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# New Tax Instruments

## 3<sup>rd</sup> World Bank Tax Conference

Conference Proceedings  
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# New Tax Instruments

## 3<sup>rd</sup> World Bank Tax Conference

### Introduction

The 3<sup>rd</sup> World Bank Tax Conference brought together leading academics and policymakers to discuss new tax instruments that help change behavior. The academic presentations focused on how tax instruments might be used to discourage negative externalities such as CO<sub>2</sub> emissions and the consumption of unhealthy food, as well as new approaches to the taxation of the digital economy. In the wake of the COVID-19 pandemic, and as governments enter the recovery phase, these instruments can, under certain circumstance, also help to mobilize revenues.

### Ten Takeaways

**Climate change, digitalization, and SSBs are individually and jointly macro-relevant.** The economic costs associated with tobacco, alcohol, and sugar-sweetened beverages (SSBs) are significant. Estimates indicate that the costs of tobacco consumption globally could amount to US\$1.4 trillion (2012) and alcohol 2.1%-2.5% of GDP, while obesity related diseases exacerbated by sugar-sweetened beverages some US\$ 2 trillion (Siu, 2021). Estimates for the costs of global warming vary but are high. One [study](#) recently conducted by the Swiss insurance company Re indicates that it could amount to 10% of global economic output by mid-21<sup>st</sup> century. World Bank analysis finds that climate change may push over 130 million into poverty by 2030 and cause over 200 million people to migrate within their own countries by 2050. The digital economy is projected to continue growing more rapidly than the global economy as a whole, presenting both opportunities for improving prosperity and challenges for effective taxation of the industry.

Selected findings from the papers and presentations at the conference were as follows:

- ① **Tax increases may be needed to reduce the consumption of meat and SSBs.** Estimates presented during the conference (Funke, 2021, and Morden) indicate that tax rises may be necessary to increase prices and thus reduce consumption of livestock products and SSBs.
- ② **SSBs may be more effective at reducing sugar consumption when there is a close non-sugary substitute.** Analysis of high-frequency data in Finland showed that SSB taxes did not lead to any discernible responses to less close non-taxed substitutes (such as chocolate and cookies) but that they did lead to large responses when close substitutes (such as non-sugary sodas) were available (Savolainen, 2021).
- ③ **SSB taxes may have a greater impact on consumption over the long-term.** This is because it can take time for addicts to respond to higher prices (Gertler, 2021).
- ④ **The taxation of SSBs can be progressive when the broader costs associated with harmful consumption are taken into consideration.** Fuchs (Forthcoming) found that the inclusion of health benefits can make the introduction of SSB taxes in Ukraine (marginally) progressive.
- ⑤ **Simplifying the existing tax system could be an important benefit associated with the implementation of a carbon tax.** Galiani noted that the introduction of a carbon tax in Argentina

provided an opportunity to rationalize the tax system, making it easier to administer and reform in future.

- ⑥ **All taxes have some effect on carbon emissions due to their impacts on production and consumption.** For this reason, Hines argued that all taxes could be considered carbon taxes. Taxes used to finance government spending result in emissions that are 10-20 times less carbon intensive than the private sector.
- ⑦ **Intensity-based carbon rebates may be more effective than output-based schemes.** Research undertaken by Fisher et al. (2021) found that intensity rebating schemes lead to larger cuts in output and emissions.
- ⑧ **Carbon taxes may be progressive in some contexts.** Warwick (2021) noted that carbon taxes in Ethiopia and Ghana are strongly progressive, though compensation for the poorer households should still be considered.
- ⑨ **The indirect taxation of foreign e-commerce could differentiate between Business-to-business (B2B) and business-to-consumer (B2C) transactions.** Agrawal (2021) discussed how the collection of VAT on B2B digital services by non-residents can be addressed through reverse charging, while it cannot be for B2C.
- ⑩ **High-quality tax policy analysis by governments can help to overcome political economy challenges.** Morden and Galiani noted that strong tax policy teams in Argentina and South Africa helped to counter political pressure and influence from lobbyists.

## Conference Structure

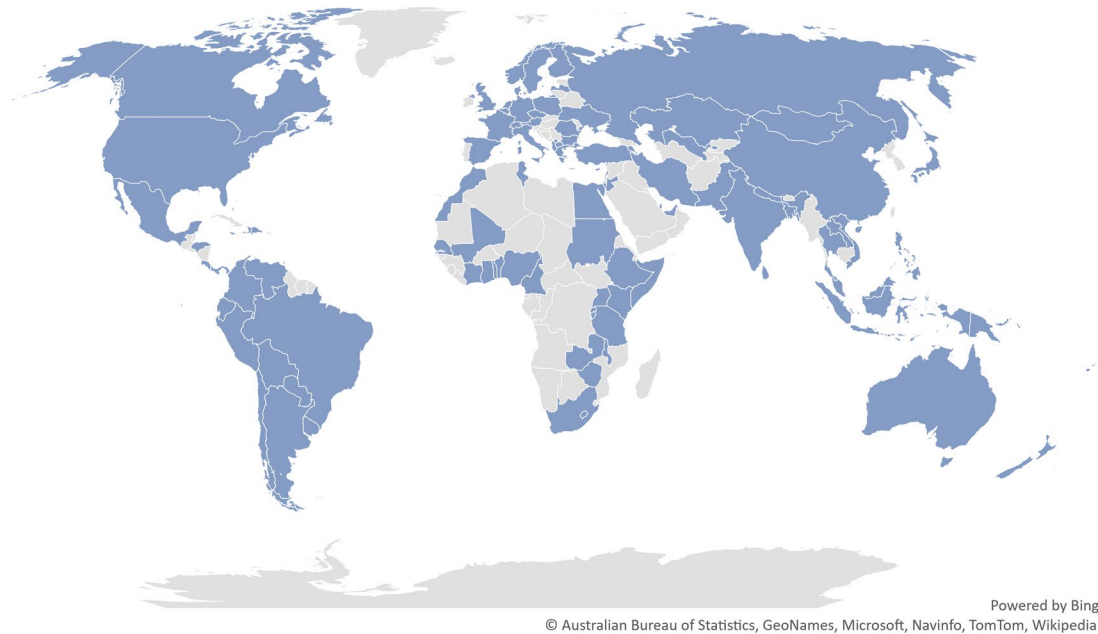
The [conference](#) was opened by Marcello Estevão (Global Director, Macroeconomics, Trade, and Investment, World Bank) and featured a keynote address by Dr. Carolyn Fischer (Research Manager, World Bank) along with six panels presenting new research and discussing the policy implications of new tax instruments. The conference was concluded by Chiara Bronchi (Global Practice Manager, Fiscal Policy & Sustainable Growth, World Bank) and Deon Filmer (Director, Development Research Group, World Bank). The topics of the panels were identified and prioritized on the basis of an open call for submission of papers.

The conference was organized by the World Bank, the Institute for Fiscal Studies, and the Overseas Development Institute, and was supported by the Global Tax Program, the Innovations in Tax Compliance Program, the Bill and Melinda Gates Foundation, and the UK government through UK aid.

## Participants

A total of 1,013 individuals registered for the conference with a 42% attendance rate. Of the individuals registered, there were 153 from universities and other institutions of higher education, 161 from government agencies with a role in taxation (typically ministries of finance and revenue authorities), 231 from the World Bank and the International Finance Corporation, 45 from other international organizations (e.g., regional development banks, IMF, and UN agencies); 34 panelists; as well as a large number of individuals from think tanks, research institutions, non-governmental organizations, and so forth. Figure 1 illustrates the countries of the registered conference participants.

*Figure 1. Registered participants for the 3<sup>rd</sup> World Bank Tax Conference.*



## Keynote Speech

Carolyn Fischer (Research Manager, World Bank)



Dr. Carolyn Fischer (Development Economics Research, World Bank)



Carolyn Fischer presented her recent work on how to design rebating schemes – which return some of the revenue collected by carbon taxes to the producers – to decarbonize the economy. Carbon pricing is increasingly accompanied by industrial policies which rebate part of the revenue collected. Compared to a carbon tax, which enables the government to keep and use all of the revenue collected, rebating can help address political economy constraints and mitigate the loss of international competitiveness. Fischer documented how the design of the rebating scheme leads to different incentives for carbon emissions and total output produced. In standard output-based rebating schemes, revenues from carbon pricing are returned to affected firms proportionally to their total production. Newer schemes instead rebate revenue as a function of the intensity of the emission cuts. Using a general equilibrium model, where the production combines labor, capital, and energy, the paper simulates the impact of the two rebating schemes (output-based vs intensity-based). Each scenario sets the same carbon price and is revenue neutral.

Intensity-based rebating schemes lead to larger cuts to both emissions and output compared to output-based schemes and should be considered to speed up the decarbonization of the economy. However, output-based rebating schemes still have a role to play to help the transition towards decarbonization as they address competitiveness, distributional, and political economy issues.

## Session 1 “Environmental Taxes”

Chair: Pierre Bachas (Economist, World Bank)



Presenter: James Hines (University of Michigan)



Hines explained that there are three channels through which carbon taxes affect emissions: (i) the substitution effect; (ii) the income effect; and (iii) the income production effect. These last two channels can exceed the substitution effect and are, thus, important channels through which carbon taxes can reduce emissions. In essence, all taxes reduce carbon emissions. Furthermore, because non-carbon taxes yield 10-40 times the revenue of carbon taxes, the former may do more to reduce emissions than carbon taxes. Finally, Hines investigated the extent to which government spending creates emissions relative to private spending. He showed that for most OECD countries, the private sector is 10-20 times more carbon-intensive than the public sector. Hines indicated plans to empirically investigate the extent to which other taxes affect carbon emissions so as to accurately gauge a country's progress towards reducing carbon emissions via the tax system.

### Carbon Pricing, Differential Effects and Energy Use

Presenter: Melanie Marten (CY Cergy Paris University)

Discussant: Remzi Baris Tercioglu (World Bank)



Marten empirically investigates the effect of a French carbon tax, implemented in 2014, on employment. Using plant-level manufacturing panel data from 2005-2018, Marten uses the share of plant-level energy consumption based on fossil fuels (relative to electricity, which is not subject to the carbon tax) to create a continuous measure of treatment. Using a difference-in-difference methodology, Marten finds that a one-unit increase in the electricity share following the carbon tax reform increased plant employment by 0.084% on average, while a one-unit increase in the fossil fuel share decreased employment by 0.088% on average. This finding is consistent with her hypothesis that electricity-intensive plants should experience improved employment outcomes, while fossil-fuel-intensive plants should experience worsened employment outcomes. Marten notes that while all employment effects of carbon taxes are statistically significant, they are very small and economically insignificant. She concludes that these findings cast doubt on the fear that carbon taxation leads to large distortions in employment decisions.

## Session 2 “Lightning Talks”

Chair: Oyebola Okunogbe (Economist, World Bank)



Presenter: Franziska Funke (Potsdam Institute for Climate Impact Research)



Funke argued that livestock is a first-order issue for mitigating eutrophication, biodiversity loss, and climate change from agriculture and, furthermore, that second-best consumption taxes on meat can advance multiple environmental objectives at once. Optimal meat regulation depends on normative viewpoints on health externalities, animal welfare, and inequality. The social costs of carbon and the social costs from nutrient pollution for beef add up to 5.76-9.21 US\$/kg. If the average social costs of carbon and nitrogen were applied in high-income countries, the retail price for beef, poultry, and pork would increase by 35-56%, 25%, and 19%, respectively. However, low-income households spend a larger share of income on meat, so will be disproportionately impacted by a carbon tax on livestock.

### Taxing the Sweet Tooth - Evidence on the Role of Substitution in Excess Burden

Presenter: Riikka Savolainen (Lecturer, Swansea University)



Savolainen notes that excise taxes are effective means to meet policy goals when they succeed in reducing consumption of the targeted goods, while VAT and sales taxes are efficient taxes when they create as little behavioral response as possible. To provide novel answers to the question of when these conditions are met, a conceptual Gorman-Lancaster theoretical framework is applied, focusing on how different product characteristics relate to substitution patterns between consumption of goods and the responses to consumption taxes. The paper studies a sweets and soda tax scheme in Finland based on unique product- and week-level data on sales and prices containing hundreds of millions of observations. The study finds that the SSB taxes did not lead to any discernible sales responses to less close non-taxed substitutes (such as chocolate and cookies) but that they did create large responses when close substitutes (such as non-sugary soda) were available.





Presenter: Silver Namunane (Tax Policy Specialist, Ministry of Finance Planning and Economic Development, Uganda)



Namunane analyzes a policy change in Uganda in 2015/16 that increased excise tax rates on specific goods (i.e., motor vehicle lubricants, fuels, confectionaries, cigarettes, beer, wine, and furniture). The effect of the rate change is estimated by comparing outcome variables of treated firms to those of a control group. The results suggest that the sales revenue for treated firms decreased by 11% and 20% in the first- and second-years post-tax change, respectively, relative to the control group. Treated firms' profits decreased on average by 27% in the years post-tax change. Given the decreases in sales revenues and profits, the evidence in this paper suggests that government tax revenues from treated products decreased by 83% relative to those whose tax rates were not changed.



Presenter: Erika Siu (Deputy Director, University of Illinois at Chicago)



Siu noted the significant economic costs associated with tobacco (US\$1.4 trillion in 2012), alcohol (2.1%-2.5% of GDP), and obesity (US\$ 2 trillion). Recent research from Pakistan shows that the cost of tobacco-related diseases and deaths in 2019 amounted to five times the tax revenue collected from the tobacco industry in the same year. Another study from Indonesia estimates the direct health care costs from tobacco-related illness to the Social Security Agency for Health and the national health insurance program to be between 0.1% and 0.2% of GDP. In Europe, it was found that alcohol and tobacco taxes were among the most effective and cost-effective interventions. Research from Mexico estimated that a 10% price increase on tobacco products would reduce consumption of cigarettes by 7.6%, alcohol by 0.2%, and soft drinks by 0.8%. Siu noted that significant rate increases are needed to reduce consumption of health harming foods and that governments should consider pro-poor uses of the tax revenue to mitigate the regressive impact.

## Session 3 “Health Taxes”

Chair: Ceren Ozer (Senior Economist, World Bank)



Presenter: Paul Gertler (Professor of Economics, Berkley Haas)

Discussant: Violeta Vulovic (University of Illinois Chicago)



Gertler developed a structural model of the demand for sugar-sweetened beverages (SSBs) that incorporates rational addiction and present bias. Few studies have tested these internalities in SSB consumption or accounted for their effects when evaluating the impact of excise taxes on SSB consumption. Failure to account for these internalities may result in an underestimate of the long-term effectiveness of an excise tax because long-term price elasticities of demand are greater than short-term elasticities in the presence of addiction. The authors estimated the model using data from Mexico. Gertler presented the paper’s two key findings: First, there is convincing evidence of addiction and forward-looking behavior in the data. Second, an SSB tax has a much greater impact in the long-run with a price elasticity that is 50% higher than in the short-run (-1.0). Gertler noted these findings have important policy implications: internalities not only provide an economic rationale for taxing SSBs, but also suggest SSB taxes may be more effective in reducing consumption in the long-run. Gertler closed with a discussion of potential avenues for future research on SSB taxes, highlighting the need for more work on how an SSB tax may affect adolescents/children, a demographic particularly prone to long-term SSB addiction.

### The Welfare and Distributional Effects of Taxing SSB to Reduce Health Risks in Ukraine” (Working Paper)

Presenter: Alan Fuchs (Senior Economist, World Bank)

Discussant: Mahvish Ifrah Shaukat (World Bank) 



Fuchs estimates the welfare and distributional effects of an excise tax on SSBs in Ukraine. Raising the price of SSBs may be a cost-effective approach to countering rising SSB consumption rates around the world. However, an excise tax may disproportionately affect poorer households since they spend a larger share of their budget on food and beverages. Understanding how an excise tax impacts households would therefore be critical. Fuchs presented the paper’s key finding: the net effect of an excise tax in Ukraine is progressive (albeit small in magnitude) when accounting for the long-term health benefits (e.g., lower medical expenses, higher labor force participation due to fewer working days lost, etc.). These results provide a lower bound estimate of the welfare and distributional gains of an excise tax because other fiscal impacts (e.g., increase in tax revenue and reduction in disability payments) are not considered in the simulation.

## Session 4 “New Tax Instruments in Practice”

Chair: Hazel Granger (Senior Research Fellow, Overseas Development Institute)



Cecil Morden (Former Chief Director, Economic Tax Analysis, South African National Treasury)



Morden presented on the design and roll-out of South Africa’s SSB tax, which was introduced in 2018 with the aim of improving health outcomes. The Policy Paper prepared by the government in 2016 notes that the literature suggests that a 10%-20% price increase of SSBs may be required to have a significant impact on consumption. It was therefore proposed that a tax rate of R0.02 per gram of sugar be implemented, roughly equating to a 20% tax for the most popular soft drink (i.e., Coca Cola, averaging 35 g / 330 ml). For SSBs that do not apply nutritional labelling, it was proposed that a relatively higher fixed gram of added (free) sugar should be assumed, i.e. 50 grams per 330, while 100% fruit juice was exempted from the tax. One lesson learned was that effective consultation was an important and necessary part of the tax design process. Another, that it was vital that government analysts had the skills and capacity to produce high quality evidence to effectively counter arguments and research commissioned by the sugar industry. Morden concluded that while some commentators have criticized the structure of the tax and suggested that the rate was too low, the SSB tax was reasonably successful in reducing the consumption by lower-income households, which had traditionally consumed more SSBs, exhibiting the largest drops in consumption.



Daniel Nuer (Head of Tax Policy Unit, Ministry of Finance, Ghana)



Nuer discussed the government’s plans to tax gambling and betting as part of broader efforts to raise additional tax revenues to support post-COVID-19 recovery. A key challenge is the fact that online gambling and gaming are replacing more traditional operators such as casinos, with existing tax instruments (notably VAT and fees/charges levied on the industry) becoming less effective. The Government of Ghana estimates the revenue leakages in the gambling and gaming sector at over GH¢300 million annually. The three key issues currently being considered by policymakers are: (i) how can operators be taxed when they have no physical presence in Ghana; (ii) which might be the most comprehensive and transparent tax instrument(s) to use; and (iii) how can the government achieve compliance in a largely online industry?



Mary Ongore (Tutorial Fellow, University of Nairobi)



Ongore noted that efforts are currently being made at the international level through the OECD's Inclusive Framework on Base Erosion and Profit Shifting (BEPS) to reach an international agreement on taxation of the digital economy. Still, unilateral methods remain open to countries, some of which have recently introduced Digital Services Taxes (DSTs), notably Kenya, Sierra Leone, Tunisia, and Zimbabwe. In 2021, Kenya introduced a DST that applies 1.5% on the gross transaction value of digital services (exclusive of VAT). Both residents and non-residents are liable to pay, if they provide or facilitate the provision of services to a user who is deemed to be located in Kenya. The criteria for determining the country nexus are: (i) payment for the digital services is made using a credit or debit facility provided by any financial institution or company in Kenya; (ii) the user accesses the digital interface from a terminal (e.g., computer, tablet or mobile phone) located in Kenya; (iii) the supplies or digital services are acquired using an Internet protocol address registered in Kenya or an international mobile phone country code assigned to Kenya; or (iv) the user has a business, residential, or billing address in Kenya. To date, Kenya's Digital Services Tax has surpassed expectations in terms of revenue collection and compliance, aided by a simplified registration process. The majority (80%) of revenue has been generated domestically.



Sebastian Galiani (Professor of Economics, University of Maryland)



As former Deputy Minister of the Treasury, Galiani led the design of Argentina's carbon tax, which was implemented in 2017. At the time, liquid fossil fuels were subject to four different taxes governed by five laws, each with slightly different tax bases and varying reporting requirements. Still, several important fossil fuels were untaxed. Key goals of the reform were to rationalize and harmonize the existing system, simplify tax administration, and increase transparency through the introduction of a uniform rate. In achieving this, future rate increases and policy changes will be much easier. Context-specific factors, and particularly the high levels of inflation in Argentina, were important considerations in the policy design. This meant moving away from an *ad valorem* system to ensure that prices did not increase regularly and cause political difficulties for the government. From a political economy perspective, the government had an advantage in that it had tasked a very technical team to design the policy and they were able to conduct their work without significant interference from lobbyists. Political discussions occurred in Congress, and although energy-rich states in Argentina did negotiate a reduced carbon tax rate for natural gas and secured a series of exemptions, the tax remains one of the most comprehensive in South America. Galiani concluded by highlighting that countries with relatively low emissions have limited incentives to implement carbon taxes because they cannot change the path of climate change. This means that international efforts, which incorporate the awarding of benefits and penalties, will be required. A key selling point for policymakers in Argentina was the incentive provided in connection with the negotiations around the EU-Mercosur Trade Agreement.

## Session 5 “Digital Taxes”

Chair: Anders Agerskov (World Bank, Senior Public Sector Specialist)

### Taxing Consumption in the Digital Economy: The Role of the Digital Divide

Presenter: David Agrawal (Associate Professor, University of Kentucky)

Discussant: Jaffar Al-Rikabi (Senior Economist, World Bank)



Agrawal noted that Business-to-Consumer (B2C) e-commerce is experiencing a growth in excess of 50% in many countries, yet bringing cross-border B2C sales into compliance has proven difficult. However, marketplace facilitator regulation appears to have been effective in increasing tax collections, reflecting the fact that firms are better at remitting than consumers. For example, the EU has instituted a one-stop-shop allowing non-resident sellers to file VAT returns in one country, with taxes allocated to member states. Empirical evidence from the United States shows that marketplace facilitator legislation has increased sales tax by approx. 6%. Al-Rikabi cautioned about what could feasibly be collected in the short-term, called for the recognition of pre-existing VAT challenges, and underscored administrative capacity as a key constraint. Agrawal suggested that taxation regimes for cross-border digital services should differentiate between B2B and B2C, since the challenges of collecting VAT on B2B (Business-to-Business) digital services by non-residents can be addressed through reverse charging, while they cannot for B2C. In the case of telecoms taxation, revenue objectives need to be reconciled with other goals (e.g., providing access to financial services for the unbanked), and consider neutrality across different technologies (e.g., regular phone service and Internet-based telephony).



Presenter: Adrienne Lees (Research Officer, Institute of Development Studies)

Discussant: Moses Kajubi (Senior Public Sector Specialist, World Bank) 



Lees noted that the number of registered, active mobile money accounts in Uganda now exceeds 16 million – compared to a working age population of 22.8 million – with annual transactions amounting to US\$ 20bn. On 1 July 2018, the government introduced a new tax of 1% of the value of all mobile money, which was capped in November 2018 to 0.5% of withdrawals after widespread public outcry. The study highlights a number of weaknesses in the policy making process: (i) the policy measure emerged from the President's office; (ii) the proposal was tabled late in the policy cycle allowing little time for a rigorous analysis; (iii) questions by some members of parliament were not satisfactorily addressed by the Ministry of Finance; and (iv) consultations were especially lacking. Despite the downward adjustment of the tax rate, FY18/19 revenues were 137% higher than forecast. Kajubi asked whether the tax – aside from the process – would be worthwhile replicating in other countries; the impact of the tax on equity, efficiency, and the informal economy; whether time constraints were indeed a factor in the analysis of the proposal given that capacity of tax policy has been confirmed to exist; and what guidance could be given as to how to maneuver a political economy challenge like the one in Uganda.

## Session 6 “Environmental Taxes II”

Chair: David Phillips (Associate Director, Institute for Fiscal Studies)



Presenter: Juan Carlos Suarez Serrato (Associate Professor of Economics, Duke University)



Serrato made a presentation on the impacts of the ‘Top 1000’ program – a prominent energy regulation that affected large energy-consuming manufacturers that are part of broader conglomerates in China. The paper uses detailed firm-level data, difference-in-difference approaches, and an industry equilibrium model to ask a series of questions, including: (i) how does regulation impact the production and energy use of regulated firms and firms that are related through ownership networks; (ii) what are the distortionary effects of the regulation and how does the ability to shift production within a conglomerate lower the cost of the program for regulated firms; and (iii) how do conglomerate and market spill-overs alter the effects of the policy on industrial energy use and welfare? Suarez and co-authors find China’s ‘Top 1000’ Program reduced energy use but did not improve efficiency. Firms responded to the program by decreasing their output by reallocating part of the lost economic activity to related businesses within the conglomerate, which were not classified as ‘Top 1000’ firms. This significantly lowered the policy’s impact on energy reduction.

### Carbon Pricing in Low- and Middle-Income Countries

Presenter: Ross Warwick (Senior Research Economist, Institute for Fiscal Studies)

Discussant: Tatiana Falcao (World Bank)



Warwick presented a paper considering the distributional implications of carbon pricing in low- and middle-income countries (LMICs). The paper uses input-output tables, household and enterprise survey data, and microsimulation methods to assess the impacts of a carbon price on: (i) households according to their levels of consumption; and (ii) firms according to their industrial sectors and levels of trade exposure. Warwick argued that while LMICs account for a relatively small share of emissions, placing a price on carbon could be key to avoiding costly lock-in effects from investments in carbon-intensive technologies and to raising revenues. The paper finds that in the context of Ethiopia and Ghana, carbon pricing appears strongly progressive, with direct consumption of energy the key driver of the results, although indirect effects are quantitatively important, too. The implementation of a carbon tax would still affect low-income households and policymakers may want to consider compensation. From the perspective of firms, sectors which use more carbon in production – either directly or through carbon used upstream in the supply chain – have higher estimated embedded carbon taxes, which could particularly disadvantage domestic producers competing internationally.