

Designing Fiscal Instruments for Sustainable Forests



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6

Letting Commodity Tax Rates Vary with the Sustainability of Production

DIRK HEINE, ERIN HAYDE & MICHAEL FAURE

Environmental versus Conventional Forestry Taxes

A core principle of environmental tax policy is to let tax rates vary so as to encourage sustainable production. In the past, countries used to tax electricity at the same rate independent of how it was produced—for example, whether from coal combustion or from renewable energies. Increasingly, countries are winding down electricity taxes and replacing them with carbon taxes, which likewise raise the price of electricity but differentiate between how the electricity was produced. The new tax burden per unit of output rises with the proportion of carbon emissions instead of blindly taxing all electricity production regardless of how it was produced. This logic equally applies in the case of forestry: Optimal fiscal incentives require varying the tax by how forest-related commodities are produced. But commodity tax systems are still caught in a setting analogous to the electricity taxation regime that prevailed in the energy sector before carbon taxes emerged: Commodities are taxed irrespective of production method. This chapter sets out a mechanism to overcome this problem.

Uncertain impact of standard forestry taxation

Conventional commodity taxes penalize output of the commodity regardless of its sustainability level. Standard forestry taxes such as stumpage and export taxes do not consider timber origin and are instead based on quantity and/or price. Even though the amount of timber produced can cause more or less damage to the forest in question depending on the type of production process used, current tax policies generally do not reflect this variability. For example, a tonne of lumber is charged the same domestic tax rate whether it was harvested from natural forests or from industrial tree plantations, whether it was harvested using reduced-impact logging or by clear-cutting.

The incentive effects of these commodity taxes are suboptimal and can even be detrimental to sustainable forest management in some market circumstances. When the government imposes a tax on timber production, it increases the overall costs firms face.¹ The firm may respond to this increase in costs by intensifying production, which is usually associated with higher environmental damages. Certain tax policies can also encourage the conversion of marginal forestlands to other, more profitable uses such as agricultural production.²

Consider the common practice of taxing timber by the tonne: While such a policy may provide an incentive to cut fewer trees, it provides no incentive for sustainable production techniques (Barbier and Burgess 1994; Leruth, Paris, and Ruzicka 2001). Another common practice is to tax based on timber value. Charging based on value (yield taxes) is popular for taxing domestic forest sectors (Amacher 1997) and may incentivize a reduction of negative externalities (Amacher and Brazeel 1997; Englin and Klan 1990; Koskela and Ollikainen 1997). By decreasing profitability, a tax on timber value provides an incentive to reduce logging or to selectively harvest. However, on the external margin such a tax also “has the perverse effect of encouraging the outright conversion of still viable (but degraded) natural forests into monocrop plantations” (Leruth, Paris, and Ruzicka 2001; equally Paris and Ruzicka 1993). As such, taxing proxies of the externality, like timber mass or value, comes at a welfare loss (Sandmo 1978), and these unintended consequences may become even worse when timber is taxed at progressive rates (Barbier and Burgess 1994; Lippman and McCall 1981; Mendelsohn 1993).

Those perverse effects are much less likely if tax rates vary depending on how a forest product has been produced. If the tax rate is lower when the timber comes from a sustainably managed forest, versus when it comes from an unsustainably managed forest or clear-cutting, the tax imposes a disincentive to both degradation and land use change.³

Varying tax rates according to production methods

Making the change to varying tax rates is administratively difficult because fiscal authorities do not have the needed information on production techniques. Indeed, the International Monetary Fund (IMF) has found that such variation may be impossible using standard taxation mechanisms (Leruth, Paris, and Ruzicka 2001). Generally, finance and forestry ministries do not have access to sufficient information on how a forest product was produced. Governments usually must rely on occasional field visits, self-reporting from the firm, or ad hoc reports from civil society groups or nongovernmental watchdogs to verify that both production methods and quantities are in line with regulations and fiscal policy. As a result, governments tax forest products based on the quantity, price, or size of plot without variation based on production methods.

Implementing variable commodity taxes requires a feasible strategy for fiscal authorities to get that data. Mechanisms are needed to overcome the asymmetric information between fiscal administrations and the firms they are trying to tax. This is a challenge especially in the rural sectors of countries with low governance and enforcement capacities—that is, the place where most deforestation happens and where the better commodity taxes would be needed most.

1 While some of the increased tax costs can be passed through to end users of the product, the firm may not be able to fully offset this increase.

2 Behavioral responses to standard forest taxation are discussed in more detail in chapters 3 and 4.

3 Assuming the land that was clear-cut would then be used for agriculture or industrial plantations, a common cause of deforestation and destruction of primary or natural forest.

Sustainability Certification and ‘Eco-labeling’

Outside tax policy, a long-tested instrument to raise information on production methods for various commodities is sustainability certification. Environmental certification schemes are voluntary standards relating to environmental as well as social, ethical, safety, and health issues, adopted by companies to demonstrate performance in a specific area. Proof of compliance by a firm to these standards is provided by a certification agency, usually independent from the government and firm. Firms then may label their products with the certifying agency’s logo (eco-label). This information is used to influence consumption patterns, as there is evidence that a significant subset of consumers in high-income consumer markets are willing to pay a premium for products with eco-labels (Thøgersen, Hangaard, and Olesen 2010).

Certification relating to the production of forest-based products has long been available for the timber industry. The earliest example is certification by the Forest Stewardship Council, which sets standards for sustainable forest management and has set up a certification scheme for foresters complying with these standards. The FSC also certifies the forest product chain of custody, and labels products as originating “from well-managed forests,” using accredited specialized certification bodies. The main alternative to FSC for forest certification is the Program for the Endorsement of Forest Certification (PEFC). Aside from sustainability certification, legal verification and licensing are also becoming more available. For example, FLEGT licenses confirm that timber was legally produced in accordance with relevant domestic laws and the requirements of the EU Timber Regulation. Other third-party agencies are also providing timber traceability and legality verification options.⁴

Environmental certification is also available for most deforestation-related commodities.

Beyond timber, certification coverage is growing for soy, palm oil, and biofuels, and it has recently been established for extractive industries, including gold, aluminum, oil and gas, as well as for other goods and services, such as electronics and tourism.⁵ The process leading to certification often involves major international roundtables established to convene stakeholders’ support for shared principles for production.⁶

Sustainability certificates provide a differentiation of consumer market access conditions.

These certificates resemble other instruments of environmental policy like bans in that they modify the terms of access to developed country consumer markets, and thereby they provide indirect incentives for timber producers to improve their standards. Timber certification has the potential to deliver improved yields and quality of output, improved conditions for workers, and reduced operational risk. Environmental certificates are also comparable to taxes, in that they may modify the prices that forestry products can command in the consumer market. However, certificates do not face the same information problems as taxes, as the certification agencies have access to the production sites of participating firms.

Sustainability certificates have been causally linked to premium prices and productivity improvements. There is evidence for various commodities that certification has led to increases of selling prices of certified products as well as to improvements in productivity and incomes

4 For example, SCS Global Services offers “Legal Harvest,” a timber traceability and legal verification option.

5 For example, for gold, SCS Global Services, <https://www.scsglobalservices.com/services/fairmined-gold-certification/>; for aluminum, Aluminum Stewardship Initiative, <https://aluminium-stewardship.org/about-asi/>; for oil and gas, Equitable Origin, <https://www.equitableorigin.org/>; and for electronics, Sustainable Electronics Recycling Institute, <https://sustainableelectronics.org/>.

6 For example, see the Roundtable on Sustainable Palm Oil at <https://rspo.org/>.

(Criscuolo and Cuomo 2018; Marconi, Hooker, and DiMarcello 2017; Mitiku et al. 2017; Waarts et al. 2013). There has been evidence of certification and compliance with standards to provide improvements in productivity, quality and yields, and negotiated supply agreements and market access (Hidayat, Offermans, and Glasbergen 2015; Kissinger, Morage, and Noponen 2014; Waarts et al. 2013). Through capacity building for production processes, certification can also reduce input costs and increase product quality, which can lead to financial benefits in the short term (Blackmore and Keeley 2012). For example, in Ghana, Rainforest Alliance-certified cocoa was shown to be both more profitable and much higher yielding than typical production methods in the country (Gockowski et al. 2013). In Côte d'Ivoire, certified cocoa farmers who received additional training experienced a 30 percent increase in productivity (Waarts et al. 2013). In Indonesia, palm oil certification has commanded only low price premiums but has nevertheless been shown to be profitable even for smallholders (Hidayat, Offermans, and Glasbergen 2016). Soy certification can improve productivity up to 50 percent (Romijn 2014; Tomei et al. 2010). If producers are able to produce more on less land, this can not only reduce the pressure on forests but also improve returns. However, these price increases—while existent—are sometimes small and can by themselves be insufficient to cover the cost of the certification and production change itself.⁷

Unlike standard commodity taxes, sustainability certificates are thus able to provide price incentives differentiated by production technique. But they have important shortcomings too. Problems include transaction costs, free riding, fraud, accreditation costs, lack of dynamic incentives, and a limited scope for competing certification schemes (see box 6.1). We will show below that these problems can be alleviated in policy packages with taxes.

TABLE 6.1
ESTIMATES OF PRICE PREMIUMS FOR CERTIFIED
AGRICULTURAL COMMODITIES

CERTIFIED COMMODITY	PRICE PREMIUMS
Timber	2%–56%, average 10.5%
Cocoa	5%–18%
Coffee	10%–30%
Palm oil	1%–6%
Soya	0.3%–80%

Sources: Potts et al. 2014; KPMG 2013.

Note: Premiums for organic- and ProTerra-certified soy are expected to remain around 25 percent (Potts et al. 2014). Premiums for certified soy oil tend to be high, as European refineries that import certified soy are given a tax rebate (KPMG 2013).

⁷ And they may not exceed the costs of certification (for the case of soy, see Cameron 2017). However, where premiums are found to be low, certification has been shown to be profitable in the short to medium term (KPMG 2013).

BOX 6.1 EFFICIENCY PROBLEMS OF USING SUSTAINABILITY CERTIFICATES WITHOUT ENVIRONMENTAL TAXES

1. Free riding: Consumers are free to ignore sustainability labels. Those who do can free ride on the efforts of other, caring consumers. Free riding itself can have knock-on effects: Experimental evidence demonstrates that people who would, in principle, be willing to behave ethically choose not to do so when others free ride on their efforts (Bicchieri and Xiao 2009; Fehr, Fischbacher, and Gächter 2002; Raihani and Hart 2010). As for labels in other markets (Carlsson, García, and Löfgren 2010; Noblet, Teisl, and Rubin 2006), consumers of timber products may choose not to purchase a certified wood product because they dislike other consumers free riding on their efforts (Lippert 2009).

2. Divergence of price premiums from external benefits: The willingness of consumers to pay higher prices for a product with a sustainability certificate may stand in no relation to the external benefits of that product. A product may create large or small benefits to society, but the price premium that consumers collectively choose to pay could be lower or higher than those external benefits; there is no arbitrage mechanism for the two to coincide.

3. Fixed costs and the sustainability threshold: Forest owners face fixed and up-front costs when joining certification schemes (Nussbaum and Simula 2005), including for adjusting to the certificate's production standards. For small producers, these fixed costs can be substantial relative to the commercial gain from selling certified produce (Gullison 2003), which strongly depends on the size of output (de Camino and Alfaro 1998). Certification can also be costly for firms that start off from production standards far below the minimum level of sustainability required by the certificate. One solution is for the state to share in the start-up cost of certification—but then, using what tax revenues? Also, in some countries, companies purchasing from smallholders have been willing to finance certification for them, but this cross-subsidization is only incentive-compatible if the purchaser yields a high enough commercial gain from certified inputs.

4. Dynamic incentives: Once a firm has achieved the level of sustainability required by the certificate, there is no dynamic incentive to keep improving

(Wüstenhagen 2000). Environmental organizations, therefore, point out the need to progressively raise sustainability standards to support continuous improvement.^a However, when certification agencies tighten standards, they further raise the entry thresholds. Certification agencies such as the Forest Stewardship Council need to weigh the costs of further increasing their standards against the damages from losing even more of the low-quality market.

5. Competition among certificates: Some authors suggest resolving the conflict of participation incentives for low-quality producers (3) and dynamic incentives for high-quality producers (4) by introducing a market for certification services where low- and high-quality sustainability certificates coexist. The end consumer would ideally be presented with commodities carrying a range of certificates of different stringencies. The problem of threshold costs could diminish as even commodity producers starting off from low sustainability standards would have a low-level certificate in reach. Moreover, the problem of dynamic incentives could equally improve: Commodity producers that have already attained a sustainability standard would face an incentive to keep improving to reach a more advanced certificate. Competition among certification agencies could also create commercial pressure to offer low-priced certification services.

6. Consumer confusion: This system of competing sustainability certificates (5) could only provide efficient incentives if consumers did have a finely differentiated willingness to pay for products carrying certificates of different stringencies. Empirical evidence points out, however, that consumers react to multiple labels by ignoring labels altogether (Martínez 2013; Spenner and Freeman 2012). Even with just two labels in a market, sustainability may already be reduced unless the labels are so different as to, effectively, compete in separate markets (Fischer and Lyon 2014). With unlabeled products and two labels of varying quality, resulting consumer confusion benefits the producers with the lesser-quality label because consumers do not differentiate between products of different sustainability standards but just consider whether a product bears some form of a label at all (Brécard 2014). Therefore,

as the commercial power of any existing sustainability certification depends on its consumer recognition, and as consumers are not able to adequately differentiate between the different sustainability standards, their demand is not sufficiently differentiated to provide efficient price signals to producers. A differentiation of certificates would then undermine the value of having a certificate at all because only a niche section of consumers would be willing to invest the time to understand the differences between the

competing certificates. With the current form of sustainability certificates, the market of certification agencies then does not work more efficiently with greater competition.

There are two important takeaways here: The efficiency of incentives from sustainability certificates could improve if the market allowed competition of certificates, but with the current reliance of certificates on consumers that is not possible.

a. Debate on increasing FSC Principles & Criteria (Feilberg 2008; Greenpeace 2014b).

Sustainability certificates have both built-in resilience and risks to fraud. Many commodity markets are notoriously shady, even plagued by illegality. If even state authorities, with their legal force, struggle to enforce basic production standards in rural producer regions, how can private certification agencies raise fine-grained data about these production techniques reliably? One important feature is the global brand recognition of sustainability certificates: Since the business of a sustainability certificate depends on its reputation with global consumers, a scandal in any individual market can be disastrous. Consumers and nongovernmental organizations thereby have great enforcement power, deterring certification agencies from fraud. Another source of discipline comes from the state itself: if it detects fraud by a certification in its borders, it can withdraw local business accreditation. This instrument is even more powerful if the certification program is state-sponsored, as in Mexico and elsewhere (García-Montiel et al. 2017). A concern for fraud, however, is that certification agencies are often paid by the firms being investigated. This causes the same incentive problems as for business audit and assurance services in most other markets. The problem could be resolved if there was a way the state could pay for the certification, which could equally resolve the smallholder problem discussed in box 6.1.

Combining Certification and Taxation

Here we develop how fiscal policy makers can use the information from sustainability certificates to enable a variation of commodity tax rates according to the sustainability of production. We also show how the efficiency not only of taxes but also of sustainability certificates can improve through this policy mix.

Existing uses of certificates in fiscal policy

Beyond taxation, sustainability certificates have already been used in some areas of fiscal policy.

In public procurement, sustainability certifications have been used to vary conditions for government contracts. Public spending can account for over 30 percent of a country's GDP (World Bank 2018). Governments increasingly seek to use this weight for greening the economy. This can be especially transformational in markets where sustainable products are still in niche markets and where early adoption by the state drives down unit costs. However, for commodities, public procurement faces the same information problems about production methods as tax policy. The British public procurement system for timber provides a good example of how to

overcome this problem. From 1997 onward, the United Kingdom first encouraged government departments to purchase only timber whose legality had been confirmed by FLEGT licenses or FSC or PEFC certificates. Since then, several other states have implemented similar sustainable procurement policies.

Several countries offer improved access to state funding or other incentives to firms adopting forest certification.

Since 2010, France and Germany have provided grant cofunding for third-party forest certification in the Congo Basin. Belgium's Flemish Regional Agency for Nature and Forests provides domestic cost sharing for group certifications. In Portugal, project-based funding is increased if the plot in question is sustainably certified by a third party. Earlier this year, Estonia introduced grants for landowners to sustainably certify their forest plots. In Japan, various local governments provide subsidies to farmers (usually smallholders) who certify. In Germany, the state of Hessen provides a subsidy worth up to 80 percent of the costs of the sustainability certification as well as subsidies for chain of custody certification at various percentages of the costs.⁸ In the United States, Wisconsin offers reduced property taxes for certified land.⁹ In the past, Gabon and Bolivia provided incentives for companies that certified their production;¹⁰ however, these programs have since ended. To promote wood and paper export, the Russian Federation provides cost-sharing subsidies for certification, provided that the buyer of the exported goods only accepts certified products. Mexico provides financing for certification through allocation of forest development support. In Brazil, firms competing for a concession have an advantage if they commit to sustainability certification. Additionally, firms that certify are eligible for a tax discount: They can obtain a discount of up to 20 percent on the total taxes paid on the timber harvested annually. Finally, the Peruvian Forest Law provides a 25 percent reduction in the concession price for full certification, and a 5 percent reduction in the harvest payment if the concessionaire has initiated the certification process.¹¹

Proposal: Letting forestry taxes vary through sustainability certificates

Countries could more generally use sustainability certificates to let the rates of commodity taxes vary according to production standards. Here we describe a mechanism for such a policy, using the example of commodity taxes on timber and forest sustainability certificates.

Taxation on defaults. Consider a tax chokepoint at which a fiscal authority presently levies a timber tax, in dollars per tonne of timber, irrespective of how the timber was produced. Now a reform takes place: Timber will be taxed at the default rate on the assumption that the wood production was not sustainable unless the timber product is accompanied by a sustainability certificate from an accredited third-party certification agency, in which case the tax rate is reduced. The more stringent the sustainability certificate carried by the timber, the greater the tax discount. By using third-party certification agencies, the tax authority gains detailed knowledge about the relative sustainability of a wood product despite its difficulty at raising this data itself. The tax authority now does not need to regularly verify the sustainability of production methods itself but only perform audits on the certification agency.

⁸ FSC Germany estimates that this policy has led to an increase of 10,000 to 15,000 hectares of certified land.

⁹ Property taxes of certified land are about 1/10 to 1/100 of the taxes on uncertified land. Additionally, if landowners provide public access to their land, they qualify for a reduction of 50 percent compared with the tax on closed-access land. The state government also encourages enrolled lands to be certified in order to access credit-eligible inputs.

¹⁰ In Gabon, firms operating with a forest management plan qualified for a lower tax on the forest area for the annual allowable cut.

¹¹ These incentives may be too low to encourage new certification; however, they do encourage the maintenance of existing certifications.

In our timber example, the mechanism could be:

$$\text{Tax payment} = (\text{Tonnes of wood}) \times [(\text{Default value of external damage per tonne of wood}) - (\text{Deduction for the showing of sustainability certificate})] \quad (6.1)$$

With this variation of tax rates, firms face a lower tax burden when they can show proof that they engaged in sustainable production. This tax incentive supports producers in offsetting costs of implementing sustainable practices and certification (Karsenty 2016).

The tax variation supports market formalization. Sustainability certificates include requirements for production to be formal and legal. Hence, the mechanism sketched here would grant a commercial incentive for producers to formalize.

This type of policy combination of a tax (or fee) with a deduction (or rebate) is often referred to as a feebate. This is not a tax expenditure (see box 6.2).

BOX 6.2 THE DIFFERENCE BETWEEN ENVIRONMENTAL TAX INCENTIVES AND TAX EXPENDITURES

Tax expenditures are defined as revenue losses attributable to provisions of the tax laws that allow a special exclusion, exemption, or deduction from a tax base or that provide a special credit, a preferential rate of tax, or a deferral of tax liability. In short, **tax expenditures are exceptions to general tax rules to favor specific taxpayers at the expense of wider society or the general taxpayer.** An example in many countries is the deduction of mortgage interest from taxable personal income: It reduces the effective income tax rate of homeowners relative to the nominal tax rate applied to the rest of the population.

Fiscal economists are generally concerned that tax expenditures distort efficiency. Great caution is hence warranted before introducing any new tax expenditures, and many countries could improve growth, equity, and public finances by reducing tax expenditures. How then does the proposal of varying commodity tax rates according to the sustainability of production methods relate to the objective of minimizing tax expenditures? Is a feebate a tax expenditure? To answer these questions, recall that tax expenditures are exceptions from general tax rules. Here we review two key rules and then judge if the recommended feebate brings us closer to these rules (that is, no tax expenditure) or further away (tax expenditure).

In an economy without externalities, the general rule is to tax all products at the same percentage rate. Consider an economy in which consumers spend

their income on two products and a state that is trying to raise public revenue by taxing those products. The most efficient way for the state to raise revenue is by applying the same tax rate to both products, leaving competition between the products for the consumers' income unaffected. Because the deadweight loss of a tax rises in the square of its rate, it is more efficient to charge low tax rates to a wide base of taxable items rather than high rates to a select few and exempt the others. To this end, most tax economists recommend raising revenues with a general VAT that applies the same percentage rate to the consumption of all products.

But when there are major external costs,^a efficiency is distorted unless specific-rate taxes correct for these externalities and applying the same percentage tax across all products then makes distortions worse. Consider again an economy with two products, but now the consumption of one of the two products causes a damage to third parties in wider society; consumption of the other product has no impact on wider society. Let's call the two products "brown" and "green" products, respectively. Thus, we have a situation where producers and consumers of the green product bear all of the costs associated with this product, whereas for the brown product, third parties in society bear part of the production costs. The brown product thus has a cost advantage over the green product that is not explained by a true comparative advantage stemming from lower *total* production costs, that is, production

costs including the costs borne by third parties. With this setup, it would be inefficient to tax both products alike. In fact, applying the same percentage tax to both products would further distort competition because it scales the cost advantage such that the brown widgets gain over the green widgets.

The point that equal taxation can cause greater costs to wider society is key, so let us illustrate it with a numerical example. Assume the total cost of producing a unit of the brown product is 105, but out of that total cost, 15 is borne by third parties in wider society, so the private production cost is 90. For the green product, the total (private and public) cost is 100. Before taxes, consumers are hence drawn to consume the brown product. Now the government introduces a 10 percent VAT. The new after-tax prices are 99 for the brown product, and 110 for the green product. Applying the same VAT to both products has increased the cost advantage of the brown product from 10 to 11. The distortion of consumer expenditures has worsened. Above, we explained that tax expenditures are exceptions to general tax rules to favor specific taxpayers at the expense of wider society or the general taxpayer. Here, we thus have an example where applying tax rates *evenly* inefficiently favors a specific product and creates external costs at the expense of wider society.

One solution to this problem would now be to grant the green product a lower VAT rate. But that would generally be inefficient, because “external” damages (that is, the costs borne by third parties) accrue per physical unit of the product—they are generally not a function of the product price. For example, there is a certain amount of environmental destruction per tonne of mahogany timber extracted from a forest. If the market price of mahogany timber changes tomorrow, the amount of environmental destruction per tonne of mahogany may still be the same. Hence, it would be suboptimal to correct the distortion of consumer choices with a tax that attaches to the price of products, like the VAT. Instead, the distortion should be corrected by a tax that targets specifically the product, or the production technique, that causes the externality.

The efficient taxation of consumption goods requires that taxes are applied in a set hierarchy or sequence. First the specific-rate taxes are added to the market prices of goods that cause external costs, with the tax rate matching the external cost per physical unit of the

product. Afterward, ad valorem taxes are applied to that sum, meaning that the VAT multiplies the specific-rate tax.

$$\text{After tax price} = (\text{Pretax price} + \text{Specific rate tax}) \times (1 + \text{VAT rate}) \quad (6.2.1)$$

Using this sequence, the specific-rate tax purges any product price differences that are due to externalities. When the VAT is then applied at the same rate across all products, it can raise revenues without causing inefficient expenditures to wider society. The efficient functioning of the tax system needs both elements. **Deviations from this rule would be tax expenditures.**

For specific-rate taxes to vary across industries is thus their core rule-based purpose, not an exception from the rule that would classify as a tax expenditure. In fact, this variation reduces tax expenditures. Letting taxes for products with important externalities vary according to the destructiveness of production methods is the rule, not the exemption.

This definition of tax expenditures is increasingly used by international organizations. In 2015, the IMF updated its definition of tax expenditures for fossil fuels to include unpriced externalities. The IMF explained that tax expenditures should be seen as deviations of tax policy from general rules on how products should be taxed. And since fossil fuels should be taxed for damages borne by third parties, countries that tax fuels like any other product without these externalities are granting tax expenditures for the consumption of these fuels (Coady et al. 2015, 2017).

Other institutions appear to use a similar definition implicitly. Consider the classification of an electricity tax and of a carbon tax on the power sector. An electricity tax imposes the same tax across all forms of electricity; a carbon tax exempts renewable energies from the tax burden as it only charges forms of electricity production that generate carbon. No international organization classifies this exemption as a tax expenditure; instead, they all call for carbon taxes as a way to reduce inefficiency from the tax system. Perhaps this is even clearer in vehicle taxation: The World Bank, OECD, IMF and EU have all recommended feebate systems for vehicles, where cars with emissions below a certain level receive a

different tax treatment relative to cars above that emissions level. None of the institutions classify vehicle feebates as tax expenditures.

For administrative and legal reasons, it is sometimes impracticable to directly vary the tax on a commodity according to external costs from its production. Feasibility can require first applying the same tax across all products and then granting a rebate for the amount of tax that has been paid too much. That should not be seen as a tax expenditure because it is a rebate for an amount that has been paid in excess of the rule. Ideally, countries would directly impose specific-rate taxes on products that vary depending on the sustainability of production. Administratively, we have

seen that this is often not feasible. The government may lack information about the production or lack the legal ability to enforce checks (see chapter 7). In these cases, we recommend a mechanism that applies the same tax rate for all units of a commodity, with a discount or rebate when the sustainability is proven. This setup turns around the burden of proof to vary the tax incidence—it does not change any of the above principles. The amount of tax rebate that the sustainable producers receive is just the amount that they should not have been taxed in the first place because their production technique imposes fewer external costs. Accordingly, this rebate should not be classified as a tax expenditure. Instead, this rebate is enforcing general tax principles rather than being a deviation from them.

a. The rule for what constitutes a “major” externality requiring public action is that the benefit to society from reducing this externality through policy exceeds the transaction costs for addressing the externality (cf. Demsetz 1967). The scope of these major externalities on which policy makers should act increases as externalities become more serious (for example, with increasing environmental destruction) and as the cost of policy decreases (for example, with new policy designs like feebates).

The mechanism can replace or complement existing commodity taxes. The discounts for certified commodities could be introduced to an existing commodity tax. Alternatively, the tax certification mechanism could be built on top of an existing commodity tax by adding an additional tax and discounts/waivers for sustainability.

The mechanism could accommodate different revenue objectives. In a revenue-neutral reform, the government would raise the default tax on the uncertified commodity to compensate the revenue shortfall from the tax discount on the certified products. Since certified commodities presently account for a tiny share of most commodity markets, governments could finance substantial tax incentives for certified commodities with small increases in the default tax rates. Having a sufficiently large tax incentive is relevant especially in the beginning because certification in most markets has not yet reached increasing returns to scale, so a sufficient incentive is needed to get started. With this incentive, the certified share of the market would increase over time. The government can then either incur some cost (as an investment for the sustainability of the commodity) or hold revenues stable by either further raising the default tax rate or reducing the tax discount. The latter option can be justified given the induced increasing returns to scale in certification.

The optimal choice of default tax rates depends on the policy maker’s preference for minimizing environmental damage versus certification costs. If the policy maker’s objective is to optimize environmental incentives or maximize public revenues, it is optimal to set a high default tax with different discounts for certificates of different stringency, starting off from offering some level of discounts already for relatively low stringency certificates. In this case, the default tax rate should coincide with the marginal external damage from the worst-case production method for producing timber. Most firms then have an incentive to certify that they have produced the timber in a more sustainable manner and receive a tax deduction. The discount

should optimally be set so it coincides with the reduction in the marginal external damage resulting from the adoption of the certified production method.

If the policy maker's objective instead is to create a system with low administration and compliance costs, it is better to set a relatively low default tax with fewer discounts, which are all reserved for high-stringency certificates. In this case, the default tax is set to match the marginal external damage of the "normal" production method used by the average firm. This design spares certification costs for firms that want to continue at the current norm, which will then shift more gradually. The tax deduction is then granted only when adopting the more advanced certificates for levels of sustainability, which are much better than what the average firm complies with.

The mechanism can substitute for costly public traceability and MRV systems. Many countries are currently discussing the introduction of systems to monitor, report, and verify land use emissions and to trace deforestation-related commodities. These systems already exist as part of many sustainability certification systems. There is then no need to establish new public systems where the state can use existing private ones and govern them by deciding which ones receive how much of a tax discount.

This mechanism can be adapted to fit a wide range of governance capacities and institutional arrangements. Taxation-and-rebate mechanisms can be implemented in different forms at varying degrees of institutional capacity. Where governments have the necessary capacity, the rebate mechanism can rely on remote sensing, satellite, or other developed MRV systems (similar to the arrangement described in chapter 5). However, where countries lack the capability to accurately measure and monitor environmental damage or lack the fiscal space to invest in such systems, a feebate combined with third-party sustainability certification (already available for many deforestation-related global value chains) can be relied on instead.

The use of certificates for fiscal policy applications also improves certificate markets themselves. Using sustainability certifications for fiscal policy reduces long-standing certification problems, including dynamic incentives and threshold costs, fraud, and orchestration. Whereas in the present configuration of the market for sustainability certificates there is little scope for increasing competition among labels due to the problem of consumer confusion (see box 6.1), the same problem does not apply when sustainability certificates are used by tax authorities. Tax authorities would be able to distinguish the stringency of competing tax certificates where consumers cannot, because finding out this information is a fixed cost. Such fixed costs, while excessive for individual consumers, are small for a tax authority given the different frequency by which the two would use that information. Because the suggested scheme expands the use of certificates to agents who can handle this mild information complexity, it becomes possible to have several certificates competing in the same market. Competing certificates would receive different tax discounts from the tax authorities (corresponding to relative stringency) and cater to producers at different levels of sustainability. This offering in turn would reduce the problems of fixed costs foreclosing the market participation of low-quality producers and the lack of dynamic incentives for high-quality producers. The first group would have easy entry-level certificates in reach for gradually climbing up the ladder toward sustainability. The second group would have advanced certificates to keep stretching for. The competition would furthermore provide competitive pressures to lower transaction costs for certification. All three are major problems of sustainability certificates relaxed through the new market design. Also the problem of fraud from certificates decreases because (1) the scheme would greatly increase the frequency by which

BOX 6.3 MIMICKING OPTIMAL TAX RATES

Optimal tax rates are those that efficiently collect revenues while minimizing distortions and therefore enhance social welfare (Mankiw, Weinzierl, and Yagan 2009; Ramsey 1927). The additivity property^a indicates that in the presence of externalities, the externality-generating commodity should be taxed, while other commodity tax rates should remain unaffected (Kopczuk 2003; Sandmo 1975). The efficiency of the tax

systems increases if rates are higher for goods that are demanded inelastically (“Ramsey taxation”). Forest products tend to be price inelastic, even in low-income countries (table B6.3.1). As a result, environmental taxation for forest products can be a way to implement Ramsey taxation without high administration, thereby increasing the efficiency of the tax system.

TABLE B6.3.1
PRICE AND INCOME ELASTICITIES OF DEMAND FOR FINAL PRODUCTS

COMMODITY	WEALTH—REGION	PRICE	INCOME
Fuelwood	High income	-0.62	-1.50
	Low income—Africa	-0.10	0.40
	Low income—Other regions	-0.10	0.15
Other Industrial Roundwood	High Income	-0.05	-0.58
	Low Income	-0.37	0.19
Sawnwood	High Income	-0.16	0.32
	Low Income	-0.21	0.46
Plywood and Veneer	High Income	-0.13	0.10
	Low Income—Europe	-0.22	1.20
	Low Income—Other Regions	-0.22	0.74
Particleboard	High Income	-0.24	1.25
	Low Income	-0.05	0.65
Fibreboard	High Income	-0.52	0.82
	Low Income—Asia, Europe	-0.52	1.50
	Low Income—Other Regions	-0.52	1.10
Newsprint	High Income	-0.05	0.21
	Low Income—Asia, Europe	-0.18	1.05
	Low Income	-0.18	0.21
Printing and Writing Paper	High Income	-0.15	0.80
	Low Income	-0.37	1.11
Other Paper and Paperboard	High Income	-0.06	0.65
	Low Income	-0.14	0.92

Source: Turner et al. 2006.

In addition, optimal environmental taxes allow governments to capture a portion of the rents from natural resource extraction. “Ricardian rents” are windfall gains and are not due to the risk-taking efforts of firms. By contrast, “economic profits” are earnings arising from risk-taking efforts. In an efficient economy, rent-seeking activities (where there is no effort to incentivize) would be discouraged relative to profit-seeking activities (which generate output but require effort). As a result, the optimal taxation literature suggests that rents should be taxed higher than profits. Natural resource extraction tends to have a larger proportion of Ricardian rents than other activities. As a result, environmental taxes can capture a portion of the rents from natural resource extraction, and this is possible irrespective of the point of tax (upstream or downstream) or point of extraction (domestic or overseas). Environmental taxes may therefore reduce economic distortions by encouraging profit-seeking activities compared to rent-seeking activities.

The optimal tax rate for natural resources should vary with the stock of the resource. For extractive industries, the optimal tax rate should increase when the stock of the resource is low and decrease when the stock is high (Berck 1981; Semmler 1994). Indeed, uniform taxes may not be optimal in the face of such distortions (Bovenberg and de Mooij 1994; Bovenberg and Goulder 1996; Cremer and Gahvari 1993), and optimal rates may even be greater than those indicated by the marginal external damages (Bento, Jacobsen, and Liu 2017; Cremer, Gahvari, and Ladoux 1998; Schöb

1997), which on the margin will draw informal labor into the formal sector. In addition, optimal tax rates should vary depending on whether externalities are a result of changes in resource stocks or from the extraction process itself (Pongkijvorasin, Pitafi, and Roumasset 2006). Optimal resource tax rates should also consider the costs incurred by firms, if possible (Boadway and Keen 2009; Melhado 2007).

Optimal rates, however, are complicated to implement in practice, mainly because of a lack of information about environmental externalities, firm characteristics, and behavioral responses, as well as due to distortions created by existing taxes (Fullerton and Wolverton 2005; Kocherlakota 2005; Liu 2013; Mirrlees 1971).

The feebate scheme described above acts in place of an optimal tax rate. Assuming that, when production methods are unsustainable, the stock of the resource will be low (in the long term and potentially in the short term as well), the default tax rate should be high based on the worst-case scenario of no sustainability in forest production. The tax rate is high when the production methods used imply that the resource stock will be low. However, when production methods are sustainable, the (future) stock of resource will be high. The tax discounts for certification lower the effective tax rate for certified firms. The tax rate is then lower when production methods imply the resource stock will be higher. In this way, the feebate scheme can mimic the optimal tax rate (Fullerton and Wolverton 2005).

a. See also the more general “principle of targeting” (Dixit 1985).

a certification company interacts with the state so that the Folk Theorem applies (Friedman 1971), (2) the tax discount and the substitutability implied by competition give the government much greater threat value against accredited certification agencies than presently, and (3) the government could replace private certification companies with state-sponsored public certificates. For more information on how the suggested mechanism creates efficiency benefits to the markets for sustainability certificates, see Heine, Faure, and Lan (2017).

Unlike before, each certification agency is now able to issue more than one sustainable forest management certificate to cater to timber producers at varying levels of sustainability.

Consequentially, as the market starts offering a greater diversity of certificates for different stringencies of sustainable production, a more significant proportion of forest owners faces a dynamic incentive to improve their sustainability because there exists a certificate in sufficiently close reach to make even a small improvement already bear some fruit. Previously, the discrete distribution of forest management certificates (a duopoly market consisting of two official certificates with one sustainability level each) made it necessary for producers to make big leaps in the sustainability of their production to acquire a certificate. As the range of competing certificates increases, approaching a continuous distribution over different sustainability stringencies, these big up-front changes to production techniques are not required anymore. Producers who are starting off from low sustainability practices then face fewer problems with fixed costs for attaining their first sustainability certificate, while producers who already reached higher sustainability levels receive an incentive to keep improving.

Variant of the mechanism in dual economies where the state needs to reach beyond chokepoints

Incorporating certificates into tax policy sends fiscal incentives for improving production methods to segments of the supply chain that the state cannot tax directly. Given the shady nature of many commodity markets, successful administration of forestry taxes relies on the use of chokepoints. These are segments of the commodity supply chain that are sufficiently hard to circumvent, such as a dominant sawmill that all timber producers in an area must use, or ports that are used for exporting all of a deforestation-related commodity. Unfortunately, this administrative need for chokepoints can be ill-related to where in the supply chain production techniques need to improve. Here, the combination of taxes with sustainability certificates can give a tax authority greater reach. Consider the example of the sawmill: The state may not be able to directly tax timber producers according to their production technique, but it can tax the sawmill for its inputs and provide tax discounts when the sawmill shows that its inputs are certified. In this case, the sawmill has an incentive to make its suppliers certify, or offer its suppliers different prices for certified inputs, given that those reduce the sawmill's own tax bill. Through this price variation, the government's environmental policy enlists the entity at the chokepoint as a voluntary private enforcer where it lacks public enforcers.

In some commodity supply chains, there may be no good chokepoint at all for enforcing a commodity tax, but the certification mechanism can nevertheless be used. In this case, sustainability certificates can be combined with direct taxes. Consider again the example where the government has identified that all timber suppliers use a certain sawmill. The government would like to apply differentiated tax policy to have the sawmill enforce environmental incentives on the timber suppliers. But suppose the government is not able to observe timber being brought into the sawmill. The sawmill knows but has no incentive to reveal

that information if it is used for taxation. In this case, the government needs to make it incentive-compatible for the sawmill itself to trace and demonstrate its quantity of timber inputs. One option is to use the corporate income tax (CIT) of the sawmill. When the sawmill demonstrates that it has purchased a certain quantity of certified timber, it gets a discount on its CIT. Again, this policy can be revenue neutral, by adjusting the default corporate income tax bill, and it again enables the tax authority to provide differentiated price incentives to producers of the timber inputs to adopt certified sustainable production methods.

Varying direct taxes against proof of sustainable purchases would be similar to widespread income tax policy for other types of externalities. The idea to grant CIT tax deductions for proof of sustainable purchases may appear unusual. A similar policy, however, is in place in most OECD countries for dealing with another externality: innovation. Expenditures of a firm for research and development (R&D) are widely believed to create benefits for the economy as a whole, just like expenditures of a firm for sustainable commodity inputs create benefits for the economy as a whole. With innovation, many countries give firms the opportunity to prove that they have spent on R&D and then grant deductions to the CIT tax bill. These tax expenditures are widely considered effective at reducing the R&D externality problem. The above suggestion would do much the same for addressing the externalities from deforestation: The firm would prove that it has spent on sustainable inputs, by showing the sustainability certificates of those inputs, and then get a discount on its CIT. This way, the combination of taxation and certification can apply even without a commodity tax chokepoint and such a mechanism would not be as unusual as one might first think.

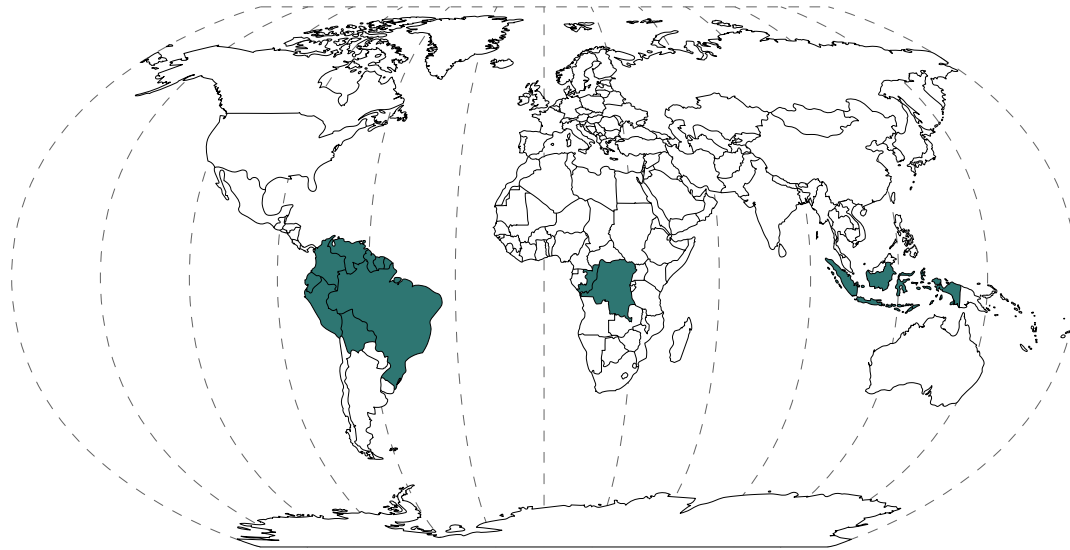
Application of the mechanism across sectors

This feebate mechanism can be applied to various commodities beyond timber. The spread of certifications across different sectors allows for this mechanism to be expanded beyond timber and other forest product commodities. Deforestation-driving commodities such as palm oil in Indonesia, cocoa in Côte d'Ivoire, and beef in Central America could be targeted using the suggested combination of policy mechanisms. Even mineral commodities such as cobalt could be included in such a scheme, given recent developments in third-party certifications for nonrenewable extractive industry products.¹²

Depending on the leading causes of deforestation in a given country, it may even be more appropriate to apply the suggested feebate mechanism to agricultural commodities. The leading drivers of deforestation and forest degradation vary depending on tropical forest region (figures 6.1 and 6.2). In the Amazon Basin, it seems most relevant to introduce differentiated tax incentives for reinforcing available sustainable production methods for beef, timber, and soy, whereas in Southeast Asia, it may be more appropriate to focus on palm oil, or on timber, paper and pulp products.

¹² See Kickler and Franken (2017) for an overview of the certifications and eco-labels available for nonrenewable extractive industry commodities.

FIGURE 6.1
KEY DEFORESTATION-DRIVING COMMODITIES



AMAZON BASIN

SOYA
BEEF
TIMBER

CONGO BASIN

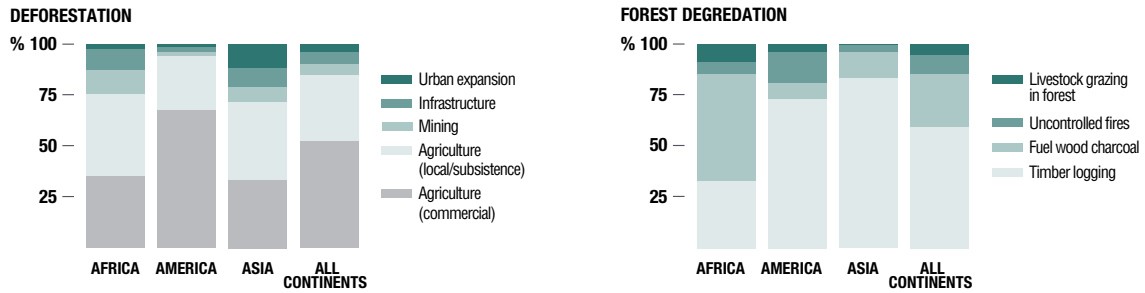
TIMBER

SOUTH EAST ASIA

PALM OIL
TIMBER, PULP & PAPER

Source: McFarland et al. 2015.

FIGURE 6.2
PRINCIPLE DRIVERS OF FOREST LOSS IN TROPICAL AND SUBTROPICAL COUNTRIES, 2000–2010



Source: McFarland et al. 2015.

International Collaboration

For both developed and developing countries, the described feebate mechanism has several advantages compared with present forest conservation mechanisms that rely on international funding. At the same time, it is an opportunity for reinforcing international collaboration.

Opportunities for developing countries

The feebate mechanism could grant the host country's fiscal authority more control than expenditure-based instruments that rely on continuous overseas funding. Donor appetite for supporting forest sustainability in developing countries can fluctuate, which poses a challenge to the predictability of today's expenditure-based conservation mechanisms like REDD+. The suggested mechanism would enable developing countries to gain more predictability and reduce dependency by generating a source of sustainability incentives that do not require continuous streams of donor funds.

Using sustainability certificates for tax policy paradoxically increases the control of local governments over sustainability certification companies. The present use of sustainability certification as consumer labels has generated concerns in some developing countries over a perceived loss of control. Private sustainability certification companies make their own rules on what they consider as sustainability, although they often undertake extensive local stakeholder consultation. The resulting certificate requirements normally align with local minimum requirements for legal production but can push the envelope without being subordinate to local governments. The extent of local control is also naturally limited as long as sustainability certificates are merely used as consumer labels. If certificates presently are just information instruments for those consumers, it is the consumers' preference that rules, not necessarily the local policy of host governments. That changes, however, if local governments start using the certificates as information instruments for their tax differentiation. Here, host country governments can formulate the conditions for accepting a sustainability certificate as the basis for tax discounts. If the extent of the tax discount is significant in relation to the price premiums granted by consumers, sustainability certification companies have a strong incentive to coordinate well with local governments. By using private sustainability certificates in fiscal policy, governments in developing countries would thus not lose autonomy. Instead, they might gain more control to effectively use sustainability certification agencies as information and enforcement tools.

Current forest sustainability instruments often rely on public funding. The feebate mechanism creates an incentive for private companies to provide co-financing, including from global commodity firms. Standard forestry regulations are not able to provide dynamic incentives for the private sector to keep investing in improving sustainability, and the informality problems undermine enforcement and hence the consequences of shirking regulations. As a result, many sustainability programs heavily rely on public funds, such as public reforestation funds, instead of private investments into reducing the deforestation of land use activities. The present use of sustainability certification overcomes these problems only very imperfectly: since the prime premiums for certified products are slim in many markets, the private sector incentive to invest in sustainability is equally limited. That changes when the price incentive to adopt certification rises as companies can gain both the consumer price premiums and the tax incentive from going sustainable. Hence, using certificates for tax policy provides an opportunity for a more even burden sharing between the private and public sectors for sustainability efforts.

In the work share of global markets, the feebate mechanism helps host countries move up the value chain. The mechanism encourages formalization of production and product differentiation. Both steps help countries move up global value chains (World Bank 2020).

Opportunities for donor countries

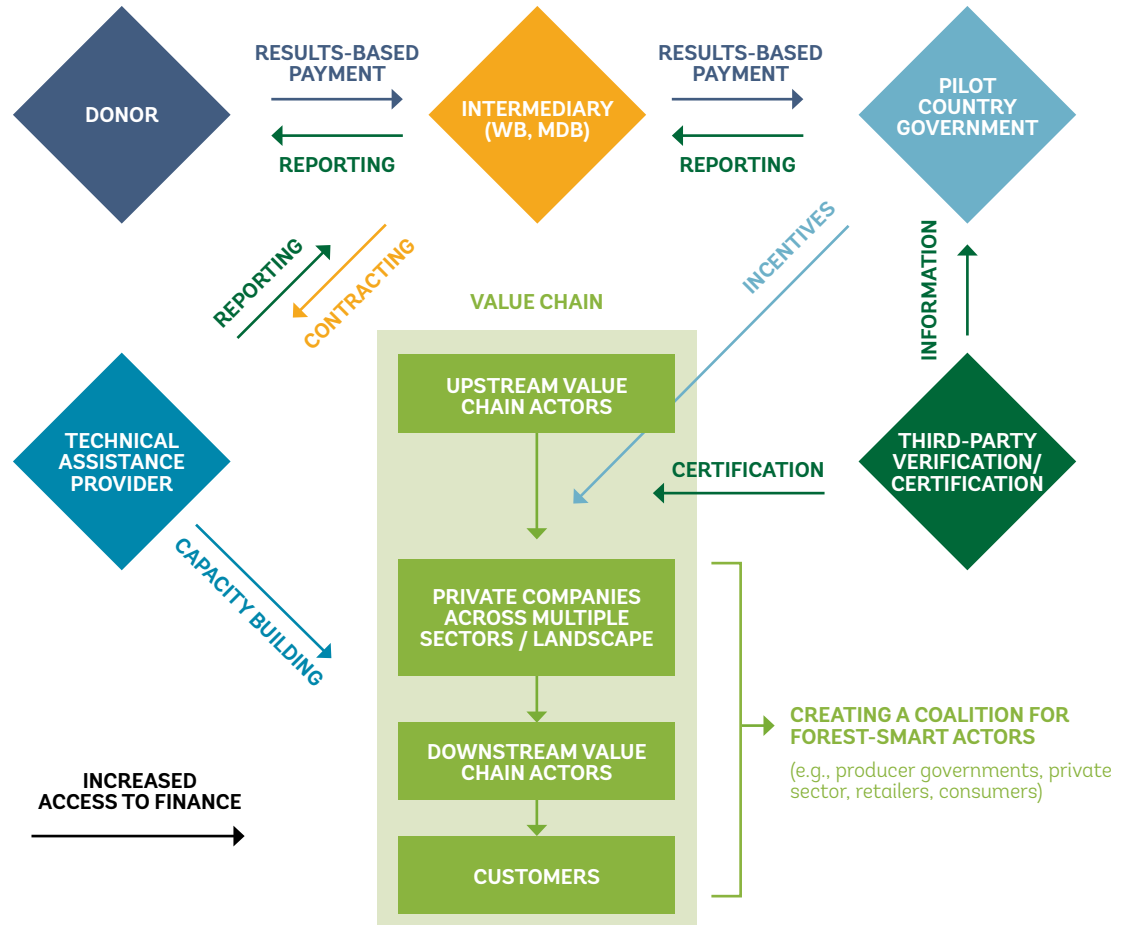
With aid-financed investment projects into forest conservation or forest-smart agriculture, there are often concerns that deforestation will just come back after donor funding streams end. The chance for long-lasting impact is best if projects involve domestic legal change, structurally alter private sector incentives, include domestic co-financing, create domestic vested interest in continuing the change, and bring in the local finance ministry, not only sectoral authorities. The suggested mechanism does all that.

Intertemporal trade-off and opportunity for collaboration

Phasing in the feebates may initially require additional funding to compensate initial revenue losses, cofinance certification costs for smallholders, and set up auditing systems. Feebates can be designed in a revenue-neutral or even revenue-raising manner. But politically, it is easier if the reform starts with just a decrease in taxes for certified sustainable commodities without an immediately matching rise in the default tax rate for commodities without the certification. Fairness, incentives, and market structure can also be improved if the costs of certification itself are not all borne by producers themselves, especially for smallholders, but financed out of a dedicated public fund. Other initial revenue losses may occur as a result of costs for setting up public systems to audit certification companies.

Donors could help cofinance these setup costs. Given the argument on relative costs in comparison with alternative interventions, and elevated chances of persistent change (see above), donors should consider co-financing the setup costs of feebate systems. Such international co-financing in the introduction of environmental fiscal policies could function within existing results-based payment systems. An existing type of results-based payments called policy crediting supports environmental tax policies by providing payments per unit of environmental improvements achieved as a direct outcome of the policy change. Thus, there already exist frameworks for facilitating such international collaboration. However, a more structured approach to potentially expand such collaborations is shown in figure 6.3.

FIGURE 6.3
ITTO PROPOSITION FOR INTERNATIONAL TRANSFER SCHEME TO INCENTIVIZE HARVESTED WOOD PRODUCT VALUE CHAIN



Source: Dieterle 2017.
Note: ITTO = International Tropical Timber Organization.

These international transfers should be transitory. As the recommended policy would provide strong incentives for firms in the informal sector to join the regular economy, the government’s ability to raise revenue would improve. Creating a sustainable business model would equally raise that revenue potential against declining BAU trajectories. Most important perhaps, transitory international support of a pilot scheme could reduce the risk and cost for governments in testing such schemes. After it is established that such mechanisms work, international support should be scaled back, and that exit plan should be transparently communicated from the beginning. This will minimize the reliance on the generosity and political winds of donor countries, which can be variable.

Conclusion

For the environmental efficiency of commodity taxes, it is essential to vary tax rates according to the sustainability of production methods. To encourage the maintenance of forests, timber from land conversion needs to be taxed at higher rates than timber from managed forests, and agricultural commodities from agroforestry systems at lower rates than monocrop

plantations, which in turn should be taxed less than commodities from illegal agricultural productions in natural forests. In short, tax rates per unit of a commodity need to rise in the marginal social damage.

However, fiscal authorities are generally not able to raise data on production methods themselves. Hence, they apply uniform rates—with ambivalent effects for sustainability.

Conventional commodity taxes often set conflicting incentives on the extensive and intensive margins. The same increase in a forest tax can create an incentive for one landowner to reduce logging and an incentive for another landowner to give up forest management altogether and convert the land to agriculture. And even for the landowner that seeks to continue holding forest area, a tax per tonne of timber provides an incentive to take less trees out of the forest but no incentive for reduced-impact logging. Similarly ambivalent, a yield tax can create incentives to both reduce or increase intensity of production, depending on market circumstances. Trying to fight deforestation with invariant commodity taxes is like trying to decarbonize an electricity sector using electricity taxes instead of carbon taxes: It can work, but it is inefficient and potentially self-defeating.

Sustainability certification agencies have the data that tax authorities lack. They can be used for fiscal policy. Sustainability certificates today exist for most deforestation-related commodities. Driven by consumer demand, certification agencies inspect and label sustainable products. Gradually, fiscal authorities have started joining consumers in using this information. Some countries give priority access for certified products to their public procurement systems, thereby creating a beachhead market for certification companies to drive down unit costs for certification and sourcing. Other countries cofinance the certification costs of producers directly. This chapter suggests a mechanism for directly integrating the information from sustainability certificates into commodity tax rates.

Tax authorities should continue applying uniform commodity taxes as the default but provide a tax discount or waiver for proof of sustainable production. This approach turns around the burden of proof, solving the tax authority's information problem through a private market solution. The default tax rates should be set on a specific-rate basis and equal the marginal social damage for the unsustainable production of the commodity. The tax should be combined with a discount or waiver when producers prove, through a sustainability certificate from a government-accredited third-party verification company, that the product has been produced more sustainably than the default assumption. The tax authority is then able to let the net tax vary efficiently without needing to observe individual producers—it just needs to occasionally audit the certification agencies that raise this information for the government.

This mechanism also provides incentives to illegal and informal market participants and levels the playing field. Since sustainability certificates require legality as an entry condition, the tax discounts become a pull to market formalization. They reduce the fiscal disadvantage that today constrains formal and sustainable market participants. Steering the informal sector is possible even when the state does not have perfect tax chokepoints. Even though it is best to apply the default tax at chokepoints that directly catch both formal and informal operators, if that is not possible, the default tax can also be applied to formal sector operators who purchase inputs from the informal sector. As the taxpayers receive discounts when they prove the sustainability and legality of their purchases, they have a strong incentive to tidy up their supply chain. Hence, the government uses the formal sector intermediaries, and the

sustainability certification companies, as its agents for cleaning up sections of the market that it cannot govern directly.

Using sustainability certificates as information sources for tax policy yields co-benefits for market price premiums, productivity, and the functioning of the certificate market itself.

Certified producers can benefit from two sources of price premiums: the tax advantage plus the market price differentiation from the certificate's consumer label. Furthermore, evidence shows that the formalization and training in improved production methods that come with certification improve productivity.

The mechanism provides an opportunity for improved international collaboration. Donor countries have been looking for mechanisms of forest sector assistance that continue to award long-lasting protection to forests in developing countries without requiring continuous streams of international financing. They should then be interested in supporting the suggested mechanism. It would be anchored in tax law changes, create a continuous source of domestic financing for sustainability, structurally alter private sector incentives to invest in sustainable supply chains, create domestic vested interests against policy reversion, and include the finance ministry, not just sectoral authorities. The mechanism also provides key features that developing countries have sought from global collaboration on forests. It rests the control over sustainability incentives with domestic policy makers, with more predictability and less dependency than expenditure-based instruments that rely on continuous overseas funding. It shifts some of the burden for sustainability investments from the public to the private sector, including international companies that bear an incidence of the differentiated net tax and thus an incentive to take responsibility for their supply chains. In the work share of global markets, the feebate mechanism helps developing countries move up the value chain by encouraging the formalization of production and product differentiation, improvements to productivity, and price premiums. Both developed and developing countries should thus have an incentive to support this mechanism. Developing countries do not forcibly need overseas assistance to make this mechanism work, but international co-financing would help overcome intertemporal trade-offs. These include the potential for short-term revenue losses, the transaction costs of certification, and administration costs for auditing certification companies. Each of these costs is front-loaded, causing a political challenge. Given the advantages of the mechanism for durable change, and long-term self-sufficiency, donor countries should consider supporting the start-up costs of this mechanism—for example, through results-based climate finance or development policy finance.

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