

THE CARBON FOOTPRINT OF GLOBAL TRADE IMBALANCES

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Abstract

A considerable share of global carbon emissions arises in producing goods consumed in a different country. The flow of carbon embodied in trade is highly asymmetrical. At the same time, trade is highly and persistently unbalanced in value terms, too. Prominently, the two countries with the largest net ex- and imports of carbon (China and the US) have consistently been among the countries with the largest trade surplus and deficit, respectively. Meanwhile, countries like Germany and Japan have large trade surpluses and are substantial net carbon importers, while India, by contrast, has a large trade deficit but exports way more carbon than it imports. Differences in environmental policy stringency around the world can be one factor contributing to global trade imbalances. Therefore, trade imbalances might allow for specialization and consumption patterns that magnify the global carbon footprint.

On the other side, trade imbalances are effected by manifold causes, such as differences in wages, production standards or tariffs. Eliminating trade imbalances will reshuffle trade and production all around the world. We cannot rule out a-priori that some of the “dirty” production of a trade surplus country like China will end up in countries that produce the same products with an even larger use of fossil fuels and hence higher emissions. To assess “the carbon footprint of global trade imbalances”,

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we develop a Ricardian quantitative trade model and simulate the effect that will result from balancing current accounts. The model includes sectoral input-output linkages, trade imbalances, and carbon emissions from fossil fuel combustion. This structure allows us to track carbon emissions along the whole global value chain of 121 countries, representing 98 % of world GDP, and distinguish products according to their carbon intensity.

We consider two different types of counterfactual scenarios. First, we simulate a balanced current account for one country after another while adjusting all other countries' deficits and surpluses only to the extent necessary to keep world trade balanced. For every individual country, the trade balancing effect on global emissions depends on the carbon intensities of its production and consumption patterns and its fossil resource abundance. Notably, the greatest global effects are caused by eliminating the imbalances of large fossil fuel exporting countries which are currently running a trade surplus.

Second, we eliminate trade imbalances for all countries at the same time. We find that the simultaneous removal of all global trade imbalances lowers world emissions by 0.48 % or 143 mio tons of carbon dioxide. This is roughly equivalent to the annual emissions of Greece or Vietnam. Despite national emission changes being highly heterogeneous in this far-fetched scenario, most countries lower their emissions. This emission reduction is driven by reduced fossil fuel supply to the international market by resource countries formerly exporting more than importing.

While it depends on the circumstances whether trade imbalances are problematic or not, this study adds another perspective to the debate. Removing all global trade imbalances would significantly decrease world carbon emissions under current specialization and consumption patterns and would decrease countries' abilities to outsource pollution emissions to their trading partners.