Getting the Prices Right: Economy-wide Policies to Promote Structural Change: British Columbia

Case Study 4. Taxing Carbon for Development: Lessons from British Columbia

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Context

Since Finland announced the first carbon tax in 1990, more than 37 countries have introduced carbon taxes (World Bank 2022m). As of 2022, nine more were scheduled or in consideration, including in Botswana, Côte d'Ivoire, Indonesia, and Morocco. A carbon tax applies a price incentive directly in proportion to the GHG emissions generated by a given product or activity. By applying the same price per $MtCO_2e$ across multiple sources or goods, carbon taxes contribute to cost-efficient climate change mitigation (Pryor et al. 2023).

Several carbon tax designs have been tried in practice, but 30 years of academic literature have focused on one design option that has a good chance of aligning climate mitigation with economic development. That design introduces carbon taxes "upstream," on the carbon content of fuels, at the same tax rate across all emissions sources, and uses revenues to substitute conventional taxes, especially on labor. The real-world carbon tax closest to this design is the carbon tax reform introduced in Canada's British Columbia (BC) province in 2008.

The BC carbon tax stands out as a model for decarbonizing development because the policy design led to several positive outcomes, including: a net increase in economic growth; a decrease in income inequality and improvement of the rural-urban divide; a significant reduction in GHG emissions; and increased public support of the carbon tax reform over time. These positive economic and environmental impacts are key expectations of climate policy in lower-middle-income countries (LMICs). The features that made this policy successful in North America may generate even greater outcomes in LMICs.

Policy

The first carbon tax in the Americas, the BC example, applies two fundamental carbon tax reform ideas. In 1992, all countries agreed on the Polluter Pays Principle (Rio Declaration, Principle 16) of charging polluters in proportion to damages

caused to society. The BC carbon tax implements this idea, with a uniform tax applied to a broad tax base. The exemptions are for fuel exported from BC, fuel used in select industrial processes, and marine diesel used in interjurisdictional transportation, among others.

The second fundamental idea underlying carbon taxation is the principle of shifting the tax burden away from taxing "goods," such as labor and income, and instead taxing "bads," such as emissions. Economists have argued that shifting tax burdens away from distortionary tax bases—such as labor effort and profits from innovation—toward emissions can help accelerate economic growth, while also reducing emissions and raising much needed resources.[7] For example, Sweden introduced its carbon tax in 1991 to help shift taxes away from labor during its largest macro crisis since World War II. During the 2001 crisis, Germany introduced a form of carbon taxation, raising electricity taxes while raising feed-in tariffs (FiTs) for renewable energies, to help finance a reduction in social security contributions. Türkiye raised fuel taxes to substitute conventional macrofiscal tightening. The BC government clearly communicated its commitment at the start of the reform that the tax would not raise the overall fiscal burden on firms and households; rather, revenues would substitute other, more distortionary, taxes.

The BC government introduced its carbon tax directly after the financial crisis in 2008, enabling it to reduce conventional taxes and support the economy by reducing the tax burden on labor. It clearly communicated this fiscal shift, committing from the start that its carbon tax reform would not lead to an overall increase in overall taxation. In 2017, BC returned 35 percent of the revenues to individuals and 65 percent to businesses. Tax cuts included the general corporate income tax from 12 percent to 11 percent, and the two lowest personal income tax rates by 5 percent (table 3.1; see also Heine and Black 2019).

Applied to all fuels purchased in BC, the tax's broad base covers approximately 70 percent of the province's GHG emissions and offers long-term predictability (Murray and Rivers 2015). The tax rate started at Can\$10/tCO_2e in 2008 and gradually increased to Can\$50/tCO_2e in 2022. Signaling future carbon prices long in advance was a key component of BC's reform, giving the private market long-term price signals to avoid stranding assets. A tax rate increase schedule served as a commitment device to help shield carbon taxes from fluctuations in political attitudes (Carattini, Carvahlo, and Fankhauser 2018). From the outset, BC's tax was designed to increase by Can\$5 annually until 2012. Evidence from BC household surveys shows that this strategy was eventually successful: at the time of the tax reform, slightly less than half the population supported the reform, but as time passed and knowledge of the workings of the reform became more widespread, support rose to more than half. There may also have been positive spillovers: Washington State is considering its own carbon tax reform, modeled on the BC example.

TABLE 3.1 Revenue Neutrality in British Columbia: Tax Cuts and Carbon Tax Revenue

Revenue/tax category	2016/2017 (million Can$)
Carbon tax revenue	**1,220**
Personal tax measures	
Low-income climate action tax credit of $115.50 per adult plus $34.50 per child	(195)
Reduction of 5% in the first two personal income tax rates	(309)
Northern and rural homeowner benefit up to $200	(84)
Children's fitness credit and children's arts credit	(8)
Other	(11)
Total personal tax measures	**(607)**
Business tax measures	
Production services tax credit	(340)
General corporate income tax rate reduced from 12% to 11%	(232)
Small business corporate income tax rate reduced from 4.5% to 2.5%	(230)
Scientific research and experimental development tax credit	(148)
Other	(159)
Total business tax measures	**(1,120)**
Total revenue measures	**1,727**

Source: British Columbia Budget and Fiscal Plan 2017.

Note: Several measures are aggregated into "other" for summarizing purposes. Can$ = Canadian dollars.

Results and Impacts

The significant academic literature that has evolved evaluating the BC example broadly finds that it achieved a combination of emissions reductions with improved socioeconomic outcomes. Extensive empirical evidence confirms that the tax reduced emissions and inequality, raised growth and employment, and over time, received majority support from citizens.

The BC carbon tax has reduced GHG emissions and fuel consumption. There is evidence of a reduction in fuel demand from the tax as well as a reduction in GHG emissions (Ahmadi and Yamazaki 2020; Metcalf 2019; Murray and Rivers 2015). Some analysis has found insignificant results, pointing at the size of the rate (too low) or the time frame (Pretis 2022).

The carbon tax had benign impacts on economic output. Studies find evidence of no adverse economic effect and some indication of a positive impact (Metcalf 2019), including increased output by 0.8 percent, largely due to the reduction of corporate income taxes encouraging energy savings and productivity-enhancing investments (Ahmadi and Yamazaki 2020).

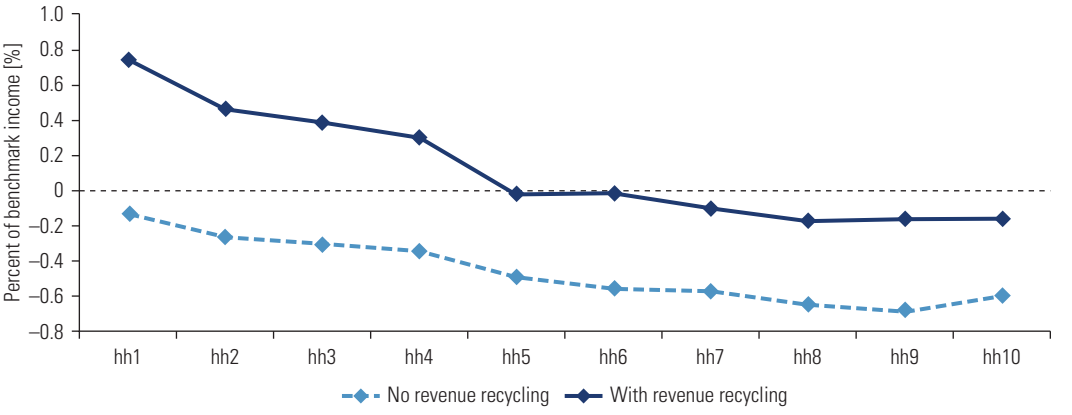
Aggregate employment has increased, albeit with different responses across industries. Although the carbon tax is found to have a positive effect on employment of 0.75 percent annually (Yamazaki 2017), there is also evidence of differing impacts on specific industries as they shift from carbon-intensive to clean sectors (Azevedo, Wolff, and Yamazaki, forthcoming). This finding suggests that protecting workers, rather than jobs in carbon-intensive sectors, through the transition is a good way to complement carbon taxation.

The BC carbon tax is progressive, narrowing the gap between poor and rich households (Beck et al. 2015). This is due to the revenue recycling scheme (figure 3.5), showing that the distributional implications of such a tax reform cannot be estimated without a precise understanding of the use of the revenues. The study also highlights the importance of income sources in driving distributional impacts: the difference between poorer and richer individuals arises more from differences in income sources (for example, sector of employment) than from differences in what they consume. This is relevant because most studies of distributional impacts of carbon pricing have focused on impacts through consumption, as assessing impacts through incomes is methodologically challenging.

Key Takeaways

BC's carbon tax reform provides crucial lessons for LMICs considering carbon taxes, showing that it is possible to enhance development and decarbonize. Numerous empirical studies point to positive impacts on economic output, aggregate employment, and

FIGURE 3.5 Distributional Impacts of British Columbia's Carbon Tax



Source: Beck et al. 2015.
Note: hh = household.

tax progressivity resulting from the carbon tax reform. Yet, design matters, and not all carbon taxes are equal. BC's reform provides real-life lessons of how a well-communicated, well-designed tax-burden-shifting strategy can allow countries to implement high carbon tax rates up front while improving political support. The development gains observed in the literature materialized quickly for the citizens in the form of lower personal and corporate tax burdens and higher labor opportunities, increasing public support over time.

How do the lessons learned from this Canadian province translate to the world? The global picture is mixed. The number of jurisdictions applying carbon taxes has risen, from two in 1991 to 37 in 2022, with nine more scheduled or under consideration (World Bank 2022a). The average carbon tax rate has also risen but remains low, at \$3/tCO_2 in 2021 (weighted for emissions). Despite this progress, most countries, especially in the developing world, continue to use energy excise taxes and subsidies, with an important impact on carbon intensity. The impact would be even greater if they were extended to all fuels and applied a rate aligned to fuel carbon content.