Tax havens and global environmental degradation

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The release of classified documents in the past years have offered a rare glimpse into the opaque world of tax havens and their role in the global economy. Although the political, economic and social implications related to these financial secrecy jurisdictions are known, their role in supporting economic activities with potentially detrimental environmental consequences have until now been largely ignored. Here, we combine quantitative analysis with case descriptions to elaborate and quantify the connections between tax havens and the environment, both in global fisheries and the Brazilian Amazon. We show that while only 4% of all registered fishing vessels are currently flagged in a tax haven, 70% of the known vessels implicated in illegal, unreported and unregulated fishing are, or have been, flagged under a tax haven jurisdiction. We also find that between October 2000 and August 2011, 68% of all investigated foreign capital to nine focal companies in the soy and beef sectors in the Brazilian Amazon was transferred through one, or several, known tax havens. This represents as much as 90-100% of foreign capital for some companies investigated. We highlight key research challenges for the academic community that emerge from our findings and present a set of proposed actions for policy that would put tax havens on the global sustainability agenda.

The role of ‘tax havens’ in the global economy has gained increasing attention in recent years. The disclosure of classified files from the law firms Appleby in 2017 (known as the ‘Paradise Papers’) and Mossack Fonseca in 2016 (known as the ‘Panama Papers’) has brought to light the intricate ways in which these financial secrecy jurisdictions lead to reduced transparency and substantial losses of tax revenue globally — currently estimated to US$200 billion per year. However, limited systematic consideration has been given to the possible links between the use of such jurisdictions and economic activities that undermine the sustainability of global environmental commons. Most analyses have instead been part of investigative journalism focusing on specific cases. Examples include tax evasion through the British Virgin Islands linked to deforestation and palm oil production in Indonesia, and the extensive use of shell companies located in tax havens by diamond mining companies operating in West Africa. The absence of a more systemic examination is not surprising considering the chronic lack of data resulting from the financial opaqueeness created by the use of these jurisdictions.

Here we examine the links between corporate use of tax havens and resource extraction from two key global environmental commons — the ocean and the Amazon rainforest. The ocean, and the fisheries it supports, plays a vital role as protein source and income for millions worldwide, and the Amazon is critical for stabilizing the Earth’s climate system. The two cases also illustrate what has been referred to in the economic geography literature as ‘furtive’ and ‘fictitious’ capital. Our analysis of global fisheries exemplifies flows of furtive capital and how tax haven jurisdictions can be used to enable and disguise illegal fishing activities. The Amazon case, instead, exemplifies flows of fictitious capital in the form of foreign loans and advance payments via tax haven jurisdictions to companies operating in the soy and beef sectors.

The two cases are thus complementary and build on a combination of data sources, with the ambition both to quantify flows of capital and, as far as possible considering available data, assess mechanisms by which the use of tax havens can be linked to unsustainable resource extraction. We then identify critical challenges related to causality and transparency, and propose key research questions and policy dimensions worth further consideration by both the scientific and policy community.

A brief overview of tax havens

In the past decade, considerable advancement has been made in our understanding of the political, economic and social dimensions of tax havens. While these jurisdictions have been argued to, in principle, provide politically neutral and reliable arenas for institutional innovation compared with settings dominated by political turbulence and institutional legal vacuum, a large body of literature also highlights their negative effects. These include the socio-political price these jurisdictions themselves pay by hosting disproportionately large amounts of foreign flows of capital; the destructive impacts of illicit financial flows for human development, particularly in the Global South; their role in ‘money laundering’ and funding of illegal activities such as trafficking of drugs and humans, terrorist financing and war crimes; and the risk of amplified global systemic financial risks created by the lack of financial transparency and oversight. Contributions from economics and sociology have also mapped the suite of strategies used by companies for aggressive tax planning through these jurisdictions, thereby highlighting that the use of tax havens spans beyond wealthy individuals to also include companies, financial institutions and their subsidiaries. Although contested and technically ambiguous, such aggressive tax planning strategies are usually legal (Supplementary Information, Appendix 1).

Box 1 lists the jurisdictions often denoted as tax havens in the academic literature. Note, however, that the terms ‘tax havens’, ‘offshore financial centres’ or ‘financial secrecy jurisdictions’ are debated (Supplementary Information, Appendix 2). Here we use the term tax havens as it is well-established and widely used among scholars, and in the public domain. Even though these jurisdictions are generally described as ‘offshore’, recent studies show that they are embedded in the wider operation of global financial networks or global wealth chains. In addition, recent estimates show that between 10 and 30% of all foreign direct investments (FDI) is

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Box 1 | List of jurisdictions classified as ‘tax havens’

The countries and jurisdictions are listed in alphabetical order. All have the following features normally associated with ‘tax havens’ or ‘financial secrecy jurisdictions’: zero or low taxes; lack of effective exchange of information; lack of transparency; and no requirement of substantial activity. Countries that also are identified as flags of convenience (FOC) states are marked with an asterisk, based on the International Transport Workers’ Federation list. See Supplementary Information, Appendix 2 for further details.

Andorra
Anguilla — overseas territory of the United Kingdom
Antigua and Barbuda
Aruba — Kingdom of the Netherlands
Bahamas*
Bahrain
Barbados*
Belize*
Bermuda — overseas territory of the United Kingdom*
British Virgin Islands — overseas territory of the United Kingdom
Cayman Islands — overseas territory of the United Kingdom*
Cook Islands — New Zealand
Costa Rica
Curaçao (from 2010)
Cyprus*
Dominica
Gibraltar — overseas territory of the United Kingdom*
Grenada
Guernsey/Sark/Alderney — dependency of the British Crown
Hong Kong
Ireland
Isle of Man — dependency of the British Crown
Jersey — dependency of the British Crown
Jordan
Lebanon*
Liberia*
Liechtenstein
Luxembourg
Macau
Maldives
Malta*
Marshall Islands*
Mauritius*
Monaco
Montserrat — overseas territory of the United Kingdom
Nauru
Netherlands Antilles — Kingdom of the Netherlands (dissolved 2010)*
Niue — New Zealand
Panama*
Samoa
San Marino
Seychelles
Singapore
Sint Maarten (from 2010)
St. Christopher and Nevis
St. Lucia
St. Vincent and the Grenadines*
Switzerland
Tonga*
Turks and Caicos — overseas territory of the United Kingdom
US Virgin Islands — external territory of the United States
Vanuatu*
tax evasion, hidden beneficiaries, falsely allocated catches and the resulting depletion (or, in the instance of South African stocks, collapse) of fish stocks, as well as reduction of critically threatened seabird populations²,³,⁶,¹².

Our analysis combines multiple datasets on fishing vessels and flag information to specifically highlight the link between IUU fishing and tax haven jurisdictions. While only 4% of all registered fishing vessels are currently flagged in a tax haven jurisdiction⁴, data from regional fisheries management organizations and the International Criminal Police Organization (INTERPOL)³⁴ show that 70% of the vessels that have been found to carry out or support IUU fishing and for which flag information is available are, or have been, flagged under a tax haven jurisdiction — in particular, Belize and Panama (Fig. 1).

The use of tax havens — and its associated problems such as loss of tax revenues, reduced transparency and lack of compliance — make tracing of fisheries resource use and allocation of accountability extremely difficult and costly²⁵. As such, it represents a major threat to the sustainability of global ocean resources that should be acknowledged and taken seriously. Similar uses of tax haven jurisdictions to support illicit environmentally destructive activities in other ecosystems have been reported, including illegal logging and trade with endangered species⁵,⁶,⁸, but require additional analysis.

**Amazonian land-use change and tax havens**

The Amazon basin has suffered from extensive deforestation, despite being considered an iconic ecosystem with unique biophysical values, and more recently also playing a critical role in the global climate system⁵,⁶,⁹,¹¹. As the extractive activities of companies are reliant on access to various forms of external capital (such as loans and equity capital) to start or expand their operations⁷,⁸, increasing attention has been directed towards understanding the financial flows and fiscal incentives underpinning environmental changes in the Amazon region⁷. However, the extent to which this capital is channelled via tax havens has until now remained obscured.

As a means to explore the connections between global financial and production networks⁸, we use a historical case, based on official figures from the Central Bank of Brazil, from October 2000 to August 2011. These are currently the only public data available, as the legal requirements for the publication of transfers of foreign capital introduced in October 2000 were suspended in August 2011 (Supplementary Information, Appendix 3a). This allows us to quantify flows of foreign capital from financial actors, based outside Brazil, to the nine largest companies operating in the soy and beef sectors of the Brazilian Amazon — two sectors representing key drivers of deforestation⁸. The studied time period overlaps partly with the most intense deforestation period in the Amazon (1995–2004), as well as the start of Brazil’s Soy Moratorium in 2006⁹. The companies were selected only for their market share, without incorporating any company-specific environmental assessment (Supplementary Information, Appendix 3b). We contacted the nine companies before publication and invited responses. The contact letter and all received responses are included in Supplementary Information, Appendix 3c, and provide further details on the structure, operations, sustainability practices and policies of some of the companies.

Figure 2 shows transfers of foreign capital to these companies channelled through tax haven jurisdictions between the years 2000–2011. The types of financial transaction whose value and currency must be declared to the Central Bank of Brazil include: loans from a foreign entity; leasing/rental transactions; and two types of transaction related to trade finance: cash in advance (anticipated payment
Financial secrecy in this case means that the protection of the interests of clients is safeguarded. Despite increased international pressure to comply with international reporting standards, the registrar in the Cayman Islands is able to release on enquiry only the name, type of company, date of registration, address of its registered office and status of the company. Except where assistance to law enforcement agencies to combat illicit activity is mandated or authorized, the disclosure of financial information by government officials, professional agents, attorneys and accountants and their staffs is considerably limited, despite recent modifications in the country’s secrecy laws.

The geographical reallocation of functions and funds within a company not only provides market opportunities, but also makes possible the favourable use of differences in national taxation policies. For example, economic actors can shift profits to subsidiaries placed strategically in countries with very low, or even zero per cent corporate tax rate. Another common strategy is denoted ‘debt loading’, whereby companies finance their activities in high-tax jurisdictions with loans from their own subsidiaries located in a tax haven. This strategy allows companies to minimize their taxes and sometimes receive a tax deduction in the high-tax country (Supplementary Information, Appendix 1). The selected companies described here together operate 2,200 subsidiaries around the world, 143 (7%) of which are located in tax havens, most commonly in the Cayman Islands, Luxembourg and Switzerland (Supplementary Information, Appendix 3).

Similar to the fisheries case, the use of tax havens in the Amazon context also plays a key role in the complex governance geography of many corporations. Company parentage is often stretched across multiple jurisdictions, which in general contributes to diminishing transparency. As an illustration, three of the focal companies in Brazil are headquartered in one jurisdiction, but incorporated in another — and tax havens feature as both headquartering and incorporation jurisdictions.

How the financial capital flowing into Brazil-located companies via tax havens is distributed across their operations is currently of exports) and import financing transactions. We add these four categories of financial transaction together to get an aggregate figure of declared foreign capital incoming to Brazil in the form of loans, financing or payments. Our analysis shows that a total of US$26.9 billion of foreign capital was transferred to the selected nine key companies between October 2000 and August 2011. Of this capital, about US$18.4 billion was transferred from tax havens (as defined in Box 1). In other words, 68% of all investigated foreign capital to these focal companies was transferred through one, or several, known tax havens. This percentage can be contrasted with the estimated 17% of all inward FDI transferred from tax havens to Brazil in 2011, or with 38% of FDI transferred from tax havens to Brazil the same year if only intercompany and intra-company loans are included.

Our estimate of 68% of capital transferred via tax havens is an average figure. For example, one company received US$6.9 billion from its own subsidiaries registered in the Cayman Islands as cash in advance, representing 90% of the total foreign capital received by that company between October 2000 and August 2011. Another company received virtually 100% of its foreign loans (about US$1.7 billion, representing 62.4% of the total foreign capital it received) from its own subsidiaries located in the Cayman Islands (Supplementary Information, Appendix 3d). Although the role of the Bahamas, the British Virgin Islands and the Cayman Islands for flows of FDI to and from Brazil is generally well known, to our knowledge this is the first exploration of their associations to companies operating in the Amazon biome.

The Cayman Islands is a central territory in the global tax haven community and a jurisdiction with strong connections to the global economy. In our data, it is identified as the largest transfer jurisdiction for foreign capital to companies operating in the Brazilian Amazon during the investigated period (Fig. 2). Channelling capital through the Caymans provides three benefits to investors: legal efficiency, tax-minimization (mostly zero taxes and low fees) and secrecy. Financial secrecy in this case means that the protection of exports and import financing transactions. We add these four categories of financial transaction together to get an aggregate figure of declared foreign capital incoming to Brazil in the form of loans, financing or payments. Our analysis shows that a total of US$26.9 billion of foreign capital was transferred to the selected nine key companies between October 2000 and August 2011. Of this capital, about US$18.4 billion was transferred from tax havens (as defined in Box 1). In other words, 68% of all investigated foreign capital to these focal companies was transferred through one, or several, known tax havens. This percentage can be contrasted with the estimated 17% of all inward FDI transferred from tax havens to Brazil in 2011, or with 38% of FDI transferred from tax havens to Brazil the same year if only intercompany and intra-company loans are included.

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How the financial capital flowing into Brazil-located companies via tax havens is distributed across their operations is currently

Fig. 2 | Foreign capital and tax havens in the Amazon. Foreign capital (that is, loans, cash in advance, financed import and leasing/rental) transferred from tax havens between October 2000 and August 2011 to key economic sectors associated with land-use change in the Brazilian Amazon (Supplementary Information, Appendix 3).

![Fig. 2](image-url)
If losses of tax revenues are substantial over time, do these •
•
• Does the use of tax havens by multinational corporations lead to
to track international flows of capital, and associated social and eco-
currently difficult, if not impossible, for scholars and policymakers
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•
•
• To what extent does the use of capital channelled through tax
havens are associated with reputational risks, they also increase cash
flow and profits, and lead to a reduced effective tax rate, which in
turn sends positive signals to investors and stimulates the growth of
economic activities across all jurisdictions of a company

Financial secrecy, data availability and causality
The examples above show that the use of tax havens is not only a
soo-political and economic challenge, but also very probably an
environmental one. Direct proof of causality remains elusive as
financial secrecy also hampers the ability of scholars and investors
to analyse how financial flows affect economic activities on the
ground, and their environmental impacts. Yet, in a globalized
world where distant drivers can induce regional and local ecological
changes through so-called ‘telecoupling’ mechanisms\(^50\),\(^51\), and where
our understanding of the close interplay between ‘onshore’ and ‘off-
shore’ finance in the global economy is limited\(^1\), such analyses are
becoming increasingly important to policymakers, investors and
enforcement agencies.

A number of methodological advancements and improved access
to ecological and economic data (for example, through increased
supply chain transparency\(^1\)) have paved the way for important
insights\(^2\). However, a key element for tracing causality to distant
financial drivers is long-term (decadal) data about how capital is
distributed across a company’s complex web of subsidiaries where extractive and financial operations take place. The use of tax haven
jurisdictions poses major challenges to transparency and makes it
currently difficult, if not impossible, for scholars and policymakers
to track international flows of capital, and associated social and eco-
logical impacts (Supplementary Information, Appendix 3e).

Putting tax havens on the global sustainability agenda
The lack of clearly established causal links between capital flows via tax
havens and environmental change should not deter from further inves-
tigations. Instead, we hope that our analysis triggers important ques-
tions for those interested in the implications of tax havens for global
environmental sustainability. For scholars, the questions centre on
causality and the importance of legal and illegal capital flows. That is:
•

- To what extent does the use of capital channelled through tax
  haven jurisdictions allow companies to expand their extractive
  operations in ways that they would not do otherwise? In particu-
  lar, to what extent does the use of tax havens allow companies to
circumvent environmental regulation and accountability?
- Does the use of tax havens by multinational corporations lead to
  underreporting of inward FDI into extractive activities affecting
  important global environmental commons?
- Are these jurisdictions used to a different extent in different
  extractive sectors, and if so, why?
- If losses of tax revenues are substantial over time, do these
  undermine national and regional monitoring and enforcement
  capacities that would help safeguard important global environ-
  mental commons?

Our study also raises important issues for policymakers. First, in
a similar way as is discussed for global fossil fuels subsidies\(^55\), loss
of tax revenue through the use of tax haven jurisdictions by com-
panies modifying the biosphere could be conceptualized as indirect
subsidies\(^55\) to economic activities with possibly detrimental global
environmental consequences. While estimating the size of such
subsidies will be challenging, systematic analyses of whether aggres-

tive tax planning in extractive industries could be viewed as sup-
porting environmental degradation should be a priority in current
international policy discussions about the realization of the 2030
Agenda for Sustainable Development.

Second, leading international fora and organizations such as the
Group of Twenty, UN Environment, the UN Food and Agriculture
Organization and the UN Office of Drugs and Crime should initi-
ate joint independent assessments of the natural capital costs, such
as loss of biodiversity and carbon sequestration, of these until now
unquantified subsidies. This assessment should help reduce uncertain-
ties around causality between capital flows and environmental
change, and include a more comprehensive set of biomes, economic
sectors, and companies and their subsidiaries than presented here.

Third, the international community should intensify its attempts
to stimulate corporate transparency and collaborate to uncover and
fight tax evasion, viewing such actions as important not only from a
soo-political perspective, but also for environmental reasons. This
includes recognizing the importance of FOC states in the structure
of the global offshore system, as well as expanding current reform
proposals. For example, the European Commission’s proposal for
a common consolidated corporate tax base, and the US-initiated
Foreign Account Tax Compliance Act\(^1\), as well as the proposal to
increase transparency by means of a country-by-country reporting
advanced by the European Commission and the Organisation for
Economic Co-operation and Development\(^5\), should progress, be
made accessible for research and be complemented with targeted
assessments of the potentially large environmental benefits of these
proposals in sectors such as fisheries, forestry, and extractive indus-
tries including oil and gas. The legislation introduced by the govern-
ment of the United Kingdom in May 2018 with the ambition to force
British overseas territories (which include large tax havens such as
Bermuda, the Cayman Islands and the British Virgin Islands) to
make public the names of the owners of thousands of companies
registered in these jurisdictions by the end of 2020 should also be
welcomed. Whether this measure will result in increased financial
transparency remains to be seen, but it has the potential to allow for
further assessments of the links between tax havens and environ-
mental degradation.

Bringing to light, quantifying and minimizing these hidden indi-

drect subsidies should be viewed as a key issue in our efforts to pro-

tect global environmental commons, and a priority at a time when
nations are coming together to endorse and finance the ambitions
expressed in the UN Sustainable Development Goals.

Data availability
All data supporting this article are openly available in the fig-
share repository https://doi.org/10.6084/m9.figshare.5857716
(Supplementary Information, Appendix 3f).

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