Title: Trade Agreements, Import Bans, and the Leverage of the E.U. on Reducing Deforestation in Brazil

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Deforestation in Brazil has become an important issue shaping its trade relationship with the European Union (E.U.). The ratification of the EU-MERCOSUR trade agreement remains stalled because some EU members have expressed worries that enhancing the access of Brazilian products to the EU market may incentivize further land clearing. With or without an EU-MERCOSUR trade agreement, the recently adopted EU deforestation regulation (EUDR) will imply market restrictions for tropical products that caused deforestation. The EUDR bill relies on private actors along the supply chain to help enforce the proposed regulations in their operations in the host countries. Conditioning the ratification of a preferential trade agreement on commitments to reduce deforestation, coupled with trade restrictions that punish products associated with recent land clearing, offers novel and interesting uses of trade policy to achieve environmental goals. The extent to which these policies can succeed will depend on a complex set of market conditions and legal developments, that range from the changing EU market shares of commodities produced in the tropics, to potential legal challenges of the use of trade policy to discriminate among products based on whether they are associated with recent deforestation. This paper investigates the potential effectiveness of the use of trade policy by the EU to reduce deforestation in Brazil: Does the E.U. have enough market leverage as an importer of deforestation-risk commodities to exert enough pressure to change producing practices in Brazil?

We measure market leverage by comparing the welfare outcomes of Brazil from complying with zero-deforestation regulations to preserve and enhance access to the EU market to the welfare outcomes of foregoing access to the EU markets while increasing the market share of deforestation commodities sold in other parts of the world. We also estimate the welfare outcomes of the implementation of the EU-MERCOSUR FTA and explore the extent to which this agreement may provide enhanced economic incentives to incur the costs associated with complying with the EUDR. We use a computable general equilibrium model based on the GTAP-AEZ framework (Hertel et al. 2009) that remaps AEZs in Brazil onto the Amazon, the Cerrado, and other biomes (Villoria et al. 2022). The model is modified to handle tariff-rate quotas (TRQs) because these types of policy instruments are used in the FTA. A CGE model such as this allows an understanding of the distributional effects of the involved policies across the production and consumption of land-based products and non-land manufacturing, thus shedding light on the potential conflicting consequences of deforestation on industries and consumers broadly conceived.

We work with four scenarios:

Baseline (Baseline): We simulate medium-run changes in the global economy between 2014 (GTAP V11) and 2022 using observed demographic, macroeconomic, and technological drivers of the world economy as in Yao et al. (2018). This gives a medium-term horizon that we can validate against recent observed land use outcomes, and against to which superimpose the counterfactuals described below.

Loss of Access of Brazil's EUDR Commodities to the EU Market (EDR-No-Comply): In this scenario, we assume that Brazilian exporters chose not to comply with an EUDR hypothetically in place since 2014, so that the EU applied prohibitive tariffs on the EUDR commodities produced in Brazil (e.g., soy, coffee, beef, cocoa and wood) in addition to all the developments in the Baseline scenario, i.e., EDR-No-Comply = Baseline + Prohibitive EU tariffs on Brazil's EUDR commodities. This scenario measures the extent of the losses for Brazil if its supply chain actors do not take measures to comply with the EUDR. The difference between this scenario and the Baseline is a gross measure of the leverage that the EU possesses to compel Brazil to comply with the EUDR. It is gross because it does not consider the costs of such compliance. These costs are estimated in the next scenario.

Implementation of Land Use Restrictions to Comply with the EDR (EDR-Comply): Models compliance with the EUDR in the Baseline scenario. Here we follow Villoria et al. (2022) and fix cropland in places that grow the crops subject to the EDR and are prone to deforestation, while quantifying the implicit subsidy necessary to compensate farmers for foregoing the revenues associated with deforestation. We also assume that if a supply chain adopts zero deforestation practices, all the supply chain is converted to zero deforestation. Fixing cropland and assuming complete conversion of the relevant supply chains are highly stylized ways of capturing the unobserved costs of adopting zero-deforestation practices at the farm level and separating supply chains so zero-deforestation commodities are separated from those commodities contaminated with deforestation; the latter assumption is supported the experience of discriminating different chains of custody for genetically modified and conventional soy, which proved to be exceedingly costly. The difference of welfare outcomes between EDR-Comply and Baseline are the counterfactual costs or gains of complying with the EUDR regulation to preserve EU market access.

Implementation of the EU-MERCOSUR FTA (FTA): this scenario starts with the EDR-Comply scenario and implements all the changes in tariffs and quotas agreed for the EU-MERCOSUR FTA.[1] This scenario produces the welfare outcomes of complying with the EDR combined with better access to the EU market. The difference between FTA and EDR-Comply measures the increase in leverage gained by the EU to compel Brazil's supply chains to adopt measures broadly compatible with the EUDR.

For each scenario we quantify the changes in land use and land cover as well as associated greenhouse gas emissions.

This is novel work with important potential for discussion as supply-chain zero-deforestation commitments (ZDC)—either voluntary or imposed by the E.U—are a major development in the global efforts to reduce deforestation. They also assign corporations an outsized role in stabilizing the planet's climate by reducing greenhouse gas emissions from deforestation and preserving standing forests that sequester carbon from human economic activity. Yet, corporate pledges and policy proposals are being developed with little understanding of the empirical facts that influence corporate action to reduce deforestation. Conflicting attitudes toward forest protection in China and the EU combined with the absence of financial mechanisms to compensate farmers for the costs of not expanding farmland, hinder the ability of current proposals to succeed. If for Brazil the costs of complying with these policies exceeds the benefits, there is a risk of a greater specialization of Brazil on markets with little concern for

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[1] The tariff elimination schedules available from: https://policy.trade.ec.europa.eu/eu-trade-relationships-country-and-region/countries-and-regions/mercosur/eu-mercosur-agreement_en

the environment, while the US could increase its market share in the more environmentally conscious EU market. This would be a perverse outcome of promoting poorly designed commitments that could be costly for the target countries, exacerbate distrust between countries in the global North and South, and be a lost opportunity to slow down global climate change and preserve biodiversity.

References

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