the decolonization wave. Using an event study design, I show a sizeable impact of becoming independent from the U.K. on the probability of becoming a tax haven, and argue that it is a causal effect. This first analysis provides three important results: i) country characteristics such as size and colonial history are important supply-side determinants of the choice of becoming a tax haven, ii) decolonization has been a major exogenous shock that transformed the history and development of tax havens, and iii) competition between tax havens, which was limited before WWII, increased following the decolonization shock.

Second, I study the demand for tax haven services. I show a graphical correlation between the introduction of direct taxes in non-tax-haven countries and the rise in the number

4. It is sometimes assumed that providing secrecy for individuals does not come with tax revenue collection. However, the users of offshore entities generally pay fees to establish trusts, exempt companies, or other structures. For instance, registering a trust in the Cayman islands costs 500$ at registration and 500$ in annual fees (see https://www.ciregistry.ky/trusts-register/trusts-fees/). According to the 2020 Compendium of Statistics of the Cayman Islands (Cayman Islands Economics and Statistics Office, 2021), *Financial Services Licenses*, that covers the revenues generated by the offshore activity, accounted for 33% of tax revenues in 2020. *Banks and Trust Licenses* account for 27.5% of the receipts in this category, and Company fees account for 42% of it. Individuals use trusts and companies in the Cayman Islands to shelter their revenues from taxation.

of tax havens. This correlation is observed at the continent level, suggesting that tax havens appear when taxes increase in neighboring countries. This intuition about geographical determinants of demand is confirmed using data from the Offshore Leaks (ICIJ, 2022a) that record micro-level bilateral information on more than 800,000 offshore entities opened in tax havens, and leaked to the International Consortium of Investigative Journalists. Using this bilateral data, I find an elasticity of the use of tax haven entities to distance of one, suggesting a strong geographical content of demand for tax haven's operations. This geographical aspect of demand is later used to identify the impact of demand on the probability of becoming a tax haven.

Third, I connect the rise of tax havens to the expansion of the offshore services market. Using Offshore leaks data, I can observe the number of offshore entities opened each year in each tax haven covered by the leaks. Concentrating on reforms that enable the use of the legal technologies covered in the Offshore Leaks data, I show a causal effect of new reforms on the creation of offshore entities in tax havens. It establishes a tight connection between the building of the legal architecture and the provision of offshore services. Then, I concentrate on the biggest market for offshore services in the 20th century, the Swiss market, and show that the size of this market increased at the same time as new tax havens appeared in the newly-decolonized world. New tax havens did not substitute for old tax havens by appropriating their market shares. This last fact makes the connection between the rise of tax havens and the size of the offshore market.

To rationalize these facts, I build a theoretical framework inspired by the literature on legal capacity building (Besley and Persson, 2011). This framework studies the decision of a government to become a tax haven given its own characteristics and the external demand for tax haven operations. The demand for tax haven operations is similar to the market access in the economic geography literature (Redding and Venables, 2004). In this framework, the demand depends negatively on bilateral evasion costs. Building on the fact that evasion costs increase with distance, I find that tax havens receive more demand from closer countries. The main testable implication of the framework is that the probability of becoming a tax haven increases when taxes in surrounding countries increase, more so for small countries. It provides theoretical underpinnings to the geographical component of demand.

I then turn to the empirical exercise where I explore the causal determinants of tax havens. In particular, I assess the role of demand shocks and supply shocks on the building of tax havens' legal architecture. I first study demand shocks. In order to establish a causal link between the rise in demand through higher taxes and the increase in the probability of becoming a tax haven, I construct the demand addressed to a country i as the average level of taxation in foreign countries weighted by their distance to country i and their size. In a regression framework, I then explain the tax haven status of a country or its probability of passing a new reform by the level of demand it receives. The identification relies on the fact that the level of taxation changes differently in different countries, which affects the demand exogenously through geography.

However, the level of taxation in surrounding countries and reforms in tax havens might be simultaneously affected by external shocks. It may constitute a threat to identification by introducing endogeneity. To circumvent it, I use an IV strategy. I first predict the level of taxation in a country using variables exogenous to such unobservable shocks. These vari-

ables come from the political science literature that shows that taxation increases with the level of democracy (Kiser and Karceski, 2017) and the ideology of the head of government. Then, I construct the demand variable using the predicted level of taxation. I confirm the OLS results and find that increasing demand by one standard deviation increases the probability that a country becomes a tax haven by 73%. This effect is larger for small countries and former U.K. colonies. I also find that demand particularly matters for the first reform rather than for other reforms. The robustness of the estimation is assessed through different tests, in particular by using different variables for demand.

As demand shocks do not explain the whole variation in reforms in tax havens, I then estimate the sensitivity of reforms to supply-side shocks. To do so, I use the quasi-natural experiment of decolonization. Decolonization increased the probability of newly independent countries to become tax havens. It created a supply shock, exogenous to the level of demand. In particular, this shock increased the number of tax havens competing together and then affected negatively their rents. To my knowledge, the role of competition between tax havens has not been explored in any empirical study. Using the decolonization shock, I first show that increased competition pushes tax havens to update their legal architecture. Using an analogy with product markets, tax havens update their products when competition increases. Competition is an essential driver of reform adoption in tax havens in the second part of the twentieth century.

In terms of channels, tax havens mostly update their legal architecture horizontally, by implementing new regulations that are not yet implemented in their country. I show that this result is driven by the diffusion of a new legal technology, the International Business Companies (IBCs). IBCs are tax-free companies with very limited legal and administrative requirements, providing an ideal environment for tax evasion and avoidance purposes. This new legal tool has diffused quickly since the success of the IBC law of 1984 in the British Virgin Islands. Its implementation costs are likely limited and allow "learning" from other countries, which can easily copy a law, as it is public and not protected (as is generally the case for new technologies in product markets). It suggests that the legal technologies used by tax havens are essential to understanding their dynamics.

To sum up, this empirical analysis explains the variation of policies in tax havens using external conditions such as changes in demand and changes in the competitive environment. I find that changes in demand increase the probability that a country becomes a tax haven but do not affect its probability of doing a new reform, conditional on being a tax haven. Such updates of the legal architecture are driven by supply-side shocks such as increases in competition and are facilitated by the availability of new legal technologies.

Finally, I study the consequences for a country of becoming a tax haven on its economic development. If countries become tax havens, this should be due to expected economic gains. This is also what I assume in the theoretical framework. To estimate the causal impact of becoming a tax haven on GDP per capita, I use an event-study framework and account for heterogeneous treatment effects using the imputation estimator of Borusyak, Jaravel, and Spiess (2022). I also implement interactive fixed effects following Gobillon and Magnac (2016), Xu (2017) and Liu, Wang, and Xu (2022) to absorb the effect of possible country-level confounders that are time invariable but whose effect might change with time. This method is akin to a generalized synthetic control method (Xu, 2017) and speaks to a recent literature that uses synthetic controls to estimate the causal impact of histori-

cal events on country-level GDP (Abadie, Diamond, and Hainmueller, 2015, Billmeier and Nannicini, 2013, Funke, Schularick, and Trebesch, 2022 for instance). I find positive growth gains of 3.4% per year during 10 years resulting in long-term gains of 40% compared to non-haven counterparts. In the long run, the effect tends to stabilize. This confirms that becoming a tax haven may be a rational strategy from the point of view of tax havens. This result is also discussed to account for the fact that GDP per capita is a biased measure of economic development, in particular in tax havens. I provide evidence that the above result captures changes in the real economy by investigating the impact of becoming a tax haven on the share of industry in GDP and on the share of agricultural lands.

This paper is related to several strands of research. A key contribution of this paper is the construction of a novel dataset of offshore reforms in tax havens. This dataset is the first attempt to follow the tax haven status of many countries along time. Providing temporal and spatial variation also enables the use of causal inference methods, in particular the generalized differences-in-differences.[5] This approach complements the more descriptive approaches from history or political science (see Palan, Murphy, and Chavagneux, 2009, Ogle, 2017, 2020, Hollis and McKenna, 2019, or Farquet, 2021 for general approaches; for country-specific approaches see Guex, 2021 on Switzerland, Rawlings, 2004 on Vanuatu or van Beurden and Jonker, 2021 on Curaçao) and allows for quantitative comparative history of tax havens. Zucman (2014) provides an interesting approach by constructing a long-run series of offshore wealth held in Switzerland. Here, I follow a different approach and bring more representativity regarding the supply of offshore services: I cover different countries that become tax havens at different times and places, and using different legal technologies. This general approach makes it possible to exploit different sources of variation and to find common factors to the rise of tax havens. This new database will also be useful to future research by enabling more panel data analysis of tax havens. In terms of data sources used, my paper also contributes to a scarce literature that uses and analyzes micro-level data from the Offshore Leaks.[6] Using this data, I am the first to document that offshore use follows a strong gravity pattern and to link Offshore Leaks data to reforms in tax havens.

Second, my paper is related to the public finance literature that studies the role of tax havens in the world economy.[7] The tax haven literature is generally interested in the effects of tax havens on other countries. However, the determinants of tax havens and their domestic consequences are less studied. Some theoretical papers in the tax competition literature are interested in the causes of tax havens (Kanbur and Keen, 1993, Hansen and Kessler, 2001, Slemrod and Wilson, 2009). On the empirical side, few papers study the determinants of tax havens. An exception is Dharmapala and Hines (2009) who study the correlation between governance institutions and the tax haven status using cross-sectional data. They argue that better-governed countries are more likely to be tax havens and that this is likely driven by initial higher governance in tax havens. My paper is different as it insists on the role of market forces on tax havens' reforms. Besides, I construct a novel database that

5. See the recent papers of de Chaisemartin and D'Haultfœuille (2020), Sun and Abraham (2021), Callaway and Sant'Anna (2021).

6. To my knowledge, the only other examples of papers that use the Offshore Leaks database systematically are Omartian (2017), Garcia Alvarado and Mandel (2022), and Le Guern Herry and Bomare (2022). In addition, leaks from tax havens have been used by Alstadsæter, Johannesen, and Zucman (2019), Brounstein (2021) or Londoño-Vélez and Ávila-Mahecha (2022) to match the leaked data with administrative wealth records.

7. General reviews of tax havens include Palan et al. (2009), Zucman (2014, 2015), Hebous (2014).

allows me to study a broader range of potential causes, and propose a causal analysis. By analyzing tax havens through the lens of the market for offshore services, I propose a unifying framework to understand them. To the best of my knowledge, this analysis is the first attempt to establish a causal link between the rise in demand and new tax havens reforms.[8] In my paper, demand is identified thanks to geographic variation in tax rates. This is connected to recent papers insisting on the importance of gravity links between high-tax countries and tax havens (see for instance Ferrari et al., 2022). Importantly, I also show the importance of competition between tax havens, which has been mostly overlooked in the literature. If taken into account in some theoretical frameworks (Slemrod and Wilson, 2009 or Johannesen, 2010 for instance), only Elsayyad and Konrad (2012) focus their argument on it. By affecting rents, competition between tax havens pushes them to adapt by reinforcing their legal architecture, which is made possible by legal technology innovations. I insist on the importance of these legal tools and show their key roles in tax havens' dynamics.[9] From a policy point of view, these mechanisms are important to understand the consequences of international tax reforms. These reforms should aim at preventing legal innovations from tax havens by increasing th costs of potential new legal technologies.

I also contribute to the literature that studies the consequences of being a tax haven. The impact of being a tax haven on GDP has been studies by Hines (2005) or Butkiewicz and Gordon (2013). They provide suggestive evidence of a positive impact on GDP. On the contrary, Miethe (2020) does not find a direct link between financial activity and local activity in tax havens, but he does not uses shocks on tax havens' financial activity to establish this result. Using a time-varying tax haven variable and recent methodological innovations for two-way fixed effects models, I show a causal impact of becoming a tax haven on GDP per capita.

Finally, I contribute to the literature that studies regulatory competition. Tax havens bear similarities with other types of regulatory competition. In particular, the concept of legal architecture can be extended to other forms of regulatory competition. Besides, studying the building of tax havens' legal architecture through the market lens is also generalizable. For instance, these concepts can be used to study the competition for capital in general (see Genschel and Schwarz, 2011, Keen and Konrad, 2013 for tax competition and Flamant, Godar, and Richard, 2021 for new forms of tax competition), pollution havens (Copeland, 2008), subsidy competition (Ossa, 2015, Slattery, 2018), legal opacity provision (Moreau-Kastler and Toubal, 2021). My results also inform on how countries choose their (economic and legal) institutional settings. It contributes to the literature interested in the determinants of institutional choices (Besley and Persson, 2011) and the role of foreign countries in these choices (Aidt, Albornoz, and Hauk, 2021).

The rest of the paper is constructed as follows. Section 2 provides more institutional details and describes the construction of the data. Section 3 presents three stylized facts about the development of tax havens. In section 5, I study the role of demand shocks on the development of tax havens. Section 6 studies the role of competition between tax havens,

8. While Desai, Foley, and Hines (2006) discuss the "demand for tax haven operations", their paper is mostly interested in who demands tax havens operations rather than its consequences on tax havens.

9. This approach is also linked to the study of policy diffusion. See for instance Shipan and Volden (2008), Cao (2010), Zhukov and Stewart (2013), Elkink and Grund (2022), or DellaVigna and Kim (2022).

and section 7 provides new results on the impact of becoming a tax haven on GDP per capita. Section 8 concludes.

2 The legal architecture of tax havens.

I construct a new dataset on the legal architecture of countries before and after becoming tax havens over the 20th century. I use both qualitative and quantitative assessment methods to gain a thorough understanding of how countries become tax havens. The new dataset is the result of a careful analysis and classification of the legal environment of tax havens. The existence of specific laws is necessary to the tax haven activity of a territory as it provides stability and predictability to its users. My methodology is new and relies on a limited set of public information that is observable by the researcher. It recognizes the fundamental role of law in wealth-creation processes (see Deakin, Gindis, Hodgson, Huang, and Pistor, 2017 and Pistor, 2019).

This data collection is motivated by the lack of time-varying, detailed and measurable information about tax havens. There are at least three reasons for this. First, tax havens operate secretly and do not disclose essential information on their activities as offshore centers. Second, many tax havens are small countries with small statistical offices or territories depending on other jurisdictions. Third, the extent of comparability across different sources and over a long period is limited.

Before describing in details the construction of the database, I make explicit the institutional context that underlies it.

Institutional Context. Following Ogle (2017)'s terminology, the *legal architecture* of a tax haven is the set of laws that provide legal instruments to supply offshore services. Low or no tax rates for specific types of incomes is a necessary condition to become a tax haven. [10] However, it is not sufficient as an offshore legal architecture is necessary to provide tools to create secrecy, provide flexibility and blur the links between ultimate wealth owners and their offshore assets and revenues. The legal architecture provided by tax havens is specifically designed to circumvent high-tax countries' regulations. [11] The new dataset informs on the development of such an architecture and on the rise of tax havens.

Tax havens can use many technologies, to build their legal architecture. For instance, one of the most prominent examples of these technologies are International Business Companies (IBC, hereafter). [12] IBCs can have only one founder, shareholder, and director who can be the same person and do not need any annual meeting. They are tax-free and require limited reporting and disclosure (e.g., financial statements are not necessary, and incorporation documents do not include the identity of the company's ultimate owners). The only condition for registering an IBC is that it cannot have any domestic activity. The history of the British Virgin Islands, especially the *International Business Companies Act* of 1984, has proven the profound role of IBCs in the transformation of the island and other countries

10. Note that having a low tax rate on all types of income is not necessary. Some tax havens can have large tax rates for incomes not covered by their specialization as tax havens.

11. See for instance the case of the Cook Islands described in Harrington (2016).

12. The importance of IBCs is recognized both by scholars (Palan et al., 2009 or Harrington, 2016 for instance) and professionals (see for instance Riegels, 2014 from the offshore law firm Harneys).

into tax havens. [13] Within a few years, the British Virgin Islands became a leader in offshore company registration, with more than 130,000 IBCs registered in 1994, representing almost half of the market (Darius and Williams, 1997).

Trusts, exempt corporations, or holdings are other examples of legal instruments implemented in tax havens. The example of New Caledonia, a Pacific French territory, illustrates why such regulations are necessary to make a country a tax haven, beyond low tax rates. New Caledonia was a no-tax jurisdiction but such offshore instruments have never been implemented. On the contrary, France was reluctant to make it a jurisdiction to book offshore revenues (Rawlings, 2004). Consequently, New Caledonia has never been considered a tax haven.

Therefore, the legal reforms are the main building blocks of the legal architecture of a tax haven. Many different types of reforms are available to tax havens, determining their offshore specialization. Table 1 summarizes the different types of laws that I record. I classify them into five broad categories that follow their different possible uses. There are the legal technologies that are used to directly circumvent personal taxation ("Personal") or corporate taxation ("Corporate"). However, in a world where a large share of income consists of business income or capital income, the frontier between personal and corporate taxation is thin and opens optimization and evasion opportunities (Love, 2021). [14] Some technologies widely implemented by tax havens are classified as "Dual" as they are equally used to circumvent corporate and personal taxation. It is for instance the case of IBCs.

For offshore strategies to work efficiently, the tax avoider must maintain secrecy and hold its offshore revenues and wealth in a bank. Offshore banking therefore greases the wheels of the offshore industry. It is classified apart as it appears complementary to other types of technologies because it allows individuals and firms to hold revenues while maintaining secrecy on their identity. Finally, the "Other" category includes regulations that do not follow the most classical categories, illustrating the diversity of options that countries have to become tax havens.

To be more precise, the category "Individual" gathers either trust laws, which constitute one of the primary legal technology used in the offshore industry (Harrington, 2016) or specific regulations targeting individuals, in particular tax abolition. This latter category covers only a few reforms, trust laws constituting the bulk of this category. The category "Corporate" gathers different types of legal technologies. First, some reforms target multinational companies, such as the Irish Export Profit Tax Relief of 1956 or "Holding company" regulations that provide a differential tax treatment for holding companies. I add to this category reforms that target the activity of insurance companies, in particular captive insurances. [15]

13. Appleby, a leading international law firm incorporated in Bermuda, wrote a blog post to celebrate the 30th anniversary of the law in 2014, recognizing that "one would be hard-pressed to find an example of a similar law that has had such profound and positive implications for the jurisdiction in which it was promulgated." (Kirk, 2014).

14. This is the problem of income shifting across the individual tax base and the corporate tax base. Gordon and Slemrod (1998) have documented its existence in the U.S. since at least 1965. Smith, Yagan, Zidar, and Zwick (2019) estimate that three-quarters of U.S. S-corporation business income (a specific legal form of corporation in the U.S.) is actually wages. Income shifting across tax bases has also been documented in other empirical setting, see for instance Harju and Matikka (2016) or Alstadsæter and Jacob (2016).

15. Companies open captive insurances to work as self-insurance companies. By playing with the insurance premium paid to their captives, firms can shift their revenues to tax havens with advantageous fiscal conditions.

Table 1 – Types of legal technologies

Category	Legal Technology	Description	Examples
Individual 38 reforms	- Trust laws ($\star$)	Allow a legal disconnection between asset use and ownership	*Turks and Caicos Islands' Trust Ordinance 1990*
	- Other ($\star$)	For instance, tax abolition	*Monaco's Abolition of personal income taxes 1869*
Corporate 37 reforms	- MNE	Attraction of MNEs activities and profits	*Ireland's Export Profits Tax Relief 1956*
	- Holding	Special regimes for holding companies	*Luxembourg's Loi sur le régime fiscal des sociétés de participations financières (Holding companies) 1929*
	- Offshore Insurance and Captives	Self insurance allowing revenue transfers to tax havens	*Barbados' Exempt Insurance Act 1983*
	- Flag of convenience	Limited regulations and tax rates for ships registered in an offshore maritime registry.	*Panama's Law/63 on foreign Ships Registration*
Dual 65 reforms	- IBC	Tax-neutral companies with no domestic activities and limited legal requirements	*British Virgin Islands' International Business Companies Act 1984*
	- Other exempt companies	Similar as IBC	*Jersey's 1940 Corporation Tax Law*
Banking 38 reforms	- Offshore banking ($\star$)	Unregulated banks with limited taxation and legal requirements	*Anguilla's Banking Ordinance, 1991*
	- Bank secrecy ($\star$)	Protects account holders from investigations	*Switzerland's Banking Act, 1934*
Other 16 reforms	- Tax treaties ($\star$)	Limit bilateral taxation, allow conduit entities to benefit from treaties	*Netherlands Antilles' tax treaty with Netherlands (Belastingregeling Koninkrinjk) 1964*
	- Specific regulations ($\star$)	Country-specific rules, not classified elsewhere.	*Bahamas' Hawksbill Creek Agreement 1955*

Note: This table classifies reforms by legal technologies and broad categories. The number displayed after the category name counts the number of reforms that have been adopted in each category at the end of the sample in 2000. The total exceeds the number of reforms recorded in the database as some reforms belong to several categories. Legal technologies highlighted with the symbol $\star$ are grouped together within a broad category to form a subcategory.

Finally, this category also gathers "flag of convenience" regulations that provide limited regulations and taxation to (commercial) ship owners (Vuillemey, 2020).

The category "Dual" encompasses a large number of reforms and corresponds to exempt-company regulations. These regulations aim at creating tax-exempt companies with limited administrative requirements and high secrecy. As described later, they are among the most spread tools offered by tax havens. Despite creating international companies, these regulations might equally be used by companies to channel offshore profits or by individuals to own their offshore wealth. This is why it is classified as "Dual". This category is subdivided between IBCs and other exempt companies in order to insist on the importance of IBCs as a legal technology for offshore users.

As underlined above, offshore banks and banking secrecy are critical technologies of offshore schemes because they are often complementary to other offshore activities. Offshore banking includes lightly regulated banks that benefit from low-tax rates and low restrictions. Banking secrecy is a key tool of tax havens as it generally prevents any investigation into the bank accounts of firms and individuals.

Finally, the category "Other" aggregates reforms not classified elsewhere. In particular, some tax treaties, by providing bilateral tax exemption, are used in tax avoidance and tax evasion schemes. For instance, the treaty between the Netherlands and the Netherlands Antilles has allowed many companies (North Americans in particular) to avoid paying some taxes by using the Netherlands Antilles as a conduit. Specific regulations, less common than those classified elsewhere, have also been used to build the legal architecture of some tax havens. This is the case of the Hawksbill Creek Agreement of 1955, which established a large free-trade and free-tax zone in the Bahamas until 2054. Different sources have recognized that this agreement spurred the development of the Bahamas as a tax haven (Ogle, 2017).

In sum, my approach relies on the reforms implemented in tax havens to build and develop their legal architecture. A potential downside of this approach is that the supply of tax haven services may not be mediated through new regulations or that my data collection might miss some significant laws. This latter case is especially relevant for countries with a long and complex offshore history. It also occurs when tracking legislation in federal countries, where offshore legislation can be enacted at sub-national levels (see for instance the case of Switzerland, described in Guex, 2021). Note that it is the case for a very limited number of countries among tax havens. In this case, one advantage of my approach, which can alleviate this bias, is that it relies on reports written by tax lawyers that advise potential users of tax havens. It allows me to include in my sample only laws that the users perceive to be the most relevant if one wants to use a tax haven. In particular, the laws not reported might not be of high importance in building the tax havens' legal structure.

A second potential limitation is that the introduction of new legal technologies through reforms does not directly capture the supply of tax haven services but measures the activity of their suppliers. For instance, tax havens can write laws that are not followed by an increase in the production of tax havens' services because of poor quality for instance. Importantly, I show in the next section that new reforms causally increase (on average) the supply of tax havens services. Besides, the purpose of this database is to record the construction of offshore architecture. In this regard, it is crucial to record any important law,

even of low quality as it marks a significant change in the willingness of a country to be a tax haven.

Construction I collect new data on major reforms undertaken by tax havens to build their legal architecture. The dataset informs on reforms that made countries tax havens (called the extensive margin) and on subsequent reforms, which update their legal architecture (called the intensive margin). Countries may update their legal architecture to reinforce existing legal technologies or create new opportunities for offshore users by introducing new technologies.

The dataset includes 50 jurisdictions covering different types and sizes of tax havens worldwide. These countries constitute today the bulk of offshore services providers. It closely matches the tax havens' list used in the literature. Appendix Table A.1 lists the countries included as tax havens in this paper. It also compares this list to eleven other lists aggregated by Palan et al. (2009). These lists of tax havens were established by different institutions and for different purposes between 1977 and 2008. Except for Costa Rica, which is absent from the list of this paper, it covers all tax havens mentioned in at least 4 of the 11 sources. [16] The data collection stops in 2000 as it marks the end of the expansion of tax havens and the beginning of a phase of regulation in high-tax countries (Sharman, 2019).

The construction of the dataset relies on a wealth of information provided by the *Guide Chambost des Paradis Fiscaux* (Chambost, 2000) and the *Guide Mondial des Paradis Fiscaux* (Beauchamp, 1992). [17] Both books scrutinize the legal architecture of tax havens and carefully describe their different possible uses. They provide a detailed description of laws and regulations that allow a potential tax evader to move its assets and revenues to the territory. Both guides describe the banking system meticulously along with the existence *de jure* or *de facto* of banking secrecy. The authors also provide information on the territory – geography, population, economy, living cost, history and political system.

For each country, I collect the key dates that the authors identify as important in the construction of the country's offshore legal architecture. I then compare these dates between both sources to ensure that any date obtained can be perceived as significant. This alleviates the potential bias of relying on only one source. This is also done to recover information about some regulations when the original text is not precise enough. Indeed, both sources often do not provide the same information. For instance, one source might not identify the original legal technology, might give the name but not the date of the regulation, might be imprecise about some regulations, or might not cover a regulation covered in

16. More precisely, I first relied on the list of tax havens established by Dharmapala and Hines (2009). To this list, I added the Netherlands and Malaysia (in particular the Federal Territory of Labuan), which have been considered as tax havens but are not included in their list. I did not include Belgium due to conflicting information on its role as a tax haven. Watteyne (2022) argues that the history of Belgium as a tax haven stopped after WWI. I did not include U.S. States such as New Jersey or Delaware either. These states have mainly been considered as local tax havens (see for instance Dyreng, Lindsey, and Thornock, 2013) even though this might be changing.

17. These books are available in French only. André Beauchamp and Édouard Chambost are international tax lawyers specialized in the use of tax havens. Chambost has written eight different editions of his book from 1977 to 2005. He is specialized in the creation of tax (avoidance) schemes between jurisdictions (http://www.edouard-chambost.com/picture_library/chambost_articles_recadrer/1998-1999/1998_paradis_fiscaux_ou_sanctuaire_suisse.pdf).

the other source. For some countries, especially minor tax havens, descriptions are shorter, and information might be missing.

To deal with these issues, I cross-check these sources and collect more information using external sources such as the guides written by Starchild (1994) and Barber (2007) and different editions of Doggart (1975)'s guide to tax havens. I also rely on academic papers on specific countries or regions (Mendis, Suss, and Williams, 2002 and Fossen, 2002 provide important and useful information for the Caribbean and Pacific tax havens). Palan et al., 2009 provide additional information on several tax havens. I also use information from various *Financial Secrecy Index*'s reports (Tax Justice Network, 2020). Finally, I use several documents written by offshore service providers to advise their clients or inform them of different offshore opportunities. [18]

These alternative sources are used to systematically confirm the existence of laws identified in the two main sources. They sometimes reveal the existence of reforms not mentioned in the main sources. In this case, the date obtained is also cross-checked in the other external sources. This is for example the case for Vanuatu. Both main sources describe Vanuatu as a tax haven but do not provide precise information on its offshore legal architecture. In this case I relied on two academic articles about the formation of the tax haven in Vanuatu (Connell and Pritchard, 1990 and Rawlings, 2004). Rawlings (2004) identifies the formation of the tax haven in 1970-1971 and refers to the *Banks and Banking Regulations* of 1970, the *Companies Regulations* of 1970 and the *Trust Companies Regulations* of 1971. These laws are also identified by Connell and Pritchard (1990), which allows me to validate these reforms and add them to the dataset. [19]

When a law is closely followed by a new one with the only purpose of correcting the first one, I disregard the second law. This is for instance the case of the Cyprus law of 1975 that created offshore companies and was immediately corrected in 1977. When different dates are given for the same regulation in the sources, I record the date that is present in most sources. To follow up on the case of Cyprus, Beauchamp (1992) gives the date of 1978 for the first Offshore Banking Units, with an authorization given to the *Banque Nationale de Paris Intercontinentale*. However, I could not find other sources referring to this fact. On the contrary, different other sources give the date of 1981 for the establishment of Offshore Banking Units following the *Guidelines on Offshore Banking* issued by the government (Phylaktis, 1994 p.125, Roussakis, 1999). I, therefore, follow this date of 1981, which appears more reliable.

Finally, I could not find reliable and precise information on the offshore legal architecture of two minor tax havens, San Marino and the Maldives. [20] Consequently, my dataset includes information about 48 tax havens.

18. For instance Trident Trusts provides "Fact Sheets" about many offshore jurisdictions: https://www.tridenttrust.com/knowledge/brochures-fact-sheets/. Trident Trust is one of the world's largest offshore providers, according to ICIJ. It operates in 19 tax havens present in my list of tax havens, besides having offices in the U.S., the U.K. and Canada. It has been exposed in the Pandora Papers, with more than 3.3 million records leaked.

19. The two sources are actually divergent about the date of the Company Regulations that are either attributed to the year 1970 or the year 1971. According to the Pacific Island Legal Information Institute (http://www.paclii.org/vu/legis/consol_act/ca107/) there are two Companies Regulations in 1970 (*New Hebrides Companies Regulation*) and 1971 (*Companies Regulation*). Only the first one is kept; see below for more details when two laws closely follow each other.

20. As illustrated by Appendix Table A.1, the Maldives appear in only three tax havens lists and San Marino in only one. Chambost (2000) only devotes two lines to San Marino to write that he does not consider it as a tax

Additional data I complement information on the legal architecture of tax havens with additional data. Appendix A provides a list of all data sources used in this paper.

I first associate each territory with a status relative to its sovereign history. Each country or territory can be either independent, non-independent and a colony, or non-independent and not a colony. This last status is created to deal with specific cases treated differently by different databases about colonial history. For instance, the islands of Jersey and Guernsey, despite being under the actual control of the United Kingdom, are generally not considered as colonies. However, for the purpose of this paper, it is important to highlight their link with the United Kingdom. To this purpose I use information from the Colonial Dates Dataset (Becker, 2020), the Cepii Gravity Dataset (Head and Mayer, 2014) and the ICOW colonial dataset (Hensel, 2018). The data is then manually completed when information is missing for a given territory using worldstatesmen.org, rulers.org, and wikipedia.org.

To measure the level of taxation worldwide, I combine two types of sources. First, I use the Tax Introduction Dataset that has been compiled by Seelkopf et al. (2021). This dataset provides for 220 countries and territories in the world the date of introduction of six different modern taxes: personal income taxes, corporate income taxes, inheritance taxes, social security contributions, general sales taxes, and value-added taxes. The authors distinguish modern taxes, compared to pre-modern taxes, by their simple and broad tax bases, their administrative complexity (they require information-intensive processes), and their redistributive potential. This database allows me to observe the extensive margin of taxation at the tax level for virtually all countries in the world. I complement this data source with information on the intensive margin of taxation. I use data from the Government Tax Revenue dataset created by Andersson and Brambor (2019a, 2019b). The dataset covers 31 countries between 1800 and 2012 (non-square) and provides information on their tax revenues as a share of GDP. I use this information as a proxy for the effective tax rate. Interestingly, the data distinguish between direct and indirect tax revenues. Despite covering fewer countries than the Tax Introduction dataset, this data covers a large share of the world economy. In 1950 it covered 66% of the world's GDP. Missing data, in particular during world wars, is linearly interpolated when it occurs between two dates where I observe the level of taxation. It allows me to gain coverage. Data is used from 1920 onwards. Before this date, the coverage is too restricted. For instance, the U.S. entered the data in 1916. Overall, both sources provide a different but complementary view on world taxation.

3 The development of tax havens

I observe 143 reforms in 48 countries. The new dataset allows me to provide new information related to the rise of tax havens in the 20th century. In particular, my approach visualizes the key supply and demand forces underlying the market for offshore tax haven services.

This section proceeds in three steps. First, I detail the characteristics and long-run evolution of tax havens (*the supply*). Then, I show the correlation between the rise of tax havens

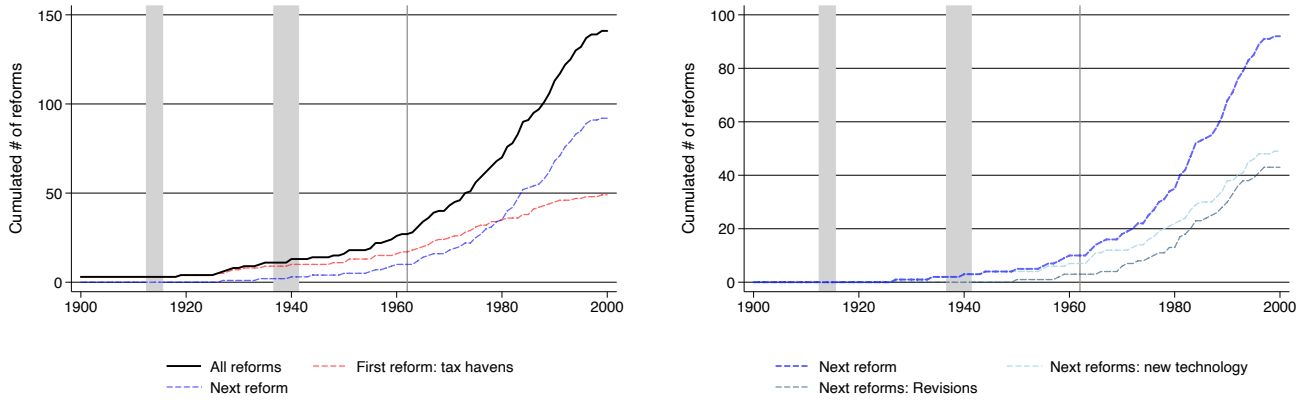
haven while Beauchamp (1992) writes that "If San Marino has an old reputation of tax haven, the republic has taken very few actions to justify it" (p.549, own translation). The Maldives are not covered in any of the main sources.

and the rise of taxation in other countries (*the demand*). Finally, I link the development of tax havens through new reforms to the supply of offshore services (*the market*).

3.1 The suppliers of offshore services

I first document the striking increase in the number of tax havens in the 20th century. I describe the type of reforms implemented and their differential use over time. Then, I show the different geographic trends by broad world regions. I finally show that country size and colonial history are two critical determinants of the choice of becoming a tax haven.

The rise of tax havens In Figure 1, I describe the development of tax havens in the 20th century, distinguishing between the extensive and intensive margins in panel (a). In panel (b), I decompose subsequent reforms between reforms introducing a new legal technology (labeled *new technology*) and reforms reinforcing a legal technology in which the country is already specialized (labeled *revisions*). This distinction is important as it illustrates one of the fundamental trade-offs faced by suppliers that face competition in a market. They can either specialize and therefore try to compete vertically or diversify their activity to compete horizontally.



(a) First and subsequent reforms

(b) Decomposition by purpose

Figure 1 – The rise of tax havens in the 20th century

Note: This figure depicts the rise of tax havens in the 20th century according to two dimensions: (a) First and subsequent reforms, (b) Decomposition of subsequent reforms between those introducing a new legal technology and those reinforcing a technology in which the tax havens is already specialized. Data on tax havens' reforms comes from own data collection detailed in section 2. Legal technologies considered here are the following: Banking, Insurance, Exempt companies (IBC or not), MNE-specific, Holding regimes, Individual, Ships, and Other. Shaded areas indicate the world wars and the vertical line (1962), the beginning of the independence wave in the U.K.-dominated Caribbean area.

Panel (a) describes the significant rise of tax havens in the 20th century, from almost none to 48. The figure reveals that the first rise of tax havens happened during the interwar period. As discussed in the following subsection, this rise is associated with the introduction of modern direct taxation in several countries through individual and corporate income taxes. Then, it is not before the fifties that countries that are already tax havens begin to update their legal architecture through new large-scale reforms. While the increase

in the first reforms appears constant over the century, we observe a clear acceleration in the subsequent reforms from the seventies. The vertical black line marks the beginning of the British decolonization in the Caribbean. It is followed by an increase in the number of reforms. I discuss below the role of decolonization and of increased competition between tax havens as drivers of this trend. At the end of the sample, the majority of reforms happen at the intensive margin (subsequent reforms) rather than at the extensive margin (new tax havens). Subsequent reforms correspond to a reinforcement of the legal architecture. Keeping in mind the market analogy, making a new reform is comparable to updating a product or proposing a new product.

To understand more precisely the intensive margin, I decompose it in panel (b) between reforms introducing new legal technologies and reforms implementing technologies in which the tax haven is already specialized (following Table 1 classification). There are slightly more reforms introducing new legal technologies than revisions. It illustrates that tax havens are probably competing horizontally by diversifying and vertically by deepening their specialization.

Legal Technologies To better understand the development of tax havens, it is necessary to look at the type of legal technologies introduced. Figure 2 decomposes the trend by havens' specialization following the distinction described in Table 1.

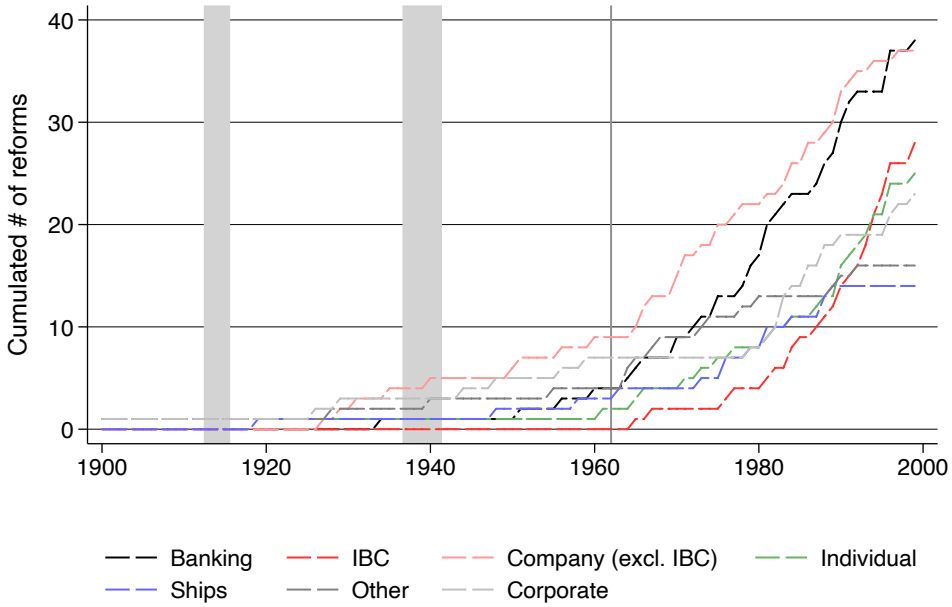


Figure 2 – Decomposition by type

Note: This figure plots the cumulated number of reforms by legal technology. Data on tax havens' reforms comes from own data collection detailed in section 2. Details on the classification used in this figure are displayed in Table 1. Shaded areas indicate the world wars and the vertical line (1962), the beginning of the independence wave in the U.K.-dominated Caribbean area.

First, it must be noted that the first reforms during the interwar are diversified in many different types of activities. It suggests that competition between them might have been limited at the beginning of tax havens' history. From the fifties, "Exempted companies" emerged as the dominant type of tax havens' technology while reforms in other activities

happened at a slower rate. Exempted companies are a flexible technology as they can be used by firms or individuals, particularly to manage their business income. This flexibility also decreases administrative costs for the tax havens that implement them (as there is a limited number of legal forms for different situations), which is an attractive property. It might explain why more and more tax havens are adopting such regulations.

We also observe a rapid rise in the number of banking reforms. Banking reforms, offshore banking or bank secrecy laws are complementary to other types of use of tax havens. Contrary to onshore banks, offshore banks offer flexibility and secrecy, which are necessary for offshore users. Therefore offshore banking reforms are expected to develop simultaneously with other types of reforms. For instance, the famous bank secrecy law introduced in 1934 in Switzerland had been partly enacted to avoid any authority having access to details about the activity in Swiss banks following a scandal in the early thirties during which French authorities pressured Swiss banks to obtain information from them (Guex, 2000).

Finally, International Business Corporations appear more and more attractive at the end of the century as we notice a significant increase in the number of IBC reforms. There are a few IBC reforms in the sixties but we observe a break in the trend following the reform of 1984 in the British Virgin Islands. Since then, IBC has been the legal technology that has experienced the most remarkable growth until the end of the century. It underlines the importance of legal innovations in the development of tax havens. It also indicates how quickly legal innovations can diffuse. Contrary to other markets, regulations can be easily replicated as they are publicly available and not protected from copy. It allows some countries to adopt regulations that appear successful quickly.

The geography of tax havens The last dimension to describe the rise of tax havens is the geographic dimension. Figure 3 reveals striking spatial differences in the development of tax havens. Some regions such as Europe, the Americas, and later Asia have a consequent number of tax havens while Oceania and Africa lag behind in havens development.

Until the fifties, almost all tax havens were located in Europe or the Americas, particularly in the Caribbean area. This is in line with the fact that taxation was first introduced in these regions. Second, for a large part of the 20th century, Europe hosted the largest number of tax havens. From the sixties, following decolonization and the global liberalization of financial flows associated with the end of the Bretton-Woods system, we observe a break in the trend of American tax havens, which number increased significantly. This is also the moment where tax havens appear in the other regions, Asia, Oceania, and to a lesser extent Africa. We can therefore divide the global history of tax havens in the twentieth century into two broad periods. During the first one, from WWI to the seventies, Europe dominated the scene of tax havens. During this period, Switzerland was the most important tax haven.[21] From the seventies, more tax havens emerge in the developing world. A new world geographic distribution of tax havens is drawn, driven by many new tax havens and new reforms in the Caribbean, which has become the region where tax havens are the most concentrated. As the center of the world economy moved from Europe to the U.S., the offshore world followed the same path.

21. The history of Switzerland, particularly its dominant role during the interwar, has led to several studies by historians. See for instance Farquet (2016, 2018) or Guex (2000, 2021).

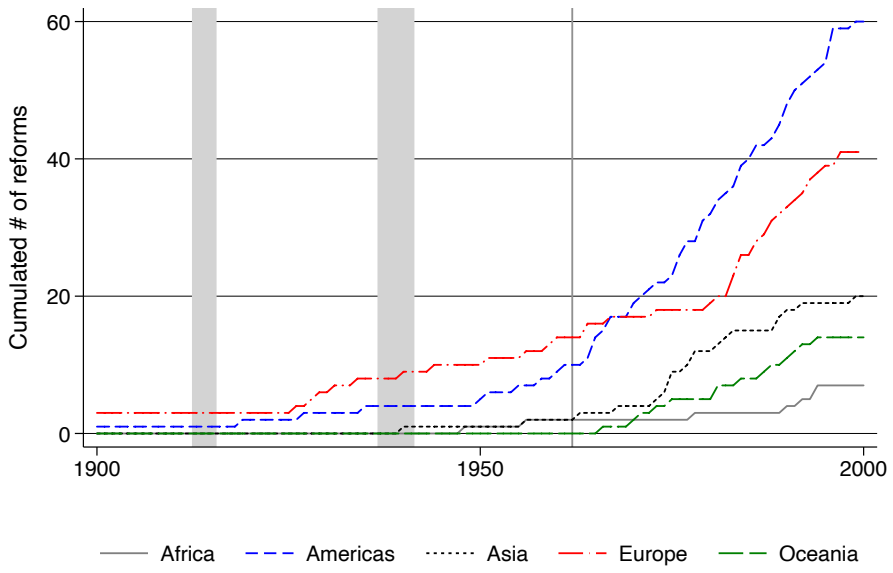


Figure 3 – The rise of tax havens in the 20th century: Decomposition by region

Note: This figure plots the cumulated number of tax haven reforms by broad world region. Data on tax havens' reforms comes from own data collection detailed in section 2. Shaded areas indicate the world wars and the vertical line (1962), the beginning of the independence wave in the U.K.-dominated Caribbean area.

What are the characteristics of tax havens? To complete the description of tax havens from the new database created in this paper, I explore their main characteristics. Several country-level characteristics of tax havens have been discussed in the literature. The most significant one is the small size of tax havens (Dharmapala and Hines, 2009). This fact is also grounded in theoretical models (for instance Kanbur and Keen, 1993, Hansen and Kessler, 2001, Slemrod and Wilson, 2009, Bucovetsky, 2014).

A second important characteristic of tax havens is their colonial history. Different studies have highlighted the tight connection between the colonial world, especially the British one, and the making of tax havens (Palan et al., 2009, Ogle, 2017, 2020 for instance). Newly independent countries have found a convenient specialization in the tax haven industry that necessitated a resource available to all countries: their sovereignty. Ogle (2017) argues that the connection between the colonial world and the offshore world is linked to the constitution of an informal empire by the United Kingdom, with limited actual sovereignty and different legal and political institutions. This difference generates loopholes that the former colons will use for offshore purposes. She also argues that the shock was partly a demand shock, with colonizers' assets partly reallocated in tax havens after the decolonization. On the contrary, Farquet (2021) argues that even though some colonial assets have been relocated to tax havens, the bulk of offshore assets is constituted by rich countries' assets.

Some scholars have also argued that the United Kingdom has encouraged, at least indirectly, these countries to become tax havens in order to reduce their development aid (Sagar, Christensen, and Shaxson, 2013, Ogle, 2017). On the contrary, other colonial powers such as France, have been more reluctant to encourage this development choice (Rawlings, 2004).

Figure A.3 in the Appendix plots the share of tax havens by size and colonial history by year. Until the decolonization period, small countries followed a similar trend, whatever their colonial history. In 1960, 20% of the small countries had become tax havens while around 5% of the large countries did. We observe a break in the trend of small countries connected to the United Kingdom from the sixties. At the end of the sample, more than 80% of the small U.K.-related countries are tax havens while only 40% of the small, not-U.K.-related countries are tax havens. The trend is similar among big countries. This figure adds to the literature a dynamic dimension: the shock of decolonization played a significant role in the construction of tax havens but only specific countries, newly independent and small, reacted to this shock.

To further explore this last fact, I study the evolution of the tax haven status in countries following their independence. To do so, I estimate the following dynamic difference-in-difference where the treated group is composed of countries experiencing decolonization and the control group is composed of countries that have never become independent in my sample:

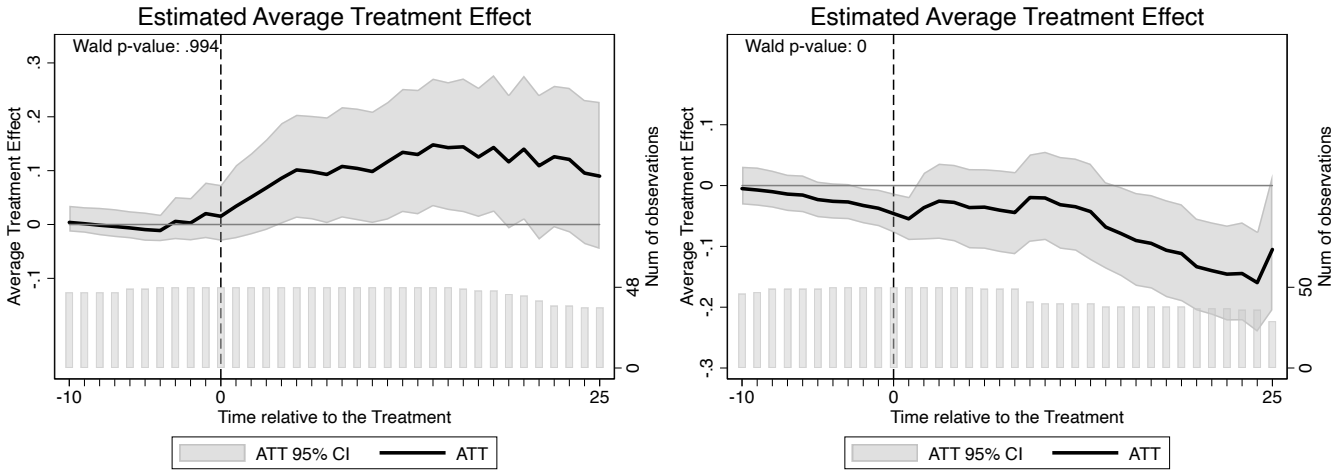
$$Tax\ Haven_{it} = \sum_{k=-10}^{25} \beta_k Independent_{it}^{k} + \mu_i + \mu_t + \epsilon_{it} \tag{1}$$

where $Tax\ Haven_{it}$ is equal to 1 when country i becomes a tax haven. $Independent_{it}^{k}$ is a dummy variable equal to one for treated countries k years before or after it becomes independent. μ_i and μ_t are country and time fixed effects, and ϵ_{it} is the error term. The equation is estimated using the imputation estimator proposed by Borusyak et al. (2022), Liu et al. (2022), and Gardner (2022) to account for potential heterogeneous effects in a generalized difference-in-difference setting with different treatment dates (de Chaisemartin and D'Haultfœuille, 2020). Borusyak et al. (2022) have shown that such estimator has attractive efficiency properties. The model is estimated for former U.K. colonies and other colonies separately. A key identification hypothesis is the exogeneity of decolonization. One can think for instance that a positive demand shock for tax haven services increases simultaneously the probability of becoming a tax haven and the probability of becoming independent. In all likelihood, the timing of decolonization appears exogenous to the probability that the decolonized country becomes a tax haven. First, the timing of independence is uncertain. Decolonization was mostly a regional phenomenon that depends on local conditions, independence wars, pro-independence protests, or negociations with the colonizer. Second, it is not necessary to make a country independent for it to become a tax haven. It happened that some territories became tax havens before their independence (Saint-Vincent-and-the-Grenadines for instance) or that some tax havens have never became independent (the Cayman Islands for instance). Then, if the timing of independence was endogenous to the probability of a country to become a tax haven, this should reflect in non-parallel pre-trends. As we will see, this is not the case, at least for former British colonies.

Results are displayed in Figure 4. I find that the probability that a former U.K. colony becomes a tax haven increases by about ten percentage points 10 years after becoming independent compared to a territory that does not. This effect is large given that the initial probability of becoming a tax haven a given year is around 7%. The absence of significant pre-trends for U.K. colonies (as suggested by the Wald p-value) as well as the exogeneity

of decolonization suggest that this is a causal effect. The coefficients estimated for other colonies display a different pattern. The estimated coefficients appear negative at all dates, even before treatment. They are therefore difficult to interpret and do not suggest a causal impact of independence on the tax haven status for this group of countries.

To sum up, the shock of decolonization has been a sizable exogenous shock, particularly for U.K. colonies. This fact helps explaining the significant increase in the number of tax havens and reforms from the sixties in the different descriptive figures above. I will use this shock later to analyze the effects of increasing competitive pressure on tax havens' choices.



(a) UK colonies

(b) Non-UK colonies

Figure 4 – Tax havens and decolonization: Event study

Note: This figure plots coefficients from an event-study regression following equation 1. I use the imputation estimator proposed by Borusyak, Jaravel, and Spiess (2022), Liu, Wang, and Xu (2022), and Gardner (2022). In panel (a), the treated group is composed of UK colonies becoming independent. In panel (b), the treated group is composed of non-UK colonies becoming independent. Both panels study how the probability of becoming a tax haven changes with a country's independence. The control group corresponds to territories that have never been independent over the period. Europe is excluded from the regression. The probability of being a tax haven one year before the treatment is 0.07 in the left panel and 0.02 in the right panel. 95% confidence intervals from bootsptrapped standard errors (500 repetitions). The Wald p-value tests for the absence of pre-trends.

3.2 Demand

In this paper, tax havens are seen as suppliers in a specific market, the market for tax avoidance and tax evasion services. The previous subsection has highlighted suppliers' spatial and temporal development in this market. In this subsection, I describe the rise in demand for tax haven operations.

A striking fact about state-building in the 20th century is the rapid spread of modern taxation (Seelkopf et al., 2021). A consequence of this global rise in taxation is that some individuals and firms are now willing to avoid it. It creates a demand for tax avoidance and tax evasion services. On the personal taxation side, this is reinforced by the fact that personal income taxes were characterized by their high degree of progressiveness, with the

top marginal tax rate often larger than 60% in the twenties.[22] In this subsection, I correlate the rise of modern taxation to the rise of tax havens.

The rise of taxation and the rise of tax havens Following the hypothesis that the rise in taxes creates demand for tax havens services, Figure 5 puts in relation the rise in the introduction of modern direct taxation through personal income tax (PIT) and corporate income tax (CIT) and the building of tax havens' architecture. It plots for Europe and Americas the cumulated number of modern direct taxes income taxes introduced in the region and the cumulated number of tax havens reforms in these regions.

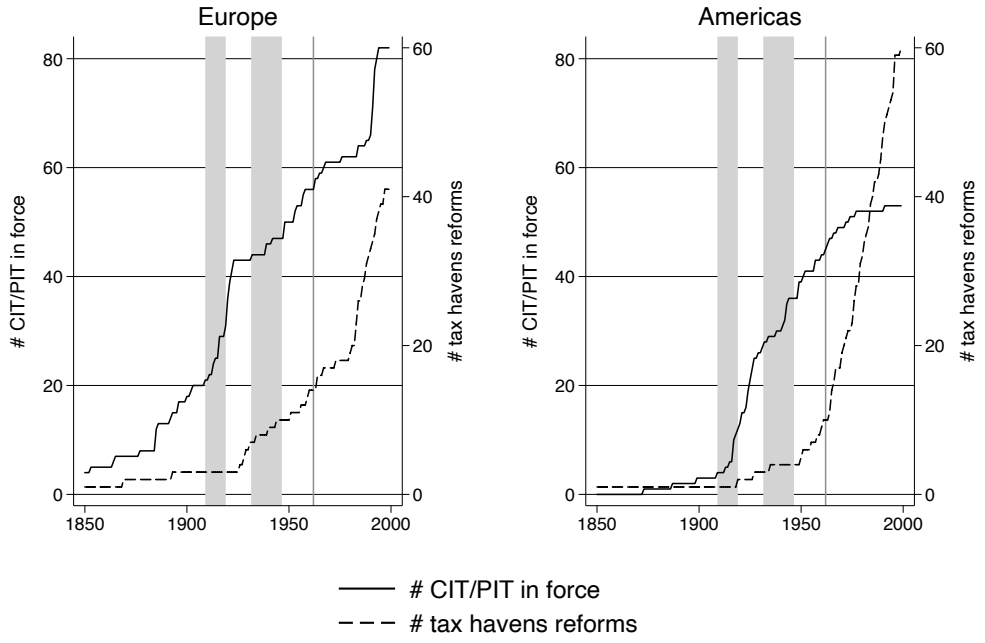


Figure 5 – The building of tax havens' legal architecture and the rise of direct taxation.

Note: This figure plots the number of direct taxes (Corporate income taxes and Personal income taxes) introduced and the number of tax haven reforms for Europe and the Americas. Data on the introduction of taxes comes from Seelkopf et al. (2021). Data on tax havens' reforms comes from own data collection detailed in section 2. Shaded areas indicate the world wars and the vertical line (1962), the beginning of the independence wave in the U.K.-dominated Caribbean area.

The first observation from this figure is that the increase in tax haven reforms always comes after the increase in tax introductions. IIt suggests that tax introductions impact positively tax haven reforms. For instance, in Europe, the steep rise in direct tax introductions began at the end of the 19th century, while the rapid increase in tax havens reforms began around 1925. On the contrary, the rapid increase in reforms in Europe at the end of the 20th century cannot be easily explained by rising taxation in the same region. A competing explanation, that will be explored later, is that the increasing competition between tax havens pushed them to update their legal architecture.

The figure for Americas reinforces this interpretation. The quick introduction of direct taxation at the beginning of the 20th century is followed by a rise in reforms in tax havens.

22. A recent literature have shown that individuals located at the top of the distribution were more likely to evade taxes (Alstadsæter et al., 2019, Leenders, Lejour, Rabaté, and Riet, 2020).

The break in the trend from the fifties can be attributed to the decolonization period as described above. However, decolonization or the rise in taxation cannot explain why the number of reforms keeps rising until the end of the century. As for Europe, an interpretation of this trend is that competition between tax havens pushed them to update their legal architecture.

Figure A.2 in the appendix plots the same figure for Asia, Africa, and Oceania. We observe a similar trend in Asia, where there is a lag between tax introductions and the rise in tax havens reforms. The evolution is different for Oceania and Africa, where a steep rise does not directly follow the rise in modern direct taxation in tax reforms.

Gravitational forces and tax haven use These figures correlate the rise of taxation with the rise of tax havens reforms both temporally and geographically. The implicit assumption is that there is a regional component of demand: when taxes are introduced in a country, it increases the demand for tax havens' services in nearby countries. It boils down to the assumption that the costs of tax evasion increase with distance. Bilateral evasion costs are diverse. For instance, they include the extent of compatibility between the regulations in the high-tax country and those in the offshore country. They also include communication and travel costs. Locating its assets in a tax haven means traveling there occasionally, communicating with intermediaries located in the tax haven, etc. These costs are most likely distance-dependent.

This assumption can be backed empirically. There is some evidence for geographically-dependent costs in the literature. Studying the behavior of multinational firms, Ferrari et al. (2022) shows that a gravity-like relationship exists for profit shifting between production places and tax havens. This link is also found in the bilateral profit shifting data of Torslov et al. (2022). Studying individuals' tax evasion in the Netherlands, Leenders et al. (2020) find that individuals close to a border tend to locate their hidden wealth in the country with which they share the border.

To complement this evidence, I use micro-level data from Offshore leaks (ICIJ, 2022b). The International Consortium of Investigative Journalists (ICIJ) has received data from different leaks in tax-advising firms between 2013 and 2021 (ICIJ, 2022a). This data includes micro-level information on entities opened in several tax havens. When available, the entity is linked with its ultimate owner and the location of this ultimate owner is identified. I use this data to gather information on the country of location of tax-haven entities and of their users. I create a variable that measures the number of links between each (non-haven; haven) pair of countries. A link corresponds to an ownership link between an offshore entity in a tax haven j and an entity in a non-haven country i. I detail the treatment of the data and the main assumptions made to count links between two countries in Appendix D. I estimate the following gravity equation to explain the number of links between two pairs:

$$\#Links_{ijk} = exp\left(\beta_1 ln(Dist._{ij}) + \beta_2 Ever\ Colony_{ij} + \beta_3 Legal\ origins_{ij} + \nu_{ik} + \nu_{jk}\right)\epsilon_{ijk} \qquad (2)$$

where $\#Links_{ijk}$ is the number of links between non-haven country i and tax haven j released in the leak source k (see the list of sources in appendix D). $Dist._{ij}$ is the geographic distance between i and j, $Ever\ Colony_{ij}$ is an indicator variable that is equal to 1 when both countries have ever been in a colonial relationship and $Common\ Legal\ origins_{ij}$ is an indicator variable that is equal to 1 if both countries share legal origins. ν_{ik} and ν_{jk} are country

$\times$ source fixed effects that account for any country-level characteristic and any country $\times$ source-level characteristics such as preferences from the offshore providers exposed in a given leak for some tax havens or some origin countries. ϵ_{ijk} is the error term. Given the count nature of the data, the equation is estimated using a Poisson pseudo-maximum likelihood (PPML) estimator.[23] This equation is estimated on a restricted sample where origin countries are necessarily non-haven countries and destination countries are tax havens to avoid haven-haven links that are less likely to reflect ultimate ownership links. Results are qualitatively similar on the full sample and with data aggregated at the country-pair level.

Results are displayed in Table 2. I find that distance plays an important role as increasing distance by 1% decreases the number of links between two countries by approximately 1%. This result supports the hypothesis that bilateral evasion costs increase with distance. It is also important to note that these costs also depend negatively on the legal similarities between the origin country and the tax haven: sharing a common legal origin increases the number of tax evasion links. It can be explained by the fact that two legal systems having the same origin might be more complementary when one wants to evade or avoid taxation. This variable also probably absorbs some colonial links as legal transplantation has followed colonial domination in history.[24]

Table 2 – Gravity in Offshore leaks data: PPML estimation

	(1)	(2)
	Nb. links	Nb. links
ln(Dist.)	-0.987***	-1.072***
	(0.104)	(0.113)
Colonial link		-0.146
		(0.241)
Common legal origin		1.435***
		(0.227)
Observations	2,291	2,291
Estimator	PPML	PPML
Origin-source and Destination-source FE	Yes	Yes

Robust standard errors clustered at the country-pair level in parentheses. *** p<0.01, ** p<0.05, * p<0.1

These results suggest that distance plays a key role in the relative demand received by tax havens. We can draw a parallel with the notion of market access from the economic geography literature (Redding and Venables, 2004). In this literature, countries that are distant from markets suffer from cost penalties, which impact the wages they can pay for a given level of technology. On the contrary, countries close to markets benefit from smaller costs and can pay higher wages. In the case of tax havens, being close to countries that introduce taxes allows them to serve more demand. Consequently, countries close to large

23. The gravity structure of the data also holds using OLS.

24. Klerman, Mahoney, Spamann, and Weinstein (2011) show that it is difficult to separate the effect of colonial links from the effects of common legal origins in the context of the study of economic development.

markets with large tax rates will be more likely to become tax havens. Here, it does not matter to be a large country. What matters is to be located close to large countries.

3.3 The market for tax havens' services

Until now, this section has shown that the rise of tax havens in the 20th century is correlated, in time and space, with the rise of modern taxation. Tax havens have been seen as the suppliers of services for tax evasion and tax avoidance but the market itself has not been described. In particular, two questions are in order. First, is becoming a tax haven followed by an increase in the provision of tax haven services? Second, do new tax havens lead to an increase in the market size, or do they substitute for older tax havens?

In this subsection, I use two different settings to answer both questions positively. It allows me to draw a direct link between suppliers - the tax havens - and the market equilibrium.

From reforms to service provision To investigate whether the provision of tax havens services follows new reforms, I use the micro-level data from the Offshore Leaks database described earlier. I now use a different feature of this database that allows me to observe offshore entities, identified by their country of registration and year of creation. I can therefore track the number of entities registered in a tax haven, before and after reform. Entities are seen as a proxy for the provision of offshore services. For this exercise, I concentrate only on reforms that aim at allowing for the registration of offshore companies. This is the type of legal technology that corresponds best to the entities registered in the database. This corresponds to "Exempted Companies" reforms and "International Business Corporations" reforms. I estimate the following event-study regression:

$$arcsinh(Entities)_{it} = \sum_{k=-10}^{15} \zeta_k Haven_{it}^k + u_i + u_t + v_{it} \tag{3}$$

where $arcsinh(Entities)_{it}$ is the inverse hyperbolic sine transform of the (cumulated) number of offshore entities registered in tax haven i at date t. This transform is used to smooth the data while keeping zeros in the estimation (Bellemare and Wichman, 2020). $Haven_{it}^k$ is a dummy variable equal to one for treated countries k years before or after it becomes a tax haven. u_i and u_t are country and time fixed effects and v_{it} is the error term. The control group corresponds to tax havens that have never enacted any exempt company (including IBC) reforms. As equation 1, the equation is estimated using the imputation estimator proposed by Borusyak et al. (2022), Liu et al. (2022), and Gardner (2022) to account for potential heterogeneous effects in a generalized difference-in-difference setting with different treatment dates. The model is estimated differently for "Exempted Companies" reforms and "International Business Corporations" reforms.

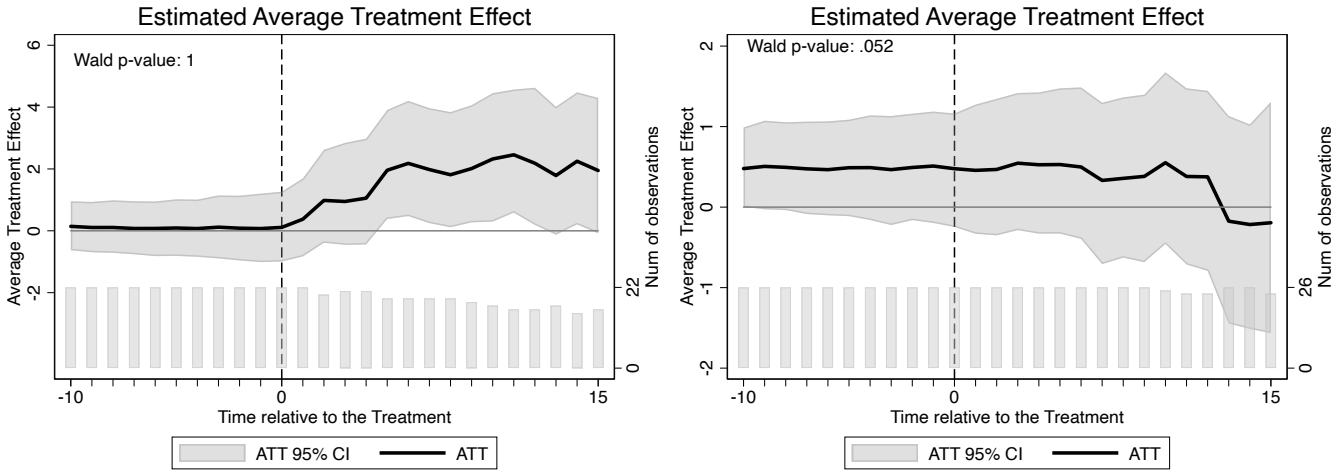
Figure 6 illustrates the different impact of both types of reforms. First, IBC reforms appear efficient in terms of entity incorporation. Following the reform adoption, the number of offshore entities recorded in the Offshore leaks data increases by 640% after 9 years. [25]

25. The coefficient after 9 years is equal to 2. $exp(2) - 1 = 6.4$. To compute this effect, I follow Bellemare and Wichman (2020) that provide elasticity formulas for inverse hyperbolic sine transformations. This computation

The effects appear immediately after the reform and increase during the next years. Estimates before the treatment are very close to zero and not statistically significantly different from zero.

Exempt companies follow a different path. On average, there is no apparent effect of these reforms on incorporation. If any, there is a slightly positive effect, but its interpretation is made uncertain due to the existence of a clear pre-trend. In any case, the effect is lower than that of IBC reforms. This result highlights the effectiveness of IBCs as legal technologies and their importance in the offshore world.

This figure shows that tax-haven reforms, in the context of company incorporation at least, materialize into an increase in the provision of tax haven services. The effect of reforms is however heterogeneous according to the type of legal technology.



(a) "International Business Companies" reforms (b) "Exempt Companies" reforms (excluding IBCs)

Figure 6 – Tax havens reforms and tax havens services: Event study

Note: This figure plots coefficients from an event-study regression following equation 3. I use the imputation estimator proposed by Borusyak, Jaravel, and Spiess (2022), Liu, Wang, and Xu (2022), and Gardner (2022). In panel (a), the treated group is composed of tax havens introducing "International Business Companies" reforms. In panel (b), the treated group is composed of tax havens introducing "Exempt Companies" reforms. It studies how the number of offshore entities registered in a tax haven changes when the country enacts a new reform of a given type. The dependent variable has been transformed using the inverse hyperbolic sine transformation to keep zeros in the estimation. The control group corresponds to tax havens that have never enacted any exempt company (including IBC) reform. The mean of the dependent variable one year before the treatment is 1.94 in the left panel and 1.71 in the right panel. 95% confidence intervals from bootsptrapped standard errors (500 repetitions). The Wald p-value tests for the absence of pre-trends.

The Swiss market for tax evasion The previous exercise draws a link between reform and service provision. This increase in the provision of services can be at the expense of tax havens already supplying the market or could expand the size of the market. This latter effect could materialize in the case of reforms implementing legal innovations that likely cut the costs of tax havens services.

holds in particular for large values of the dependent variable which is verified in this case. The average value of the number of entities in the estimation sample is 1080 for countries that have implemented an IBC reform is 835.

The first challenge to answering this question is finding historical data about tax havens services' market size. To do so, I use data from Zucman (2013) that collects fiduciary deposits in Switzerland by country of origin between 1976 and 2014 from the Swiss National Bank (SNB). Fiduciary deposits are deposits collected by Swiss banks and invested on behalf of their clients. As described by Zucman (2013), fiduciary deposits are used to avoid paying the 35% Swiss advance tax.[26] An interesting feature of this data is that the SNB records the origin of the last owner and does not see through conduit entities in tax havens. Consequently, it records investments made through tax havens from other places. Zucman (2013) argues that the majority of these investments are actually coming from European ultimate owners and are going to Switzerland through conduits in tax havens. Going through tax havens adds layers of secrecy between Swiss accounts and their actual owners. Assuming that the bulk of fiduciary deposits of tax havens corresponds to the use of sham corporations (such as IBCs for instance), an increase in the share of fiduciary deposits from tax havens corresponds to an increase in tax havens' market size for the Swiss market. The Swiss market is one of the largest ones for individuals' tax avoidance: according to Zucman (2013) it represented 34% of all offshore financial wealth in 2008 and it was probably even larger before this date (Alstadsæter et al., 2018). An increase in the share of fiduciary deposits from a given tax haven corresponds to an increase in market share from this tax haven in the Swiss offshore market.

Figure 7 plots the market size of tax havens and decomposes it between countries that become tax havens before 1960 and countries that become tax havens after this date. This year represents the moment of the entry of new tax havens following decolonization (see Figure A.3 in appendix). These tax havens will develop their activity gradually during the end of the 20th century. We observe that the global size of the tax haven market in the Swiss place has been increasing over the period, especially since the beginning of the nineties. The share of the older tax havens has been oscillating around 30% of all deposits with a little upward trend since the nineties.

Importantly, the market share of new tax havens has constantly been increasing, reaching the level of old tax havens after 2010. This increase in the share of new tax havens is not associated with a sharp decrease in the share of old tax havens, indicating that substitution between new and old tax havens should have been limited. On the contrary, the total market share of tax havens in Switzerland, proxied by the thick black line, has constantly increased. We can conclude from this graph that there is a positive correlation between the entry of new tax havens since the sixties and the increase in the market size of tax havens. In other words, the entry of new tax havens has contributed to the increase in the market size of tax havens. It must also be noted that the increase in the share of fiduciary deposits held in Switzerland is positively correlated with the increase in offshore entities recorded in the Offshore Leaks (see Table A.2 in appendix).

26. More precisely, any interest received on fiduciary deposits are considered as paid by foreigners. The bank acts as "fiduciary". This feature then creates a tax exemption. Fiduciary deposits represent one quarter of all foreign holdings in Switzerland in 2008.

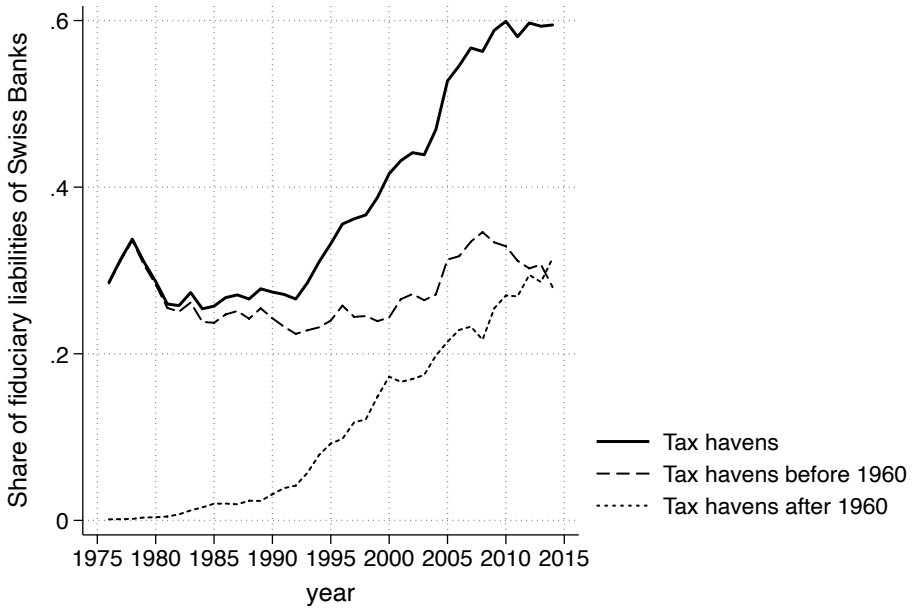


Figure 7 – The Swiss Market for tax havens' services

Note: This figure plots the share of fiduciary liabilities of Swiss banks by the origin country of the direct owner. Fiduciary deposit data is from Zucman (2013) which collects fiduciary deposits in Swiss by origin from the Swiss National Bank (SNB). Fiduciary deposits are deposits collected by Swiss banks and invested on behalf of their clients. They are used to avoid paying some Swiss taxes. The SNB records the last owner's origin and does not see through conduit entities in tax havens. Data on tax havens' reforms comes from own data collection detailed in section 2. The category "Tax havens" includes all tax havens covered in the SNB dataset. This represents the market share of tax havens in Swiss fiduciary deposits. "Tax havens before 1960" includes entities that become tax havens before 1960: Andorra, Netherlands Antilles, Bahamas, Bermuda, Cayman Islands, Honk-Kong, Isle of Man, Ireland, Jersey, Lebanon, Liberia, Liechtenstein, Luxembourg, Monaco, Netherlands, and Panama. "Tax havens before 1960" includes entities that become tax havens after 1960: Aruba, Antigua and Barbuda, Bahrain, Belize, Barbados, Cyprus, Dominica, Guernsey, Gibraltar, Grenada, Jordan, Saint Kitts-and-Nevis, Saint Lucia, Macao, Marshall Islands, Malta, Mauritius, Malaysia, Nauru, Singapore, Seychelles, Turks and Caicos Islands, Tonga, Saint Vincent-and-the-Grenadines, Virgin British Islands, Vanuatu, and Western Samoa.

4 A Theoretical Framework

This section presents a conceptual framework that describes the fundamental forces underlying the choice of a government to become a tax haven and update its legal architecture.

To build it, I use the legal capacity building framework of Besley and Persson (2011). This choice is motivated by the fact that this type of model allows for a rich characterization of a country's institutions. Beyond the tax rate, I need to model the tax havens' legal architecture and its change which I model as specific institutions. Models à la Besley and Persson (2011) are particularly centered on institutions and their evolution and therefore correspond well to the objectives of this section.

In this 2-periods framework, a utility-maximizing government chooses its tax rate and the level of productive infrastructures. Between the two periods, it can decide to invest in its level of productive infrastructure in order to increase revenues in period 2. To attract more tax revenues, he can also decide to set up an offshore legal architecture. This legal architecture can be upgraded through investment between period 1 and period 2. Comparing its utility over the two periods, the government chooses before period 1 if it chooses to become a tax haven.

This framework is centered on the tax haven decision and not on the reaction of non-haven countries. In this respect it is different from the tax competition models with endogenous tax havens (Slemrod and Wilson, 2009, Bucovetsky, 2014). These models generally assume countries that only differ by their size. In my framework, countries must not be symmetric to allow for geography and market access of tax havens. This framework is particularly designed to explain the trajectory of tax havens in the first half of the twentieth century, where competition between tax havens was likely limited (see above in section 3).

A simple economy Consider a simple economy where a government makes its choices taking the state of the economy in foreign countries as granted (mimicking the small open economy framework). There are two time periods $s = 1, 2$ and the population corresponds to N homogeneous individuals. The utility of a given individual is $u_s = (1 - t_s)y(\pi_s) + \alpha_s g_s$ with y its revenues, t_s the income tax rate, and g_s its consumption of a public good. Revenues are a positive function of the level of infrastructure in the country π_s. π_s encompasses the legal support such as the administrative support or property rights protection but also more generally the level of public infrastructures in the economy such as education or health infrastructures.[27] It can be seen as the productivity of the real sector of the economy. $\alpha_s \geq 1$ is the value of the public good.

The tax rate t_s and the level of infrastructure π_s are constrained by the fiscal capacity τ_s and the infrastructure capacity Π_s. As seen later, in this simple model a non-haven government sets the highest possible tax rate and infrastructure level. The fact that they are constrained will push governments to invest in their respective capacities in order to increase the future revenues. Here, because we are interested in tax havens that generally set taxes under the level of fiscal capacity, we consider the fiscal capacity as fixed: $\tau_s = \tau$. The government can invest in infrastructure by paying a cost defined as follows: $\mathcal{L}(\pi_2 - \pi_1)$.

27. This enlarges the definition of the fiscal capacity from Besley and Persson (2011). However, it is in line with their interpretation that investment in productive infrastructures and legal capacity share many similarities, see section 3.2 of their book.

The cost is a positive and convex function of the difference between the levels of infrastructure in period 2 and in period 1 with $\mathcal{L}(0) = 0$.

Before considering the model where a country can choose to become a tax haven, I describe the optimum solution in the standard case.

The government budget is :

$$\underbrace{t_s y(\pi_s) N}_{\text{Revenues}} = \underbrace{g_s N + m_s N}_{\text{Expenses}}$$
$$\text{s.t. } t_s < \tau,$$
$$\pi_s < \Pi_s$$

with m_s the cost of investment per capita (which is 0 when $s = 2$). The tax revenues on the left-hand side should equal the government expenditures on the right-hand side: public goods provision and investment in infrastructures. As described in detail later, becoming a tax haven will precisely affect the government budget by bringing tax revenues from the taxation of offshore activity. Note that in the non-haven case, the size of the population will not matter. It will become important when introducing tax havens.

The timing is the following: τ_1, Π_1, α_1 and α_2 are given in stage 0.[28] The government chooses whether or not to become a tax haven by writing a law. At the beginning of period 1, the government chooses a set of period-1 policies: $\{t_1, \pi_1, g_1\}$ and invest to determine Π_2. At the beginning of period 2 the government chooses a set of period-2 policies: $\{t_2, \pi_2, g_2\}$. The model is solved by backward induction.

A non-haven government maximizes:

$$u_s^I = (1 - t_s) y(\pi_s) + \alpha_s g_s$$
$$\text{s.t } t_s y(\pi_s) = g_s + m_s,$$
$$t \leq \tau,$$
$$\pi_s \leq \Pi_s.$$

The level of public goods can be written as a residual from the government constraint: $g_s = t_s y(\pi_s) - m_s$. Therefore, taking into account the level of the public goods, the government now maximizes:

$$u_s^I = (1 - t_s) y(\pi_s) + \alpha_s \left(t_s y(\pi_s) - m_s\right)$$

What is the level of infrastructures and taxes? A first result of the model is that they are both set at their maximum possible level, those of their respective capacities.

Proof: the first order conditions are

$$\frac{\partial u_s^I}{\partial \pi_s} = (1 - t_s)\, y_\pi + \lambda_s t_s y_\pi \geq 0 \text{ (infrastructures)}$$
$$\frac{\partial u_s^I}{\partial \pi_s} = -y_\pi + \lambda_s y_\pi \geq 0 \text{ (taxes)}$$

with $y_\pi = \frac{\partial y(\pi_s)}{\partial \pi_s}$. This notation, where derivation is noted with subscripts is applied for other variables in the rest of the paper.

28. As it would not bring key results in this framework, the value of the public goods in period 2 is assumed to be known to the government in period 1.

Increasing the level of infrastructures or the level of taxation always increases utility. At the optimum, $t_s = \tau$ and $\pi_s = \Pi_s$. To increase utility in period 2, the government can invest in the infrastructure capacity, which will increase the general level of infrastructures in period 2, therefore increasing revenues.

I now describe how the level of investment is set. The investment in infrastructure capacity is an intertemporal problem. The government sets the optimal level of infrastructures in period 2 by maximizing its utility over the two period.

$$W = (1 - t_1)y(\pi_1) + \alpha_1 \left(t_1 y(\pi_1) - m_1 \left(\pi_2 - \pi_1\right)\right) + (1 - t_2)y(\pi_2) + \alpha_2 \left(t_2 y(\pi_2)\right)$$

By maximizing W, I find that the level of investment in the public infrastructures is defined by:

$$\underbrace{\alpha_1 \mathcal{L}_\pi(\pi_2 - \pi_1)}_{\text{Marginal cost of investment}} \geq \underbrace{y_\pi \left[1 + (\alpha_2 - 1)t_2\right]}_{\text{Marginal benefits from investment}} \tag{4}$$

The government invests in the infrastructure capacity until the marginal cost of investment (lower public goods provision in period 1) is equal to or larger than the marginal benefits (higher revenues and higher public goods provision in period 2). The left-hand side is equal to 0 when there is no investment. The right-hand side is always positive because $\alpha_2 \geq 1$. Therefore, investment in the public infrastructure capacity will be positive. I use this condition as a benchmark to compare it with the situation where the country is a tax haven.

The tax haven option I now introduce the possibility for a country to become a tax haven. The government can choose to write a law before period 1 to make its country a tax haven for periods 1 and 2. I assume that the government of a tax haven has the ability to tax foreign offshore revenues, ω_s^F. This modeling of tax evasion aims at being very simple to be as broad as possible and cover different uses of tax havens. It is possible to interpret it as individual tax evasion when an individual uses a trust structure or opens an international business company to channel its revenues in the tax haven in exchange of a small tax or a fee. It can also be interpreted as a firm shifting its revenues to the tax haven. Benefits of becoming a tax haven only come from higher tax revenues. As argued before, both types of specialization (firms or individuals) bring revenues to tax havens. Tax havens benefit from tax evaders only through additional taxes. As noted by Slemrod and Wilson (2009), this could extend to any indirect source of revenues such as revenues from tourism.

This new source of revenues comes with a constraint: the tax rates on the domestic economy and on the offshore revenues cannot be independent. I assume that the tax rate on the domestic economy is proportional to the tax rate on the offshore revenues: $t_s^D = \delta t_s$ with t_s^D the tax rate on the domestic economy, t_s the tax rate on the offshore economy and $\delta \geq 1$. In absence of this constraint, becoming a tax haven is always utility-maximizing.

This constraint creates a trade-off: decreasing its tax rate to attract more offshore revenues is done at the expense of the domestic economy. This is a similar mechanism as in Slemrod and Wilson (2009). From an empirical point of view, tax rates on the domestic economy in tax havens tend to be lower than those of comparable countries.[29] More

29. Table A.9 in appendix E compares the corporate and individual tax rates on the domestic economy in tax havens and non havens. It shows that tax rates in tax havens tend to be smaller than those in non havens by 5

broadly, this assumption boils down to assuming that developing the offshore economy absorbs resources from the domestic economy.

The demand for tax haven services Before describing how becoming a tax haven affects the choices of the country, I put more structure on ω_s^F, the demand for tax haven services addressed to the country of interest. To do so, we look at the behavior of taxpayers in other countries indexed by i. The utility of individual n when she pays taxes in i (no evasion) is: $V_i = (1 - t_i)\omega_i + \varkappa_h$ with ω_i its revenues and $\varkappa_h$ the preference of individual n for paying its taxes in i, distributed Gumbel.[30] We can interpret it as tax morale for instance. The individual can also choose to evade its taxes by locating all of its revenues in a tax haven $h \in \{TH\}$.

The service of tax evasion is sold competitively in each tax haven. I assume its marginal cost to be $\frac{1}{p_h}$ with p_h the quality of tax haven h. The quality of the tax haven represents how effective is the process of tax evasion in a country. It can be mediated through better offshore laws, better communication and travel infrastructure, better administrative and legal efficiency in the offshore sector, incentives for foreign banks and law firms to establish, etc. It works as a cost shifter parameter that decreases the cost of using the country as a tax haven when it increases. On top of this cost, an individual from i has to pay an iceberg bilateral cost τ_{ih} that corresponds to communication costs, transport costs, and any other bilateral cost (the compatibility between the law systems of i and h for instance). This assumption is empirically relevant as demonstrated in section 3. I also assume that one has to use an intermediary in h to use it a tax haven. The taxes paid by the intermediary firms in tax havens are fully passed-through to consumers.[31]

The total cost of evading taxes in country h is therefore: $\frac{\tau_{ih}\omega_i}{p_h(1-t_h)}$ The utility of the individual that evades taxation is h is $V_h = (1 - t_h)\omega_i - \frac{\tau_{ih}\omega_i}{p_h(1-t_h)} + \varkappa_h$. In both cases, U_k is the deterministic part of the utility. Using the properties of the Gumbel distribution, the probability that an individual in i pays its taxes in country h, noted $\mathbb{P}_{ih}$, is

$$\begin{aligned}\mathbb{P}_{ih} &= \mathbb{P}(V_h > V_k, \forall k \in \{TH\} \cup \{i\}) = \mathbb{P}(\varkappa_k < \varkappa_h + U_h - U_k) \\ &= \frac{exp\left((1 - t_h) - \frac{\tau_{ih}}{p_h(1-t_h)}\right)}{\sum_{k\in\{TH\}} exp\left((1 - t_k) - \frac{\tau_{ik}}{p_k(1-t_k)}\right) + exp(1 - t_i)}\end{aligned}$$

This represents the share of people evading taxation in country i to tax haven h. As an individual that evades taxes shelters all his revenues in the tax haven, we can deduct the total amount of revenues sent from country i to tax haven h, which represents the demand from i to h and the total demand addressed to h

percentage points for personal taxation and 7 points for corporate taxation. As this gap might be driven by some characteristics independent from the tax haven status, I control for different country characteristics in figures A.6 and A.7. The figures reveal that tax havens have lower tax rates than similar countries, confirming the empirical foundations of this hypothesis. One can also imagine that a disconnection between both tax rates will push taxpayers to try to appear as foreigners in order to benefit from the lower tax rates. This is for instance what happens with round-tripping when firms invest in their domestic countries through foreign entities to benefit from advantageous conditions. See for instance Hanlon, Maydew, and Thornock (2015).

30. This assumption allows for a functional form for ω_s^F.

31. This assumption makes the demand to be zero when taxes in the tax haven are equal to one.

$$\omega_s^F = \sum_i D_{ih} = \sum_i N_i \omega_i \mathbb{P}_{ih} \tag{5}$$

Demand has the desired properties as it decreases with the tax haven tax rate and the bilateral costs. It increases with the quality of the tax haven. Importantly it also decreases with the number of competitors and their bilateral costs relative to non-haven countries. In a parallel with economic geography literature (Redding and Venables, 2004), ω_s^F can be seen as the market access of tax havens for exchanging tax haven services. In particular, variations in market access are partially driven by geography, which is an arguably exogenous factor. This suggest that this property can be used for the empirical identification of the effect of demand on the supply of tax haven services.

Tax rate, legal support, and tax haven quality The optimal public good level is set similarly as in the non-haven case. The new government objective function writes:

$$u_s^I = (1 - \delta t_s) y(\pi_s) + \frac{\alpha_s}{N} \left[\delta t_s y(\pi_s) N + \underbrace{t_s \omega_s^F(p_s, t_s)}_{\text{Haven-specific revenues}} - m_s N \right]$$

Once a country is a tax haven it has to choose its quality p_s. By increasing its quality, the tax haven becomes more attractive, which increases ω_s^F. The quality of the tax haven is constrained by the "tax-haven-quality" capacity noted P_s. Between periods 1 and 2, the government can invest in P in order to be able to raise its quality capacity in period 2. The cost of investment is noted $\mathcal{P}(p_2 - p_1)$ and has the same properties as $\mathcal{L}$.

Intuitively, as we can see π_s as the productivity of the real sector, p_s can be interpreted as the productivity of the offshore sector. Their relative strength can therefore be indicative of the advantage a country has in a sector.

We can now solve for the optimal tax rate, legal support and tax haven quality. To set its tax rate, the government maximizes its utility. Contrary to the non-haven case, where the tax rate is set at the level of the fiscal capacity, in this case, the tax rate might be set at a rate lower than the fiscal capacity. Therefore the tax rate is determined following the first-order condition:

$$\frac{\partial U_s}{\partial t_s} = \delta y(\pi_s)(\alpha_s - 1) + \frac{\alpha_s}{N} \left(\omega^F + t_s \omega_t^F \right) = 0 \tag{6}$$

with ω_t^F, the partial derivative of ω_s^F by t. The tax rate is set at the point where the marginal revenues from a higher tax rate equal the marginal losses on the offshore economy. There is no explicit solution to this equation. I note t_s^* the solution of this equation. The tax rate on domestic activity is set to $t_s^D = min\{\delta t_s^*, \tau_s\}$. In the rest of the exposition, I will consider that $t_s^D = \delta t_s^*$, *i.e.* that δt_s^* is small enough to be lower than the fiscal capacity. The optimal infrastructure level and tax haven quality are set the same way as in the non haven case. They are set at their maximum possible level, *i.e.* est their respective capacities (see proof in appendix F).

Investment in legal support and tax haven quality In order to enhance its expected utility of the two periods, the government can now invest in its infrastructure capacity and its tax haven quality. It does so by maximizing its expected utility over the two periods.

Implication 1 : Tax havens always invest in their quality. The more so if the costs of investment are low. In particular this is the case when the tax haven quality is small (as

the cost function is convex) and when new legal technologies reduce the marginal cost of investment, $\mathcal{P}_p$, for all p. The introduction of a new legal technology that decreases costs therefore increases investment in quality.

Proof: the two following conditions describe investment in infrastructure capacity and tax-haven quality:

$$\alpha_1 \mathcal{L}_\pi(\pi_2 - \pi_1) \geq y_\pi \left[1 + (\alpha_2 - 1)\delta t_2\right] \tag{7}$$

$$\alpha_1 \mathcal{P}_p(p_2 - p_1) \geq t_2 \frac{\alpha_2}{N} \omega_p \tag{8}$$

The government invests in the infrastructure and tax haven quality until the left-hand side of equations 7 and 8 are larger than the right-hand side. The left-hand side corresponds to the marginal cost of investment weighted by α_1, the marginal value of foregone tax revenue in period one. The right-hand side corresponds to the marginal gains of investment. As $\mathcal{L}(0) = 0$ and $\mathcal{P}(0) = 0$, it means that investment in infrastructure and tax haven quality will be positive as long as the right-hand side is positive. This is the case because $\alpha_1 - 1 > 0$.

Note that investment in the general public infrastructure is lower in tax havens than in non-haven countries. This result comes from the comparison of the investment condition in infrastructure when the country is a tax haven and when it is not. Both are very similar since the only difference is that it is scaled by a different tax rate. Because the equilibrium tax rate on the domestic economy is lower in tax havens than in other countries, this makes the investment in productive infrastructure less valuable. This result is important as it implies that tax havens, despite maximizing welfare, will invest less in the general public infrastructure than if they were not tax havens.

Which countries become tax havens? We now have all the elements to compare the utility when a government chooses to make its country a tax haven or not. The government does so by comparing utilities in both cases. The country becomes a tax haven if $U^H > U^{NH}$ over the two periods: $\mathbf{1}\{Haven\} = \mathbf{1}\{U^H > U^{NH}\}$. I define $\Delta_U = U_1^{TH} - U_1^{NTH} + U_2^{TH} - U_2^{NTH}$, the difference between the utility when the country is a tax haven and when it is not.

$$\begin{aligned} U^H - U^{NH} = & \underbrace{y(\pi_1^*)\left(\delta t_1^{H*} - t_1^{NH*}\right)}_{\text{More domestic revenues in non-haven countries}} \underbrace{(\alpha_1 - 1)}_{\text{Net value of publics funds}} \\ & + \frac{\alpha_1}{N}\left(\underbrace{t_1^{H*}\omega_1^F}_{\text{Offshore sector revenues}}\right) + \underbrace{m_1^{NH*} - m_1^{H*}}_{\text{Differences in investment}} \\ & + \left(1 + (\alpha_2 - 1)\,\delta t_2^{H*}\right) y(\pi_2^{H*}) - \left(1 + (\alpha_2 - 1)\,t_2^{NH*}\right) y(\pi_2^{NH*}) \\ & + \frac{\alpha_2}{N} t_2^{H*} \omega_2^F \end{aligned}$$

The first line shows the losses from becoming a tax haven due to lower tax revenues on the domestic economy. These lower tax revenues only impact the difference in utility if the net value of public funds is strictly positive. The level of infrastructures, by increasing revenues, increases the value of these losses. The second line shows the gains from becoming a tax haven due to higher tax revenues on the offshore economy. It also shows the role of the differences in investment in legal capacity and tax haven quality. The third and fourth line are the equivalent of the two first lines for the second period. The only difference is

that $y(\pi_2^{H*}) < y(\pi_2^{NH*})$ because the investment in infrastructures has been lower in the tax haven. As a consequence, the higher the cost of investment in infrastructure, the higher the probability of becoming a tax haven all other things being equal.

I now describe how ΔU is impacted by country size (N), changes in foreign tax rates (t_i), and initial levels of infrastructure and haven quality (π_1 and p_1) .

Implication 2: The probability that a country becomes a tax haven decreases with its size.

Proof in appendix F where I show that $\frac{\partial \Delta_U}{\partial N} \leq 0$. This result is due to the fact that a large population size provides more domestic tax receipts while not affecting offshore tax receipts. This result is in line with observations that tax havens are generally small countries. A similar result, with a different theoretical setting, is obtained by Slemrod and Wilson (2009).

Implication 3: The introduction of taxes in foreign countries increases the probability that a country becomes a tax haven. This probability decreases when distance with these countries increases and decreases with country size.

Proof in appendix F. Intuitively, the introduction of taxes in foreign countries increases demand all other things being equal. Therefore it increases the potential revenues from becoming a tax haven. This benefits more tax havens that are closer to the country that introduces taxes because costs rise with distance, and tax havens that are smaller because the benefits of becoming a tax haven decrease with size. This result shows the key role of the market access of tax havens.

This result explains well the patterns uncovered in the previous section that links the rise of taxation in a continent and the subsequent rise in the number of tax haven reforms.

Implication 4: The higher the level of initial tax haven quality, the higher the probability of becoming a tax haven. On the contrary the higher the initial level of infrastructure, the lower the probability of becoming a tax haven. This implication exhibits the role of absolute advantage. Countries with large p compared to π will have more incentives to become tax havens.

Proof in appendix F. This result is due to the fact that higher initial quality will increase the utility to become a tax haven compared to staying a non-haven country. As a consequence, if we make the hypothesis that the common law provides key legal instruments for offshore activity, common law countries are more likely to become tax havens, all other things being equal. The hypothesis of a greater offshore potential of the common law lies in the fact that trust laws are a key instrument of offshore practices and that they find their origins in the English common law (see Palan et al., 2009, Pistor, 2019 or Harrington, 2016 for discussions). Besides, if we assume the newly decolonized countries have a low level of infrastructure, we find that U.K. newly decolonized countries are more likely to become tax havens. This can explain the pattern found in Figure 4 that there is a causal impact of decolonization on the probability of becoming a tax haven. It also confirm that the reaction of countries to this shock directly depends on their characteristics. [32]

32. On a side note, combined with Implication 1, these results can shed light on the empirical results of Dharmapala and Hines (2009). The authors argue that, on average, tax havens are better-governed countries than other countries. They also write that they cannot establish the direction of the causality. In their empirical framework, governance is measured by voice and accountability, political stability, government effectiveness, rule of law and control of corruption. One can argue that these variables are associated with a larger tax haven quality p_s. Indeed all these variables are likely to decrease the cost of using a tax haven by providing stability and predictability

Discussion This model does not include competition between tax havens. Such extension is left for future work. A few remarks are in order. Competitors enters directly in the specification of the demand, ω_s^F, which decreases with the number of tax havens. Consequently, an exogenous increase in the number of competitors will negatively affect the demand, all other thing being equal. to maintain constant demand, tax havens have to either decrease their tax rates or to reinforce their legal architecture. While tax rates are constrained, this is not the case of the legal architecture that has much more flexibility.

We can also note, that the level of competition from other tax havens will also depend on their access to demand. Other tax havens that are further away from demand (high τ_{ih} with many i countries for instance) have a lower impact on competitive pressure than closer tax havens. A consequence of this is that tax havens that are close by compete for the same demand and therefore exert a higher competitive pressure on others. as with demand, competition has a geographical component. This will be used in the empirical analysis to identify the effect of increased competition on tax havens' policies.

5 Demand shocks in tax havens

The theoretical framework shows that the market access of tax havens is a driver of their development (Implication 3). A first exploration of the data in section 3 motivates the analysis by providing descriptive evidence about the correlation between increasing taxation in close countries and new reforms. To test this proposition, I use the temporal and spatial variation of the demand shocks triggered by the increase in taxation in the 20th century.

Demand shocks The conceptual framework indicates that this demand has a geographical component (Implication 3). The geographical variation in demand comes from i) the assumption of bilateral evasion costs and ii) the assumption that bilateral costs increase with distance. The assumption that bilateral costs increase with distance is critical in the identification as it creates country-level variation in the demand faced by a country. A country further away from the shock experiences a lower increase in demand than a closer country. The empirical relevance of this assumption has been demonstrated in section 3 by studying the elasticity of offshore use to distance.

I construct demand shocks received by country i as an average of other countries' tax level, weighted by the size of these countries (proxied by population) and their distance with country i. This specification has the advantage of being easy to interpret and can deliver elasticities of reforms to foreign demand. The weight is constructed as follows: $W_{ijt} = \frac{ln(pop_{jt})}{ln(dist_{ij})}$. pop_{jt} is the number of inhabitants in country j at date t and $dist_{ij}$ is the geographical distance between countries i and j. From these weights, I compute demand as:

$$D_{it} = \left(\sum_j W_{ijt} \right)^{-1} \times \sum_j \left(W_{ijt} \times \frac{Direct\ Tax\ Revenues_{jt}}{GDP_{jt}} \right) \tag{9}$$

to its users. Implication 3 implies that a higher initial p_1 is associated with a higher likelihood of becoming a tax haven, while Implication 1 suggests that tax havens invest in their governance. In other words, the causality likely goes in both directions.

The tax rate in country i is proxied by the average direct tax revenues in GDP, which is a macro-level proxy for the effective tax rate on (any) revenues. Data comes from the Government Revenues Dataset (Andersson and Brambor, 2019a, 2019b). I assess the robustness of this specification at the end of the section.

Identification To study the effect of demand on reforms transforming countries in tax havens, I estimate the following equation:

$$\mathbb{1}_{Reform_{it}} = \alpha_1 ln(D_{it}) + \chi Z_{it} + \mu_i + \mu_t + u_{it} \tag{10}$$

with $\mathbb{1}_{Reform_{it}}$ an indicator variable equal to 1 if country i makes a reform at date t, $ln(D_{it})$, the logarithm of the demand received by country i at date t. Z_{it} is a vector of control variables, and χ is the associated vector of coefficients. Control variables include an indicator variable for being independent at date t and the number of years since independence. In specifications without country fixed effects, I also include the log of the size of the country, an indicator variable for being a (current or former) U.K. colony, and indicator variables for common law and civil law. Country fixed effects and time fixed effects are introduced through μ_i and μ_t. u_{it} are the residuals. The equation is estimated using a linear probability model.[33] All countries, including countries that never become tax havens, are included in the estimation sample.

The demand corresponds to a i-specific average of the tax rate in foreign countries weighted by the size of these countries and the distance of these countries to country i. In the cross-section, the variation comes from the fact that bilateral distance is unique for all pairs of countries. Any difference in the level of taxation in a foreign country j affects all other countries in the world differently. Besides, this source of variation is exogenous as it is based on geography. In the time dimension, variation in the demand received by country i comes from changes in the tax environment in foreign countries j. Overall, different countries are affected differently by demand shocks based on geography and on the timing of tax changes in foreign countries.

Endogeneity The identification of the impact of demand shocks on tax haven formation raises empirical identification concerns. In particular, some shocks can affect both the tax-revenues-to-GDP ratio observed in foreign non-haven countries and the probability of doing a reform. It can typically happen in the case of a large regional shock such as a war, that will affect both tax rates (increasing them to finance the war) and the probability that countries become tax havens due to capital flight (see for instance Hollis and McKenna, 2019).

To deal with this issue, I propose an instrumental variable strategy. The goal of the instrumentation strategy is to construct a variable that affects the probability of doing a reform only through its effect on the demand for tax havens services. To do so, I construct a variable, $\widehat{\frac{Direct\ Tax\ Revenues_{jt}}{GDP_{jt}}}^{IV}$, that predicts tax revenues based only on exogenous variables. Then, I use this variable to construct an exogenous demand variable, D_{it}^{IV}.

33. According to Timoneda (2021), a linear probability model with fixed effects if well-suited for estimating models with rare events, which is the case in our data. It also facilitates the use and interpretation of instrumental variables and interaction models.

To find exogenous variable that will predict changes in $\frac{Direct\ Tax\ Revenues_{jt}}{GDP_{jt}}$, I use results from the comparative taxation literature. In particular, Kiser and Karceski (2017) highlight three important determinants of tax revenues from a comparative perspective: war, democracy, and development. Cameron (1978) also points the role of governments' ideology in explaining taxation trends.

First, the occurrence or the threat of war has been extensively discussed as a determinant of tax revenues (Tilly, 1990). However, as just described, the occurrence of war might be correlated both with tax levels and tax flight and does not constitute a good candidate for the IV. Development, measured by GDP per capita, might also be subject to endogeneity as it is likely to be correlated to regional economic shocks, and then affect both the dependent and the independent variables. On the contrary, democratization appears much more independent from these shocks. For instance Acemoglu, Johnson, Robinson, and Yared (2008, 2009) and Barron, Miguel, and Satyanath (2014) argue that democratization is not cause, in a panel setting, by changes in income. Therefore, the level of democracy is probably not correlated to regional-level economic shocks that might affect the probability that some countries enact tax havens reforms. In addition, there is a long-standing literature that describes how different government ideologies affect economic outcomes, in particular taxation levels (Cameron, 1978, Tavares, 2004, Pettersson-Lidbom, 2008). For instance tax revenues tend to be larger for left-wing government than right-wing ones. The variation in tax levels due to changes in government ideology are likely to be exogenous from the tax havens' reforms in nearby countries. Therefore, this variable appears suitable for our IV strategy.

In an initial stage of the IV strategy, $\widehat{\frac{Direct\ Tax\ Revenues_{jt}}{GDP_{jt}}}^{IV}$ will be predicted using the level of democracy, the ideology of the head of government (left, center or right), country fixed effects and time fixed effects. To increase the reliability of my estimates, the democracy index and ideology indexes are interacted with continent dummies is order to obtain continent-specific effects of each variables on the ratio of direct tax revenues over GDP. As argued above, democratization and development are more likely to be independent of the formation of tax havens in close countries as they are generally country-specific, contrary to war that can affect a whole region and therefore have a much more significant impact on foreign countries. I, therefore, use these two variables to predict exogenous tax to GDP ratios.

In an initial stage, I construct the predicted share of direct taxation in GDP by estimating the following regression:

$$\begin{aligned} \frac{Direct\ Tax\ Revenues_{jt}}{GDP_{jt}} &= \theta_1 Democracy_{jt} + \theta_2 \mathbb{1}_{Left_{jt}} + \theta_3 \mathbb{1}_{Right_{jt}} \\ &+ \delta_j + \delta_t + e_{jt} \end{aligned} \tag{11}$$

where $\frac{Direct\ Tax\ Revenues_{jt}}{GDP_{jt}}$ is the share of direct taxation in GDP in country j at date t, $Democracy_{jt}$ is a variable that captures the extent of democracy in country j using VDEM's electoral democracy index (Coppedge et al., 2021). $\mathbb{1}_{Left_{jt}}$ and $\mathbb{1}_{Right_{jt}}$ are indicator variables that indicates whether the head of government belong to the left or the right (the excluded category are "center" head of governments). Data comes from Brambor, Lindvall, and Stjernquist (2017) which provide information on the ideology of the head of government of 33 countries from 1870 to 2012. δ_j are country fixed efects, δ_t are year fixed effects and e_{jt} is the error term. The regression is estimated over the period 1920-2000.

Using the predicted value, $\widehat{\frac{Direct\ Tax\ Revenues_{jt}}{GDP_{jt}}}$, I construct the instrument, D_{it}^{IV}, as the weighted average of direct taxation around a given country i following equation 9. As an instrumental variable, D_{it}^{IV} should fulfill two conditions: i) D_{it}^{IV} must be correlated with D_{it}, ii) it should only affect the probability of becoming a tax haven through its effect on D_{it} (exclusion restriction). The first condition will be checked by looking at the first-stage F-statistics. Anticipating the results, the F-statistics are large and above the thresholds of relative bias computed by Stock and Yogo (2005). The exclusion restriction will be fulfilled as long as no endogenous variation is introduced in our initial stage. For this to be the case, democratization level and head of government's ideology of foreign countries j should be exogenous to the presence of tax havens around them. This condition should be fulfilled as, contrary to wars, democratization and ideology are not linked to large regional shocks but are country-specific.

Results The results from the estimation of equation 10 are displayed in Table 3. The table gives the results for all reforms in columns (1) to (3), for only the reform that makes a country a tax haven (the country leaves the estimation sample once it becomes a tax haven) in columns (4) to (6) and for other reforms conditional on being a tax haven in columns (7) to (9). The number of observations in the sample with only first reforms and in the sample with only other reforms sums up to the number of observations in the sample with all reforms. Results are presented for OLS estimations and IV estimations. I begin by describing OLS results.

In column (1), the regression does not include country fixed effects. The coefficient can be interpreted as the effect of demand on the probability of becoming a tax haven exploiting variation between countries. An increase in the average tax-GDP ratio by 1% increases the probability of becoming a tax haven by 13 percentage points. In columns (2) and (3), I include country fixed effects. In the specification with controls and exploiting within-country variation, I find that increasing potential demand by 1% increases the probability that a country becomes a tax haven by 19 percentage points.

To scale these effects, they must be compared with a typical variation in the residualized dependent variable and with the average probability of enacting a reform in the sample. [34] Using the estimates in column (3), I multiply the estimated effect with a standard deviation of (residualized) $ln(D_{it})$, and divide it by the probability of enacting a reform at any point in the sample. I obtain that a one standard deviation change in demand increases the probability of doing a reform by 31.2% ($\frac{0.187*0.0122}{0.00732} = 0.312$). Note that the initial probability of doing a reform is very small in the sample. If a typical change in demand significantly impacts the probability of doing a reform, it is still small in absolute value. It suggests that large demand increases are necessary to impact the decision to enact a reform.

The effects estimated for the probability of becoming a tax haven are smaller. In the version without country fixed effects, I find that the probability of becoming a tax haven increases by 4 percentage points when potential demand increases by 1%. Once scaled, this coefficient is closer to those estimated in the first three columns. It is explained by the fact that the probability of doing a reform in this sample is smaller. Adding country fixed effects, the coefficient increases to 0.08 without controls and 0.1 with controls. It corresponds to a

34. The residualized dependent variable corresponds to the dependent variable cleared from the variation coming from the fixed effects. It follows the methodology proposed by Mummolo and Peterson (2018).

Table 3 – The impact of demand on the probability of reform

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
		$\mathbb{1}_{Reform}$			$\mathbb{1}_{FirstReform}$			$\mathbb{1}_{OtherReforms}$	
OLS									
$ln(D_{it})$	0.131***	0.170**	0.187**	0.0446***	0.0839*	0.101**	0.409***	0.358	0.507
	(0.0304)	(0.0796)	(0.0809)	(0.0163)	(0.0443)	(0.0466)	(0.118)	(0.421)	(0.337)
IV									
Second-Stage									
$ln(D_{it})$	0.116***	0.124	0.157	0.0416**	0.131**	0.165**	0.328***	-0.149	0.0788
	(0.0317)	(0.114)	(0.115)	(0.0167)	(0.0609)	(0.0676)	(0.118)	(0.580)	(0.589)
First-Stage									
$ln(D_{it}^{IV})$	0.947***	0.904***	0.912***	0.951***	0.860***	0.863***	0.879***	0.859***	0.828***
	(0.00877)	(0.0517)	(0.0494)	(0.00942)	(0.0581)	(0.0551)	(0.0441)	(0.171)	(0.187)
Av. Dep. Var.	0.00732	0.00732	0.00732	0.00261	0.00261	0.00261	0.0529	0.0529	0.0529
s.d residualized indep. var	0.0122	0.0122	0.0122	0.0115	0.0115	0.0115	0.0178	0.0178	0.0178
Scaled effect OLS	0.218	0.284	0.312	0.196	0.369	0.442	0.138	0.121	0.171
Scaled effect IV	0.194	0.207	0.262	0.183	0.576	0.725	0.110	-0.0502	0.0266
F-Test	11645	306	341.6	10195	218.7	245.4	398.4	25.19	19.59
Time FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Country FE	No	Yes	Yes	No	Yes	Yes	No	Yes	Yes
Controls	Yes	No	Yes	Yes	No	Yes	Yes	No	Yes
Observations	18,574	18,574	18,574	16,836	16,836	16,836	1,738	1,738	1,738

Note: This table estimates equation 10. Data on the share of taxes in GDP comes from Andersson and Brambor (2019b). Data on tax havens' reforms comes from own data collection detailed in section 2. Columns (1), (2) and (3) include all reforms as dependent variables. In columns (4), (5) and (6), tax havens leave the sample after the first reform. Columns (7), (8), (9) only consider new reforms from countries that are already tax havens. Additional controls correspond to ln(Area), indicator variable for common law and civil law, indicator variable for being a former U.K. colony, indicator variable for being independent and the number of years since independence. When country fixed effects are added, only the two last variables are used as controls, the other being absorbed by the fixed effects. The scaled effects are computed by multiplying the coefficient by the standard deviation of the residualized independent variable and dividing it by the average of the dependent variable in the sample. It can be interpreted as the percentage change in the probability of the event represented by the dependent variable when demand increases by one standard deviation. "K-P F-stat" stands for the Kleibergen-Paap Wald rk F statistic. Robust standard errors clustered at the country level in parentheses. *** p<0.01, ** p<0.05, * p<0.1

change of 37% and 44% in the probability of becoming a tax haven for a typical change in demand.

The three last columns consider reform adoption when a country is already a tax haven. In this case, I find lower estimates than before, particularly in the specifications with country fixed effects. In the specifications with country fixed effects, the estimated coefficients are not statistically different from zero at the standard significance levels. These results show that conditional on being a tax haven, demand has a lower impact on the building of the legal architecture of tax havens.

The second part of the table shows the results from the IV estimation. A look at the first stage regressions indicates coefficients close to 1 and statistically significant, which is expected by design. The first-stage Kleinbergen-Paap Wald rk statistics are large and above the thresholds of 5% relative bias computed by Stock and Yogo (2005). [35] I concentrate here on the results that include fixed effects and controls in columns (3), (6), and (9). In column (3), the IV estimates are close to the OLS ones despite being non significantly different from zero at the conventional levels. Turning to column (6) where I consider only countries becoming tax havens, we observe a larger IV estimate than OLS. The scaled effect is 73% larger and indicates that a one standard deviation increase in demand results in an increase of the probability of becoming a tax haven by 72.5%. Demand, as proxied by exogenous changes in taxation in foreign countries substantially contributes to the decision of countries to become tax havens. The IV coefficient estimated in column (9) is not significantly different from zero and much lower than the OLS estimate, confirming that demand mainly explains the fact that countries become tax havens but not subsequent updates of their legal architecture.

The theoretical framework predicts that small countries are more likely to become tax havens and to react to demand shocks (Implications 2 and 3). This is also the case for countries with low infrastructure capacity and high tax haven quality (Implication 4). As argued above, former U.K. colonies are good candidates for being in this group of countries. To test these predictions, I interact the demand variable with i) an indicator for being a small country (country size lower than the median) and ii) an indicator for being a (current or former) U.K. colony. I compare the effect for countries belonging to these groups to the effect for other countries by taking their ratio. I plot this ratio in Figure A.4. The left panel corresponds to the ratio for the size dummy and the right panel to the ratio with the U.K.-colony dummy. The ratio is positive and larger than 1 in all cases. It indicates a higher probability of becoming a tax haven after a demand shock in countries belonging to each group.

Overall, these results suggest that the level of external potential demand strongly affects the probability that a country becomes a tax haven as predicted in the theoretical framework. However, demand determinants seem less important when looking at new reforms conditional on being a tax haven. This result is somewhat at odds with the theoretical framework, where higher demand should lead to more investment in the quality of the tax haven. It also suggests that other factors, such as supply-side factors might be at play.

35. Table A.3 in appendix displays Montiel Olea-Pflueger Effective F statistics (Montiel Olea and Pflueger, 2013) and the associated 5% critical values for testing the null hypothesis that the asymptotic estimator bias exceeds 10%. The effective F statistics are systematically higher than the threshold except for the estimations in the last column, where it is slightly above the critical value.

Robustness I run different additional regressions to assess the robustness of the results. First, I correct the IV estimates for spatial correlation using the estimator of Colella, Lalive, Sakalli, and Thoenig (2019). I specify spatial clusters such as the correlation between error terms of two observations decreases linearly with distance and is zero when their distance is larger than 1000km and when they are separated by more than 10 years. Results are displayed in the upper panel of Table A.4. The new standard errors are in the range of those computed in the main table, and all results hold.

In the lower panel of Table A.4, I assess the robustness of the specification of the demand variable. To make sure that the variation used to identify the effect of demand is coming from changes in tax rates, I compute the demand without the size weight: $W_{ijt} = \frac{1}{ln(dist_{ij})}$. The results are similar to those obtained in Table 3 and the coefficients within one standard deviation of the original estimates.

Then, in table A.5, I use a different variable to measure demand. Instead of relying on the weighted average of the tax-GDP ratio in foreign countries, I rely on information about tax introduction. Using data from Seelkopf et al. (2021), I create three indicator variables that count the number of corporate income taxes and personal income taxes introduced in countries i) closer than 500km, ii) located in a range of 500km to 1000km, iii) located in a range of 1000km to 2500km, iv) located further away than 2500km. This demand variable has the interest of being straightforward to interpret. Tax introductions also constitute larger shocks than those captured in the baseline exercise. The time coverage is also better and allows me to include years between 1900 and 1920 in the estimation sample. The scaled effects are generally of a larger magnitude in general than in the baseline results. It illustrates that tax introductions capture larger shocks than changes in tax rates.

I also construct D_{it} following its definition in the theoretical framework. A key difference is that this measure of demand is weighted by the presence of competitors. Again, this specification is very close to the idea of market access as analyzed in the economic geography literature. All variables of the model cannot be identified empirically, though. This is why this specification is used as a robustness test. The form of demand is the following: $D_{it} = \sum_j GDP_j \frac{exp(1-ln(dist_{ij}))}{\sum_k exp(1-ln(dist_{jk}))+exp(1-t_j)}$. To obtain it, I use equation 5 and I assume that the tax rate in tax havens is 0, that the ratio $\frac{\tau_{ih}}{p_h}$ can be approximated by the log of the distance between i and h, and that the tax rate in country i can be proxied by the average direct tax revenues in GDP. Note that this regression is endogenous for the same reason as in Table 3 but also because it depends on other tax havens policies. I use the same IV strategy as in Table 3 exploiting only exogenous variations in tax-GDP ratios in foreign countries to identify the effect of demand. In table A.6 I find results similar to those in Table 3, especially for the first reforms in OLS and IV. In column (6), the scaled effects are comparable in OLS and larger by 44% in IV. The OLS results are somewhat different from the main ones for other estimations. The estimates are small and not significantly different from zero in the specifications with fixed effects. These results are reversed in the IV regressions, where only exogenous variation in foreign countries' tax rates is used to identify the impact of demand. IV estimates are overall close to those in the main table, with comparable scaled effects. The main result, that demand is important for the first reform and less so for other reforms, holds in both OLS and IV regressions.

In the last robustness test, I proceed to a placebo test through permutations. I randomly permute the tax haven history of countries in my sample. Countries (tax havens and non-

tax-havens countries) are randomly assigned with the tax haven history of another country. Then I run the specification in column (6) of Table 3 1000 times with the OLS and IV estimators. Results are displayed in table A.7. Positive and statistically significant coefficients are found in 6% of the cases in OLS and in 5.2% of the cases in IV regressions. The probability of obtaining a coefficient as large as the coefficient in the baseline estimation is 0.1% in OLS and 0.1% in IV regressions.

6 Competition shocks

The previous section has studied how tax havens are affected when the demand for tax haven services changes exogenously. It has been established that an increase in the potential demand received by a country increases its probability of becoming a tax haven. This effect is amplified if the country is small or if it has a colonial link with the United Kingdom. The results also suggest that demand does not explain why countries update their legal architecture well.

In this section, I explore whether other types of shocks can help to understand other causal determinants of tax havens. I use a large quasi-natural experiment, the decolonization of British colonies in the Caribbean and the Pacific. Decolonization can be seen as a large supply shock in the market for tax haven services. Figure 4 has demonstrated that this shock causally increased the probability of becoming a tax haven for former U.K. colonies. Following the wave of decolonization, many newly decolonized countries became tax havens or updated their legal architecture. This shock can mainly be described as a supply shock that pushed many newly independent countries to seek additional revenues. As discussed in the theoretical framework, former U.K. colonies have characteristics that incentivize them to become tax havens. It must be added that on top of these characteristics, the policy of the U.K. concerning its colonies and former colonies has participated in the choices of these countries to become tax havens (Palan et al., 2009, Sagar et al., 2013, Ogle, 2017). This shock of decolonization exogenously increased competition between tax havens by increasing the number of competitors in the market.

To motivate the importance of competition for tax havens, I use the Offshore Leaks data. If competition, materialized by the number of tax havens, affects tax havens' rents negatively, we should observe it in the number of entities registered in a given tax haven h. An additional assumption is necessary to identify an effect. I assume that, as for demand, there is a geographic component of competition. Two tax havens that are geographically close will compete more than two remote tax havens. This assumption is directly linked to the theoretical framework where tax havens that are geographically close attract demand from the same places.[36] In table A.8 in appendix B, I explore the effect of an increase in the number of tax havens in an area of 1000 km around a tax haven h, on the number of offshore entities registered in h. I separate the sample between tax havens that have enacted an "Exempt Company" regulation before the wave of decolonization in 1960, and those that did not. Exempt companies are the types of offshore entities that appear in the Offshore Leaks. Given the coverage of the data, I therefore expect that only tax havens with such regulations are going to be affected by more competition. I find that when the number of tax

36. Note that this assumption can also be grounded in spatial models of industrial organization where firms a located along a line or a circle compete for the same demand as their neighbors (Salop (1979)).

havens in a 1000km-circle around a tax haven h increases, the number of newly registered offshore entities is negatively affected in tax havens with Exempt companies before the shock while other tax havens are not affected. One additional tax haven around reduces the number of entities by 8%. [37]

We can draw a parallel with the standard product market. The economic literature studies how competition affects the firms participating in the market, particularly how they innovate. I follow a similar approach and look at the effect of competition on the decisions taken by countries to enact havens' reforms. Updating its legal architecture is akin to differentiating, either vertically, by increasing the quality of its current regulations or horizontally, by creating regulations in new offshore areas. This exercise is important because it participates in understanding how tax havens adapt when they face negative shocks on their rents. This is for instance what is expected when governments introduce anti-avoidance policies.

Identification To identify the impact of the increased competition on tax havens' legal architecture, I keep using the same geographical variation by looking at the impact of new offshore reforms in a circle of 1000km. The impact of competition is then identified by the fact that different countries are hit differently by the competition shock according to their geography. The shock hits harder the countries closer to tax havens that implement reforms. In the cross-section, variation comes from geographical variations. To study the role of competition on tax havens' policies, I estimate the following equation:

$$\mathbb{1}_{Reform_{it}} = \beta_1 ln(D_{it}) + \beta_2 \left(\sum_j Reforms_{jt} \times \mathbb{1}_{Dist_{ij}<1000km} \right) + CZ_{it} + \gamma_i + \gamma_t + v_{it} \quad (12)$$

where $\mathbb{1}_{Reform_{it}}$ is an indicator variable equals to 1 when a reform is enacted in country i at date t. $\left(\sum_j Reforms_{jt} \times \mathbb{1}_{Dist_{ij}<1000km} \right)$ is a variable that counts the number of reforms enacted in foreign havens j distant by less than 1000 kilometers. Z_{it} is a vector of control variables, γ_i are country fixed effects and γ_t are time fixed effects. v_{it} are the residuals. The equation is estimated using a linear probability model.

The effect of competition on the legal architecture of tax havens is estimated through β_2. Equation 12 is subject to endogeneity issues through reverse causality. Indeed, reforms taken in country i depend on other tax havens policies, which in turn depends on i policies. Therefore, I use the natural experiment of decolonization to obtain exogenous variation in reforms. I concentrate on post-war American and Pacific areas since these are the areas affected by the decolonization shock. I instrument the number of tax reforms in the 1000km around a given country by the number of newly independent British colonies in the 1000km around this country. Because of the country and time fixed effects, this instrument only captures the variation coming from newly independent countries. The variation exploited in these regressions comes from a different exposure of different tax havens to the shock due to differences in geography and differences in the timing of decolonization.

The exclusion restriction imposes that the independence of countries in an area of 1000km around country i affects its offshore policies only because it pushes newly independent

37. See Bellemare and Wichman (2020) for elasticity and semi-elasticities formulas with the Inverse Hyperbolic Sine Transformation.

countries to enact tax haven reforms. The geography and timing of decolonization have the advantage of being independent of the level of demand for tax haven services. However, one might argue that decolonization could have impacted tax havens development through a demand channel. If decolonization increased uncertainty, this might create capital flight to close countries. This is however unlikely. As just described, the exploration of the Offshore Leaks data (table A.8 in Appendix B) shows a decrease in offshore entities registration when neighboring countries implement new reforms. This is not compatible with a positive demand shock, in which case we would have observed an increase in the number of registered entities. Therefore it excludes a violation of the exclusion restriction through this channel.

Results Results are displayed in Table 4. The three first columns display OLS regressions, columns (3) to (6) display IV regressions with the number of independent countries in 1000km around as an instrument, columns (7) to (9) restrict the sample of the IV regressions to countries that do not become independent during the period studied. This sample restriction limits the extent of bias introduced by the fact that some countries might experience the decolonization shock at the same time as the competition shock. This is an additional robustness exercise as this channel is accounted for by controlling for independence and time since independence in columns (3) to (6). The coefficient on the number of reforms around has been multiplied by 100. It should be interpreted as the percentage point increase in the probability of becoming a tax haven when there is one new reform around. The average change in the number of reforms in a circle of 1000km from 1945 to 2000 in the sample is on average 8 conditional on being a tax haven.

Looking at all reforms in column (1), we observe that 1 additional tax haven reform around a given country increases its probability of becoming a tax haven by 1.2 percentage points. The effect is similar if we concentrate only on the first reforms. When looking at subsequent reforms made in countries that are already tax havens, 1 additional reform increases the probability of making a new reform by 3.4 percentage points. The effect is imprecisely estimated though and not significantly different from 0 at the 10% level. The level of demand, captured through the weighted level of taxation if foreign countries positively affects the probability of reform though not significantly.

The IV regressions confirm the above results: one new reform around a country increases the probability of doing a reform by 1.5 percentage points, of becoming a tax haven by 1.3 percentage points and of adopting a subsequent reform once a country is already a tax haven by 6.1 percentage points. When the sample is restricted to countries that never become independent in the sample, I find a large effect on subsequent reforms. A new reform in a circle of 1000km increases the probability of adopting a subsequent reform by 11.8 percentage points. However, despite being positive, the effect on first reforms is now lower than in the previous columns and not significantly different from zero. This suggests that for these countries, the level of competition played little in entry into the tax haven status.

Overall, these results show a large effect of competition on tax havens' policies. I now discuss a potential channel of this effect: the role of legal technologies and their diffusion.

Mecanism: legal technologies At least two channels can be at play. On the one hand, more competition in the market for tax havens services reduces the rent of tax havens.

Table 4 – The impact of increased competition on the probability of reform

	(1) $\mathbb{1}_{Reform}$	(2) $\mathbb{1}_{FirstRef.}$	(3) $\mathbb{1}_{OtherRef.}$	(4) $\mathbb{1}_{Ref.}$	(5) $\mathbb{1}_{FirstRef.}$	(6) $\mathbb{1}_{OtherRef.}$	(7) $\mathbb{1}_{Ref.}$	(8) $\mathbb{1}_{FirstRef.}$	(9) $\mathbb{1}_{OtherRef.}$
# Reforms < 1000 km	1.217**	1.150*	3.406	1.538**	1.328*	6.097	2.205**	0.971	11.83***
	(0.607)	(0.604)	(3.090)	(0.771)	(0.699)	(3.664)	(0.933)	(0.984)	(1.704)
ln(Av. Direct Tax/GdP)	0.0798	0.0236	-0.705	0.0892	0.0230	-0.104	0.733	0.174	8.395**
	(0.231)	(0.134)	(1.550)	(0.241)	(0.134)	(1.910)	(0.812)	(0.540)	(3.499)
K-P F-stat				542	577.8	65.07	476.7	254.6	426.8
Controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Post-1945	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Non independent only	No	No	No	No	No	No	Yes	Yes	Yes
Observations	4,139	3,488	651	4,139	3,488	651	1,389	1,119	254

Note: This table estimates equation 12. Coefficients on # *Reforms < 1000 km* have been multiplied by 100 for readability. Data on the share of taxes in GDP comes from Andersson and Brambor (2019b). Data on tax havens' reforms comes from own data collection detailed in section 2. Columns (1), (2) and (3) estimate OLS. Columns (4), (5) and (6), estimate an IV regression. Columns (7), (8), (9) estimate an IV regression restricted to the sample of never-independent territories. Additional controls are included in columns (1) to (6) and correspond to an indicator variable for being independent and the number of years since independence. All regressions include country and year fixed effects. "K-P F-stat" stands for the Kleibergen-Paap Wald rk F statistic. Robust standard errors clustered at the country level in parentheses. *** p<0.01, ** p<0.05, * p<0.1

This is directly seen from model equation 5 where new competitors decrease the demand addressed to a given tax haven. This should have a negative impact on the probability of reforms. On the other hand, tax havens might want to adjust to this shock by updating their legal architecture to increase their rents.[38] This latter effect can benefit from the diffusion of new legal technologies.

We know, for instance, that the International Business Company law of the British Virgin Islands enacted in 1984 has been copied almost word for word by other offshore jurisdictions such as Anguilla or the Bahamas. It suggests that the diffusion of new legal technologies can reduce the costs of updating the legal architecture and increase the probability of reform (see Implication 1 of the theoretical framework).

The competition effect is therefore intertwined with a learning effect where actual and potential competitors can observe the type of laws used by other countries and can design their laws according to their perception of the effectiveness of these laws. This effect can be even more important given that the laws are generally written with the help of a small pool of lawyers advising several countries simultaneously.

This second effect dominates the first as we observe an increase in the number of reforms in tax havens hit by the competition shock. In particular, we see that tax havens react on the intensive margin. This intensive margin can be decomposed between reforms in an area of specialization in which the tax haven has already made a reform or reforms in a new area. An area of specialization corresponds to a broad type of legal technologies. This is what I explore in Table 5. This table replicates columns (6) and (9) of Table 4 with indicator variables for "reforms in a new area" or "revisions" as dependent variables. The table shows that the competition shock has a larger impact on investment in new areas than in areas in which the tax haven is already specialized. This is true both for all countries and for only non-independent countries.

38. Another alternative would be to compete on tax rates. The absence of historical information on the tax rate applied by tax havens prevents me from exploring this channel.

Table 5 – Competition and type of reform

	(1) $\mathbb{1}_{Reform\ in\ new\ area}$	(2) $\mathbb{1}_{Revision}$	(3) $\mathbb{1}_{Reform\ in\ new\ area}$	(4) $\mathbb{1}_{Revision}$
# Reforms $<$ 1000 km	4.503***	0.689***	3.102***	0.772***
	(1.075)	(0.189)	(0.867)	(0.193)
F-Test	65.07	65.07	426.8	426.8
Controls	Yes	Yes	Yes	Yes
Reforms	Next	Next	Next	Next
Post-1945	Yes	Yes	Yes	Yes
Non independent only	No	No	Yes	Yes
Observations	651	651	254	254

Note: Coefficients on # *Reforms* $<$ *1000 km* have been multiplied by 100 for readability. The sample from columns (1) and (2) correspond to the sample of column (6) in Table 4.The sample from columns (3) and (4) correspond to the sample of column (9) of Table 4. Robust standard errors clustered at the country level in parentheses. "New area" corresponds to reforms made in a sub-category in which the country had done no reform before and "revision" corresponds to reforms made in a sub-category in which the country had already made a reform before. Sub-category classification is the following: Banking, Insurance, Exempt companies (IBC or not), MNE-specific, Holding regimes, Individual, Ships, and Other. Additional controls are included: in columns (1) and (2) they include $ln(D_{it})$, an indicator variable for being independent and the number of years since independence. In columns (3) and (4) they include $ln(D_{it})$. The other control variables cannot be included as the sample is restricted to non-independent territories. *** p$<$0.01, ** p$<$0.05, * p$<$0.1

Innovation in a new area can be facilitated if investment in the architecture is not costly. This is the case when new types of reforms (or legal technologies in a more general vocabulary) emerge. For instance, International Business Companies constitute such a technology. I have shown in section 3 that IBCs diffused quickly between countries despite being a relatively late innovation in the 20th century. The emergence of new legal technologies can favor learning of tax havens which helps to mitigate the negative effects of decreased rents. Learning is particularly facilitated by the fact that laws are public and not protected from reproduction.

In Table 6, I explore the extent of diffusion of different types of legal technologies. To do so, I follow the structure of equation 12 and look at the impact of new reforms of a given type c in a circle of 1000km on the probability of introducing this type of reform in its legal architecture:

$$\mathbb{1}_{FirstReform^c_{it}} = \zeta_1 ln(D_{it}) + \zeta_2 \left(\sum_j Reforms^c_{jt} \times \mathbb{1}_{Dist_{ij}<1000km} \right) + CZ_{it} + \gamma_i + \gamma_t + u_{it} \quad (13)$$

where $\mathbb{1}_{FirstReform^c_{it}}$ is an indicator variable equals to 1 when a reform of type c is enacted in country i at date t for the first time. The country leaves the sample once it has enacted the reform for the first time. $\left(\sum_j Reforms^c_{jt} \times \mathbb{1}_{Dist_{ij}<1000km} \right)$, is a variable that counts the number of reforms of the type c enacted in foreign havens distant by less than 1000 kilometers. Z_{it} is a vector of control variables, γ_i are country fixed effects and γ_t are time fixed effects. u_{it} are the residuals. The equation is estimated using a linear probability model.

The coefficient ζ_2 is interpreted as the effect of one additional reform in a circle of 1000km in a category c on the probability of doing a reform in this category. A larger coefficient for a category c means that reforms of the category c are more likely to diffuse geographically. This model is estimated for reforms in the four more important categories at the end of the sample: Banking, Exempt Companies (no IBC), IBCs, and Individual. The first column estimates equation 13 using OLS on the whole sample to assess the global diffusion patterns of these reforms. In the four next columns, the sample is restricted to the sample used in Table 4. These columns correspond to IV estimates and look at the diffusion patterns at play during the "decolonization" shock using the same instrument as in Table 4.

The results in the first column of Table 6 reveal that IBC reforms are those that diffuse the most in the whole sample. One additional reform around a tax haven not yet specialized in IBCs increases its probability of implementing such reform by 4.5 percentage points. This effect is statistically significant at the 5% level. The coefficient for the other types of regulations is not significantly different from zero and low, even negative for Exempt Company laws and Finance laws. These results suggest that the cost of implementation and diffusion differs by technology.

In the four next columns, I concentrate on the IV sample of Table 4 (post-1945 in Americas and Pacific areas) to identify the role of legal technologies in the effect of competition. Column (2) considers all reforms and includes independent and non-independent countries. The coefficients estimated are not significantly different from zero but the point estimates are close to those estimated in column (1). It means that the diffusion patterns are relatively similar in this sample than in the whole sample. The Kleinbergen-Paap F statistic is above conventional levels. It is higher for IBCs, suggesting a stronger correlation between independence from the U.K. and the implementation of IBC reforms. Column (3) restricts

Table 6 – Competition and legal technology diffusion

	(1)	(2)	(3)	(4)	(5)
	Whole Sample	IV Sample			
	OLS	IV			
IBC					
Number of laws $<$ 1000km	4.533**	4.094	2.323	3.647	22.60***
	(1.863)	(2.721)	(4.857)	(5.396)	(4.004)
K-P F-stat		841.2	217.3	479.9	139.5
Observations	5,214	1,444	651	564	254
Exempt (no IBC)					
Number of laws $<$ 1000km	-2.858	-3.373	8.079	-2.099	-0.151
	(2.674)	(6.142)	(9.162)	(7.545)	(0.185)
K-P F-stat		105.4	34.11	199.8	273.8
Observations	5,214	1,444	651	564	254
Finance					
Number of laws $<$ 1000km	-2.459	-2.056	12.49*	0.808	-2.171
	(2.079)	(3.780)	(7.121)	(6.365)	(4.541)
K-P F-stat		188.3	42.17	116.1	108.6
Observations	5,214	1,444	651	564	254
Individuals					
Number of laws $<$ 1000km	0.449	-4.940	-8.638	-6.600	-23.39**
	(2.308)	(5.101)	(7.321)	(8.689)	(9.280)
K-P F-stat		452.7	92.37	282.4	95.53
Observations	5,214	1,444	651	564	254
Controls	Yes	Yes	Yes	Yes	Yes
Country and year FE	Yes	Yes	Yes	Yes	Yes
Reform	All	All	Others	All	Others
Non-independent only	No	No	No	Yes	Yes

Note: This table estimates equation 13. Coefficients on # *Reforms* $<$ *1000 km* have been multiplied by 100 for readability. Column (1) estimate it on the whole sample. Columns (2) to (5) estimate it on the "IV sample" of Table 4 i.e for countries in Americas and Oceania, after 1945. "Number of laws $<$ 1000km" corresponds to the number of laws of the type indicated in the panel header that have been implemented in countries that are located in less than 1000km of the country of interest. The dependent variable is an indicator variable equal to 1 if a law of the type indicated in the panel header have been implemented. Country are dropped from the sample once they implement a law the category studied. Additional controls are included: in columns (1) to (3) they include $ln(D_{it})$, an indicator variable for being independent and the number of years since independence. In columns (4) and (5) they include $ln(D_{it})$. The other control variables cannot be included as the sample is restricted to non-independent territories. Data on tax havens' reforms comes from own data collection detailed in section 2. Details on the classification of reforms are displayed in Table 1. Robust standard errors clustered at the country level in parentheses *** p$<$0.01, ** p$<$0.05, * p$<$0.1

the sample to subsequent reforms once a country is already a tax haven. There are large and positive coefficients for Exempt company laws (excluding IBCs) and Finance laws. The coefficients are not estimated with a lot of precision.

Column (4) limits the sample to non-independent countries. Again, the coefficients are close to those estimated in columns (1) and (2). Finally, column (5) looks at subsequent reforms. I find a large positive coefficient for IBCs, revealing an important diffusion pattern among non-independent countries following the decolonization shock. A large and negative coefficient is also found for Individuals regulations.

The results of this section suggest one mechanism to explain the observed effect of competition. Facing a negative shock on rents, tax havens tend to explore new areas of specialization. New legal technologies, especially if implementation costs are low such as in the case of IBCs, facilitate the upgrading of tax havens following the competition shock. Legal innovations are therefore crucial to understanding tax haven dynamics, particularly when they face a negative shock on their rents.

7 The consequences of becoming a tax haven

The previous sections have explored the causes of the development of tax havens. The argument developed in these sections has assumed that becoming a tax haven had positive economic consequences. It is explicitly assumed in the theoretical framework that countries that become tax havens maximize their utility. In other words, we have assumed that if countries become tax havens, it is because they have economic incentives to do so.

To verify that this holds in the data, this section investigates the effects of becoming a tax haven on GDP per capita. To do so, I run an event study regression. I regress the log of GDP per capita on leads and lags of the event of becoming a tax haven. Data on GDP per capita is taken from the World Bank and begin in 1962. It is not available for all countries, especially tax havens that are small, sometimes non-independent countries. This limits the number of tax havens that can be included in the estimation sample.

To identify causal effects of becoming a tax haven, we would like, in an ideal experiment, to compare the evolution of two similar countries with one that becomes a tax haven and the other not. In order to be as close as possible from this thought experiment, I adopt different strategies. First, I follow the methodology advertised by Borusyak et al. (2022) and use an imputation estimator to run a difference-in-difference with heterogeneous timing of treatment. To be able to compare effectively tax havens to similar countries, I restrict the sample to countries in the same region as new tax havens. This exercise is restricted to the Caribbean, the Middle East and the Pacific, and nine tax havens are included in the treated group.[39] Then to include more tax havens in the estimation, I switch to a interactive fixed effects estimator. This estimator has been introduced by Gobillon and Magnac (2016) and Xu (2017) and recently discussed in Liu et al. (2022). It can be seen as an extension of generalized Synthetic Control Matching (Xu, 2017). By including interaction between an individual-specific effect and a time-specific effect, it captures more finely possible con-

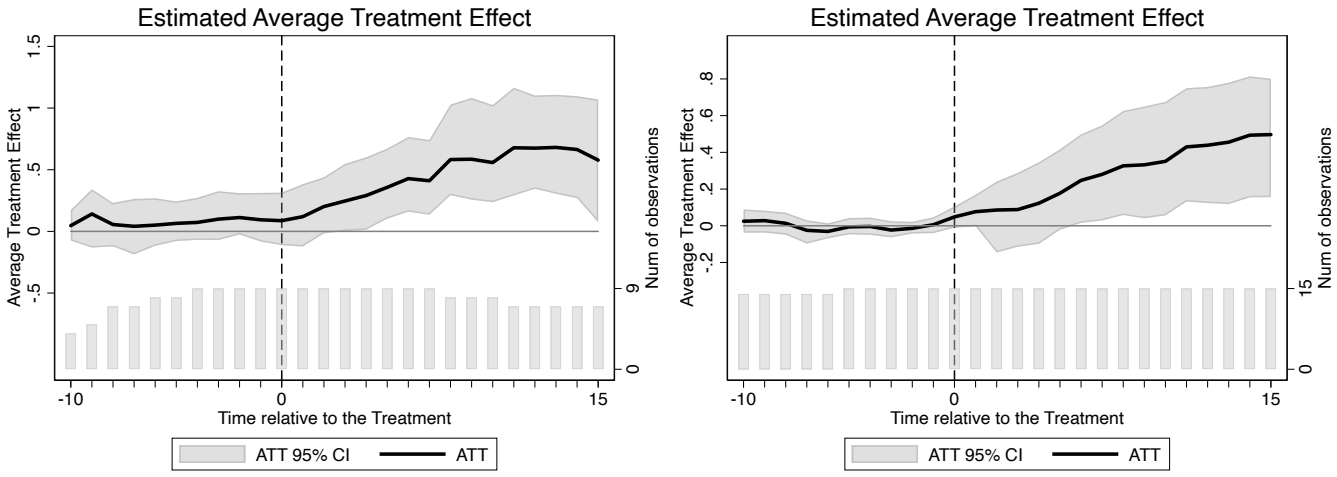
39. The tax havens included in the sample are Dominica, Grenada, Jordania, Saint Kitts-and-Nevis, Saint Lucia, Marshall Islands, Tonga, Saint Vincent-and-the-Grenadines, and Western Samoa.

founders that are time invariable but whose effect might vary over time. Fifteen treated countries are included in this estimation sample. [40]

I estimate the following equation:

$$ln(GDPpc_{it}) = \sum_{k=-10}^{15} \theta_k Haven_{it}^k + \eta_i + \eta_t + \iota_{it} \tag{14}$$

where $GDPpc_{it}$ is the GDP per capita of country i at date t. $Haven_{it}$ is equal to 1 when country i becomes a tax haven. $Independent_{it}^k$ is a dummy variable equal to one for treated countries k years before or after they become independent. η_i and η_t are country and time fixed effects, and ι_{it} is the error term. The control group corresponds to countries that have never become tax havens.



(a) Imputation estimator, restricted sample

(b) Interactive fixed effects

Figure 8 – Effect of becoming a tax haven on GDP per Capita

Note: This figure plots coefficients from an event-study regression following equation 14. In panel (a), I use the imputation estimator proposed by Borusyak, Jaravel, and Spiess (2022), Liu, Wang, and Xu (2022), and Gardner (2022). The treated group is composed of 9 tax havens from the Caribbean, Middle East and Pacific: Dominica, Grenada, Jordania, Saint Kitts-and-Nevis, Saint Lucia, Marshall Islands, Tonga, Saint Vincent-and-the-Grenadines, and Western Samoa. The control group is composed of countries that never become tax havens from the same regions. In panel (b), I use interactive fixd effects following Gobillon and Magnac (2016), Xu (2017) and Liu, Wang, and Xu (2022). The treated group is composed of 15 tax havens: the 9 of panel (a) plus Belize, Hong-Kong, Mauritius, Malaysia, Singapore, and Seychelles. The control group is composed of all never-haven countries in the world. Both panels study how becomming a tax haven affect GDP per capita. 95% confidence intervals from bootsptrapped standard errors (500 repetitions). The Wald p-value tests for the absence of pre-trends.

Results are displayed in Figure 8. Both panels of the figure go in the same direction and reveal an interesting pattern: becoming a tax haven increases GDP per capita by large amounts. The average growth rate estimated is almost 50% after 10 years in the restricted sample of panel (a). This number corresponds to an annual additional growth rate of the GDP per capita of 4.1%. In panel (b), the estimation is a bit lower, around a gain of 40% after 10 year corresponding to an annual growth premium of 3.4%. This result is in line with the

40. Belize, Hong-Kong, Mauritius, Malaysia, Singapore, and Seychelles are added to the previous list.

anecdotal observation that the countries in our sample experienced large growth rates at the end of the 20th century. For instance, one year after becoming a tax haven in 1986, Grenada experienced a 9.3% increase in its GDP per capita.[41] The gains from becoming a tax haven virtually stagnate after 10 years on average and potentially decrease over time in panel (b). This pattern is not found in panel (b) even if gains appear smaller over time. Even in the case of a short-term premium from becoming a tax haven is mainly short-term, it creates long-term differences in GDP per capita. in both figures, the pre-trends are small, stable, and not significantly different from zero. This reinforces the causal interpretation of the results.

It must be noted that the GDP data should be taken with caution. First, it might not be very precise or be partly imputed, given the level of development of the countries that enter the estimation. This is a drawback that is hard to correct for. Measurement error appears here to be a confounding factor. However, this confounding factor would have to follow a very specific path to be consistent with the observed trend in Figure 8. Second, increases in GDP in tax havens can reflect revenues accruing only to foreigners that represent a large share of the economy. Increase in GDP might therefore not reflect changes in real activity.

If it is hard to test if GDP changes really correspond to growth in real production because of lacking data for tax havens, I look at different indicators in figure A.5. In particular, using an interacted fixed effects model, I look at the effect of becoming a tax haven on the share of industry (including construction) in GDP. I also check the reaction of the share of agricultural land. The share of the industry in GDP appear to grow by around 10% when a country become a tax haven, despite not significantly, given the large confidence intervals. The effect of becoming a tax haven on the share of agricultural land is more precisely estimated. I find that becoming a tax haven decreases by 20% the share of agricultural land after 15 years, with a steadily decreasing trend. This last effect appears to go in the same direction as the effect on industry and suggests that at least part of the change in GDP per capita is driven by a transition of the economies of tax havens out of agriculture.

Finally, these results can be interpreted in the light of the tax competition theory. In this literature, countries become tax havens as long as there is a positive rent to do so. The marginal tax haven should be indifferent between becoming a tax haven or not (Slemrod and Wilson, 2009, Johannesen, 2010). The results here are at odds with this theoretical reasoning. There could be different reasons. First, I study here a specific group of tax havens. The large positive effects on GDP per capita would suggest that they are still rents to acquire by becoming a tax haven. In absence of structural changes in the international taxation environment, more countries would be expected to enter. Second, it might be possible that rents exist for some country characteristics but that no existing country has the required characteristics and then no country is willing to enter. Third, as discussed before, GDP per capita, overestimates welfare in tax havens. Using the right metric might decrease the potential gains from becoming a tax haven.

41. Using different empirical settings, Hines (2005) and Butkiewicz and Gordon (2013) also find a positive impact of being a tax haven on GDP.

8 Conclusion

In this paper, I have created a new database that tracks the building of the legal architecture of tax havens. Using this database, I show the key role of market forces in the creation and development of tax havens. Demand matters through the market access of tax havens, while competition between tax havens has been one of the main drivers of their development. I also show that legal innovations can play an important role in the way tax havens react to shocks. Finally, I show that becoming a tax haven has positive and lasting effects on GDP per capita.

How can we analyze the recent developments in tax havens regulation using the framework discussed in this paper? In the last years, two major reforms have been led by the OECD. The first one concerns the tax evasion of individuals. The Common Reporting Standard (CRS) put in place a multilateral automatic exchange of information between the signatories, which includes major tax havens. The United States is not part of the CRS because it has its own exchange of information mechanism (FATCA). The second one aims to reduce the use of tax havens by multinational firms by introducing destination taxation on residual profits (Pillar 1) and enacting a minimum tax rate (Pillar 2). [42]

These regulations constitute large negative shocks on tax havens' rents. [43] Insights from this paper suggest that it may induce tax havens, especially those that are more dependent on the offshore sector, to update their legal architecture. This can be facilitated by using new legal technologies not regulated by high-tax countries.

Indeed, these recent reforms have likely led some tax havens to deepen their offshore legal architecture. For instance, some Caribbean tax havens have enacted new "high-risk" Citizenship-by-investment schemes to bypass the CRS (Langenmayr and Zyska, 2021, OECD, 2022). It allows these countries to raise a substantial amount of revenue. According to the Eastern Caribbean Central Bank data, in 2021, Citizenship by investment schemes represent 9% of government's revenues in Antigua and Barbuda (0% in 2014), 54% of government's revenues in Dominica (12% in 2014), 4% of government's revenues in Grenada (0% in 2014), 51% of government's revenues in Saint-Kitts and Nevis (37% in 2014).

An unintended effect of regulations can be increased competition between tax havens and increased aggressiveness in tax havens' regulations. Consequently, this paper suggests that international regulations of tax havens should be designed to be as robust as possible against tax havens' legal innovations and their diffusion. This could be achieved by reducing the legal complexities involved in the reforms, for instance, through increased transparency (third-party reporting or asset registries, for instance) or minimum taxation (that makes the place of location of assets and revenues less relevant). Both these directions align with the current policy directions followed by the OECD.

42. See for instance the https://www.oecd.org/tax/automatic-exchange/ of the OECD for more information on the CRS and OECD (2020) about the reform for multinational firms.

43. For instance, Gomez Cram and Olbert (2022) show that the announcements of new regulations on multinational firms have increased the perception by markets of the default risk of tax havens.

References

Abadie, A., Diamond, A., & Hainmueller, J. (2015). Comparative Politics and the Synthetic Control Method. *American Journal of Political Science*, *59*(2), 495–510.

Acemoglu, D., Johnson, S., Robinson, J. A., & Yared, P. (2008). Income and Democracy. *American Economic Review*, *98*(3), 808–842.

Acemoglu, D., Johnson, S., Robinson, J. A., & Yared, P. (2009). Reevaluating the modernization hypothesis. *Journal of Monetary Economics*, *56*(8), 1043–1058.

Aidt, T. S., Albornoz, F., & Hauk, E. (2021). Foreign Influence and Domestic Policy. *Journal of Economic Literature*, *59*(2), 426–487.

Alfaro, L., Faia, E., Judson, R. A., & Schmidt-Eisenlohr, T. (2020). *Elusive Safety: The New Geography of Capital Flows and Risk* (No. 27048). National Bureau of Economic Research, Inc.

Alstadsæter, A., & Jacob, M. (2016). Dividend Taxes and Income Shifting. *The Scandinavian Journal of Economics*, *118*(4), 693–717.

Alstadsæter, A., Johannesen, N., & Zucman, G. (2018). Who owns the wealth in tax havens? Macro evidence and implications for global inequality. *Journal of Public Economics*, *162*, 89–100.

Alstadsæter, A., Johannesen, N., & Zucman, G. (2019). Tax Evasion and Inequality. *American Economic Review*, *109*(6), 2073–2103.

Andersen, J. J., Johannesen, N., Lassen, D. D., & Paltseva, E. (2017). Petro Rents, Political Institutions, and Hidden Wealth: Evidence from Offshore Bank Accounts. *Journal of the European Economic Association*, *15*(4), 818–860.

Andersen, J. J., Johannesen, N., & Rijkers, B. (2022). Elite Capture of Foreign Aid: Evidence from Offshore Bank Accounts. *Journal of Political Economy*, *130*(2), 388–425.

Andersson, P. F., & Brambor, T. (2019a). *Codebook: Financing the State: Government Tax Revenue from 1800 to 2012* (mimeo).

Andersson, P. F., & Brambor, T. (2019b). *Financing the State: Government Tax Revenue from 1800 to 2012* (mimeo).

Barber, H. (2007). *Tax Havens Today: The Benefits and Pitfalls of Banking and Investing Offshore*. John Wiley & Sons.

Barron, M., Miguel, E., & Satyanath, S. (2014). Economic Shocks and Democratization in Africa*. *Political Science Research and Methods*, *2*(1), 33–47.

Beauchamp, A. (1992). *Guide mondial des paradis fiscaux* (Nouv. éd. ent. rev. et complétée édition). Grasset.

Becker, B. (2020). Colonial Legacies in International Aid: Policy Priorities and Actor Constellations. In C. Schmitt (Ed.), *From Colonialism to International Aid: External Actors and Social Protection in the Global South* (pp. 161–185). Springer International Publishing.

Bellemare, M. F., & Wichman, C. J. (2020). Elasticities and the Inverse Hyperbolic Sine Transformation. *Oxford Bulletin of Economics and Statistics*, *82*(1), 50–61.

Besley, T., & Persson, T. (2011). *Pillars of Prosperity – The Political Economics of Development Clusters*. Princeton University Press.

Billmeier, A., & Nannicini, T. (2013). Assessing Economic Liberalization Episodes: A Synthetic Control Approach. *The Review of Economics and Statistics*, *95*(3), 983–1001.

Borusyak, K., Jaravel, X., & Spiess, J. (2022). *Revisiting Event Study Designs: Robust and Efficient Estimation* (arXiv:2108.12419). arXiv.

Brambor, T., Lindvall, J., & Stjernquist, A. (2017). The Ideology of Heads of Government, 1870–2012.

Brounstein, J. (2021). *The tax-price elasticity of offshore tax avoidance: Evidence from Ecuadorian transaction data* (wp-2021-187). World Institute for Development Economic Research (UNU-WIDER).

Bucovetsky, S. (2014). Honor among tax havens. *Journal of Public Economics*, *110*, 74–81.

Butkiewicz, J. L., & Gordon, L.-R. C. (2013). The Economic Growth Effect of Offshore Banking in Host Territories: Evidence from the Caribbean. *World Development*, *44*, 165–179.

Callaway, B., & Sant'Anna, P. H. C. (2021). Difference-in-Differences with multiple time periods. *Journal of Econometrics*, *225*(2), 200–230.

Cameron, D. R. (1978). The Expansion of the Public Economy: A Comparative Analysis. *American Political Science Review*, *72*(4), 1243–1261.

Cao, X. (2010). Networks as Channels of Policy Diffusion: Explaining Worldwide Changes in Capital Taxation, 1998–2006. *International Studies Quarterly*, *54*(3), 823–854.

Cayman Islands Economics and Statistics Office. (2021). 2020 Compendium of Statistics.

Chambost, E. (2000). *Guide Chambost des paradis fiscaux*. Favre.

Colella, F., Lalive, R., Sakalli, S. O., & Thoenig, M. (2019). *Inference with Arbitrary Clustering* (No. 12584). Institute of Labor Economics (IZA).

Connell, J., & Pritchard, B. (1990). Tax Havens and Global Capitalism: Vanuatu and the Australian Connection. *Australian Geographical Studies*, *28*(1), 38–50.

Copeland, B. R. (2008). The Pollution Haven Hypothesis. *Handbook on Trade and the Environment*.

Coppedge, M., Gerring, J., Knutsen, C. H., Lindberg, S. I., Teorell, J., Alizada, N., Altman, D., Bernhard, M., Cornell, A., Fish, M. S., Gastaldi, L., Gjerløw, H., Glynn, A., Hicken, A., Hindle, G., Ilchenko, N., Krusell, J., Lührmann, A., Maerz, S. F., … Ziblatt, D. (2021). V-Dem Country-Year Dataset v11.1.

Coppola, A., Maggiori, M., Neiman, B., & Schreger, J. (2021). Redrawing the Map of Global Capital Flows: The Role of Cross-Border Financing and Tax Havens. *The Quarterly Journal of Economics*, *136*(3), 1499–1556.

Darius, R., & Williams, O. (1997). Impact of growth in international business companies on the british virgin islands economy: lessons for the ECCB area. *Social and Economic Studies*, *46*(2/3), 169–198.

Deakin, S., Gindis, D., Hodgson, G. M., Huang, K., & Pistor, K. (2017). Legal institutionalism: Capitalism and the constitutive role of law. *Journal of Comparative Economics*, *45*(1), 188–200.

de Chaisemartin, C., & D'Haultfœuille, X. (2020). Two-Way Fixed Effects Estimators with Heterogeneous Treatment Effects. *American Economic Review*, *110*(9), 2964–2996.

DellaVigna, S., & Kim, W. (2022). *Policy Diffusion and Polarization across U.S. States* (Working Paper No. 30142). National Bureau of Economic Research.

Desai, M. A., Foley, C. F., & Hines, J. R. (2006). The demand for tax haven operations. *Journal of Public Economics*, *90*(3), 513–531.

Dharmapala, D., & Hines, J. R. (2009). Which countries become tax havens? *Journal of Public Economics*, *93*(9), 1058–1068.

Doggart, C. (1975). *Tax Havens and their uses*. The Economist Intelligence Unit.

Dyreng, S. D., Lindsey, B. P., & Thornock, J. R. (2013). Exploring the role Delaware plays as a domestic tax haven. *Journal of Financial Economics*, *108*(3), 751–772.

Elkink, J. A., & Grund, T. U. (2022). Modeling Diffusion through Statistical Network Analysis: A Simulation Study and Empirical Application to Same-Sex Marriage. *International Studies Quarterly*, *66*(1), sqab087.

Elsayyad, M., & Konrad, K. A. (2012). Fighting multiple tax havens. *Journal of International Economics*, *86*(2), 295–305.

Farquet, C. (2016). *La défense du paradis fiscal suisse avant la Seconde Guerre mondiale : une histoire internationale* (1st edition). Alphil-Presses universitaires suisses.

Farquet, C. (2018). *Histoire du paradis fiscal suisse*. Presses de Sciences Po.

Farquet, C. (2021). *Attractive Sources. Tax Havens' Emergence: Mythical Origins versus Structural Evolutions* (SSRN Scholarly Paper No. 3897377). Social Science Research Network. Rochester, NY.

Ferrari, A., Laffitte, S., Parenti, M., & Toubal, F. (2022). *Profit Shifting Frictions and the Geography of Multinational Activity* (mimeo).

Flamant, E., Godar, S., & Richard, G. (2021). *New Forms of Tax Competition in the European Union: an Empirical Investigation* (halshs-03461688). HAL.

Fossen, A. (2002). Offshore Financial Centres and Internal development in the Pacific Islands. *Pacific Economic Bulletin*, *17*.

Funke, M., Schularick, M., & Trebesch, C. (2022). *Populist Leaders and the Economy* (No. 15405). C.E.P.R. Discussion Papers.

Garcia Alvarado, F., & Mandel, A. (2022). The network structure of global tax evasion evidence from the Panama papers. *Journal of Economic Behavior & Organization*, *197*, 660–684.

Garcia-Bernardo, J., & Janský, P. (2022). *Profit Shifting of Multinational Corporations Worldwide* (arXiv:2201.08444). arXiv.

Gardner, J. (2022). *Two-stage differences in differences* (arXiv:2207.05943). arXiv.

Genschel, P., & Schwarz, P. (2011). Tax competition: a literature review. *Socio-Economic Review*, *9*(2), 339–370.

Gobillon, L., & Magnac, T. (2016). Regional Policy Evaluation: Interactive Fixed Effects and Synthetic Controls. *The Review of Economics and Statistics*, *98*(3), 535–551.

Gomez Cram, R., & Olbert, M. (2022). *Measuring the Effects of the Global Tax Reform - Evidence from High-frequency Data* (SSRN Scholarly Paper No. 4052575). Social Science Research Network. Rochester, NY.

Gordon, R. H., & Slemrod, J. (1998). *Are "Real" Responses to Taxes Simply Income Shifting Between Corporate and Personal Tax Bases?* (No. 6576). National Bureau of Economic Research, Inc.

Guex, S. (2000). The Origins of the Swiss Banking Secrecy Law and Its Repercussions for Swiss Federal Policy. *The Business History Review*, *74*(2), 237–266.

Guex, S. (2021). The Emergence of the Swiss Tax Haven, 1816–1914. *Business History Review*, 1–20.

Guriev, S., Melnikov, N., & Zhuravskaya, E. (2021). 3G Internet and Confidence in Government. *The Quarterly Journal of Economics*, *136*(4), 2533–2613.

Guvenen, F., Mataloni Jr., R. J., Rassier, D. G., & Ruhl, K. J. (2018). *Offshore Profit Shifting and Domestic Productivity Measurement* (No. 751). Federal Reserve Bank of Minneapolis.

Hanlon, M., Maydew, E. L., & Thornock, J. R. (2015). Taking the Long Way Home: U.S. Tax Evasion and Offshore Investments in U.S. Equity and Debt Markets. *The Journal of Finance*, *70*(1), 257–287.

Hansen, N. A., & Kessler, A. S. (2001). The Political Geography of Tax H(e)avens and Tax Hells. *American Economic Review*, *91*(4), 1103–1115.

Harju, J., & Matikka, T. (2016). The elasticity of taxable income and income-shifting: what is "real" and what is not? *International Tax and Public Finance*, *23*(4), 640–669.

Harrington, B. (2016). *Capital without Borders: Wealth Managers and the One Percent*. Harvard University Press.

Head, K., & Mayer, T. (2014). Gravity Equations: Workhorse,Toolkit, and Cookbook. *Handbook of International Economics* (pp. 131–195). Elsevier.

Hebous, S. (2014). Money at the Docks of Tax Havens: A Guide. *FinanzArchiv / Public Finance Analysis*, *70*(3), 458–485.

Hensel, P. (2018). ICOW Colonial History Data Set, version 1.1.

Hines, J. R. (2005). Do Tax Havens Flourish? *Tax Policy and the Economy*, *19*, 65–99.

Hines, J. R., & Rice, E. M. (1994). Fiscal Paradise: Foreign Tax Havens and American Business. *The Quarterly Journal of Economics*, *109*(1), 149–182.

Hollis, J., & McKenna, C. (2019). The Emergence of the Offshore Economy, 1914–1939. *Capitalism's Hidden Worlds* (pp. 157–178). University of Pennsylvania Press.

ICIJ. (2022a). ICIJ publishes final batch of Pandora Papers data on more than 9,000 offshore companies, trusts and foundations - ICIJ.

ICIJ. (2022b). Offshore Leaks Database.

Johannesen, N. (2010). Imperfect tax competition for profits, asymmetric equilibrium and beneficial tax havens. *Journal of International Economics*, *81*(2), 253–264.

Kanbur, R., & Keen, M. (1993). Jeux Sans Frontières: Tax Competition and Tax Coordination When Countries Differ in Size. *The American Economic Review*, *83*(4), 877–892.

Keen, M., & Konrad, K. A. (2013). The Theory of International Tax Competition and Coordination. In A. J. Auerbach, R. Chetty, M. Feldstein, & E. Saez (Eds.), *Handbook of Public Economics* (pp. 257–328). Elsevier.

Kirk, J. (2014). 30th anniversary of the BVI International Business Companies Act 1984.

Kiser, E., & Karceski, S. M. (2017). Political Economy of Taxation. *Annual Review of Political Science*, *20*(1), 75–92.

Klerman, D. M., Mahoney, P. G., Spamann, H., & Weinstein, M. I. (2011). Legal Origin or Colonial History? *Journal of Legal Analysis*, *3*(2), 379–409.

Kollewe, J. (2022). Russia's richest man may have avoided freeze on £1bn Tui shares. *The Guardian*.

Langenmayr, D., & Zyska, L. (2021). *Avoiding Taxes: Escaping the Exchange of Information: Tax Evasion via Citizenship-by-Investment* (No. 204). CESifo.

Le Guern Herry, S., & Bomare, J. (2022). *Will We Ever Be Able to Track Offshore Wealth? Evidence from the Offshore Real Estate Market in the UK* (No. 4). EU Tax Observatory.

Leenders, W., Lejour, A., Rabaté, S., & Riet, M. v. '. (2020). *Offshore Tax Evasion and Wealth Inequality: Evidence from a Tax Amnesty in the Netherlands* (No. 417). CPB Netherlands Bureau for Economic Policy Analysis.

Liu, L., Wang, Y., & Xu, Y. (2022). A Practical Guide to Counterfactual Estimators for Causal Inference with Time-Series Cross-Sectional Data. *American Journal of Political Science*.

Londoño-Vélez, J., & Ávila-Mahecha, J. (2022). *Behavioral Responses to Wealth Taxation: Evidence from Colombia* (mimeo).

Louis-Sidois, C., & Mougin, E. (2020). *Silence the Media or the Story? Theory and Evidence of Media Capture* (SSRN Scholarly Paper No. ID 3561443). Social Science Research Network. Rochester, NY.

Love, M. (2021). *Where in the World Does Partnership Income Go? Evidence of a Growing Use of Tax Havens* (SSRN Scholarly Paper No. 3985535). Rochester, NY.

Mendis, M. C., Suss, M. E. C., & Williams, M. O. (2002). *Caribbean offshore Financial Centers: Past, Present, and Possibilities for the Future* (No. 2002/088). International Monetary Fund.

Miethe, J. (2020). *The Elusive Banker: Using Hurricanes to Uncover (Non-)Activity in Offshore Financial Centers* (No. 8625). CESifo.

Montiel Olea, J. L., & Pflueger, C. (2013). A Robust Test for Weak Instruments. *Journal of Business & Economic Statistics*, *31*(3), 358–369.

Moreau-Kastler, N., & Toubal, F. (2021). *Legal opacity, narcotics laws, and drug seizures* (No. 2021/191). UNU-WIDER. Helsinki.

Mummolo, J., & Peterson, E. (2018). Improving the Interpretation of Fixed Effects Regression Results. *Political Science Research and Methods*, *6*(4), 829–835.

OECD. (2020). *Statement by the OECD/G20 Inclusive Framework on BEPS on the Two-Pillar Approach to Address the Tax Challenges Arising from the Digitalisation of the Economy - January 2020, OECD/G20 Inclusive Framework on BEPS*. OECD.

OECD. (2022). Residence/Citizenship by investment schemes.

Ogle, V. (2017). Archipelago Capitalism: Tax Havens, Offshore Money, and the State, 1950s–1970s. *The American Historical Review*, *122*(5), 1431–1458.

Ogle, V. (2020). 'Funk Money': The End of Empires, The Expansion of Tax Havens, and Decolonization as an Economic and Financial Event. *Past & Present*, *249*(1), 213–249.

Omartian, J. D. (2017). *Do Banks Aid and Abet Asset Concealment: Evidence from the Panama Papers* (SSRN Scholarly Paper No. 2836635). Rochester, NY.

Ossa, R. (2015). *A Quantitative Analysis of Subsidy Competition in the U.S.* (Working Paper No. 20975). National Bureau of Economic Research.

Palan, R., Murphy, R., & Chavagneux, C. (2009). *Tax Havens: How Globalization Really Works*. Cornell University Press.

Pettersson-Lidbom, P. (2008). Do Parties Matter for Economic Outcomes? A Regression-Discontinuity Approach. *Journal of the European Economic Association*, *6*(5), 1037–1056.

Phylaktis, K. (1994). *The Banking System of Cyprus: Past, Present and Future* (1995th edition). Palgrave Macmillan.

Pistor, K. (2019). *The Code of Capital: How the Law Creates Wealth and Inequality*. Princeton University Press.

Rawlings, G. (2004). Laws, liquidity and eurobonds: The making of the Vanuatu tax haven. *Journal of Pacific History*, *39*, 325–341.

Redding, S., & Venables, A. J. (2004). Economic geography and international inequality. *Journal of International Economics*, *62*(1), 53–82.

Riegels, C. (2014). The BVI IBC Act and the Building of a Nation.

Roussakis, E. (1999). Offshore Banking at the Close of the Twentieth Century. *Academia Revista Latinoamerica De Administracion*, (22), 99–112.

Sagar, P., Christensen, J., & Shaxson, N. (2013). British government attitudes to British tax havens: An examination of whitehall responses to the growth of tax havens in british dependent territories from 1967-75. In J. Leaman & A. Waris (Eds.), *Tax Justice and the Political Economy of Global Capitalism, 1945 to the Present* (pp. 107–132). Berghahn Books.

Salop, S. C. (1979). Monopolistic Competition with Outside Goods. *The Bell Journal of Economics*, *10*(1), 141–156.

Seelkopf, L., Bubek, M., Eihmanis, E., Ganderson, J., Limberg, J., Mnaili, Y., Zuluaga, P., & Genschel, P. (2021). The rise of modern taxation: A new compre-

hensive dataset of tax introductions worldwide. *The Review of International Organizations*, *16*(1), 239–263.

Sharman, J. C. (2019). *Havens in a Storm: The Struggle for Global Tax Regulation*. Cornell University Press.

Shipan, C. R., & Volden, C. (2008). The Mechanisms of Policy Diffusion. *American Journal of Political Science*, *52*(4), 840–857.

Slattery, C. (2018). *Bidding for Firms: Subsidy Competition in the U.S.* (SSRN Scholarly Paper No. 3250356). Rochester, NY.

Slemrod, J. (2008). Why Is Elvis on Burkina Faso Postage Stamps? Cross-Country Evidence on the Commercialization of State Sovereignty. *Journal of Empirical Legal Studies*, *5*(4), 683–712.

Slemrod, J., & Wilson, J. D. (2009). Tax competition with parasitic tax havens. *Journal of Public Economics*, *93*(11), 1261–1270.

Smith, M., Yagan, D., Zidar, O., & Zwick, E. (2019). Capitalists in the Twenty-First Century*. *The Quarterly Journal of Economics*, *134*(4), 1675–1745.

Starchild, A. (1994). *Tax Havens for International Business*. Palgrave Macmillan.

Stock, J., & Yogo, M. (2005). Testing for Weak Instruments in Linear IV Regression. *Identification and Inference for Econometric Models*. Cambridge University Press.

Sun, L., & Abraham, S. (2021). Estimating dynamic treatment effects in event studies with heterogeneous treatment effects. *Journal of Econometrics*, *225*(2), 175–199.

Tavares, J. (2004). Does right or left matter? Cabinets, credibility and fiscal adjustments. *Journal of Public Economics*, *88*(12), 2447–2468.

Tax Justice Network. (2020). Financial Secrecy Index.

Tilly, C. (1990). *Coercion, Capital, and European States, A.D. 990-1990* (Revised edition). Wiley-Blackwell.

Timoneda, J. C. (2021). Estimating group fixed effects in panel data with a binary dependent variable: How the LPM outperforms logistic regression in rare events data. *Social Science Research*, *93*, 102486.

Torslov, T., Wier, L., & Zucman, G. (2022). The Missing Profits of Nations. *forthcoming*.

van Beurden, T., & Jonker, J. (2021). A perfect symbiosis: Curaçao, the Netherlands and financial offshore services, 1951–2013. *Financial History Review*, *28*(1), 67–95.

Vuillemey, G. (2020). *Evading Corporate Responsibilities: Evidence from the Shipping Industry* (SSRN Scholarly Paper No. ID 3691188). Social Science Research Network. Rochester, NY.

Watteyne, S. (2022). *Threat on the Belgian Tax Haven during La Belle époque.* (mimeo).

Xu, Y. (2017). Generalized Synthetic Control Method: Causal Inference with Interactive Fixed Effects Models. *Political Analysis*, *25*(1), 57–76.

Zhukov, Y. M., & Stewart, B. M. (2013). Choosing Your Neighbors: Networks of Diffusion in International Relations1. *International Studies Quarterly*, *57*(2), 271–287.

Zucman, G. (2013). The Missing Wealth of Nations: Are Europe and the U.S. net Debtors or net Creditors? *The Quarterly Journal of Economics*, *128*(3), 1321–1364.

Zucman, G. (2014). Taxing across Borders: Tracking Personal Wealth and Corporate Profits. *Journal of Economic Perspectives*, *28*(4), 121–48.

Zucman, G. (2015). *The Hidden Wealth of Nations - The Scourge of Tax Havens*. University of Chicago Press.

Appendix

A Data sources

GDP and GDP per capita and population: Long-term GDP and population data from GapMinder that aggregates GDP from World Bank (World Development indicators), the Maddison Project, and the Penn World Tables. Details on the documentation: https://www.gapminder.org/data/documentation/gd001/. The event study on tax havens and GDP per capita uses GDP and population data from the World Bank's World Development Indicators.

Colonial History: I first associate each territory with a status relative to its sovereign history. Each country or territory can be either independent, non-independent and a colony, or non-independent and not a colony. This last status is created to deal with specific cases treated differently by different databases about colonial history. For instance, the islands of Jersey and Guernsey, despite being under the actual control of the United Kingdom, are generally not considered as colonies. However, for the purpose of this paper, it is important to highlight their link with the United Kingdom. To this purpose I use information from the Colonial Dates Dataset (Becker, 2020), the Cepii Gravity Dataset (Head and Mayer, 2014) and the ICOW colonial dataset (Hensel, 2018). The data is then manually completed when information is missing for a given territory using worldstatesmen.org, rulers.org, and wikipedia.org. The main colonial variable used in this paper record the last ruler of a territory (including its current ruler if applicable). It includes countries not generally considered as colonies, such as the Channel Islands.

Tax introductions: Data from Seelkopf et al. (2021).

Tax revenues: Data from Andersson and Brambor (2019a, 2019b).

Gravity data: Data from the U.S. International Trade Commission Gravity Portal (release 2.1), Gurevich and Herman (n.d.).

Swiss Market for haven's services: Data from Zucman (2013)

Fee revenues in Cayman Islands: Data from Cayman Islands Economics and Statistics Office (2021)

Citizenship by investment revenues: Data from the statistics portal of the Eastern Caribbean Central Bank (https://www.eccb-centralbank.org/statistics/fiscals/comparative-report/3).

B Supplementary tables

Table A.1 – Comparing different lists of tax havens.

Country	Lists	Country	Lists	Country	Lists	Country	Lists	Country	Lists	Country	Lists	Country	Lists
Bahamas	11	**Vanuatu**	10	**Monaco**	8	**Samoa**	6	Latvia	2	Campione	1	Nigeria	1
Bermuda	11	**Gibraltar**	9	**Nauru**	8	**Seychelles**	6	Madeira	2	Egypt	1	Northern Cyprus	1
Cayman	11	**Hong Kong**	9	**St Kitts & Nevis**	8	**Lebanon**	5	**Netherlands**	2	France	1	Palau	1
Guernsey	11	**Singapore**	9	**Andorra**	7	**Niue**	5	Philippines	2	Germany	1	Puerto Rico	1
Jersey	11	**St Vincent & the Grenadines**	9	**Anguilla**	7	**Macau**	4	South Africa	2	Guatemala	1	Russia	1
Malta	11	**Switzerland**	9	**Bahrain**	7	**Malaysia**	4	**Tonga**	2	Honduras	1	San Marino	1
Panama	11	**Turks & Caicos Islands**	9	Costa Rica	7	**Montserrat**	4	Uruguay	2	Iceland	1	Sao Tome e Principe	1
Barbados	10	**Antigua & Barbuda**	8	**Marshall Islands**	7	Maldives	3	**US Virgin Islands**	2	Indonesia	1	Sark	1
British Virgin Islands	10	**Belize**	8	**Mauritius**	7	United Kingdom	3	USA	2	Ingushetia	1	Somalia	1
Cyprus	10	**Cook Islands**	8	**St. Lucia**	7	Brunei	2	Alderney	1	**Jordan**	1	Sri Lanka	1
Isle of Man	10	**Grenada**	8	**Aruba**	6	Dubai	2	Anjouan	1	Marianas	1	Taipei	1
Liechtenstein	10	**Ireland**	8	**Dominica**	6	Hungary	2	Belgium	1	Melilla	1	Trieste	1
Netherlands Antilles	10	**Luxembourg**	8	**Liberia**	6	Israel	2	Botswana	1	Myanmar	1	Ukraine	1

Note: This table counts the number of tax havens lists in which each country is reported. Countries used in the sample of this paper are highlighted in **bold** font. The list of countries comes from table 1.4 of Palan, Murphy, and Chavagneux (2009). The eleven lists are the following: International Bureau of Fiscal Documentation (1977), Charles Irish (1982), Hines and Rice (1994), OECD (2000), IMF (2000), FSF (2000), FATF (2000,2002), TJN (2005), IMF (2007), STHAA (2007), Low-Tax.net (2008).

Table A.2 – Offshore entities and fiduciary deposits.

	(1)	(2)	(3)
	arcsinh(Fiduciary deposits)		
arcsinh(Number entities)	0.394***	0.415***	0.370***
	(0.0682)	(0.0770)	(0.0962)
Observations	934	404	524
R-squared	0.910	0.901	0.930
Sample		IBC reform	Other exempt reform
Country and year FE		Yes	Yes

This table display the results of the estimation of the following equation: $arcsinh(Fiduciary\ deposits_{it}) = \kappa_1 arcsinh(Number\ entities_{it}) + a_i + a_t + u_{it}$. $Fiduciary\ deposits_{it}$ correspond to Swiss fiduciary deposits coming from country i at date t, $Number\ entities_{it}$ corresponds to the number of offshore entities recorded in the Offshore Leaks in country i at date t, a_i are country fixed effects, a_t are year fixed effects and u_{it} are the residuals. "IBC reforms" stands for countries that have implemented IBC reforms. "Other exempt reform" stands for countries that have implemented other exempted company reforms. Robust standard errors clustered at the country level in parentheses.*** p<0.01, ** p<0.05, * p<0.1

Table A.3 – Montiel Olea-Pflueger robust weak instrument test (Montiel Olea and Pflueger, 2013)

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
		$\mathbb{1}_{Reform}$			$\mathbb{1}_{FirstReform}$			$\mathbb{1}_{OtherReforms}$	
Effective F stat.	11645	302.2	337.3	10195	215.8	242.1	398.4	24.46	19.02
10% Critical value	23.11	23.11	23.11	23.11	23.11	23.11	23.11	23.11	23.11
Time FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Country FE	No	Yes	Yes	No	Yes	Yes	No	Yes	Yes
Controls	Yes	No	Yes	Yes	No	Yes	Yes	No	Yes

This table shows the Montiel Olea-Pflueger effective F-stat and the critical value at the 10% confidence level for a worst bias of 5% for the estimations in Table 3. Each column in this table reports the results corresponding to the estimation that has the same column number in Table 3.

Table A.4 – The impact of demand on the probability of reform: robustness for spatial autocorrelation and independent variable definition

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
	$\mathbb{1}_{Reform}$			$\mathbb{1}_{FirstReform}$			$\mathbb{1}_{OtherReforms}$		
Spatial correlation									
ln(Av. Direct Tax/GDP)	0.116***	0.124	0.157	0.0416**	0.131**	0.165***	0.328**	-0.149	0.0788
	(0.0277)	(0.104)	(0.103)	(0.0172)	(0.0566)	(0.0629)	(0.160)	(0.520)	(0.572)
K-P F-stat	19912	767	806.2	15974	539.9	562.5	1196	76.32	53.87
Distance weights only									
ln(Av. Direct Tax/GDP)	0.123***	0.180**	0.197**	0.0430**	0.0878*	0.105**	0.365***	0.399	0.543
	(0.0305)	(0.0824)	(0.0839)	(0.0166)	(0.0458)	(0.0482)	(0.117)	(0.433)	(0.353)
Time FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Country FE	No	Yes	Yes	No	Yes	Yes	No	Yes	Yes
Controls	Yes	No	Yes	Yes	No	Yes	Yes	No	Yes
Observations	18,574	18,574	18,574	16,836	16,836	16,836	1,738	1,738	1,738

This table estimates equation 10. Data on the share of taxes in GDP comes from Andersson and Brambor (2019b). Data on tax havens' reforms comes from own data collection detailed in section 2. Columns (1), (2) and (3) include all reforms as dependent variables. In columns (4), (5) and (6), tax havens leave the sample after the first reform. Columns (7), (8), (9) only consider new reforms from countries that are already tax havens. "Distance weights only" uses an independent variable computed as the weighted average of direct taxation over GDP in foreign countries, each country being weighted by the inverse of the log(distance) with the country of interest. Additional controls correspond to ln(Area), indicator variables for common law and civil law, an indicator variable for being a former UK colony, an indicator variable for being independent, and the number of years since independence. When country fixed effects are added, only the two last variables are used as controls, the other being absorbed by the fixed effects. "K-P F-stat" stands for the Kleibergen-Paap Wald rk F statistic. Robust standard errors clustered at the country level in parentheses. *** p<0.01, ** p<0.05, * p<0.1

Table A.5 – The impact of demand on the probability of reform: number of tax introductions

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
		$\mathbb{1}_{Reform}$			$\mathbb{1}_{FirstReform}$			$\mathbb{1}_{OtherReforms}$	
Extensive margin									
# Direct $<$ 500km	0.332*	0.566**	0.575**	0.112	0.253*	0.269*	1.172	6.434***	5.684***
	(0.182)	(0.250)	(0.232)	(0.0858)	(0.145)	(0.143)	(1.709)	(1.738)	(1.338)
# Direct *in* [500;1000]	0.205	0.326	0.318	0.0534	0.0518	0.0534	0.822	5.876***	5.247***
	(0.187)	(0.242)	(0.221)	(0.0873)	(0.139)	(0.132)	(1.569)	(1.465)	(1.191)
# Direct *in* [1000;2500]	0.276	0.319	0.332	0.0783	0.0449	0.0546	0.810	6.453***	5.899***
	(0.191)	(0.250)	(0.224)	(0.0848)	(0.132)	(0.128)	(1.502)	(1.533)	(1.205)
# Direct $>$ 2500km	0.242	0.334	0.354*	0.0729	0.0635	0.0794	0.765	5.939***	5.345***
	(0.184)	(0.234)	(0.211)	(0.0839)	(0.130)	(0.125)	(1.527)	(1.545)	(1.243)
Av. Dep. Var.	0.00590	0.00590	0.00590	0.00210	0.00210	0.00210	0.0506	0.0506	0.0506
s.d residualized indep. var	0.00630	0.00630	0.00630	0.00626	0.00626	0.00626	0.00667	0.00667	0.00667
Scaled effect # Direct $<$ 500km	0.354	0.604	0.614	0.334	0.754	0.800	0.155	0.848	0.749
Time FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Country FE	No	Yes	Yes	No	Yes	Yes	No	Yes	Yes
Controls	Yes	No	Yes	Yes	No	Yes	Yes	No	Yes
Observations	23,214	23,214	23,214	21,396	21,396	21,396	1,818	1,818	1,818

This table estimates equation 10. # Direct refers to the number of Corporate income taxes or Personal income taxes introduced within a distance range. The coefficient has been multiplied by 10 to facilitate interpretation. Data on the introduction of taxes comes from Seelkopf et al. (2021). Data on tax havens' reforms comes from own data collection detailed in section 2. Columns (1), (2) and (3) include all reforms as dependent variables. In columns (4), (5) and (6), tax havens leave the sample after the first reform. Columns (7), (8), (9) only consider new reforms from countries that are already tax havens. Additional controls correspond to ln(Area), indicator variables for common law and civil law, an indicator variable for being a former UK colony, an indicator variable for being independent, and the number of years since independence. When country fixed effects are added, only the two last variables are used as controls, the other being absorbed by the fixed effects. The scaled effects are computed by multiplying the coefficient by the standard deviation of the residualized number of direct taxes introduced in less than 500km and dividing it by the average of the dependent variable in the sample. It can be interpreted as the percentage change in the probability of the event represented by the dependent variable when demand increases by one standard deviation. *** p$<$0.01, ** p$<$0.05, * p$<$0.1

Table A.6 – The impact of demand on the probability of reform: robustness on the definition of demand

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
		$\mathbb{1}_{Reform}$			$\mathbb{1}_{FirstReform}$			$\mathbb{1}_{OtherReforms}$	
OLS									
$ln(D_{it})$	0.00802***	-0.00627	-0.00145	0.00207**	0.0115	0.0162*	0.0226***	-0.0900	-0.0675
	(0.00193)	(0.0191)	(0.0189)	(0.000875)	(0.00915)	(0.00966)	(0.00742)	(0.101)	(0.104)
IV									
Second-Stage									
$ln(D_{it})$	0.00896***	0.0281	0.0362	0.00327**	0.0288**	0.0368**	0.0264**	-0.0372	0.0201
	(0.00246)	(0.0259)	(0.0265)	(0.00133)	(0.0131)	(0.0145)	(0.00998)	(0.141)	(0.152)
First-Stage									
$ln(D_{it}^{IV})$	12.29***	4.002***	3.957***	12.10***	3.905***	3.866***	10.91***	3.437***	3.250***
	(0.486)	(0.252)	(0.256)	(0.499)	(0.279)	(0.289)	(1.285)	(0.981)	(1.109)
Av. Dep. Var.	0.00732	0.00732	0.00732	0.00261	0.00261	0.00261	0.0529	0.0529	0.0529
s.d residualized indep. var	0.0798	0.0798	0.0798	0.0743	0.0743	0.0743	0.121	0.121	0.121
Scaled effect OLS	0.0874	-0.0684	-0.0158	0.0589	0.327	0.461	0.0516	-0.206	-0.154
Scaled effect IV	0.0977	0.306	0.395	0.0931	0.820	1.046	0.0603	-0.0850	0.0459
F-Test	639.6	252.2	239.1	588.1	196.1	179.2	72.18	12.29	8.588
Time FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Country FE	No	Yes	Yes	No	Yes	Yes	No	Yes	Yes
Controls	Yes	No	Yes	Yes	No	Yes	Yes	No	Yes
Observations	18,574	18,574	18,574	16,836	16,836	16,836	1,738	1,738	1,738

This table estimates equation 10. Demand variable $ln(D_{it})$ is constructed following the theoretical formula of equation 5. Data on the share of taxes in GDP comes from Andersson and Brambor (2019b). Data on tax havens' reforms comes from own data collection detailed in section 2. Columns (1), (2) and (3) include all reforms as dependent variables. In columns (4), (5) and (6), tax havens leave the sample after the first reform. Columns (7), (8), (9) only consider new reforms from countries that are already tax havens. Additional controls correspond to ln(Area), indicator variables for common law and civil law, an indicator variable for being a former UK colony, an indicator variable for being independent, and the number of years since independence. When country fixed effects are added, only the two last variables are used as controls, the other being absorbed by the fixed effects. The scaled effects are computed by multiplying the coefficient by the standard deviation of the residualized independent variable and dividing it by the average of the dependent variable in the sample. It can be interpreted as the percentage change in the probability of the event represented by the dependent variable when demand increases by one standard deviation. "K-P F-stat" stands for the Kleibergen-Paap Wald rk F statistic. Robust standard errors clustered at the country level in parentheses. *** p<0.01, ** p<0.05, * p<0.1

Table A.7 – Permutation tests

	OLS	IV
Share α_1 positive and significant at 10%	6%	5.2%
Share α_1 as large as the baseline coefficient	0.1%	0.1%

This table shows the result of a permutation test. I run the OLS and IV specifications of column (6), Table 3 on a dataset where observations of the dependent variable have been permuted between countries. In particular, it comes down to assigning the offshore history of country i' to another country i. I replicate this exercise with 1000 different permutations of the data.

Table A.8 – Offshore entities and competition.

	(1)	(2)
		arcsinh(Number entities)
# Reforms $<$ 1000 km	0.0136	-0.182**
	(0.0431)	(0.0644)
Exempt regulation before 1960	No	Yes
Controls	Yes	Yes
Country and year FE	Yes	Yes
Observations	2,269	440

Controls include an independence dummy, a dummy for offshore reforms, a count of the number of offshore reforms implemented in the country, an indicator variable indicating whether a "Exempt Company" law has been implemented .*** p<0.01, ** p<0.05, * p<0.1

C Supplementary figures

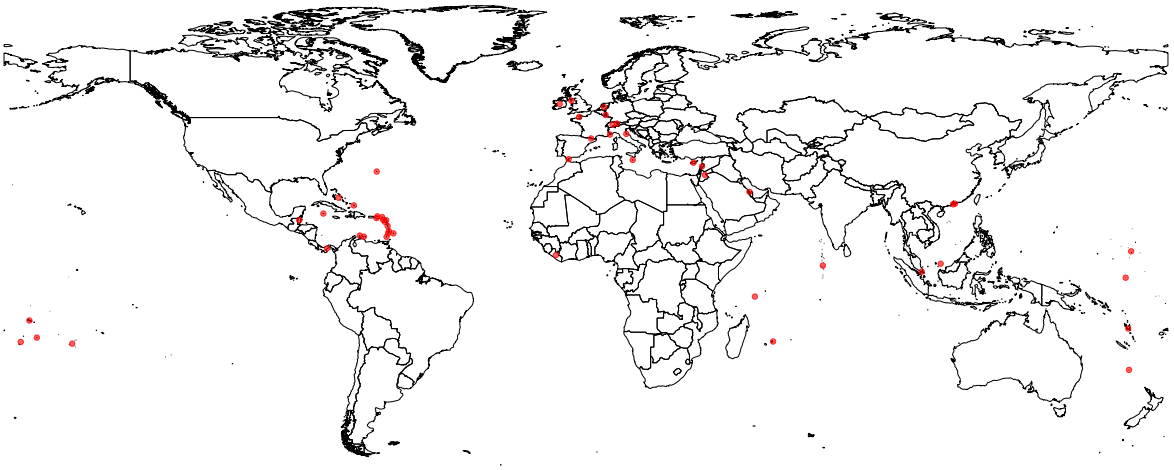


Figure A.1 – The location of contemporary tax havens.

Note: This map depicts tax havens nowadays. This list of tax havens is discussed in section 2 and presented in appendix Table A.1.

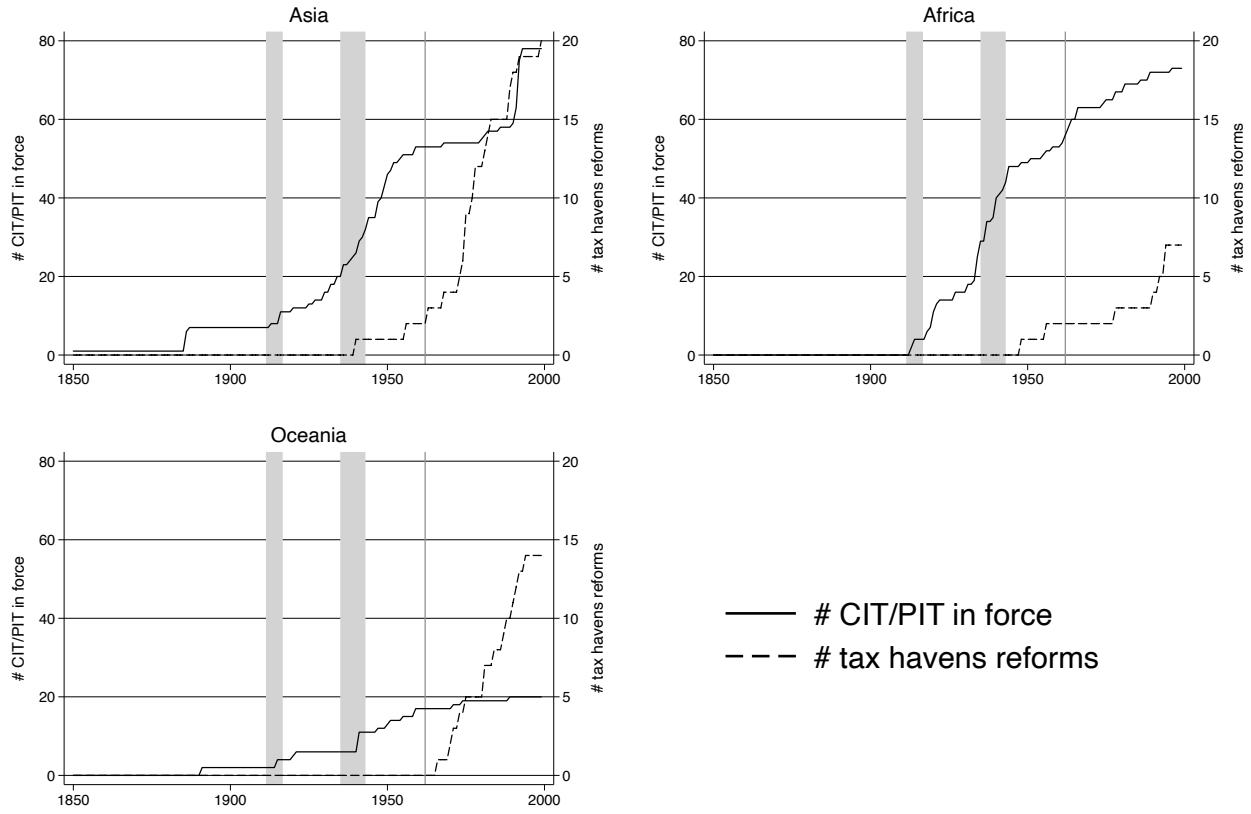


Figure A.2 – The building of tax havens' legal architecture and the rise of direct taxation (other regions)

Note: This figure plots the number of direct taxes (Corporate income taxes and Personal income taxes) introduced and the number of tax havens reforms for Africa, Asia, and Oceania. Data on the introduction of taxes comes from Seelkopf et al. (2021). Data on tax havens' reforms comes from own data collection detailed in section 2. Shaded areas indicate the world wars and the vertical line (1962), the beginning of the independence wave in the UK-dominated Caribbean area.

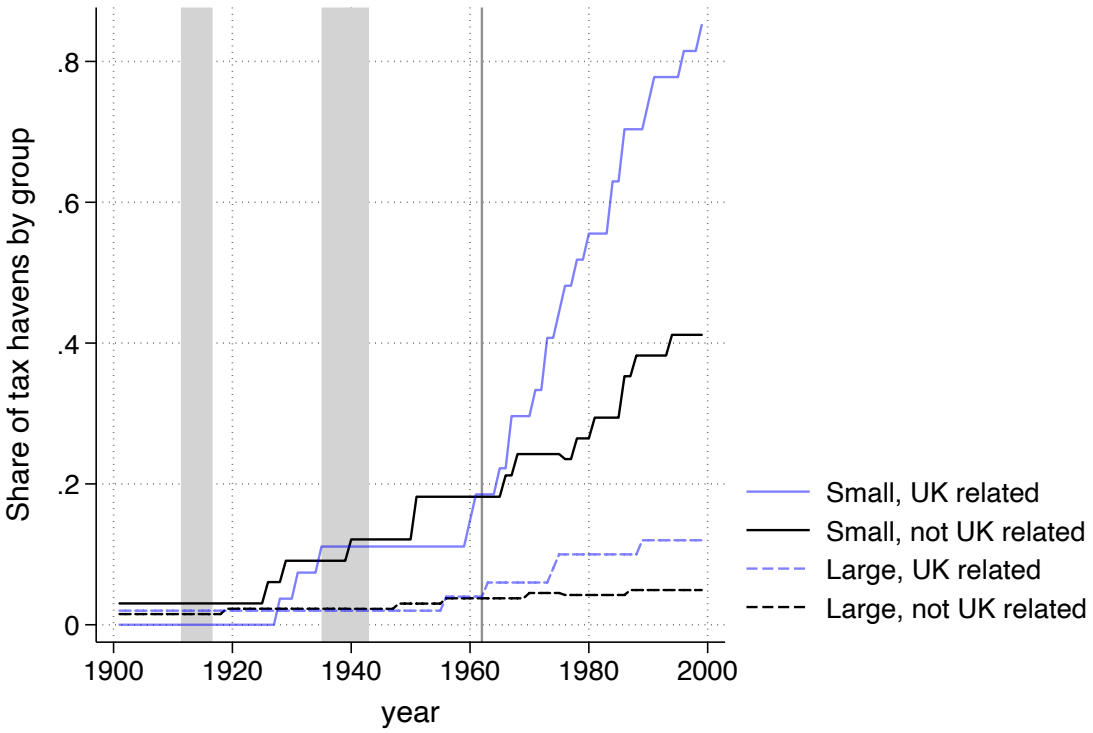
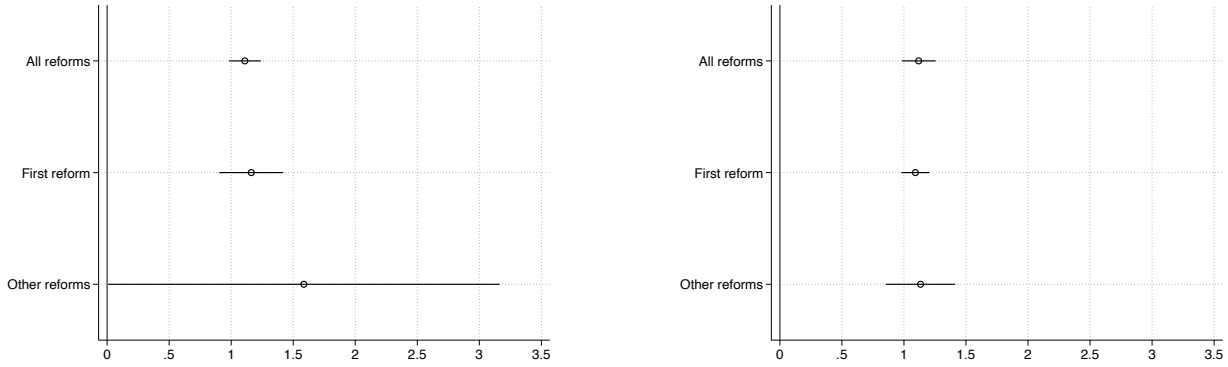


Figure A.3 – Tax havens characteristics: size and colonial history

Note: This figure plots the share of tax havens in two size groups (small and large countries) crossed with groups constructed according to colonial history (UK related or not). The group of small countries corresponds to countries in the first quartile of country size. Other countries are classified as large. UK-related colonies correspond to colonies for which the last ruler is the United Kingdom. The construction of colonial history is detailed in section 2. Data on tax havens' reforms comes from own data collection detailed in section 2. Shaded areas indicate the world wars and the vertical line (1962), the beginning of the independence wave in the UK-dominated Caribbean area.

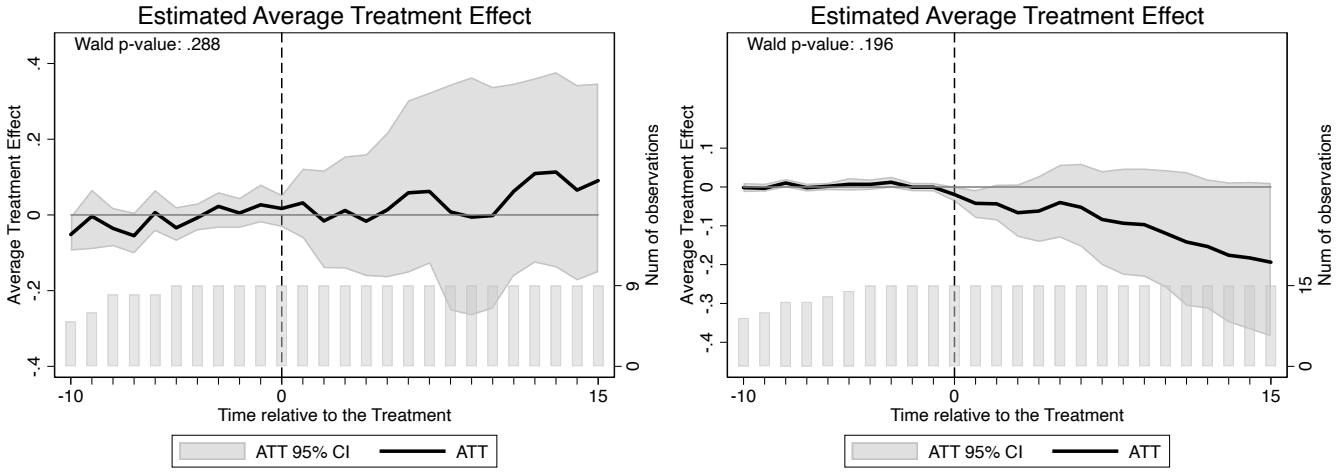


(a) Size premium

(b) UK colony premium

Figure A.4 – Premia in the probability of becoming a tax haven for size and colonial history

Note: This figure plots the ratio of the demand coefficients for small countries (panel a) and (former and current) UK colonies (panel b) to demand coefficient for other countries. The confidence interval corresponds to a 5% confidence interval. It can be interpreted as a premium for small countries and UK colonies. A coefficient of 1.5 in the left panel means that the elasticity of the probability of becoming a tax haven to demand is 1.5 times higher in small countries. Small countries are defined as countries smaller than the median country size in the sample. Each coefficient is computed for three different dependent variables: $\mathbb{1}_{Reform}$, $\mathbb{1}_{FirstReform}$ and $\mathbb{1}_{OtherReforms}$. Each model includes control variables and country and year fixed effects following the specifications in columns (3), (6) and (9) of Table 3.



(a) Share of industry in GDP

(b) Share of agricultural lands

Figure A.5 – Effect of becoming a tax haven on GDP per Capita: channels

Note: This figure plots coefficients from an event-study regression following equation 14 using interacted fixed effects following Gobillon and Magnac (2016), Xu (2017) and Liu, Wang, and Xu (2022). Panel (a) looks at the impact of becomming a tax haven on the industry share in GDP. The treated group is composed of 9 tax havens: Belize, Dominica, Grenada, Jordania, Saint Kitts-and-Nevis, Mauritius, Malaysia, Singapore, Tonga. Panel (b), looks at the impact of becomming a tax haven on the share of agricultural land. The treated group includes countries of panel (a) plus Hong-Kong, Saint Lucia, Marshall Islands, Saint Vincent-and-the-Grenadines, Western Samoa, and Seychelles. The control group is composed of all never-haven countries in the world. 95% confidence intervals from bootsptrapped standard errors (500 repetitions). The Wald p-value tests for the absence of pre-trends.

D Offshore Leaks

To provide evidence that the use of tax havens follows a gravity structure, I use data from Offshore Leaks released by the International Consortium of Investigative Journalists (ICIJ, 2022a, 2022b). This data result from different leaks:

— Panama Papers (2016): entities registered by the law firm Mossack Fonseca.
— the Paradise Papers (2017): clients of the law firm Appleby and seven tax havens' corporate registries.
— the Pandora Papers (2021): data leaked from 12 offshore service providers.
— the Bahamas leaks (2016): Bahamas corporate registry containing information on Bahamian Companies, trusts and foundations.
— the Offshore Leaks (2013): entities incorporated through two service providers.

The data allows linking entities registered in tax havens to their owners (beneficial owners when available) and to the intermediaries participating in the offshore structure. The ICIJ has linked the owners (individuals or companies, named officers in the database) to specific countries using their registered addresses. The database provides information on more than 800,000 offshore entities. In 8.6% some cases, a given officer might be linked to more than one country. I drop cases where a given officer is linked to more than three countries (0.87% of the cases). Otherwise, I assign to the officer all the countries listed. I drop entities without any officer listed.

I then count any observed entity linked to a given officer as a "link" between the tax haven in which the entity is registered and the country to which the officer has been assigned (if there are multiple countries, I count one different link for each different country). I obtain a dataset where I observe the number of offshore links for each pair of countries available in the data and for each different leak source. Keeping the heterogeneity coming from the source provider allows me to control for additional non-observed factors (such as the differential propensities for some law firms to work with tax havens or origin countries) through fixed effects.

I drop same-country pairs. The rest of this exercise assumes that the links available in the Offshore Leaks are a good proxy for the actual (unobserved) links. It should be the case as long as the entities revealed by the leaks are not correlated with the origin countries of officers. In all likelihood, this is not a strong assumption given the number of independent sources and the fact that the ICIJ has released data indistinctly from these considerations. This data is then merged with the USITC gravity dataset (Gurevich and Herman, n.d.) to perform gravity estimations.

E Tax rates in tax havens

One assumption of the theoretical framework is that the tax rate on the domestic and offshore economies are correlated in tax havens. Consequently, tax rates in tax havens should be lower than in comparable countries. This section explores this hypothesis. I explore this hypothesis by collecting corporate and individual tax rates from KPMG tax rates tables (KPMG, n.d.).[44] Data are provided for 151 countries between 2011 and 2021. For corporate tax rate it lists the statutory tax rate for a large firm, including local taxes when substantial. For individual tax rates, it generally lists the top marginal income tax rate and does not include deductions or special rules.

Table A.9, describes the average tax rate applicable in tax havens for corporate income tax and individual income tax. It reveals substantial differences in tax rates between tax havens and non-havens. The corporate tax rate in tax havens is, on average, about 7 percentage points lower. It is, on average, 5 percentage points lower for the personal income tax rate. However, it is uncertain if this difference is driven by the fact that tax havens have specific characteristics such as being small countries or because they are tax havens, all other things being equal. The tax competition literature has shown that small countries have lower tax rates in equilibrium than larger countries, even in models that do not include tax havens (Bucovetsky, 1991). Consequently, tax havens tax rates should be compared to those of similar countries.

Table A.9 – Comparison of tax rates between havens and non-havens

	Corporate Income Tax	**Personal Income Tax**
Tax havens	17.3	24.0
Non-havens	24.2	29.1

Note: Average tax rates for tax havens and non-havens in 2021. Data on statutory income tax rates is taken from KPMG Tax Rates Tables. Corporate income tax corresponds to the statutory tax rate including local tax rates when applicable. Personal income tax corresponds to the top marginal tax rate and does not include deductions or special rules. The list of tax havens used is described in section 2 of the paper and available in Table A.1 of the appendix.

To do so, I estimate the following equation by OLS:

$$Rate_{it} = \beta_1 Tax\ Haven_i + CZ_i + \mu_t + \epsilon_{it}$$

with $Rate_{it}$ being the statutory tax rate (either corporate or personal), $Tax\ Haven_i$ an indicator variable equal to 1 if country i is a tax haven, Z_i a vector of country-level characteristics such as its size, its GDP or its legal origins, C is the vector of coefficients associated. μ_t is a year fixed effect and ϵ_{it} is the error term.

In figures A.6 and A.7, I plot the estimation of β_1 along with its 95% confidence interval for different models. Figure A.6 reveals that for all models, corporate income tax rates are lower in tax havens than in comparable countries by 3 percentage points on average. This

44. See https://home.kpmg/xx/en/home/services/tax/tax-tools-and-resources/tax-rates-online/corporate-tax-rates-table.html and https://home.kpmg/xx/en/home/services/tax/tax-tools-and-resources/tax-rates-online/individual-income-tax-rates-table.html

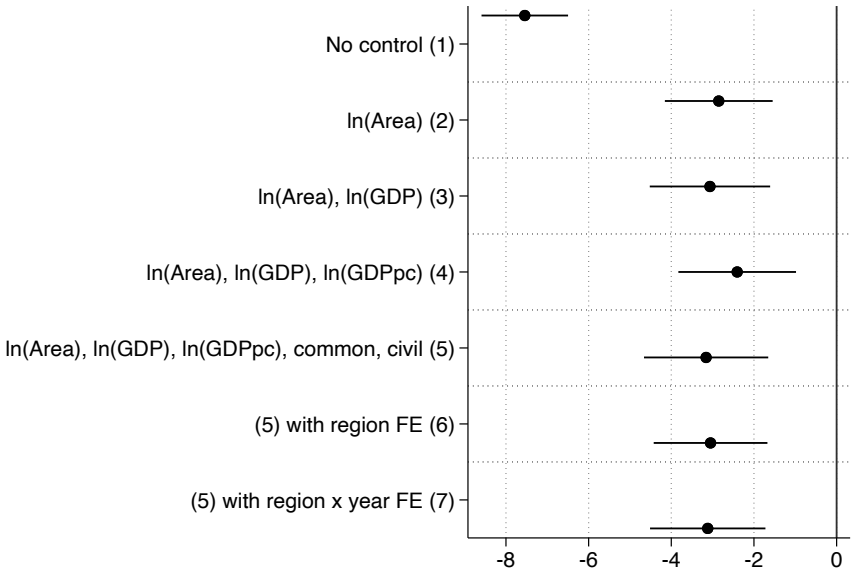


Figure A.6 – Estimation of β_1 for corporate income taxes

Note: This figure plots the estimation of β_1 along with its 95% confidence interval (robust standard errors) for different models. The dependent variable is the statutory corapote income tax rate including local taxes if applicable. Data on statutory income tax rates is taken from KPMG Tax Rates Tables.

effect is significantly different from zero at the 5% level. It is also true when we control for size, GDP, GDP per capita, legal origin and include region $\times$ year fixed effects. Interestingly, adding controls to the regression decreases by approximately 2.5 the estimated coefficient of tax havens. It confirms that a part of the lower tax rates in tax havens can be explained by their characteristics, particularly their size. However, controlling for these characteristics cannot fully explain why tax havens have lower tax rates than comparable countries.

Figure A.7 repeats the exercise for the individual tax rate. In models (1) to (5), including a diverse set of controls and year fixed effects, we observe a lower tax rate in tax havens than in comparable countries by about 2 percentage points. We add region fixed effects and region $\times$ year fixed effects in models (6) and (7). These models compare countries to similar countries in the same broad world region. The coefficient estimated appears negative but lower than in other models. This coefficient is also imprecisely estimated and not significantly different from zero at the 5% level.

Overall, these results do not contradict the assumption made in the theoretical framework that the domestic tax rate is not independent of the tax rate on the offshore economy. Indeed, tax rates on the domestic economy tend to be lower in tax havens than in comparable countries.

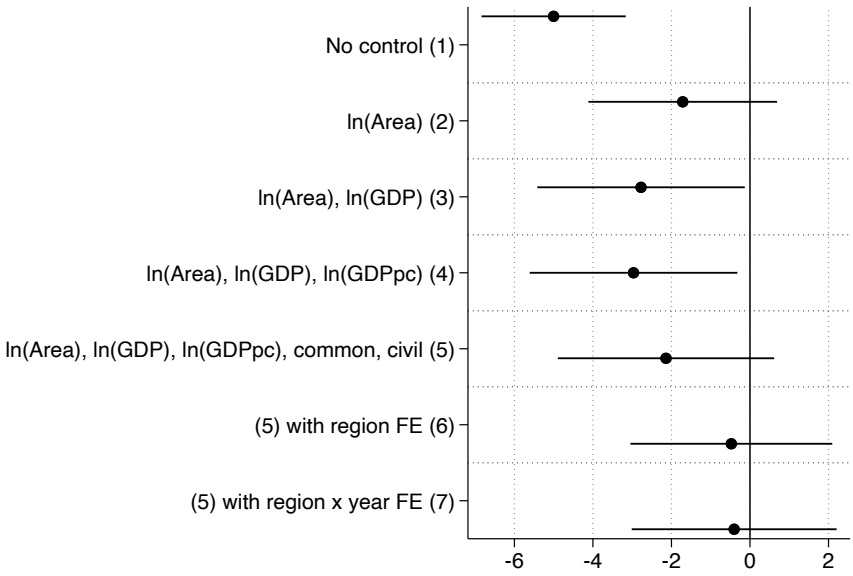


Figure A.7 – Estimation of β_1 for individual income taxes

Note: This figure plots the estimation of β_1 along with its 95% confidence interval (robust standard errors) for different models. The dependent variable is the statutory personal income tax rate base on the top marginal tax rate. Data on statutory income tax rates is taken from KPMG Tax Rates Tables.

F Theoretical proofs

Infrastructure level and tax haven quality. Proof that the level of infrastructure and the quality of the tax haven are set at their maximum in the non-haven case:

The firs-order condition for infrastructure maximization is:

$$\frac{\partial u_s^I}{\partial \pi_s} = \underbrace{y_\pi \left(\delta t_s(\alpha_s - 1)\right)}_{\geq 0} + t_\pi \underbrace{\left(\delta y(\pi_s)(\lambda_s - 1) + \frac{\alpha_s}{N}\left(\omega^F + t_s \omega_t^F\right)\right)}_{=0 \text{ using } 6} \geq 0$$

Therefore $\frac{\partial u_s^I}{\partial \pi_s}$ is always positive. The level of infrastructure is set at his maximum, constrained by the infrastructure capacity.

The first-order condition for tax haven quality maximization is:

$$\frac{\partial u_s^I}{\partial p_s} = t_p \underbrace{\left(\delta y(\pi_s)\left(\alpha_s - 1\right) + \frac{\alpha_s}{N}\left(\omega_s^F + \omega_t t_s\right)\right)}_{=0 \text{ using } 6} + \frac{\alpha_s}{N} t_s \frac{\partial \omega}{\partial p} \geq 0$$

Therefore $\frac{\partial u_s^I}{\partial p_s}$ is always positive. The tax haven quality is set at his maximum, defined by the tax haven capacity.

Implication 2 I compute $\frac{\partial \Delta U}{\partial N}$:

$$\frac{\partial \Delta U}{\partial N} = \sum_s t_{sN}\left(y\left(\pi_s\right)\left(\alpha_s - 1\right)\delta + \frac{\alpha_s}{N}\left(\omega_s^F + t_s^H \omega_{st}^F\right)\right) - \frac{\alpha_1}{N^2} t_s^H \omega_s^F$$

Because of the first-order condition on tax rate, $y\left(\pi_s\right)\left(\alpha_s - 1\right)\delta + \frac{\alpha_s}{N}\left(\omega_s^F + t_s^H \omega_{st}^F\right) = 0$ (this is the envelope condition). It follows that

$$\frac{\partial \Delta U}{\partial N} = -\sum_s \frac{\alpha_1}{N^2} t_s^H \omega_s^F \leq 0$$

Implication 3 To show that an increase in taxes in other countries increases the probability that a country become a tax haven, I compute $\frac{\partial \Delta U}{\partial t_i}$. I can make use of the envelope theorem to derive only the direct effect of t_i on ΔU, not considering effects of change in t_i in the endogenous variables.

$$\frac{\partial \Delta U}{\partial t_i} = \sum_s \frac{\alpha_s}{N}\left(t_s^H \omega_{t_i}^F\right)$$

with$\omega_{t_i}^F = \sum_i \omega_i N_i \mathbb{P}_{ih} \frac{exp(1-t_i)}{\left(\sum_{k\in\{TH\}} exp(A_k) + exp(1-t_i)\right)} \geq 0$

Additionally we can show that $\frac{\partial \Delta U}{\partial t_i \partial N} \leq 0$ and $\frac{\partial \Delta U}{\partial t_i \partial \tau_{ih}} \leq 0$:

$$\frac{\partial \Delta U}{\partial t_i \partial N} = -\sum_s \frac{\alpha_s}{N^2}\left(t_s^H \omega_{t_i}^F\right) \leq 0$$

$$\frac{\partial \Delta U}{\partial t_i \partial \tau_{ih}} = \sum_s \frac{\alpha_s}{N}\left(t_s^H \sum_i \omega_i N_i \frac{exp(1-t_i)}{\left(\sum_{k\in\{TH\}} exp(A_k) + exp(1-t_i)\right)} \mathbb{P}_{ih}\left(\frac{-1}{p_h(1-t_h)}\right)\right) \leq 0$$

Implication 4 To show that, the higher the level of initial tax haven quality, the higher the probability to become a tax haven, I compute $\frac{\partial \Delta U}{\partial p_1}$. To show that the higher the initial level of infrastructure, the lower the probability to become a tax haven, I compute $\frac{\partial \Delta U}{\partial \pi_1}$. Again, I make use of the envelope theorem.

$\frac{\partial \Delta U}{\partial p_1}$ gives:

$$\frac{\partial \Delta U}{\partial p_1} = \frac{\alpha_1}{N}\left(t_1^H \omega_p^F\right)$$

with

$$\omega_p^F = \sum_i N_i \omega_i \frac{\tau_{ih}}{p^2\left(1-t_h\right)}\left(\mathbb{P}_{ih} - \mathbb{P}_{ih}^2\right) \geq 0$$

$\frac{\partial \Delta U}{\partial \pi_1}$ gives:

$$\frac{\partial \Delta U}{\partial \pi_1} = y_\pi(\pi_1)\left(\delta t_1^H - t_1^{NH}\right)\left(\alpha_1 - 1\right) \leq 0$$

This result is obtained because $\alpha_1 \geq 1$ and $\delta t_1^H - t_1^{NH} \leq 0$.

References

Andersson, P. F., & Brambor, T. (2019a). *Codebook: Financing the State: Government Tax Revenue from 1800 to 2012* (mimeo).

Andersson, P. F., & Brambor, T. (2019b). *Financing the State: Government Tax Revenue from 1800 to 2012* (mimeo).

Becker, B. (2020). Colonial Legacies in International Aid: Policy Priorities and Actor Constellations. In C. Schmitt (Ed.), *From Colonialism to International Aid: External Actors and Social Protection in the Global South* (pp. 161–185). Springer International Publishing.

Bucovetsky, S. (1991). Asymmetric tax competition. *Journal of Urban Economics*, *30*(2), 167–181.

Cayman Islands Economics and Statistics Office. (2021). 2020 Compendium of Statistics.

Gobillon, L., & Magnac, T. (2016). Regional Policy Evaluation: Interactive Fixed Effects and Synthetic Controls. *The Review of Economics and Statistics*, *98*(3), 535–551.

Gurevich, T., & Herman, P. (n.d.). The Dynamic Gravity Dataset: Technical Documentation.

Head, K., & Mayer, T. (2014). Gravity Equations: Workhorse,Toolkit, and Cookbook. *Handbook of International Economics* (pp. 131–195). Elsevier.

Hensel, P. (2018). ICOW Colonial History Data Set, version 1.1.

ICIJ. (2022a). ICIJ publishes final batch of Pandora Papers data on more than 9,000 offshore companies, trusts and foundations - ICIJ.

ICIJ. (2022b). Offshore Leaks Database.

KPMG. (n.d.). Corporate Tax Rates Table.

Liu, L., Wang, Y., & Xu, Y. (2022). A Practical Guide to Counterfactual Estimators for Causal Inference with Time-Series Cross-Sectional Data. *American Journal of Political Science*.

Montiel Olea, J. L., & Pflueger, C. (2013). A Robust Test for Weak Instruments. *Journal of Business & Economic Statistics*, *31*(3), 358–369.

Palan, R., Murphy, R., & Chavagneux, C. (2009). *Tax Havens: How Globalization Really Works*. Cornell University Press.

Seelkopf, L., Bubek, M., Eihmanis, E., Ganderson, J., Limberg, J., Mnaili, Y., Zuluaga, P., & Genschel, P. (2021). The rise of modern taxation: A new comprehensive dataset of tax introductions worldwide. *The Review of International Organizations*, *16*(1), 239–263.

Xu, Y. (2017). Generalized Synthetic Control Method: Causal Inference with Interactive Fixed Effects Models. *Political Analysis*, *25*(1), 57–76.

Zucman, G. (2013). The Missing Wealth of Nations: Are Europe and the U.S. net Debtors or net Creditors? *The Quarterly Journal of Economics*, *128*(3), 1321–1364.