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Sovereign States in the Greenhouse: Does Jurisdiction Speak against Consumption-Based Emissions Accounting?

The paper investigates the significance of jurisdiction for the choice of accounting method of greenhouse gases. Making use of the distinction between retrospective and prospective responsibility, it assesses three different arguments from jurisdiction against consumption-based emissions accounting. It argues that one of these arguments, the effectiveness argument, provides a strong potential reason against consumption-based emissions accounting. To the extent jurisdictional control is needed to reduce some emissions, and production-based accounting incentivizes states to reduce these emissions, there is a reason of environmental effectiveness for sticking with production-based accounting.

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1. Introduction

A key question of international climate policy is how emissions should be counted. The current method, known as *production-based accounting*, counts emissions at their geographical point of origin.² The United Nations Framework Convention on Climate Change (UNFCCC) instructs countries to keep inventories over ‘greenhouse gas emissions and removals taking place within national territory and offshore areas over which the country has jurisdiction’ (IPCC 2006, p. 1.4). An alternative method is *consumption-based accounting*. Under consumption-based accounting, a country is ascribed emissions embodied in the goods and services it consumes, but not emissions embodied in the goods and services it exports for consumption elsewhere. Thus, rather than counting the emissions that went into making, say, a smart phone in the countries that manufactured and assembled it, this method counts the emissions in the country where the final consumer resides (Peters 2008; Peters and Hertwich 2008; Davis and Caldeira 2010; Barrett *et al.* 2013; Lininger 2015).

Proponents argue that consumption-based (CB) accounting would provide for a more just and environmentally effective allocation of climate burdens. Counting emissions on the consumption side would shift emissions from developing to developed countries, and since developed countries are not only rich but also tend to have more ambitious climate policies, making them shoulder a greater share of the overall climate burden would be both appropriate and better for the climate.³ This line of argument rests on two key assumptions. First, countries’ levels of emission are relevant for their climate burdens. Second, countries would not lower their climate policy ambitions as a reaction to being ascribed more emissions. While the first of these assumptions is very plausible—no matter what we might think of it in principle, the way emissions are ascribed to countries does matter for their climate burdens in practice—the second is more doubtful. Still, the case for CB accounting is strong enough to have generated increasing interest in this option, and scholars have consequently debated its complexity, feasibility, justice, and effectiveness.⁴

² Some prefer the term ‘territory-based accounting’ for UNFCCC’s system of accounting and use ‘production-based accounting’ in a slightly different way (Barrett *et al.* 2013). See also the distinction between production, consumption, extraction, and income-based approaches in Steininger *et al.* (2016).

³ This is typically cast in terms of CB accounting preventing *carbon leakage* (the process whereby emissions relocate to countries where they are subject to less stringent regulation). A popular distinction is between *strong* (climate-policy induced) and *weak* (consumption induced) carbon leakage (Afionis *et al.* 2017, pp. 3–4). See also the distinction between the relocation, energy market, income, and technological spillover channels of carbon leakage in Steininger *et al.* (2016).

⁴ For summaries of the arguments for and against CB accounting, see Steininger *et al.* (2014) and Afionis *et al.* (2017). Roser and Tomlinson (2014) offer an overview of the arguments for and against the closely related idea of border carbon adjustments. The feasibility of CB accounting is discussed by Grasso and

One striking feature of the choice of accounting method is that international climate policy revolves around sovereign states or governments.⁵ Environmental policies have traditionally been ‘production-based’ precisely because this allows states or governments to address problems in the territory over which they have jurisdiction. Yet CB accounting ensures that ‘a part of the emissions occur outside of the regulated country where there is no jurisdiction to regulate emissions’ (Peters et al. 2016, p. 51). For example, CB accounting would attribute some emissions produced in China to other countries even though the latter lack jurisdiction over Chinese territory. It is natural to suspect that this is a deep flaw of CB accounting. Despite this, the significance of jurisdiction has not been subjected to systematic scrutiny in the emerging normative debate on this method.

To rectify this shortcoming, in this paper I investigate what I call *the argument from jurisdiction against CB accounting*. The general idea behind this argument is simple: when attributing emissions, we should attribute them to the entity that has jurisdiction over the territory from which the emissions emanate, because doing so ensures that responsibility is assigned to the entity with the legal power to control emissions. In one version of the argument, this is important because it would be *unfair* to assign emissions otherwise (it would hold states responsible for emissions they did not cause or cannot control). In another version, it is important because it would be more *effective* (it would give the state with the best ability to lower emissions an incentive to do so). Using the tools of normative ethics and classical logic, my aim in this paper is to assess these arguments. I will suggest that while the arguments seem persuasive at first glance, a closer analysis reveals that they are subject to significant doubt. The fairness-based arguments are largely unsuccessful. The effectiveness-based argument provides a potentially strong ground for counting emissions at the point of production, but its soundness depends on empirical premises the truth of which remain to be established.

Three preliminary remarks about the paper: First, although emissions accounting is a fascinating and important topic in its own right, the argument from jurisdiction of course has wider implications than just emissions accounting. The argument is relevant for any context in which we are unsure about how to allocate responsibility between producers and consumers.⁶ Second, while this paper given its focus on jurisdiction and legal control treats states or governments as the relevant bearers of climatic responsibility, nothing prevents applying some of the

Roberts (2014) and Grasso (2017). For good discussion of the additional complexity introduced by CB accounting, see Peters (2008).

⁵ I use ‘state’ and ‘government’ interchangeably to describe the national political authority of a country, but for the sake of simplicity, I shall mostly speak of ‘states.’

⁶ For consumer responsibility and ethical consumption generally, see, e.g., Hussain (2012) and Lawford-Smith (2015). For a well-known analysis of responsibility under global supply chains, see Young (2006).

logic of the arguments in a more individualistic setting. One of the points I make below is that whenever we face a question of allocating costs between producers and consumers, we may think about it through the lens of both retrospective and prospective responsibility. That point remains relevant when we conceive of consumers and producers as individuals as opposed to states or governments. Third, I treat CB accounting and production-based (PB) accounting as rival and exhaustive options, meaning that if an argument speaks against one method, it simultaneously speaks in favor of the other. I do not consider other methods of accounting, nor do I consider potential ways of combining CB accounting and PB accounting.⁷

2. Retrospective and prospective responsibility for emissions

Before we get to the argument from jurisdiction, in this section I establish the distinction between retrospective and prospective responsibility. The debate on CB accounting is to large extent about responsibility for emissions, yet it does not sufficiently distinguish backward-looking and forward-looking senses of responsibility. Parsing the concept of responsibility more carefully will allow us to sort the argument from jurisdiction into its different versions.

It is widely recognized by philosophers that ‘responsibility’ does not refer to a unified concept. Vincent (2011) offers a taxonomy over no less than six responsibility concepts—responsibility as virtue, role responsibility, outcome responsibility, causal responsibility, moral responsibility, and responsibility as liability—each of which contain subtle distinctions in turn. For our purposes here it is enough to use a somewhat crude distinction between being responsible for something having occurred (*retrospective responsibility*) and being responsible for ensuring that something happens (or does not happen) in the future (*prospective responsibility*). The generic phrase ‘Agent A is responsible for state of affairs X’ is neutral between these two senses of responsibility. When we are ascribing retrospective responsibility, we are essentially trying to explain why an outcome occurred, often with an eye to assigning praise or blame. Prospective responsibility, by contrast, is about assigning tasks or duties. Here we are trying to identify the party or parties that have the task of ensuring that something happens (or does not happen) in the future.⁸

⁷ For shared responsibility/costs models, see Lenzen et al. (2007).

⁸ Retrospective responsibility is always about causal responsibility and in addition typically takes on the texture of *moral* responsibility in the sense that the retrospectively responsible actor is praise- or blameworthy for an outcome. Prospective responsibility is similar to what David Miller calls ‘remedial responsibility’, although it is not necessarily a special responsibility (Miller 2007). For prospective responsibility, see Goodin (1985) and van de Poel (2011).

It should be clear that, while the two senses of responsibility are distinct, they often interrelate. For example, when someone has littered your backyard, it is natural to argue that the person who caused the mess (retrospective responsibility) should clean it up (prospective responsibility). The influential Polluter Pays Principle connects the two types of responsibility precisely in this way.⁹ Yet the two types of responsibility are logically distinct, and they can come apart in practice. For example, it is common to argue that the most capable agents should sometimes assume the responsibility for addressing a problem even though they did not bring it about. In such situations, retrospective responsibility is neither a necessary nor a sufficient condition for prospective responsibility.

The relevance of this distinction for the choice between CB accounting and PB accounting is that an accounting method could be seen as a way to ascribe either retrospective or prospective responsibility for emissions. Read as a way to ascribe retrospective responsibility, an accounting method is a way of saying who brought about emissions. Read as a way to ascribe prospective responsibility, however, it is rather a way of saying where the task of managing and reducing these emissions lies—to put it colloquially, whose business these emissions now are.

That the accounting method could be seen as serving different goals is important because it means that there are different ways of *evaluating* whichever distribution of emissions that an accounting method produces. More specifically, we can worry about this distribution for backward-looking and forward-looking reasons. Suppose one accounting method attributes x tons of CO₂ to a country C whereas another attributes y tons of CO₂ to C , and y is greater than x . Which attribution should we prefer? One natural question is whether one method is more accurate than another method from the perspective of who *caused* the emissions. For example, if an accounting method attributes y rather than x tons of CO₂ to C , then we may worry that this exceeds the emissions that C actually brought about. This is the same as using retrospective responsibility as the evaluative lens. But another question is whether one method is better than the other when understood as a way to allocate the task of reducing emissions, which is the aspect highlighted by prospective responsibility. For example, we may wonder whether a method is more likely to lead to emission reductions. The lesson is that we must always assess the way emissions are attributed to countries in light of some normative standard.

This is not to deny that we generally think of the accounting method in a particular way. It seems to me that we typically regard the emissions accounting

⁹ However, different versions of the Polluter Pays Principle explain this in different ways. Read as a ‘fault-based’ principle, polluters should pay because this is just (Shue 1993). Read as a forward-looking principle, polluters should pay to ensure that would-be polluters have an incentive not to pollute (de Sadeleer 2002). For a philosophical discussion of the principle as applied to climate change, see Caney (2005) and Roser and Seidel (2017, pp. 118–129).

exercise as ascribing retrospective responsibility *in order to* assign prospective responsibility. Our assumption then is (i) that attributing emissions to countries is the same thing as giving them the task of managing or reducing emissions and (ii) the task of managing or reducing emissions should befall those who are retrospectively responsible for them. But the backward-looking and forward-looking concerns are distinct and could be valued independently. Those who see it as unimportant that emissions are attributed in accordance with retrospective responsibility, for example, will not worry about that a method might attribute emissions to countries that did not cause those emissions. Since an accounting method might be worse in one dimension but not the other, it is important to be clear about which dimension we invoke in assessing it.

3. The argument from jurisdiction

Let us now turn to the argument from jurisdiction against CB accounting. The argument relies on the claim that states have *effective jurisdiction* over their territories. ‘Jurisdiction’ should here be understood as the exclusive formal right ‘to make and enforce laws throughout the territory’ (Miller 2012, p. 253).¹⁰ ‘Effective’ jurisdiction, meanwhile, refers to a capacity to *exercise* this right. Thus, the claim that states have effective jurisdiction over their territories amounts to the claim that states have the right and the ability to decide which laws and regulations to enact. It is this fact, so the argument from jurisdiction holds, that ensures that CB accounting would be a poor choice for international climate policy.

I shall not dispute the claim that states have effective jurisdiction over their territories. I recognize that there are cases where the claim is false, but the argument from jurisdiction only relies on that it is true for *most* states, and this seems plausible enough. Hence, it is no objection against the argument that there are individual cases where a state lacks effective jurisdiction because, for example, it has been annexed by another state or is ridden by civil war. It is also important to note that the argument does not assume that effective jurisdiction renders states omnipotent over what transpires in their territories. It only stresses that effective jurisdiction ensures that states alone are able to decide which laws and regulations to put in place. This does give states a special kind of control over what transpires on their

¹⁰ By saying that it is ‘formal’ right, I want to signal that this is not a normative claim: I am not suggesting that all states that have jurisdiction over their territory *should* have it. Moreover, the right is ‘exclusive’ in the sense that the right to make and enforce law is only held by the state. The latter may seem too strong because, as one commentator notes, ‘the Hobbesian model of a single sovereign with a unified, complete jurisdiction has never existed’ (Valverde 2014, p. 387). But the argument from jurisdiction does not assume complete jurisdiction, so I will here gloss over the extent to which, if at all, the national state or government shares the right to make and enforce law with other political authorities.

territory, but it does not give them anything like complete control, nor does it rule out that other agents, like private business or foreign powers, may in turn influence their legislative choices.

Effective jurisdiction provides one reason to ascribe retrospective responsibility to the state for what transpires on its territory. Although individuals, firms and other organizations decide what to do *within* the framework set out by the legal order, so this thought goes, the state controls their actions in the sense that it controls the legal framework. For example, in the case of climate change, we could argue that the emissions emanating from a territory are ultimately the state's fault since the state establishes the framework within which these emissions were permissible (Caney 2005, p. 755). This is complicated once we factor in that no state is able to secure full compliance with laws and regulations. The point here, however, is that jurisdiction can and does ground claims for holding states' retrospectively responsible for what transpires on their territory. If a state is unable to enforce its laws and regulations, then this just means that it has little retrospective responsibility for what individuals, firms and other organizations do on its territory.

Jurisdiction can also play a key role for the ascription of prospective responsibility. Suppose it is difficult to lower the emissions emanating from a territory without having effective jurisdiction over that territory. The fact that a state has effective jurisdiction then makes it a natural site for prospective responsibility: we should ascribe the task of reducing emissions to the state because the state is the entity that is most able to affect the amount of emissions flowing from a territory. Thus, the same considerations that make the ascription of retrospective responsibility appropriate may underpin a case for ascribing prospective responsibility. Legal power and prospective responsibility should go hand in hand.¹¹

The argument from jurisdiction flows from these observations. It holds that CB accounting is a bad idea because, in counting emissions at the point of final consumption, it attributes some emissions to states that lack the legal power to control them. Precisely why this is a bad idea comes in different versions, each of which could stand on its own but could easily be combined.

4.1 The fairness argument from retrospective responsibility

One argument is that effective jurisdiction is a precondition for, or strongly contributes to, retrospective responsibility for emissions. Suppose the United Kingdom

¹¹ Again, this is not to suggest that the amount of emissions flowing from the territory is *fully* under the control of the state. Individuals and other agents could choose to reduce emissions more than legally required or emit more than legally permitted. The point is simply that the state is in the best position to affect the amount of emissions in virtue of setting up proscriptions and prescriptions for other agents.

(UK) is attributed with the emissions that go into the goods it imports from China. According to the fairness argument from retrospective responsibility, the UK should not be held accountable for emissions associated with its consumption of Chinese goods since, given its lack of jurisdiction over those emissions, it had no control over how those goods were produced.

The argument can be given a positive or a negative form. The positive formulation draws on the claim that it is appropriate that those who cause a bad outcome are held accountable. Thus, what is problematic about CB accounting is that it inappropriately exonerates states from emissions associated with their exports. We can state this argument as follows:

P1. It is appropriate to hold agents accountable for bad outcomes they cause.

P2. CB accounting fails to hold agents accountable for some bad outcomes they cause.

Therefore, CB accounting is inappropriate.

The negative formulation states, more modestly, that what is problematic about CB accounting is that it holds states accountable for outcomes it did not cause. While it is not important that those at fault are held accountable, it is important that no one is held accountable without being at fault. We can state this argument as follows:

P1. It is unfair to hold agents accountable for outcomes they did not cause.

P2. CB accounting holds agents accountable for outcomes they did not cause.

Therefore, consumption-based accounting is unfair.

These arguments capture a natural objection to CB accounting, as evidenced by the emerging debate on whether this method of accounting conflicts with the Polluter Pays Principle (Duus-Otterström & Hjorthen 2018). Skeptics argue that CB accounting is incompatible with this principle since counting emissions at the point of final consumption exonerates the polluters, that is, those who actually *release* greenhouse gases into the atmosphere. As one commentator puts it, 'producers are principally, logically and obviously responsible for emissions from production' (Liu 2015, p. 5).

The problem is that premise P2 is doubtful in both arguments. The gist of these premises is that those who produce the emissions are the ‘real’ polluters, but it is not clear that this stands up to critical scrutiny. As Roser and Tomlinson (2014) note, the central concern for the Polluter Pays Principle is causation—polluters are those who cause emissions to occur.¹² Yet no theory of causation suggests that only producers are polluters thus understood. Both producers and consumers contribute to the causal sequences that give rise to emissions, and for both of them is true that, had they not behaved the way they did, the emissions would not have occurred. Thus, producers and consumers *jointly* cause emissions. The Polluter Pays Principle therefore neither favors nor condemns PB accounting. Instead, it holds that the emissions—and, more importantly, the costs associated with them—should be split between producers and consumers, perhaps in proportion to their degree of causal contribution.

We may quarrel that Roser and Tomlinson overlook the normative and conventional dimensions of posing a question like ‘who is causing pollution?’ What counts as a cause of an outcome cannot simply be read off the empirical facts but depends, as J.L. Mackie showed years ago, on our perspective or explanatory interest (Mackie 1965).¹³ In explaining why pollution occurs, many different causes may be highlighted, ranging from high-level phenomena like human nature or capitalism, to more mundane factors such as the lack of sufficient alternatives to fossil fuels, and while these explanations are not mutually exclusive, different people will emphasize different ones depending on which factors seem salient to them. Hence, even though consumer demand is a necessary condition for many emissions, it does not follow without further argument that it counts as a *cause* of emissions. Perhaps we regard consumer demand as a mere background factor, much like the presence of oxygen in Mackie’s famous example of a house burning down due to a faulty circuit. If so, we would hardly think of consumers as ‘causing emissions.’

There is little doubt, however, that both consumers and producers are salient in explaining why pollution occurs. Indeed, it is precisely because consumers and producers seem to contribute to climate change that the question of apportioning retrospective responsibility between them has become the subject of discussion.

¹² To be precise, Roser and Tomlinson argue that the Polluter Pays Principle ultimately cares about *agent responsibility* (Vallentyne 2008), which is similar to the perhaps better-known concept of *outcome responsibility* (Miller 2007, pp. 86–97). However, they think that the question of states’ responsibility for emissions essentially boils down to causal contribution since producers and consumers are typically agent responsible for their involvement in production-consumption sequences (Roser and Tomlinson 2014, p. 237).

¹³ Mackie expressed this in terms of causal statements presupposing a ‘causal field’. See also Miller (2007, p. 87).

Taking Mackie's more nuanced perspective on causal attribution therefore does not change the conclusion that producers and consumers are jointly causing pollution.¹⁴

The upshot is that the fairness argument from retrospective responsibility fails. Even though producing goods lies closer to what we intuitively think of as 'causing emissions', on reflection it is not obvious that consumers are any less of a cause of emissions than producers. Hence, we cannot say that attributing retrospective responsibility to them is unfair.

4.2 The fairness argument from prospective responsibility

Let us return to the example of attributing some of the emissions emanating from China to the UK. We just saw that it is not obviously unfair or inappropriate to hold the UK retrospectively responsible for these emissions since the UK can be seen as a cause of them. Another perspective on the issue, however, does not concern the fairness of blaming the UK for emissions it purportedly did not cause, but rather whether it is fair to assign the UK the prospective responsibility to reduce these emissions *moving forward*. Note that this concern is independent of whether the UK is retrospectively responsible for the emissions or not.

The fairness argument from prospective responsibility offers a different and much less discussed way to attack CB accounting. We can state this argument as follows:

P1. It is unfair to ascribe prospective responsibility to an agent when the agent cannot discharge that responsibility.

P2. Consumption-based accounting ascribes prospective responsibility to agents that cannot discharge that responsibility.

Therefore, consumption-based accounting is unfair.

What can we say about this argument? Premise P1 is very plausible, falling under the well-known rule that 'ought implies can.' If CB accounting means that the UK is supposed to lower emissions over which it has no control, then CB accounting would clearly be unfair to the UK.¹⁵

¹⁴ It does not follow from this that they are *equally* causally responsible. It is possible to argue that *A* and *B* are jointly responsible for *X* yet argue that *A* is *more* responsible than *B*. Indeed, this is normal in many cases of pollution, such as when two cities together pollute a lake, but one city releases more pollutants than the other. But this qualification does not affect my analysis as any degree of retrospective responsibility on the side of consumers is enough to defeat the fairness argument from retrospective responsibility.

¹⁵ China might nevertheless act in a way that conforms to what the UK should have brought about. In

Premise P2, however, is more doubtful. First, it is far from self-evident that the UK does lack control over Chinese emissions. What the premise gets right is that the UK is unable to make *legal* decisions in the Chinese territory. Factories in China obey Chinese law, not British law. However, the UK could nevertheless exercise some control over Chinese emissions. To ‘control’ something is roughly the same as having the ability to affect the likelihood of something occurring by undertaking to bring it about, and control thus understood does not presuppose effective jurisdiction. For example, the UK could introduce border carbon adjustments that make imports from China more expensive, which in turn could encourage the Chinese state to pass laws mandating greener production.¹⁶ Call this kind of control, where a country affects the laws and policies of another country through regulating its own consumption, *indirect control*.

The opportunity to exercise indirect control shows that even if we were to consider the UK’s responsibility to be to lower emissions emanating from Chinese territory, having jurisdiction is not a precondition for discharging that responsibility. Since the UK can affect emissions emanating from China through demand-side measures such as carbon tariffs, its lack of jurisdiction at most means that its position is *worse* in that regard than that of China. We will return to this point shortly, but for now the conclusion we can draw is that lack of jurisdiction over foreign territories does not render other states unable to affect the emissions emanating from those territories. Hence, we cannot condemn CB accounting because it ascribes prospective responsibilities to states that states cannot discharge.

There is a more serious problem with P2. The premise assumes that CB accounting gives importing countries a responsibility to lower emissions emanating from exporting countries. But this is actually not what CB accounting entails. CB accounting only says that the UK must lower *its own* emissions, *parts* of which are due to consuming goods imported from China. CB accounting is a method for constructing national emissions inventories, so when it ascribes more emissions to a net-importer of GHGs, it does not say that net-importers should be ascribed someone else’s emissions. Instead, it offers an alternative approach to calculating which emissions are properly countries’ own emissions. This reinforces the point that CB accounting does not ascribe responsibilities that states cannot discharge.

such cases, however, we cannot speak of the UK having ‘discharged’ its prospective responsibility since the success conditions are met independently of what the UK does. The charge, then, is that CB accounting is unfair to the UK in that it assigns a task over which it has no, or little, control, not because the *task as such* is impossible or overly demanding. For ‘ought implies can’, see Stern (2004).

¹⁶ As Roser and Tomlinson explain, border carbon adjustments are policies that ‘focus on applying climate policy to imports and exports and thereby adjusting the differential costs for consumers and producers in countries with different climate policies’ (Roser & Tomlinson 2014, p. 228; cf. Böhringer et al. 2012).

After all, if it turns out that the UK is unable to affect the territorial emissions in China, it could choose to reduce its domestic emissions instead or simply consume less. It is only when it is *impossible* to reduce one's emissions sufficiently without reducing foreign emissions that the fairness argument from prospective responsibility succeeds in showing that there might be something unfair about CB accounting.

The fairness argument from prospective responsibility is thus not in good health. Although the argument flows from a plausible normative principle—agents should not be ascribed tasks the success or failure of which is independent of what they do—it does not establish that CB accounting violates this principle. States typically *are* able affect emissions emanating from elsewhere, and CB accounting does not entail that states can only discharge their climatic responsibilities by reducing imported emissions anyway.

4.3 The effectiveness argument

We just noted that it is an exaggeration to say that states cannot affect emissions emanating from other territories since states can exercise 'indirect' control over production taking place abroad. However, this is compatible with saying that states have *less* control over such production compared to the state that has jurisdiction over the relevant territory. The effectiveness argument exploits this point. In this section, I argue that this argument shows that we have a reason to prefer PB accounting to CB accounting in some circumstances.

The effectiveness argument assumes that the accounting method is ultimately about distributing the task of managing and reducing emissions, that is, prospective responsibility. Its normative premise is that the responsibility to perform a task should be ascribed to the agent that is most likely to *discharge* that responsibility.¹⁷ The argument is thus forward-looking. We can state it as follows:

P1. The responsibility to reduce emissions should be ascribed so that greater emissions reductions are more likely.

P2. Production-based accounting ascribes responsibility to reduce emissions so that greater emissions reductions are more likely.

¹⁷ A further question is whether ascribing prospective responsibility in this way would also be more *efficient*, meaning that tasks are performed at lower cost. For the sake of brevity, I will disregard this aspect, but since economically efficient mitigation probably also means greater emission cuts, we should not overplay the distinction between efficiency and effectiveness here.

Therefore, production-based accounting should be adopted.

Notice that there is a gap in the argument. Since P1 does not say that the responsibility to reduce emissions should *only* be ascribed with an eye to effectiveness, it does not establish the conclusion that PB accounting ‘should be adopted.’ This is instructive because it shows that even if we were convinced that PB accounting leads to deeper emission cuts, this would not automatically show that this accounting method is preferable. We might care about things other than effectiveness in assigning prospective responsibility such as that it is fair to the burden takers.¹⁸ Still, reducing emissions is highly important. If PB accounting leads to more mitigation than CB accounting, this counts strongly in its favor.

Since P1 is likely true when these qualifications are borne in mind, the relevant question is whether P2 is true. What ground is there for thinking that PB accounting makes greater emissions reductions more likely? This premise is the conclusion of another argument:

P1. Compared to other states, the national state is best placed to affect the emissions emanating from its territory.

P2. Production-based accounting incentivizes states to lower the emissions emanating from their territory.

P3. Therefore, production-based accounting incentivizes the best-placed state to lower emissions emanating from its territory (from 1 and 2).

P4. If we incentivize the best-placed agent to reduce emissions, greater emission reductions are more likely.

Therefore, production-based accounting makes greater emission reductions more likely (from 3 and 4).

The argument is valid and has immediate force. There is admittedly an ambiguity in that the argument aspires to show that PB accounting probably leads to more emission reductions *overall* whereas the premises only speak of emissions emanating *from territories*. However, except for emissions that are not currently attributed to any country, all emissions emanate from some territory. The argument is that if we put emissions on the ledger of the state or government with jurisdiction

¹⁸ For an exploration of the tension between fairness between burden takers and effectiveness, see Caney (2014).

over the territory from which emissions emanate, this makes greater emissions reductions more likely compared to when we count them at the point of final consumption.

Let us go through the argument systematically. Note first that premise P2 seems true. While a state may not care about reducing emissions in the first place, P2 makes the more limited point that if states' climate burdens are sensitive to their level of emissions, and states have an interest in reducing their climate burdens, then PB accounting gives states a reason to care about their territorial emissions. The premise does look problematic if interpreted as saying that *only* PB accounting incentivizes China to lower Chinese territorial emissions. China would have an incentive to lower its territorial emissions under CB accounting, too, since this would enable it to export more goods. But the logic behind P2 is simply that PB accounting incentivizes states to focus on reducing their own territorial emissions. Territorial emissions are the currency through which states live up to their mitigation pledges.

The argument faces objections in relation to the key premises P1 and P4, though. Consider first P4. Even if we concede that the national state is best placed to affect the emissions emanating from a territory, such that PB accounting would incentivize the best-placed agent to reduce those emissions, there is no guarantee that this would lead to emissions reductions, let alone greater reductions. For one thing, some states might simply lack an ambition to reduce their territorial emissions. The fact that such states remain the best placed to reduce their territorial emissions *if they try* is beside the point. For another thing, even if a state does want to reduce its territorial emissions, the extent of these reductions could be smaller than what would have occurred under a system of CB accounting. After all, despite being in a worse position to reduce emissions taking place in a territory, other states could have sufficiently greater climate ambitions, or economic muscle, that the result of demand-side measures is a greater reduction in emissions.

There are, then, some doubts about P4. Still, it seems true enough in a general sense that a problem is more likely to be addressed if we incentivize the agents with the most ability to address a problem to address it. Suppose we could incentivize different agents to perform a task to the same degree. It would then be exceedingly odd if the agent with the greatest ability to perform the task would not generally be the most reliable performer of the task.

The key questions instead pertain to the pivotal premise P1. Unless effective jurisdiction gives states greater control over its territorial emissions, the effectiveness argument breaks down completely. A first thing to note is that P1 says more than just that states have more control over the emissions emanating from their territory than over other emissions. It makes the stronger and more contentious

claim that the national state is better placed to control the emissions emanating from a territory compared to *other states*. We can distinguish between two different comparisons:

The narrow effectiveness comparison. For any state, it is true that the state has more control over its territorial emissions than it has over other emissions.

The wide effectiveness comparison. For any territorial emissions, it is true that the national state has more control over these emissions than other states do.

The narrow effectiveness comparison seems plausible enough, but P1 rests on the wide effectiveness comparison. Thus, to assess the truth of P1 we must consider states' avenues for affecting the emissions emanating from other states and then compare the effectiveness of those avenues to the direct control jurisdiction enables.

The case *against* P1 is the following: Under a system of CB accounting, states have an interest in the export sectors of other countries, and to reduce their emissions (which now include imported emissions) they may exercise what I previously called indirect control over them. The clearest example of this is border carbon adjustments, but there are other kinds of demand-side measures, such as product standards or public information campaigns that seek to convince citizens to buy fewer imported goods (Roser and Tomlinson 2014). Such measures are no less likely to lead to emissions reductions than direct regulation of the emissions at their geographical source. Thus, the national state does not have more control over their territorial emissions compared to other states.

The case *for* P1 is that jurisdiction gives states additional tools with which to pursue climate mitigation. In the literature on environmental regulation, it is commonplace to distinguish between policies that harness economic incentives and command-and-control (Baldwin *et al.* 2011).¹⁹ Under incentive-based policies, the regulator seeks to achieve desired outcomes through economic incentives, for example, by offering tax breaks to companies who pollute less. Command-and-control type policies, by contrast, seek to achieve desired outcomes by 'imposing standards backed by sanctions' (Baldwin *et al.* 2011, p. 106). Thus, command-and-control type regulation makes direct use of the law, and may mandate or proscribe a certain behavior. The extra regulatory tools this offers ensure that states are generally best placed to affect the emissions emanating from their territory. Whereas states are at the mercy of indirect economic measures when it comes to

¹⁹ For a more nuanced taxonomy over different kinds of regulation, see Coria and Sterner (2011).

reducing emissions taking place elsewhere, they can directly intervene in what goes on in their own backyard.

I do not know which case is more plausible, and I suspect that adjudicating the issue is enormously complicated. But let me add a few observations that may help clarify the issue somewhat, before I turn to how I think we should think of the effectiveness argument as a whole. First, the claim that only PB accounting gives states access to direct jurisdictional control over all their emissions is probably correct. While we could imagine states that legislate imported consumption just as much as they legislate production, in practice this is unlikely. In our open economies, it is more common for states to impose laws on factories than on individual consumers when it comes to reducing greenhouse gas emissions.

Second, we can endorse P1 while maintaining that regulation based on economic incentives is generally more effective than command-and-control. Many social scientists argue that incentives-based regulation is better in virtue of its greater flexibility, lower regulatory burden, and lesser risk of regulatory capture.²⁰ But conceding this point does not mean that command-and-control regulation is unimportant. Command-and-control might be necessary when incentive-based policies prove inadequate to achieve the desired outcome.

However, third, even if we grant that PB accounting gives states access to regulatory tools which would be needed *if* indirect policies fail to bring about the desired outcomes, this does not show that these tools *are* needed for the simple reason that indirect policies might *actually* be enough to bring about the desired outcomes. Put differently, if a carbon tariff implemented by importing states is enough to reduce emissions in China, the fact that direct legislative action by the Chinese state would have been needed to reduce emissions if the tariff did not work is simply irrelevant. This is important because if the additional control jurisdiction offers is never needed, it can give us no reason to prefer PB accounting. (Remember, the idea we are now discussing is that PB accounting is effective because it ensures that states seek to reduce the emissions over which they have the most control.)

There is admittedly some reason to doubt the adequacy of indirect or demand-side policies. Policies that aim to change consumption behavior through labelling and information campaigns, for example, tend to be relatively ineffective (Peters et al. 2016). Economic policies such as carbon tariffs—if they are even legal according to current international trade rules—face the problem of price inelasticity, and in addition risk to merely divert exports to another importer as opposed to reducing the territorial emissions of the exporter (Roser and Tomlinson 2014).²¹ However, as

²⁰ A well-known statement of this view is Tietenberg (1991). For summaries of the debate, see Goulder and Parry (2008); Baldwin et al. (2011); and Coria and Sterner (2011).

²¹ Price inelasticity is a problem for PB accounting too, since a state will be unable to reduce their

evidenced by the large and inconclusive debate on the environmental effects of consumption-based emissions policies, these problems should not be seen as conclusive reason to think that PB accounting is more effective. It is simply unclear at this point whether a move to CB accounting would make greater emissions reductions more likely.²²

Fourth and most importantly, even if the ability to regulate emissions directly at the source means that PB accounting *in general* ascribes prospective responsibility to the agent that is best placed to control emissions, this does not mean that it *always* does so. To give just one example, it might be that carbon tariffs employed by the EU (setting their legality to one side) could do more to reduce global emissions than assigning unambitious states the responsibility to reduce their territorial emissions. In all such cases, the effectiveness argument from jurisdictional control is unsuccessful — it gives us no reason to prefer PB accounting to CB accounting. Thus, the truth of P1 is probably something we must assess on a case-to-case basis.

This means that the effectiveness argument merely establishes an important *potential* ground for preferring PB accounting. The soundness of the argument must be established inductively. More specifically, we must assess the extent to which the national state or government is best placed to affect the territorial emissions in each case, and then tally up the results into an aggregate picture. If it turns out that the national state or government is best placed in most cases, or in relation to most emissions, then that is a reason to stick with PB accounting. But if it turns out that other states are better placed, then that is a reason to switch to CB accounting instead.

Though tallying up individual cases in this way appears to be the right approach, this is not to suggest that it would be easy to *determine* whether the national state or government is best placed in each individual case, and I shall certainly not attempt to do so. My point is simply that there is a coherent case for thinking that PB accounting might be preferable to CB accounting on effectiveness grounds. Finding out whether this case holds should be a priority for economists and political scientists interested in international climate policy.

Three further points are worth making. First, what happens once we factor in

territorial emissions by introducing, say, a carbon tax if domestic consumers are insensitive to price increases for domestically produced goods. But the point is that the state has access to command-and-control type regulation in the territory over which it has jurisdiction, and such regulation is not (as) plagued by price inelasticity.

²² For the studies that seek to model the effects of consumption-based emissions policies, see, e.g., Steckel *et al.* (2010); Jakob *et al.* (2014); Springmann (2014); Steininger *et al.* (2014); and Lininger (2015). Peters *et al.* (2016, p. 52) argue that the border carbon adjustment literature suggests that such indirect measures reduce policy-induced carbon leakage, but only marginally so. It is worth pointing out that these studies are based on modelling since actual consumption-based emissions policies are yet to be tried out.

uneven political will? Proponents of CB accounting frequently stress that this method would be more effective only because it would attribute more emissions to countries that have more progressive climate ambitions.²³ In the current configuration of the world, where net importers tend to be rich countries with more stringent mitigation targets, CB accounting could indeed ramp up the global mitigation effort compared to the status quo for this reason. However, that possibility does not invalidate the point that PB accounting might have an advantage over CB accounting when employed among states with similar climate ambitions. Needless to say, if political will is lacking all around, it does not matter how we count emissions.

Second, effectiveness is not all we should care about when choosing accounting method. Suppose that we would get greater emission reductions by counting emissions at their geographical point of origin, but that this would also release rich countries from prospective responsibilities they would have under CB accounting. If we subscribe to a view of climate justice according to which rich countries should cover the costs of climate policy, the latter would be a reason in itself to regard PB accounting as morally worse. Distributive justice in burden sharing bears on the choice of accounting method quite independently of effectiveness (redacted 1).

Third, even if we focus on effectiveness, we must distinguish between the environmental effects of an accounting method and the environmental effects of *switching* to that method. Some warn that attempting to switch to CB accounting would slow down the urgently needed international action on climate change (Peters et al. 2016; Afionis et al. 2017). If this is right, another effectiveness-based argument in favor of sticking with PB accounting is simply that it is the system we currently have.

7. Conclusion

I investigated the significance of jurisdiction for the choice of accounting method of greenhouse gases. Making use of the distinction between retrospective and prospective responsibility, I assessed three different arguments from jurisdiction against consumption-based accounting. I argued that the effectiveness provides a strong potential reason against consumption-based accounting. To the extent jurisdictional control is needed to reduce some emissions, and production-based accounting incentivizes states to reduce these emissions, there is a reason of environmental effectiveness for sticking with production-based accounting.

²³ Another important reason, relevant especially for border carbon adjustments, is that pricing imports in accordance with the domestic carbon price protects the domestic industry, ensuring that states with more ambitious climate targets are not put at a disadvantage (Roser and Tomlinson 2014).

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