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# Working Paper High Tariffs, High Stakes: The Policy Drivers Behind Firm-Level Adoption of Green Technologies

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# High Tariffs, High Stakes: The Policy Drivers Behind Firm-Level Adoption of Green Technologies

# Abstract

Addressing climate change requires green technology deployment. This paper uses firm-level import data in 35 emerging markets to examine how trade policies affect firms' imports of products associated with solar, wind power, and electric vehicle value chains. Panel estimates show a particularly negative effect of tariffs on green value chain imports compared to average imports, especially in solar and downstream segments. This effect is pervasive from import values and quantities to import probabilities, with undiversified firms most affected. Import regulations have smaller, varied impacts. Emerging markets should avoid protectionist policies, as local firms depend on imports to adopt green technologies.

JEL-Codes: F130, F140, L110, O190.

Keywords: imports, green value chains, trade policy, tariffs, non-tariff measures, firm-level imports, decarbonization value chains, green technology adoption, trade and environment, green technologies.

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# 1 Introduction

Addressing climate change requires the deployment of low-carbon or green technologies, such as solar photovoltaic (PV), wind power, or batteries for electric vehicles (EV). Trade plays a crucial role in facilitating the diffusion of these technologies beyond their production centers. However, trade policy is increasingly being used – mostly in high-income countries – to restrict imports of green technologies to eliminate unfair competition and to protect national security. The recent tariffs imposed by the European Union (EU) and the United States (US) on imports of China's electric vehicles, lithium-ion batteries, and solar cells illustrate this trend. For most emerging markets, imports are the main channel to access green technologies, but we know very little about the patterns of trade protection in place and how they influence such imports.

In this paper, we use novel firm-level import transaction data for 35 emerging markets over the period 2017-2021 to examine the trade policy drivers of firms' green technology imports at the intensive and extensive margins. We focus on the dominant instruments of today's trade policy: tariffs and non-tariff measures (NTMs), with variation over time, across countries of origin and products. Specifically, we consider the two most common types of NTM: Sanitary and Phytosanitary measures (SPS) and Technical Barriers to Trade (TBT) that regulate the appearance of imported products (e.g., nutritional labeling requirements), but also their production process (e.g., pesticide residue restrictions).<sup>1</sup> Using a careful mapping of products associated with green value chains of EV, solar, and wind turbines recently proposed by Rosenow and Mealy (2024) in a dynamic structural gravity framework, this allows us to assess the relative importance of different trade policy instruments and their heterogeneous effects among importing firms.<sup>2</sup>

Our main findings are as follows. First, firms' import response to tariffs is particularly adverse for green value chain products relative to average imports. On average, a one standard deviation decrease in tariffs is associated with a 3.3% increase in firms' imports of green value chain products. Second, trade regulations like SPS and TBT have a smaller and ambiguous impact on firms' imports of green value chain products. While imports decrease with the stringency of TBT ad-valorem equivalents (AVEs), they increase with SPS AVE stringency. Third, importing firms in the solar value chain and importing firms in the downstream segments of green value chains are the most responsive to trade policies. Fourth, the adverse impact of tariffs on the imports of green value chain products is particularly strong for undiversified firms. Finally, this effect is pervasive for both the level and the probability of firms importing green value chain products.

<sup>&</sup>lt;sup>1</sup>See United Nations Conference on Trade and Development (2012) and Espitia et al. (2020). An example of an SPS on green value chain products is a maximum residue limit established for heavy metals. An example of a TBT on green value chain products is a requirement that machines need to carry a label indicating their size, weight, and level of electricity consumption.

<sup>&</sup>lt;sup>2</sup>In what follows, we use interchangeably the terminology 'green technologies', 'green products', 'green value chain products', and 'products associated with green value chains'.

This paper advances our understanding of the role of trade policy in green value chain trade, contributing to three strands of literature. First, our paper relates to the trade and climate literature, which highlights the interplay between trade policy and climate change mitigation efforts. Trade challenges climate goals through carbon leakage, as Grossman and Krueger (1991) pollution-haven hypothesis suggests that trade liberalization causes polluting industries to relocate to countries with weaker environmental regulations. While many countries, including the EU, adopted carbon taxes and other measures to reduce greenhouse gas emissions, non-taxing countries gained a trade advantage through lower production costs. The EU's Carbon Border Adjustment Mechanism (CBAM), a tariff on imports based on their carbon content, and other trade policies seek to induce these countries to decarbonize their economies according to Climate Club members (Nordhaus, 2015). Such carbon taxes are being introduced to counteract the evidence of stronger trade protection for green goods relative to emissionsintensive goods obtained for the US and other advanced economies (Shapiro, 2020).

Second, our paper relates to the decades-old literature on trade and endogenous growth, which argues that imports of capital goods and intermediate inputs are a key channel for the diffusion of advanced technologies to firms in emerging markets (Coe et al., 1997; Eaton and Kortum, 2002; Keller, 2004). Specifically, our paper contributes to an emerging literature on the adoption and diffusion of green technologies. Bastos et al. (2024) examine the diffusion of low-carbon technologies between regions, countries, and industries.<sup>3</sup> Their evidence shows a rapid increase in the deployment of low-carbon technologies in 2022, particularly in advanced economies, which is linked to the global energy crisis resulting from the Russian invasion of Ukraine.

Third, our paper relates to the literature on the impact of NTMs on trade.<sup>4</sup> The studies generally find negative effects of NTMs, but often rely on a cross-section of products subject to different NTMs at a fixed point in time. An emerging set of studies exploit the time variation in NTMs to estimate their impact on trade at the product level. While tariffs are expected to hurt imports, the effects of NTMs on trade depend on compliance costs relative to information benefits and are, in theory, ambiguous. At the firm level, to our knowledge, existing studies focus only on the decisions of exporting firms as a function of the NTMs they face in their destination markets (Fontagné et al., 2015; Fontagné and Orefice, 2018; Fernandes et al., 2019; Rosenow, 2024).

Our study complements these three literature strands in several ways. First, we consider the adoption of green technologies through firms' import decisions at the intensive and extensive margins, a crucial channel for the diffusion of embedded knowledge in emerging markets. Using transaction-level import data from 35 emerging markets, we capture the heterogeneity and specific behavior of firms.

<sup>&</sup>lt;sup>3</sup>They define low-carbon technologies according to the European Patent Office's classification of patents related to climate change mitigation technologies and capture diffusion through their inclusion in the text of job postings or in quarterly earnings calls of large firms. Some of the key groups of their low-carbon technologies are renewable energy, new energy vehicles, improved thermal performance, and electricity generation and storage.

<sup>&</sup>lt;sup>4</sup>See Ederington and Ruta (2016) for surveys of the literature.

Unlike country or product-level trade data, this provides detailed insights into how firms respond to trade policies and adopt new technologies. Second, we examine the relative importance of different trade policies in mitigating climate change. We highlight the trade-off between decarbonization and economic security faced by high-income countries as they adopt protectionist policies to reduce dependence on China, the leading producer of green technologies. Our findings show a strong adverse response to tariffs, suggesting that emerging market firms should avoid similar policies, as they rely on imports for the short-term diffusion of green technologies. Third, we focus on a broad and diverse group of emerging markets, where current understanding of green technology adoption and existing trade policies remains limited. Fourth, we gather novel evidence on the role of firm heterogeneity for the responses to trade policy for importing firms and specifically for their green value chain imports.

The remainder of the paper is structured as follows. Section 2 provides a brief conceptual discussion. Section 3 describes our data sources. Section 4 documents stylized facts about firms importing green technologies and the trade policy measures they face. Section 5 explains our empirical strategy. The results and robustness tests are presented in Section 6. Finally, Section 7 concludes and discusses the implications of our results.

### 2 Conceptual Discussion

Since the seminal paper by Melitz (2003) and subsequent work by Chaney (2008) and Bernard et al. (2011), trade models with firm heterogeneity generate responses at the intensive and extensive margins to changes in trade costs. In models focused on exports, fixed and variable trade costs are predicted to negatively affect firms' export decisions at the extensive margin. However, the impact on the intensive margin is less clear. Fixed trade costs should not have an effect, as existing exporters have already incurred these costs. Additionally, under certain model assumptions, variable trade costs may also have no impact on firm exports.<sup>5</sup>

Firm import decisions have also been considered in the context of models with self-selection based on firm productivity (Gopinath and Neiman, 2014; Laszlo Halpern and Szeidl, 2015; Antràs et al., 2017). A key assumption in such models is that firms must pay a fixed cost to import which, in principle, generates a response of imports at the extensive margin.<sup>6</sup>

The literature on production fragmentation and vertical specialization with foreign sourcing suggests that high fixed costs influence import dynamics (see Yi (2003)). This implies that small reductions in variable trade costs will lead primarily to increased imports (of intermediates) at the intensive margin by existing firms, with little change on the extensive margin. Empirical evidence confirms a modest re-

<sup>&</sup>lt;sup>5</sup>Under the assumption of a Pareto distribution for firm productivity, variable trade costs do not affect the intensive margin of exports.

<sup>&</sup>lt;sup>6</sup>Antràs et al. (2017) motivate such assumption by their evidence across countries that importers are larger than non-importers and that such relative size advantage increases in the number of countries from which importers source.

sponse of firms' import participation decisions to modest tariff reductions (Feinberg and Keane, 2009). Similarly, the same is found when the extensive margin is measured at the product level (Debaere and Mostashari, 2010).

Trade policy instruments can act as variable and/or fixed trade costs. Tariffs are variable trade costs that vary over time and are charged as a percentage of the import value. In contrast, regulatory NTMs, such as SPS and TBT regulations, and associated compliance costs imply fixed trade costs and possibly also fixed production costs.<sup>7</sup> On the other hand, when SPS standards become more prevalent in an industry, small, low-quality firms are forced to leave (Macedoni and Weinberger, 2022).

However, while understood as fixed trade costs, regulatory NTMs in theory have an ambiguous effect on imports at both margins. On the one hand, labeling requirements or safety certifications are telling examples of regulatory NTMs, assuring safety and product quality for consumers and encouraging imports. On the other hand, these regulations also increase importers' compliance and thus production costs since additional investment in technology and processes may be required. This implies that regulatory NTMs can both reduce the supply of and increase the demand for tradable goods. As a result, their impact on imports depends on compliance costs relative to information benefits.<sup>8</sup>

Overall, the literature does not offer clear predictions on the impact of variable and fixed trade costs on imports at intensive and extensive margins. Therefore, this remains an empirical question that we address in our analysis.<sup>9</sup>

### 3 Data

The empirical investigation is based on four different databases, all covering the period 2017–2021. The first database contains novel information on import transactions. The second database is a classification of HS 6-digit products included in trade data into three green value chains, taken from Rosenow and Mealy (2024). The third and fourth databases measure trade policy: bilaterally applied ad valorem tariffs and ad valorem equivalents (AVE) of different types of NTMs.

#### 3.1 Firm-Level Customs Transaction Data

We use novel transaction-level import data for 35 emerging markets that is part of the expansion to the Exporter Dynamics Database, described in Fernandes et al. (2016). The countries listed in Appendix

<sup>&</sup>lt;sup>7</sup>The evidence supports the modeling of regulatory NTMs as fixed cost. On the one hand, export destinations with a higher number of regulations see fewer exporters (extensive margin), but an unchanged average value per exporter (intensive margin), as shown in Macedoni and Weinberger (2024).

<sup>&</sup>lt;sup>8</sup>Bratt (2017) draws on the models by Marette and Beghin (2010) and Beghin et al. (2012) to formalize how NTMs can have dual effects on imports: if an NTM raises fixed or variable costs, it may lower demand and reduce imports; however, if the NTM acts as a screening tool to reduce information asymmetries, it can lower transaction costs and increase imports by improving product quality. Zavala et al. (2023) provide evidence supporting this last effect, showing increased imports associated with NTMs.

<sup>&</sup>lt;sup>9</sup>In particular it is difficult to generalize predictions from models with firm heterogeneity for exports to imports due to an important difference in how import decisions are modeled under firm heterogeneity and fixed sourcing costs, with interdependence across markets whereas export decisions are separate across markets.

Table A1 are diverse and spread across regions.<sup>10</sup>

For each country, the data cover the universe of importing firms in all sectors at the importing firm-HS 6-digit product-origin country-year level and includes seven variables: importing country, importing firm unique identifier, country of origin, HS 6-digit product, import value, import quantity, and year.<sup>11</sup> Information on import values is expressed in US dollars, while information on import quantity is expressed in kilograms.<sup>12</sup> Raw data for each country were subjected to a series of cleaning procedures, as described in Fernandes et al. (2016). In particular, we exclude from each country's data all observations for HS 6-digit products belonging to the oil sector (HS chapter 27).<sup>13</sup> The reason for this is the poor coverage of oil imports in customs data. In addition, this helps to avoid potential distortions from commodity price cycles. As our analysis focuses on the data for the period 2017–2021, we use the HS 2017 nomenclature as it appears in the raw data. The bulk of our analysis focuses on the subset of importing firms and their products in green value chains, as described in the next section. However, for some calculations, our analysis uses the universe of importing firms and products.

We consider two outcome variables to capture both the intensive and extensive margins of firmlevel imports. For the intensive margin, the outcome variable  $Y_{i,f,j,v,t}$  is the logarithm of firm f's import value from origin country *j* for 6-digit HS product *p* in year *t*, where the importing firm is located in country *i*. For the extensive margin, the outcome variable  $Y_{i,f,j,p,t}$  is a binary variable equal to 1 if firm f imports a positive value of product p from origin country j in year t, and 0 otherwise. This requires expanding the initial database so that for each importing country, each firm-product-origin country has an observation in all sample years, with an import value of zero in a year when imports by the firm-product-origin country do not occur.<sup>14</sup>

For our heterogeneity analysis, we identify firms' import diversification, by first determining the number of HS 6-digit products that each firm imports in its first year in the sample  $t_0$ . We then define an indicator variable I[Single Product  $f_{f,t_0,vc}$ ], which is equal to one for firms that import only a single product, and zero for firms that import multiple products.<sup>15</sup>

<sup>&</sup>lt;sup>10</sup>The import data is obtained from customs agencies but for India, Mexico, Sri Lanka and Viet Nam, the import data is obtained from the S&P Global Market Intelligence's Panjiva data platform. See Ghose et al. (2023) for a description of how firm identifiers are constructed for Sri Lanka. A similar approach is followed for the other three countries.

<sup>&</sup>lt;sup>11</sup>Concerns about imports being simply re-exports are mitigated by two factors. First, our country sample does not include transshipment locations, such as Singapore; Hong Kong SAR, China; or the Netherlands, where firms import to then export the same products without transformation. Second, our cleaning of firm-level import data excludes from import value flows that are re-imports, temporary imports, and warehouse import regimes.

<sup>&</sup>lt;sup>12</sup>Chile, India, Mexico and Viet Nam do not include quantity (in kilograms) information and are thus excluded from the analysis of firm import quantities.

<sup>&</sup>lt;sup>13</sup>Total imports for each country and year based on our customs data are very similar to the corresponding total non-oil imports reported by UN COMTRADE.

 $<sup>^{14}</sup>$ The objectives in constructing the expanded database is to have observations that are economically meaningful, i.e., that indicate plausible firm choices with as few assumptions as possible, and keep the size of the database computationally manageable. To build intuition about our filling procedure, consider an observation from the initial database in which firm f begins to import product p from the origin country j in year t. If in the expanded database we add an observation with a zero import value for firm f product p origin country j in year t-1, this implies that in year t-1 we allow firm f to choose whether to import product p from origin country j and the firm chooses not to do so. This is a plausible and not overly restrictive assumption. Firms that import from a product-origin market in every year and thus have a zero in the dependent variable in every year, are effectively dropped from the estimation sample for the extensive margin given the specific fixed effects (firm-product-origin) included in our specifications. <sup>15</sup>The use of a time-invariant indicator variable defined in the first year of a firm's observation helps to mitigate endogeneity

#### 3.2 Green Value Chains Data

To identify products in the value chains of decarbonization technologies, we follow the approach of Rosenow and Mealy (2024). That study provides a mapping of the 6-digit HS products corresponding to the segments of raw and processed materials, subcomponents, and end products in the value chains of solar panels, wind turbines, and electric vehicles.<sup>16</sup> The mapping was constructed based on (i) a thorough review of the literature on the identification of products associated with the value chains of solar panels, wind turbines and electric vehicles, (ii) a careful examination of the description of these products to classify them into the various segments of the value chains (raw and processed materials, subcomponents, and finished products), and (iii) a validation of the mapping by industry specialists in each of the value chains who compared the technical specifications of the products in the value chains to the HS 6-digit descriptions.<sup>17</sup> Appendix table A2 provides a definition of the value chain segments, and end products. Appendix Table A3 compares the number of HS 6-digit products mapped to each value chain and segment.<sup>18</sup>

#### 3.3 Tariff Data

For our key trade policy measure, tariffs, we rely on two data sources to maximize time series coverage for the 35 countries: ITC's Macmap (for 27 countries) and WTO-IDB (for 8 countries).<sup>19</sup> From each data source we take applied tariff rates by importing country-HS 6-digit product-origin country for each year between 2017 and 2021. Applied tariff rates reflect the lowest available tariff. If a preferential tariff exists, it is used as the effectively applied tariff. Otherwise, the Most-Favored-Nation (MFN) tariff is used.

#### 3.4 NTM Data

For NTMs, we rely on time-varying bilateral AVE at the HS 6-digit product level from Ghodsi et al. (2024), constructed following the methodology proposed by Kee et al. (2008) and Kee et al. (2009). Ghodsi et al. (2024) obtain AVEs for two types of regulatory NTMs: SPS and TBT. SPS and TBT measures are the most commonly used NTM types.

To construct NTM AVEs for TBT and SPS measures, Ghodsi et al. (2024) first obtain the impact of the

bias by addressing reverse causality in the relationship between firm-level imports and the explanatory variables. See Rosenow (2024) or Fernandes et al. (2021).

<sup>&</sup>lt;sup>16</sup>A caveat to this mapping is that HS 6-digit products may have dual use, being used for decarbonization technologies as well as for other purposes. Such granularity cannot be measured using HS 6-digit data.

<sup>&</sup>lt;sup>17</sup>For electric vehicles, Rosenow and Mealy (2024) propose a narrow and a broad mapping. We choose the narrow mapping, which ensures that we do not consider HS 6-digit products that are also used for internal combustion engine vehicles.

<sup>&</sup>lt;sup>18</sup>The full list of HS 6-digit products mapped to each value chain is provided in Annex A3 of Rosenow and Mealy (2024). <sup>19</sup>The websites for these two sources of tariff data are: https://www.macmap.org/ and http://tariffdata.wto.org/Default.aspx?culture=en-US.

stock of NTMs on bilateral import volumes of HS 6-digit products for the period 1996-2021 estimating a gravity regression using Poisson pseudo maximum likelihood (PPML) to account for zeros in import volumes.<sup>20</sup> To address the potential endogeneity of NTMs on import volumes, an instrumental variable approach is used following Kee et al. (2009). The exogenous instruments for NTMs are bilateral HS 6-digit product-year export volumes, lagged growth in bilateral HS 6-digit product year import volumes, and a price-weighted average of NTMs imposed by other countries on the same HS 6-digit product. In a second step, Ghodsi et al. (2024) divide the estimated impacts of the two types of NTM by bilateral import demand elasticities that vary between the importing and exporting countries' HS 6-digit product using estimates from Adarov and Ghodsi (2023).<sup>21</sup>

The resulting AVEs for SPS and for TBT are ad valorem and vary at the importing country-exporting country-HS 6-digit product-year level. For example, an AVE for SPS of 5% indicates that the set of SPS measures imposed by the importing country on that product from that origin country in a year is equivalent to a tariff rate of 5% being imposed on imports of that product. NTM AVEs are set to zero by Ghodsi et al. (2024) when estimates are insignificant and can be negative, in which case they indicate that the measures encourage imports. This occurs for 26.2% of the observations in our sample, and we test the robustness of our results to excluding such observations.

We express NTMs in AVE terms to capture their stringency and make them comparable to tariffs, which are also expressed in ad valorem terms. However, as a robustness test, we also consider simple indicator variables for the presence of SPS or TBT at the importing country-exporting country-HS 6-digit product-year level.

# 4 Stylized Facts

The share of green products in total imports increased in most countries between 2017 and 2021, particularly in wealthier ones like Costa Rica, Mexico, and Viet Nam, as seen in Appendix Figure A1. This patterns holds for all green value chains, but EVs' share of total imports remains small, under 5% in all countries except Mexico and Viet Nam. Next, we look at the microeconomics behind these imports, presenting a set of stylized facts about importing firms in the three green value chains and the trade policies they face.

First, while average imports of green products per firm vary widely, most firms show an increased but sporadic likelihood of importing green products. Figure 1 shows the evolution over time in our firm-level outcome variables across countries to make this point. Panel (a) shows that countries with

<sup>&</sup>lt;sup>20</sup>Their regression controls for bilateral HS 6-digit product-year tariffs, GDP and GDP per capita of the importing and exporting country, and bilateral controls: geographic distance between the country pair, colonial links, common language, contiguity, and having been a single country in the past, and a variable indicating that both countries are members of the World Trade Organization (WTO). Information on the number of SPS and TBT measures is obtained from the WTO Integrated Trade Intelligence Portal (I-TIP).

<sup>&</sup>lt;sup>21</sup>Import demand elasticities indicate how much, in percentage terms, import volumes change when import prices change by 1%. Adarov and Ghodsi (2023) estimate import demand elasticities using data for the period 1996-2018.

higher average import values per firm in green value chains in 2018 maintained higher average import values per firm until 2021.

However, there is substantial heterogeneity in average imports per firm between countries, value chains, and segments. Firms in Zambia (raw materials for solar), Viet Nam, or Georgia (both raw materials for electric vehicles) import on average millions of US dollars' worth of green products while firms in Malawi (raw materials for solar) and Georgia (raw materials for solar) import on average green products worth less than 10,000 US dollars.

Panel (b) reveals that firms' probability of importing green products increased for most countries across value chains and segments. This suggests a dynamic and expanding market for green value chain products for our emerging markets sample. However, many firms are importing green products only sporadically, as shown by import probabilities in the 20%-40% range.<sup>22</sup>

Second, tariffs on green value chain products have consistently been lower than those on other products, with the gap widening over time. Figure 2 illustrates this by showing the distribution of tariffs on imports of green versus non-green products in our sample.<sup>23</sup> Three findings merit attention. First, tariffs on green value chain products were, on average, lower than those on other products in all years. Second, the gap between tariffs for green and non-green products widened over time: the median tariff on green value chain products dropped from around 6% until 2019 to 4% in 2020. Third, there is substantial heterogeneity in tariffs across countries. Georgia and Mauritius allow duty-free imports of green value chain products whereas Ethiopia and Togo impose average tariffs of more than 15%.<sup>24</sup>

Third, tariffs rates and AVE of NTMs exhibit heterogeneity across green value chains and their segments. Panel (a) of Figure 3 shows that import tariffs on raw materials are low in the value chains of electric vehicles and wind, with a median across countries of 0%. In contrast, import tariffs are much higher in the solar value chain, with a median across countries greater than 5% and an average tariff of 27% in Gabon. On average, SPS and TBT have positive AVEs, as seen in panels (b) and (c). The AVEs are particularly high for end-products in the solar and wind value chains and for EV subcomponents, with medians across countries exceeding 20%. However, negative AVEs are also found, especially for SPS on processed materials and for TBT within the solar value chain.

Fourth, EV products face tariff escalation, while wind products experience tariff de-escalation. Panel (a) shows that tariffs on EV products are higher for processed materials and subcomponents, with particularly steep tariffs on end products. In Cambodia, Ecuador, Sri Lanka and some Sub-Saharan African

<sup>&</sup>lt;sup>22</sup>Product and origin diversification of importing firms in green value chains increased between 2017 and 2021, as seen in Appendix Figure A2. The number of HS 6-digit products per importing firm increased for several countries in the wind and solar value chain, but remains relatively small for electric vehicles between 2017 and 2021. The number of origin countries per importing firm increased from 2017 to 2021 for several countries, but it hovered from 1 to 3 for all countries over time.

<sup>&</sup>lt;sup>23</sup>Non-green products are defined here as all that are not part of a green value chain according to Rosenow and Mealy (2024). <sup>24</sup>India diverges from the global trend of reducing import tariffs on green value chains, as seen in Appendix Figure A3. For all green value chains, India imposes some of the highest tariff rates among countries and tariffs for solar and wind products exhibit a significant upward trend. This reflects India's protectionist policies recently documented in World Bank (2024) and efforts to encourage domestic production in green product industries by discouraging imports.

countries (Gabon, Kenya, Senegal, Tanzania, and Uganda), the average tariffs imposed on imports of products in the end segment of the EV value chain exceed 20%. In contrast, products in the solar value chain face tariff de-escalation, with significantly lower tariffs on processed materials and subcomponents, and especially low tariffs on end products. Solar panels can be imported duty-free in 26 countries in our sample. Finally, in the wind value chain, tariffs decrease from the processed materials segment to the subcomponent segment and further to the end product segment.

Fifth, unconditional correlations suggest that, on average, tariffs are associated with a reduction in both the value of firms and the likelihood of imports within green value chains for our sample of emerging markets. Panel (a) of Figure 4 illustrates the inverse relationship between firms' average imports and tariff rates. Panel (b) shows a negative correlation between firms' average probability of importing and tariff rates. We delve deeper into these relationships in the subsequent section with our econometric analysis.

### 5 Empirical Methodology

We use a firm-product dynamic structural gravity model to examine the impact of trade policy on firms' green technology import behavior at the intensive and extensive margins. Our specification for both margins is as follows:

$$Y_{i,f,j,p,t} = \beta_1 ln(1 + \tau_{i,j,p,t-1}) + \beta_2 ln(1 + \text{AVE SPS}_{i,j,p,t-1}) + \beta_3 ln(1 + \text{AVE TBT}_{i,j,p,t-1}) + \gamma X_{i,j,p,t} + \omega_{f,j,p} + \omega_{f,t} + \varepsilon_{i,f,j,p,t}$$
(1)

where *f* is a firm in country *i* that imports from origin country *j* HS 6-digit product *p* in year *t*. The outcome variable  $Y_{i,f,j,p,t}$  is: (i) for the intensive margin either the logarithm of firm import value, import quantity<sup>25</sup> or import unit prices, and (ii) for the extensive margin the indicator variable for import participation defined in Section 3.1. Our regressors of interest are tariffs and AVEs for SPS and for TBT, all entering as the logarithm of 1 plus their percentage rate.

The vector  $X_{i,j,p,t}$  of control variables includes three bilateral time-varying variables: (i) an indicator variable for the existence of a Preferential Trade Agreement ( $PTA_{i,j,t}$ ) between importing country and sourcing country in year t; (ii) the logarithm of the average bilateral tariff on products that are not part of green value chains (Non-Green Tariff\_{i,j,t}) and (iii) a measure of market size in origin countries defined as the total exports from a given origin country in an HS 6-digit product in a green value chain to the world excluding the importing country (Market Size\_{i,j,p,t}). This control accounts for supply shocks at the product level, in particular the growth of China as a supplier of green goods.

<sup>&</sup>lt;sup>25</sup>Import quantity is measured by import weight and import unit prices are defined as import value divided by import weight.

We exploit the granularity of the data to control for two types of stringent fixed effects. This greatly reduces concerns about alternative explanations for our effects. First, fixed effects at the firm-origin country-HS 6-digit product level  $\omega_{f,j,p}$  account for unobserved heterogeneity in the panel dimension of the data, and thus allow us to identify our coefficients of interest based on *within* firm-origin countryproduct changes in imports as tariffs or AVEs for NTMs change at the origin country-product level over time. Second, firm-year fixed effects  $\omega_{f,t}$  capture firm productivity or other granular firm demand or supply shocks that can influence firm import decisions. Note that since each firm is located in a unique importing country, the firm-year fixed effects are a richer substitute for the importing country-year fixed effects that would be expected in a structural gravity regression. Moreover, such effects account for a large global shock experienced during our sample period: the Covid-19 pandemic. Together, our two fixed effects control for multilateral resistance terms in a structural gravity equation (Baier and Bergstrand, 2007; Felbermayr et al., 2020).

To explore heterogeneous effects of trade policies across firm types, we estimate:

$$Y_{i,f,j,p,t} = \beta_1 \ln(1 + \tau_{i,j,p,t-1}) + \beta_2 \ln(1 + \tau_{i,j,p,t-1}) \cdot I[\text{Single Product}_{f,t_0,vc}] + \beta_3 \ln(1 + \text{AVE SPS}_{i,j,p,t-1}) + \beta_4 \ln(1 + \text{AVE SPS}_{i,j,p,t-1}) \cdot I[\text{Single Product}_{f,t_0,vc}] + \beta_5 \ln(1 + \text{AVE TBT}_{i,j,p,t-1}) + \beta_6 \ln(1 + TBT_{i,j,p,t-1}) \cdot I[\text{Single Product}_{f,t_0,vc}] + \gamma X_{i,j,p,t} + \omega_{f,i,p} + \omega_{f,t} + \varepsilon_{i,f,i,p,t}$$
(2)

where variables are defined as above, and I[Single Product<sub>*f*,*t*<sub>0</sub>,*vc*] represents a time-invariant indicator for firms importing a single product in a given value chainFac, as defined in Section 3.1. Small firms tend to be less diversified, hence in the absence of an ideal measure of firm size this single-product indicator also acts as a proxy for firm size.<sup>26</sup></sub>

We estimate both intensive and extensive margins of firm import decisions in Equations 1 and 2 with high-dimensional ordinary least squares (OLS). Our model for import participation follows recent contributions, such as that of Boschma and Capone (2015), and sticks to the linear probability model for the binary outcome. There are many reasons to do so. First, non-linear models suffer from the so-called incidental parameter problem with many fixed effects, as described by Greene (2004). In these models, the maximum likelihood estimator tends to be inconsistent when T, the length of the panel, is fixed, as in our case with four time intervals. Second, non-linear fixed effects models are not the most commensurate estimation technique, given Angrist and Pischke (2009) argument that average effects from the linear probability resemble marginal effects of non-linear models. Third, and crucial for our case, non-linear fixed effects models impose a challenging computational complexity. Estimating two large groups of interacted fixed effects in our expanded firm database across 35 emerging markets proved untenable.

 $<sup>^{26}</sup>$ The correlation between indicator variables for single-product firms and small firms, defined as those with import values below their median in a value chain and segment in their first year in the sample  $t_0$ , is 0.4273.

For comparison purposes, we report standardized coefficients in all tables by normalizing the independent variables to have a mean of zero and a unit standard deviation in their respective samples. The inference is based on Huber-White robust standard errors, clustered at the level of the importing country-origin country-HS 6-digit product to account for the source of variation in the three policy variables of interest.

One concern when estimating these equations is the potential endogeneity of trade policy with respect to import performance. However, from the perspective of an individual firm in Equation 1, it is unlikely that trade policies are specifically tailored to its import performance. If anything, one could argue that a higher level of import penetration might encourage increased trade restrictions. Still, to assuage potential endogeneity concerns, we include a one-year lag of all trade policy measures. Additionally, the inclusion of a rich set of fixed effects in our specifications helps mitigate concerns about omitted variable bias. Moreover, in robustness tests we follow an estimation approach that controls for an Inverse Mills Ratio (IMR) to address non-random firm selection into importing. The results from this approach confirms our baseline findings and show that selection bias is accounted for.

Before delving into econometric estimates, we present summary statistics on the variables entering the regressions in Table 1. Panel A displays statistics for the sample used for analysis on the intensive margin of imports, at the importing country-firm-origin country-HS 6-digit product-year level. On average, firms in our 35 emerging markets import \$171,146 worth per year per product in a green value chain from an origin country.<sup>27</sup> Firms face, on average, tariffs of 1.2% and SPS and TBT regulations with ad valorem equivalents of 0.9% and 1.3%, respectively. In the sample, 4% of observations correspond to firms importing a single product.<sup>28</sup> Our sample includes 66% of observations for firm imports from origin countries with a bilateral trade agreement.

Panel B reports the statistics for the sample used for analysis on the extensive margin of imports, also at the importing country-firm-origin country-HS 6-digit product-year level. The probability of importing is a frequent phenomenon: on average, firms import green products in 37% of the possible cases.

### 6 Results

#### 6.1 Intensive Margin of Imports: Baseline Results

We first evaluate the impact of trade policy on firms' imports of green value chain products at the intensive margin. Table 2 presents the results from estimating Equation 1, considering the complete

<sup>&</sup>lt;sup>27</sup>For clarity we report average imports in levels rather than logarithms, which will be used in the empirical specifications. We also report tariffs and SPS and TBT AVE as rates rather than logarithms, which will be used in the empirical specifications.

<sup>&</sup>lt;sup>28</sup>By definition, single-product firms have fewer observations in the database. However, the majority of importers are single-product firms, making up 71.3% of all firms in our sample.

sample for all three green value chains in column (1) and results for sub-samples of each green value chain in columns (2)-(4), and for subsamples of each of value chain segment in columns (5)-(8).<sup>29</sup> Tables 3, 4, and 5 present further results for the intensive margin, showing heterogeneity for India and non-green products as well as a decomposition into import quantity and unit prices.

Seven key findings emerge. First, firms' imports of green value chain products are most responsive to tariffs, relative to NTMs. The negative effect of tariffs is both statistically and economically significant. Column (1) of Table 2 suggests that, on average, a one standard deviation decrease in tariffs (about 5%) is associated on average with a 3.3% increase in firms' imports of green value chain products. Given the 2 percentage point reduction in import tariffs on green technologies between 2017 and 2021 shown for countries in our sample in Figure 2, our estimates suggest an average increase of 1.2% in firms' imports.<sup>30</sup>

Second, trade regulations have less impact on firms' imports of green value chain products, and the impact is actually ambiguous depending on the type of regulation. TBT reduce firms' imports of green technologies. The estimates in column (1) suggest that a one standard deviation increase in their AVE stringency (about 1.3%) is associated on average with a 0.32% decrease in firms' imports per product-origin country. In contrast, SPS do not have any statistical impact on firm-level imports, with the notable exception of products within the solar value chain.

Third, firms imports in the solar value chain are the most sensitive to trade policies. A one standard deviation decrease in tariffs or in the AVE for TBT for products in the solar value chain is associated with an increase in imports of 4.3% and 0.7%, respectively (column 3). In contrast, a one standard deviation increase in SPS AVE stringency is associated with an average 0.6% increase in firms' imports per product-origin country. This aligns with positive import responses to some trade regulations found by (Zavala et al., 2023), suggesting a role for regulatory NTMs in ensuring consumers of product quality and thus increasing demand.

Fourth, firms' imports are more responsive to tariffs in the downstream segments of green value chains. A one standard deviation increase in tariffs on end-products is associated with decreases in firms' imports of 33% (column 8). In contrast, the elasticities for AVEs of SPS and TBT by value chain segment are inconclusive due to the heterogeneity of the value chain and the importing country.

Fifth, contrary to expectations, Indian firms' imports respond favorably to tariffs. Table 3 presents the results from estimating Equation 1 including an indicator for the importing country India interacted with each of the three trade policy instruments. Column (1) shows that Indian firms increased their imports of green technologies in response to rising tariffs. This interaction effect is statistically significant and different from the average effect across the other 34 emerging markets, which is negative.

<sup>&</sup>lt;sup>29</sup>A similar column structure is followed in all subsequent tables.

 $<sup>^{30}</sup>$ This value is calculated by multiplying the coefficient of -0.0327 by the standardized change: a reduction of 2 percentage points, expressed in standard deviations, is -2%/5%.

over, this effect is particularly pronounced for products in India's solar value chain and especially for end-product segments in all green value chains, as shown in columns (3) and (8), respectively. This supports anecdotal evidence that Indian companies continued importing solar panels despite rising tariffs. Our findings align with new trade theory, which suggests that imports may persist under high tariffs due to consumers' preference for diverse product varieties. This challenges the standard model of tariff-induced losses, which assumes that domestic and imported goods are perfect substitutes.

Sixth, tariffs hurt firms' green imports more than the average import. Table 4 presents the results of estimating Equation 1 for a much larger database that adds to the sample all non-green products and includes an indicator for green products interacted with each of the three trade policy instruments. A one standard deviation increase in tariffs reduces firm-level imports of the average product by 0.9%, while for green products there is an additional significant reduction of 0.8%. This effect is even more pronounced when India is excluded in column (2). To investigate the factors behind this stronger adverse tariff effect, we perform three exercises. In the first exercise, we narrow the sample to include a more relevant comparison group: HS 4-digit subsectors including at least one green value chain product. Columns (3)-(4) of Table 4 show that, within those subsectors, tariffs have no distinct effect on imports of green compared to non-green products. Hence, the differential effect in columns (1)-(2) is driven primarily by products in other HS 4-digit subsectors. In the second exercise, we show that processed materials and subcomponents of green value chains drive the stronger adverse tariff effects observed for the full sample (Appendix Table A5). Both segments consist of intermediate products, which exhibit greater sensitivity to tariffs as they tend to cross borders multiple times within global supply chains. In fact, in the third exercise, we confirm that HS 4-digit subsectors including products associated with green value chain have larger shares of homogeneous products and of intermediates, two product characteristics associated with higher trade elasticities (Fontagné et al., 2022; Grübler et al., 2022; Kee and Nicita, 2022).<sup>31</sup>

Seventh, import quantities drive firms' responses to trade policy. To investigate the mechanisms through which firms' import responses to trade policy changes operate, we decompose the effects into the contribution of import quantity and import price. We estimate Equation 1 with these two variables as the outcome variables and present the results in Table 5: Panel B focuses on import quantities, while panel C examines unit import prices, measured before tariffs are applied. The results indicate that decreases in tariff rates are associated with significantly higher import quantities, especially in the solar value chain.<sup>32</sup>

The absence of tariff pass-through to unit prices (not inclusive of tariffs) in the regression that pools

<sup>&</sup>lt;sup>31</sup>See Appendix Tables A6 and A7. We define homogeneous products following Rauch (1999) and intermediate goods based on the United Nations Classification by Broad Economic Categories (BEC).

<sup>&</sup>lt;sup>32</sup>Since the sample with quantity information is smaller than that in table 2, Panel A of Table 5 provides estimates of the impact of trade policy on firm import values for this smaller sample. The sample used for the quantity and import price regressions excludes Chile, India, Mexico, and Viet Nam.

across all green value chains (column 1) aligns with recent findings on the China-US tariff war. Studies by Amiti et al. (2019), Cavallo et al. (2019), and Fajgelbaum et al. (2019) found no significant effect of tariff increases on US prices (excluding tariff changes). This evidence is consistent with the predictions of a partial equilibrium model of the impact of tariffs when export supply is inelastic. This is likely to be the case in the context of our emerging markets, which are arguably too small to affect the prices set by foreign suppliers of green value chain products.

The three control variables included in Equation 1 have the expected signs and statistical significance. In particular, the presence of a PTA between the importing country and the country of origin supports a significant increase in firm-level imports of subcomponents of green value chains.<sup>33</sup> In addition, an increase in the market size of a firm's sourcing countries is associated with higher import values. Finally, increases in average tariffs on non-green products dampen firm-level imports in green value chains.

Overall, Latin American importing firms explain these results. Appendix D supports this point by estimating Equation 1 separately for each region.<sup>34</sup>

#### 6.2 Intensive Margin of Imports: Robustness Results

We subject our baseline results on the trade policy drivers of firm imports in green value chains at the intensive margin to a number of robustness tests and present the results in the appendix. First, while theoretically correct, negative AVEs for NTMs may not be desirable (Kee et al., 2009). Therefore, we reestimate Equation 1 excluding observations whose AVEs for NTMs are negative. The impacts of tariffs and AVEs of NTMs on firms' imports of green value chain products are maintained (see Appendix Table B1).

Second, we consider alternative standard errors for our baseline specification. Our results are robust to the use of robust standard errors clustered by firm, which allow controlling for within-firm serial correlation (see Appendix Table B2) as well as to the use of bootstrapped standard errors, which may be important in the presence of estimated regressors, such as our AVEs of SPS and TBT (see Appendix Table B3).

Third, while the simple presence of an NTM on imports of a product does not indicate the stringency of such measure as AVEs of NTMs do, it is important to examine whether our findings hold when measures for such presence are used. We consider as NTM measures the number of SPS and TBT measures or an indicator variable for the presence of at least one SPS or TBT, defined at the level of the importing country-origin country-HS 6-digit product-year. In both cases, our baseline results are qualitatively preserved (see Appendix Tables B4 and B5).

<sup>&</sup>lt;sup>33</sup>This is aligned with Foster (2012) who shows that imports respond positively to the presence of a PTA between countries. <sup>34</sup>Country-specific regression results are available from the authors upon request.

Fifth, we estimate Equation 1 by setting the AVE of SPS and TBT to zero when their count variable is zero. This accounts for a potential overestimation of trade costs associated with these NTMs when they are not present. Our baseline results are preserved (see Appendix Table B6).

Sixth, to account for the non-random selection of firms into importing, we follow a control function approach by including the Inverse Mills Ratio (IMR) in the estimation of Equation 1. A control function approach is preferred over an instrumental variable method due to the fact that the primary concern is the potential for selection bias resulting from the firm's individual decision to import, rather than the issue of reverse causality in Equation 1 and the associated endogeneity of the regressors. Moreover, since we model the second stage linearly for both margins, controlling for the IMR is appropriate.

Specifically, we follow the control function approach set forth by Kee and Nicita (2022) and estimate an IMR for each of the three continuous trade policy instruments (TPI): tariffs, AVE of SPS and TBT given by:

$$TPI^{l}_{i,j,p,t} = \Phi\left(\sum_{l \in L} \gamma_{l} \overline{TPI}^{l}_{i',j,p,t} + \gamma X_{i,j,p,t} + \omega_{f,j,p} + \omega_{f,t} + \varepsilon_{l,i,j,p,t}\right)$$
(3)

where  $TPI_{i,i,v,t}^{l}$  indicates the trade policy instrument of type l imposed by importing country i on origin country *j* and product *p* in year *t*;  $\Phi$  represents the cumulative distribution function of the standard distribution;  $\gamma_l$  evaluates to which extent an importing country *i* is more likely to implement a TPI of type l given its three closest countries i' implement TPI of type l; and  $\overline{TPI}_{i',i,v,t}^l$  represents the simple average of the TPI of type l of the three countries *i*' that are closest to importing country *i*.<sup>35</sup> The control variables and fixed effects are identical to those used in Equation 1.<sup>36</sup> Appendix Table B7 shows the estimates of the control function for each of the three TPIs that confirm that the adoption of TPIs in the closest countries is predictive of a country's own TPI.

We use the estimated  $\hat{\gamma}_l$  to compute the IMR for each type of TPI *l*:

$$I\hat{M}R_{i,j,p,t}^{l} = \frac{\Phi\left(\sum_{l\in L}\hat{\gamma}_{l}\overline{TPI}_{i'j,p,t}^{l}\right)}{\phi\left(\sum_{l\in L}\hat{\gamma}_{l}\overline{TPI}_{i'j,p,t}^{l}\right)}$$
(4)

where  $\phi$  represents the standard normal density function.

Next, we include the three IMR for tariffs, SPS and TBT as additional control variables in Equation 1 to account for the correlation that the importing country enforces a TPI despite a high IMR, our concern about endogeneity. This ensures that we compare treated and untreated units that have similar chances

 $<sup>^{35}</sup>$ To define closeness, we rely on bilateral distance between countries, weighted by population of main cities, provided by

Mayer and Zignago (2011). <sup>36</sup>While the TPI variables are defined at the country level, Equation 3 is estimated using firm-level data. This allows us to include the same control variables and fixed effects as in Equation 1.

of being treated, based on the actions of closest three countries.<sup>37</sup> Table B8 confirms our baseline result, providing evidence that selection bias is mitigated.

#### 6.3 Intensive Margin of Imports: Heterogeneity Results

More diversified and generally larger firms, which tend to be more productive and often more profitable, are likely to be better able to absorb the tariff and NTM costs required to import green technologies. The literature shows a clear disadvantage for small exporting firms in overcoming the fixed costs required to comply with NTMs in their destination markets (importing countries).<sup>38</sup> To our knowledge, there is no evidence on the role of firm size —proxied by the lack of product diversification— in how importing firms respond to trade policy. We provide such evidence for green value chain imports.

Table 6 shows the heterogeneity of trade policy responses for firms of single products by estimating Equation 2 with an interaction term for the single-product firm indicator. Column (1) shows that firms importing a single green product reduce their imports nearly twice as much as diversified importers in response to higher tariffs. This effect is of statistical and economic significance. Moreover, it is primarily driven by the negative import response to tariffs by single-product firms in the wind value chain and in subcomponents segments, as shown in columns 4 and 7, respectively. Another regressive effect for single-product firms imports comes from TBT. While increased stringency of TBT is associated with higher imports for diversified importers, firms importing a single product in the raw materials segment see reduced imports in response to AVE of TBT increases, as shown in column 5.

#### 6.4 Extensive Margin of Imports: Baseline Results

Table 7 presents the results from estimating Equation 1 to examine the impact of trade policies on the probability that firms will import green products. Table 8 provides additional results for the extensive margin that separates India.

Five findings stand out. First, similar to the intensive margin, column (1) of Table 7 shows that firms respond most strongly to import tariffs, followed by TBT. On average, a one percent decrease in tariffs is associated with a 0.7 percentage point increase in firms' import probability. Compared to the unconditional import probability of 37%, this represents a relatively muted effect in terms of economic significance. The overall effect is driven by dynamics in the solar and wind value chains (columns 3 and 4) and in the processed and subcomponents segments (columns 6 and 7).

Second, TBT regulations have a more systematic negative impact on imports at the probability of importing for the complete sample as well as the different value chains and segments. However, the economic magnitude of the impact is small; a one standard change in their AVE stringency is associated

<sup>&</sup>lt;sup>37</sup>The IMR captures the hazard of non-selection: if the IMR is higher, the importing country is less likely to have implemented the TPI, considering the TPI imposed by its closest countries.

<sup>&</sup>lt;sup>38</sup>See Fugazza et al. (2018), Fernandes et al. (2019), and Rosenow (2024).

with a 0.1 percentage point decrease in firms' import probability.

Third, firms in the solar value chain are more responsive to trade policies. This is consistent with the findings for the intensive margin of imports.

Fourth, firms are more responsive to tariffs in the upstream segments of green value chains. In contrast to the findings in Section 6.1, tariffs do not significantly affect the probability of firms importing end products. More liberal trade policies elicit increased import volumes from incumbent firms, but do not significantly affect new import participation.

Fifth, Indian firms do not show a differential response in their import probability to tariff increases. Table 8 shows that the interaction effect for India is statistically insignificant compared to the average for the other 34 emerging markets across all value chains and segments. Given the differential response of Indian firms on the intensive margin, this suggests that trade policy in India affects only the imports of incumbent firms, not the overall dynamics of market entry.

Latin American importing firms drive the results at the extensive margin, similar to the intensive margin. This is supported by Appendix E, which estimates Equation 1 separately for each region.

#### 6.5 Extensive Margin of Imports: Heterogeneity Results

Table 9 presents the heterogeneity in trade policy responses for single-product firms at the extensive margin. This is done by estimating Equation 2 with an interaction term for the single-product firm indicator.

Column (1) shows that tariffs reduce the import probability of firms importing a single green product by an additional 0.4 percentage points compared to diversified importers. This interaction effect of single-product firms is statistically significant. This regressive effect of tariffs is driven by the negative import response of single-product firms in the solar value chain and in subcomponent segments, as shown in columns 3 and 7, respectively.

TBT and SPS do not have a regressive effect on importers of single products.

#### 6.6 Extensive Margin of Imports: Robustness Results

The results for the extensive import margin are subjected to the same robustness tests as for the intensive margin. The results are maintained whether we exclude observations with negative AVEs (Appendix Table C1), cluster the standard errors by firm (Appendix Table C2), or bootstrap standard errors (Appendix Table C3). The results are also retained when NTMs are measured with a count variable (Appendix Table C4), an indicator variable capturing the presence of at least one NTM (Appendix Table C5) or when setting the AVE of SPS and TBT to zero when their count variable is zero (Appendix Table C6). Finally, the results remain consistent, though the coefficients reduced in magnitude, after controlling for the Inverse Mills Ratio (Appendix Table C7).

# 7 Conclusion

This paper studies how trade policy challenges firm-level import decisions to source products in green value chains, critical to mitigating climate change. Our panel analysis of firms in 35 emerging markets indicates that tariffs reduce imports of green products more than the average product. This is particularly evident in the solar value chain and the downstream segments of all green value chains. Trade regulations, such as SPS and TBT, play a lesser role in shaping firms' imports of green value chain products. However, the overall impact of tariffs and trade regulations varies significantly between firms. TBTs redirect imports from less diversified to more diversified firms.

Our findings have important policy implications. First, with China being the dominant producer of green technologies, there is a growing trade-off between decarbonization and economic security in high-income countries as they seek to reduce their dependence on China. This tension is particularly evident in the EU and the US, where recent green industry trade policies protect domestic firms but make EVs more expensive for consumers and delay the decarbonization of transport (see e.g., Kee and Xie (2024)). Our results suggest that firms in emerging markets are highly sensitive to tariffs imposed on imports of green technologies, particularly of end products. Thus, emerging markets should refrain from following the policy choices of the EU and the US, as they are dependent on imports for the diffusion of these green technologies and cannot expect to develop sufficient domestic production in the short term.

Second, preferential trade agreements increase firms' imports of green technologies by reducing tariffs and other trade barriers between member countries. This helps accelerate the adoption of green technologies in emerging markets and can help them to meet their decarbonization goals more effectively.

Third, the additional sensitivity of undiversified firms to both import tariffs and NTMs highlights the need for targeted policies that support these vulnerable segments. This will ensure that they have access to green technologies without being disproportionately burdened by trade barriers.

# **Figures**



Figure 1: Evolution of Firm-level Outcome Variables, averages by Country, Value Chain, and Year



Note: Each node represents the average of a country-value chain-segment in the first and last year of the sample. The initial year with information for Timor-Leste, Togo and Viet Nam is 2018, while for Lao PDR and Pakistan, it is 2019. The last year with information for Senegal and Uganda is 2020. For countries and value chain segments whose differences between periods are most prominent, the dot with the country's name and the segment name is labelled.



Figure 2: Evolution of Tariffs, by product group and year (%)

Note: Each box plot illustrates the distribution of tariffs in our country sample of 35 emerging markets for a specified year, displaying the range, median, and interquartile spread of tariff rates. The median is the horizontal bar in the box that represents the interquartile spread.



# Figure 3: Tariffs and Advalorem Equivalents (AVEs) of Sanitary and Phytosanitary (SPS) and Technical Barriers to Trade (TBT), by Value Chain and Segment (%)

Note: Each box plot illustrates the distribution of tariffs and NTMs in our country sample of 35 emerging markets, displaying the range, median, and interquartile spread. The median is the horizontal bar in the box that represents the interquartile spread.

Nodes represent the average value at the country-value chain-segment level.

For presentation purposes, outliers defined as tariff or AVE rates above 40 percent are excluded.







Note: Each node represents the average value of outcome variables and tariffs for each country, value chain and year.

# Results

Table 1: Summary Statistics

Variable	Ν	Mean	Std. Dev.	Min.	Max.
Panel A - Intensive Margin of Imports					
Ln(Import Value) <sub><math>i, f, j, p, t</math></sub>	1,911,864	8.228	2.67	-9.2	22.1
$Ln(1+Tariff)_{i,j,p,t-1}$	1,911,864	0.021	0.05	0.0	0.3
$Ln(1+AVE SPS)_{i,j,p,t-1}$	1,911,864	0.009	0.16	-9.5	4.6
$Ln(1+AVE TBT)_{i,i,p,t-1}$	1,911,864	0.013	0.09	-6.8	4.1
$PTA_{i,j,t}$	1,911,864	0.661	0.47	0.0	1.0
$Ln(1 + Non-Green Tariff)_{i,i,t-1}$	1,911,864	0.036	0.04	0.0	0.2
$Ln(Market Size)_{i,i,p,t}$	1,911,864	13.433	2.06	-6.9	18.6
I[Single Product $f_{f,t_0,vc}$ ]	1,911,864	0.039	0.19	0.0	1.0
SPS count <sub><i>i</i>,<i>j</i>,<i>p</i>,<i>t</i>-1</sub>	1,911,864	0.293	0.88	0.0	6.0
TBT count <sub><i>i</i>,<i>i</i>,<i>p</i>,<i>t</i>-1</sub>	1,911,864	5.327	7.21	0.0	40.0
$I[SPS_{i,i,p,t-1}]$	1,911,864	0.117	0.32	0.0	1.0
$I[TBT_{i,j,p,t-1}]$	1,911,864	0.654	0.48	0.0	1.0
Panel B - Extensive Margin of Imports					
Probability of Importing <sub><i>i</i>,<i>f</i>,<i>i</i>,<i>p</i>,<i>t</i></sub>	15,396,435	0.371	0.48	0.0	1.0
$Ln(1+Tariff)_{i,i,p,t-1}$	15,396,435	0.033	0.06	0.0	0.7
$Ln(1+AVE SPS)_{i,j,p,t-1}$	15,396,435	0.012	0.18	-9.5	4.6
$Ln(1+AVE TBT)_{i,i,p,t-1}$	15,396,435	0.013	0.10	-9.6	4.5
$PTA_{i,j,t}$	15,396,435	0.570	0.50	0.0	1.0
$Ln(1 + Non-Green Tariff)_{i,i,t-1}$	15,396,435	1.366	0.98	0.0	3.0
Ln(Market Size) <sub><i>i,i,v,t</i></sub>	15,396,435	13.088	2.31	-6.9	18.6
I[Single Product $f_{f,t_0,v_c}$ ]	15,396,435	0.160	0.37	0.0	1.0
SPS count <sub><i>i</i>,<i>j</i>,<i>p</i>,<i>t</i>-1</sub>	15,396,435	0.199	0.73	0.0	6.0
TBT count <sub><i>i</i>,<i>i</i>,<i>p</i>,<i>t</i>-1</sub>	15,396,435	4.256	6.54	0.0	40.0
$I[SPS_{i,i,p,t-1}]$	15,396,435	0.082	0.27	0.0	1.0
$I[TBT_{i,i,p,t-1}]$	15,396,435	0.596	0.49	0.0	1.0

This table presents descriptive statistics for our key dependent variables: firms' import value and import probability. It also includes statistics for all our explanatory and control variables. Panel A presents the sample used for the estimation of the intensive margin of firm-level imports. Panel B presents for the sample used in the estimations of the extensive margin of firm-level imports.

Dependent variable: Ln(Import Value) <sub>i f i n t</sub>												
	All	·	Value Chain			Segments						
		EV	Solar	Wind	Raw	Processed	Subcomponents	End-product				
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)				
$Ln(1+Tariff)_{i,j,p,t-1}$	-0.0327	-0.0604	-0.0425	-0.0235	-0.3285	-0.0746	-0.0173	-0.3295				
	(0.012)***	(0.128)	(0.019)**	(0.019)	(0.263)	(0.040)*	(0.013)	(0.135)**				
$Ln(1+AVE SPS)_{i,j,p,t-1}$	0.0022	-0.0182	0.0066	-0.0007	-0.0461	0.0036	0.0009	0.0072				
	(0.002)	(0.016)	(0.002)***	(0.002)	(0.030)	(0.004)	(0.002)	(0.011)				
$Ln(1+AVE TBT)_{i,j,p,t-1}$	-0.0032	0.0101	-0.0067	-0.0009	0.0569	-0.0025	-0.0025	-0.0135				
	(0.002)**	(0.009)	(0.002)***	(0.002)	(0.029)**	(0.004)	(0.002)	(0.011)				
$PTA_{i,j,t}$	0.0234	-0.0029	0.0273	0.0170	0.1594	0.0282	0.0220	-0.0120				
	(0.009)***	(0.067)	(0.012)**	(0.013)	(0.124)	(0.022)	(0.009)**	(0.050)				
$Ln(1 + \overline{Non-Green Tariff})_{i,j,t-1}$	-0.0630	-0.6125	-0.0453	-0.0544	0.0757	-0.0319	-0.0694	0.2809				
	(0.035)*	(0.258)**	(0.046)	(0.054)	(0.339)	(0.086)	(0.037)*	(0.246)				
Ln(Market Size) <sub>i,j,p,t</sub>	0.2364	0.1178	0.2822	0.2089	0.1264	0.1717	0.2907	0.0480				
.,,,,.	(0.021)***	(0.103)	(0.036)***	(0.027)***	(0.158)	(0.045)***	(0.026)***	(0.098)				
Observations	1,911,864	22,961	908,830	868,615	5,017	307,773	1,444,775	37,894				
Adjusted R2	0.80	0.82	0.80	0.79	0.85	0.80	0.79	0.79				
Fixed Effects	f-t, f-p-j	f-t, f-p-j	f-t <i>,</i> f-p-j	f-t <i>,</i> f-p-j	f-t, f-p-j	f-t <i>,</i> f-p-j	f-t, f-p-j	f-t, f-p-j				

Table 2: Intensive Margin of Firm-level Imports - Baseline Results

Note: This table estimates Equation 1 for firm f in importing country i of product p from origin country j in year t. The sample covers firm-level import data from 34 countries in the appendix table A1, excluding India. Columns (1)-(8) show coefficients standardized with zero mean and unit standard deviation in their respective sample. Clustered standard errors at the origin-destination-HS6 product level are presented in parentheses; \*\*\*, \*\*, and \* denote significance at the 1%, 5%, and 10% levels, respectively.

Dependent variable: Ln(Import Value) <sub>i,f,j,p,t</sub>											
	All		Value Chain		Segments						
		EV	Solar	Wind	Raw	Processed	Subcomponents	End-product			
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)			
$Ln(1+Tariff)_{i,j,p,t-1}$	-0.0343	-0.0565	-0.0463	-0.0240	-0.3394	-0.0759	-0.0185	-0.3192			
	(0.013)***	(0.119)	(0.021)**	(0.019)	(0.268)	(0.041)*	(0.013)	(0.131)**			
$Ln(1+Tariff)_{i,i,p,t-1} \cdot I[India_i]$	0.0355	-0.0181	0.0521	-0.0268	0.5446	-0.1455	0.0286	-0.3761			
	(0.016)**	(0.150)	(0.026)**	(0.021)	(0.640)	(0.095)	(0.017)*	(0.193)*			
$Ln(1+AVE SPS)_{i,j,p,t-1}$	0.0022	-0.0182	0.0067	-0.0007	-0.0692	0.0035	0.0010	0.0072			
	(0.002)	(0.016)	(0.002)***	(0.002)	(0.044)	(0.004)	(0.002)	(0.011)			
$Ln(1+AVE SPS)_{i,i,p,t-1} \cdot I[India_i]$	-0.0019	-0.0019	-0.0019	-0.0033	-0.0164	-0.0019	-0.0011	-0.0001			
	(0.002)	(0.025)	(0.002)	(0.003)	(0.047)	(0.006)	(0.002)	(0.015)			
$Ln(1+AVE TBT)_{i,i,v,t-1}$	-0.0032	0.0103	-0.0068	-0.0009	0.0559	-0.0025	-0.0025	-0.0136			
.,,,,,,	(0.002)**	(0.010)	(0.002)***	(0.002)	(0.028)**	(0.004)	(0.002)	(0.012)			
$Ln(1+AVE TBT)_{i,i,v,t-1} \cdot I[India_i]$	-0.0010	-0.0190	-0.0023	0.0013	-0.0534	0.0017	0.0003	-0.0024			
, <sub>1</sub> ,	(0.002)	(0.013)	(0.002)	(0.003)	(0.030)*	(0.005)	(0.002)	(0.021)			
Observations	2,160,566	28,013	1,032,768	972,236	7,350	342,611	1,635,823	42,792			
Adjusted R2	0.79	0.83	0.79	0.78	0.87	0.79	0.79	0.79			
Fixed Effects	f-t <i>,</i> f-p-j	f-t, f-p-j	f-t <i>,</i> f-p-j	f-t, f-p-j	f-t, f-p-j	f-t <i>,</i> f-p-j	f-t, f-p-j	f-t, f-p-j			

Table 3: Intensive Margin of Firm-level Imports - Heterogeneous Effects of India

Note: This table estimates Equation 1 for firm f in importing country i of product p from origin country j in year t. The sample covers firm-level import data from 35 countries in the appendix table A1. Columns (1)-(8) show coefficients standardized with zero mean and unit standard deviation in their respective sample. Three additional control variables and their interactions with India<sub>i</sub> are included in the regression:  $PTA_{i,j,t}$ ,  $Ln(1 + Non-Green Tariff)_{i,j,t-1}$  and  $Ln(Market Size)_{i,j,p,t}$ . Clustered standard errors at the origin-destination-HS6 product level are presented in parentheses; \*\*\*, \*\*, and \* denote significance at the 1%, 5%, and 10% levels, respectively.

Dependent variable: Ln(Import Value) <sub><i>i</i>,<i>f</i>,<i>j</i>,<i>p</i>,<i>t</i></sub>				
	Full	Sample	HS 4-digit products in §	t headings with green value chains
	With India	Without India	With India	Without India
	(1)	(2)	(3)	(4)
$Ln(1+Tariff)_{i,j,p,t-1}$	-0.0092	-0.0071	-0.0486	-0.0498
	(0.003)***	(0.003)**	$(0.014)^{***}$	(0.014)***
$Ln(1+Tariff)_{i,j,p,t-1} \times I[Green Products_p]$	-0.0088	-0.0160	0.0171	0.0023
	(0.005)*	(0.004)***	(0.014)	(0.013)
$Ln(1+AVE SPS)_{i,j,p,t-1}$	-0.0005	-0.0008	0.0006	-0.0007
	(0.001)	(0.001)	(0.002)	(0.002)
$Ln(1+AVE SPS)_{i,j,p,t-1} \times I[Green Products_p]$	0.0005	0.0009	0.0007	0.0023
	(0.001)	(0.001)	(0.002)	(0.002)
$Ln(1+AVE TBT)_{i,j,p,t-1}$	-0.0001	-0.0006	0.0040	0.0053
	(0.001)	(0.001)	(0.003)	(0.003)**
$Ln(1+AVE TBT)_{i,j,p,t-1} \times I[Green Products_p]$	-0.0013	-0.0010	-0.0065	-0.0071
	(0.001)**	(0.001)	(0.002)***	(0.003)***
Observations	14,148,626	12,718,663	3,271,974	2,892,980
Adjusted R <sup>2</sup>	0.84	0.84	0.81	0.81
Fixed Effects	f-t, f-p-j	f-t, f-p-j	f-t, f-p-j	f-t, f-p-j

Table 4: Intensive Margin of Firm-level Imports - Heterogeneous Effects of Green Products

Note: This table estimates Equation 1 for firm f in importing country i of product p from origin country j in year t. Columns (1) and (2) include firm-level import data for the full sample and exclude India, respectively. Columns (3) and (4) reduce the sample to HS 4-digit headings with at least one product associated with green value chains. Coefficients are standardized with zero mean and unit standard deviation. Additional controls include PTA<sub>*i*,*j*,*t*</sub> and Ln(Market Size)<sub>*i*,*j*,*p*,*t*</sub>. Clustered standard errors at the origin-destination-HS6 product level are presented in parentheses; \*\*\*, \*\*, and \* denote significance at the 1%, 5%, and 10% levels, respectively.

	All		Value Chair	ı		Segments					
		EV	Solar	Wind	Raw	Processed	Subcomponents	End-product			
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)			
Panel A: Dependent var	riable: Ln(I	mport Valı	$ue)_{i,f,j,p,t}$								
$Ln(1+Tariff)_{i,j,p,t-1}$	-0.0335	-0.1912	-0.0651	-0.0060	-0.3881	-0.0213	-0.0250	-0.3203			
	(0.016)**	(0.159)	(0.029)**	(0.023)	(0.473)	(0.057)	(0.017)	(0.175)*			
$Ln(1+AVE SPS)_{i,j,p,t-1}$	0.0016	-0.0073	0.0037	-0.0006	-0.0302	0.0016	0.0008	0.0199			
	(0.002)	(0.020)	(0.003)	(0.003)	(0.032)	(0.005)	(0.003)	(0.013)			
$Ln(1+AVE TBT)_{i,j,p,t-1}$	-0.0042	0.0009	-0.0091	-0.0011	0.0656	-0.0081	-0.0030	-0.0047			
	(0.002)*	(0.019)	(0.003)***	(0.003)	(0.047)	(0.007)	(0.003)	(0.016)			
Adjusted R2	0.77	0.82	0.77	0.75	0.89	0.77	0.76	0.76			
Panel B: Dependent var	iable: Ln(Ir	nport Weig	ght) <sub>i,f,j,p,t</sub>								
$Ln(1+Tariff)_{i,j,p,t-1}$	-0.0378	-0.2001	-0.0672	-0.0239	-0.5777	-0.0214	-0.0323	-0.2678			
	(0.018)**	(0.179)	(0.031)**	(0.025)	(0.408)	(0.053)	(0.019)*	(0.197)			
$Ln(1+AVE SPS)_{i,j,p,t-1}$	-0.0001	-0.0127	0.0031	-0.0014	-0.0390	0.0008	0.0013	-0.0042			
	(0.002)	(0.024)	(0.004)	(0.003)	(0.035)	(0.005)	(0.003)	(0.019)			
$Ln(1+AVE TBT)_{i,j,p,t-1}$	-0.0032	0.0085	-0.0072	-0.0007	0.1000	-0.0089	-0.0026	-0.0074			
	(0.002)	(0.020)	(0.004)*	(0.004)	(0.052)*	(0.007)	(0.003)	(0.016)			
Adjusted R2	0.81	0.89	0.81	0.79	0.94	0.83	0.79	0.82			
Panel C: Dependent var	riable: Ln(II	nport Uni	t Value) <sub>i,f,j,p</sub>	p,t							
$Ln(1+Tariff)_{i,j,p,t-1}$	0.0043	0.0089	0.0022	0.0180	0.1896	0.0001	0.0073	-0.0525			
	(0.011)	(0.098)	(0.020)	(0.015)	(0.345)	(0.035)	(0.012)	(0.092)			
$Ln(1+AVE SPS)_{i,j,p,t-1}$	0.0017	0.0054	0.0007	0.0008	0.0089	0.0009	-0.0004	0.0241			
	(0.002)	(0.016)	(0.003)	(0.002)	(0.014)	(0.004)	(0.002)	(0.013)*			
$Ln(1+AVE TBT)_{i,j,p,t-1}$	-0.0009	-0.0076	-0.0019	-0.0004	-0.0344	0.0008	-0.0005	0.0027			
.,,,,	(0.001)	(0.010)	(0.002)	(0.002)	(0.036)	(0.004)	(0.001)	(0.009)			
Adjusted R2	0.80	0.89	0.80	0.77	0.87	0.79	0.78	0.79			
		10 150	110 500	<b>a</b> aa <b>/a</b> =	4 8 4 4	10 ( 00 ;					
Observations	876,638	12,170	410,528	390,627	1,761	136,394	658,255	16,611			
Fixed Effects	t-t, t-p-j	t-t, t-p-j	t-t, t-p-j	t-t, t-p-j	t-t, t-p-j	t-t, t-p-j	t-t, t-p-j	t-t, t-p-j			

Table 5: Intensive Margin of Firm-level Imports - Margins of Imports

Note: This table estimates Equation 1 for firm f in importing country i of product p from origin country j in year t. The sample covers firm-level import data from 31 countries in appendix table A1 as those with quantities information. Columns (1)-(8) show coefficients standardized with zero mean and unit standard deviation in their respective sample. Three additional control variables are included in the regression:  $PTA_{i,j,t}$ .  $Ln(1 + Non-Green Tariff)_{i,j,t-1}$  and  $Ln(Market Size)_{i,j,p,t}$ . Clustered standard errors at the origin-destination-HS6 product level are presented in parentheses; \*\*\*, \*\*, and \* denote significance at the 1%, 5%, and 10% levels, respectively.

Dependent variable: Ln(Import Value) <sub><i>i</i>,<i>f</i>,<i>j</i>,<i>p</i>,<i>t</i></sub>										
	All	Value Chain				Segments				
		EV	Solar	Wind	Raw	Processed	Subcomponents	End-product		
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)		
$Ln(1+Tariff)_{i,j,p,t-1}$	-0.0289	-0.0892	-0.0400	-0.0205	-0.3294	-0.0726	-0.0146	-0.3483		
	(0.012)**	(0.168)	(0.019)**	(0.019)	(0.265)	(0.042)*	(0.013)	(0.155)**		
$Ln(1+Tariff)_{i,j,p,t-1} \cdot I[Single Product_{f,t_0,vc}]$	-0.0243	0.0655	-0.0258	-0.0360	0.5107	-0.0119	-0.0194	0.1819		
	(0.011)**	(0.185)	(0.020)	(0.015)**	(0.449)	(0.025)	(0.010)**	(0.212)		
$Ln(1+AVE SPS)_{i,j,p,t-1}$	0.0024	-0.0178	0.0067	-0.0009	-0.0437	0.0034	0.0010	0.0072		
	(0.002)	(0.017)	(0.002)***	(0.002)	(0.030)	(0.004)	(0.002)	(0.011)		
$Ln(1+AVE SPS)_{i,i,p,t-1} \cdot I[Single Product_{f,t_0,vc}]$	-0.0015	0.0020	-0.0016	0.0031	-0.0443	0.0012	-0.0006	0.0002		
	(0.001)	(0.017)	(0.002)	(0.002)	(0.051)	(0.003)	(0.002)	(0.009)		
$Ln(1+AVE TBT)_{i,i,p,t-1}$	-0.0033	0.0078	-0.0067	-0.0009	0.0573	-0.0029	-0.0025	-0.0132		
	(0.002)**	(0.010)	(0.002)***	(0.002)	(0.029)**	(0.004)	(0.002)	(0.012)		
$Ln(1+AVE TBT)_{i,j,p,t-1} \cdot I[Single Product_{f,t_0,vc}]$	0.0021	0.0157	0.0001	0.0010	-0.0309	0.0073	-0.0007	-0.0039		
	(0.001)	(0.011)	(0.002)	(0.002)	(0.016)**	(0.003)**	(0.002)	(0.015)		
Observations	1.911.864	22.961	908.830	868.615	5.017	307.773	1.444.775	37.894		
Adjusted R2	0.80	0.82	0.80	0.79	0.85	0.80	0.79	0.79		
Fixed Effects	f-t, f-p-j	f-t, f-p-j	f-t, f-p-j	f-t, f-p-j	f-t, f-p-j	f-t, f-p-j	f-t, f-p-j	f-t, f-p-j		

Table 6: Intensive Margin of Firm-level Imports - Heterogeneous Effects of Single-Product Firm

Note: This table estimates Equation 2 for firm f in importing country i of product p from origin country j in year t. The sample covers firm-level import data from 34 countries in the appendix table A1, excluding India. Single product firms import a unique product per vc. Columns (1)-(8) show coefficients standardized with zero mean and unit standard deviation in their respective sample. Three additional control variables and their interactions with firm types are included in the regression:  $PTA_{i,j,t}$ ,  $Ln(1+Non-Green Tariff)_{i,j,t-1}$  and  $Ln(Market Size)_{i,j,p,t}$ . Clustered standard errors at the origin-destination-HS6 product level are presented in parentheses; \*\*\*, \*\*, and \* denote significance at the 1%, 5%, and 10% levels, respectively.

Dependent variable: Probability of Importing <sub><i>i</i>,<i>f</i>,<i>j</i>,<i>p</i>,<i>t</i></sub>												
	All		Value Chain	l	Segments							
		EV	Solar	Wind	Raw	Processed	Subcomponents	End-product				
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)				
$Ln(1+Tariff)_{i,i,p,t-1}$	-0.0069	-0.0010	-0.0056	-0.0092	-0.0032	-0.0175	-0.0054	0.0041				
	(0.003)**	(0.014)	(0.003)*	(0.005)*	(0.033)	(0.010)*	(0.003)**	(0.011)				
$Ln(1+AVE SPS)_{i,j,p,t-1}$	-0.0000	0.0048	0.0007	-0.0009	0.0017	0.0003	-0.0008	0.0029				
	(0.000)	(0.001)***	(0.000)*	(0.000)*	(0.004)	(0.001)	(0.000)***	(0.002)*				
$Ln(1+AVE TBT)_{i,i,p,t-1}$	-0.0008	-0.0018	-0.0008	-0.0006	-0.0099	-0.0012	-0.0009	0.0020				
	(0.000)***	(0.001)	(0.000)**	(0.000)	(0.006)*	(0.001)**	(0.000)***	(0.001)				
$PTA_{i,i,t}$	0.0120	0.0026	0.0119	0.0123	0.0089	0.0094	0.0118	0.0082				
·)·	(0.002)***	(0.009)	(0.002)***	(0.002)***	(0.018)	(0.004)**	(0.002)***	(0.007)				
$Ln(1 + \overline{Non-Green Tariff})_{i,i,t-1}$	-0.0205	0.0142	-0.0238	-0.0182	0.0468	-0.0042	-0.0251	-0.0101				
	(0.008)***	(0.027)	(0.010)**	(0.011)	(0.054)	(0.020)	(0.009)***	(0.023)				
Ln(Market Size) <sub>i,i,v,t</sub>	0.0376	-0.0046	0.0524	0.0327	0.0110	0.0385	0.0434	-0.0000				
	(0.003)***	(0.011)	(0.005)***	(0.004)***	(0.018)	(0.007)***	(0.004)***	(0.010)				
Observations	15,396,435	289,004	7,366,189	7,055,080	41,735	2,748,228	11,448,457	415,215				
Adjusted R2	0.24	0.12	0.24	0.22	0.13	0.21	0.24	0.15				
Fixed Effects	f-t, f-p-j	f-t, f-p-j	f-t, f-p-j	f-t, f-p-j	f-t, f-p-j	f-t <i>,</i> f-p-j	f-t, f-p-j	f-t, f-p-j				

Table 7: Extensive Margin of Firm-level Imports - Baseline Results

Note: This table estimates Equation 1 for firm f in importing country i of product p from origin country j in year t. The sample covers firm-level import data from 34 countries in the appendix table A1, excluding India. Columns (1)-(8) show coefficients standardized with zero mean and unit standard deviation in their respective sample. Clustered standard errors at the origin-destination-HS6 product level are presented in parentheses; \*\*\*, \*\*, and \* denote significance at the 1%, 5%, and 10% levels, respectively.

Dependent variable: Probability of Importing <sub>i,f,j,p,t</sub>												
	All		Value Chair	ı	Segments							
		EV	Solar	Wind	Raw	Processed	Subcomponents	End-product				
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)				
$Ln(1+Tariff)_{i,j,p,t-1}$	-0.0068	-0.0010	-0.0057	-0.0090	-0.0030	-0.0170	-0.0054	0.0039				
	(0.003)**	(0.013)	(0.003)*	(0.005)*	(0.030)	(0.010)*	(0.003)**	(0.010)				
$Ln(1+Tariff)_{i,j,p,t-1} \cdot I[India_i]$	0.0010	-0.0050	-0.0017	-0.0032	-0.0726	-0.0393	-0.0001	-0.0171				
	(0.003)	(0.029)	(0.004)	(0.005)	(0.060)	(0.013)***	(0.003)	(0.022)				
$Ln(1+AVE SPS)_{i,i,p,t-1}$	-0.0000	0.0048	0.0007	-0.0009	0.0024	0.0003	-0.0008	0.0029				
	(0.000)	(0.001)***	(0.000)*	(0.000)*	(0.006)	(0.001)	(0.000)***	(0.002)*				
$Ln(1+AVE SPS)_{i,j,p,t-1} \cdot I[India_i]$	-0.0002	0.0016	-0.0006	-0.0001	-0.0280	-0.0020	0.0005	-0.0009				
	(0.000)	(0.002)	(0.000)	(0.000)	(0.007)***	(0.001)**	(0.000)*	(0.002)				
$Ln(1+AVE TBT)_{i,j,p,t-1}$	-0.0008	-0.0018	-0.0009	-0.0006	-0.0099	-0.0012	-0.0009	0.0020				
	(0.000)***	(0.001)	(0.000)**	(0.000)	(0.006)*	(0.001)**	(0.000)***	(0.001)				
$Ln(1+AVE TBT)_{i,i,p,t-1} \cdot I[India_i]$	0.0000	0.0009	-0.0003	0.0003	0.0028	0.0007	-0.0002	0.0009				
	(0.000)	(0.001)	(0.000)	(0.000)	(0.004)	(0.001)	(0.000)	(0.002)				
Observations	17,797,628	343,365	8,602,617	8,059,403	60,564	3,121,734	13,291,238	470,165				
Adjusted R2	0.24	0.12	0.23	0.22	0.14	0.20	0.24	0.15				
Fixed Effects	f-t, f-p-j	f-t, f-p-j	f-t, f-p-j	f-t, f-p-j	f-t, f-p-j	f-t, f-p-j	f-t, f-p-j	f-t, f-p-j				

Table 8: Extensive Margin of Firm-level Imports - India Interaction

Note: This table estimates Equation 1 for firm f in importing country i of product p from origin country j in year t. The sample covers firm-level import data from 35 countries in the appendix table A1. Columns (1–8) show coefficients standardized with zero mean and unit standard deviation in their respective sample. Three additional control variables and their interactions with India<sub>i</sub> are included in the regression: PTA<sub>i,j,t</sub>, Ln(1+Non-Green Tariff)<sub>i,j,t-1</sub> and Ln(Market Size)<sub>i,j,p,t</sub>. Clustered standard errors at the origin-destination-HS6 product level are presented in parentheses; \*\*\*, \*\*, and \* denote significance at the 1%, 5%, and 10% levels, respectively.

Dependent variable: Probability of Importing <sub>i,f,j,p,t</sub>											
	All	Value Chain			Segments						
		EV	Solar	Wind	Raw	Processed	Subcomponents	End-product			
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)			
$Ln(1+Tariff)_{i,j,p,t-1}$	-0.0056	0.0118	-0.0043	-0.0089	-0.0066	-0.0177	-0.0039	0.0020			
	(0.003)*	(0.017)	(0.004)	(0.005)*	(0.035)	(0.010)*	(0.003)	(0.013)			
$Ln(1+Tariff)_{i,j,p,t-1} \cdot I[Single Product_{f,t_0,vc}]$	-0.0040	-0.0268	-0.0050	-0.0010	-0.0021	0.0008	-0.0051	0.0036			
	(0.002)**	(0.019)	(0.003)**	(0.003)	(0.029)	(0.004)	(0.002)***	(0.014)			
$Ln(1+AVE SPS)_{i,j,p,t-1}$	-0.0001	0.0051	0.0006	-0.0008	-0.0024	0.0004	-0.0010	0.0029			
	(0.000)	(0.002)***	(0.000)	(0.000)	(0.005)	(0.001)	(0.000)***	(0.002)			
$Ln(1+AVE SPS)_{i,i,v,t-1} \cdot I[Single Product_{f,t_0,v_c}]$	0.0002	-0.0004	0.0004	-0.0004	0.0105	-0.0003	0.0005	0.0003			
.,,, ,,,,,	(0.000)	(0.002)	(0.000)	(0.000)	(0.006)*	(0.001)	(0.000)**	(0.001)			
$Ln(1+AVE TBT)_{i,j,p,t-1}$	-0.0008	-0.0023	-0.0009	-0.0006	-0.0103	-0.0011	-0.0008	0.0017			
	(0.000)***	(0.001)*	(0.000)**	(0.000)*	(0.006)*	(0.001)**	(0.000)**	(0.002)			
$Ln(1+AVE TBT)_{i,j,v,t-1} \cdot I[Single Product_{f,t_0,vc}]$	-0.0000	0.0017	0.0001	0.0002	0.0014	-0.0001	-0.0003	0.0012			
	(0.000)	(0.002)	(0.000)	(0.000)	(0.004)	(0.000)	(0.000)	(0.001)			
Observations	15,396,435	289,004	7,366,189	7,055,080	41,735	2,748,228	11,448,457	415,215			
Adjusted R2	0.24	0.12	0.24	0.22	0.13	0.21	0.24	0.15			
Fixed Effects	f-t <i>,</i> f-p-j	f-t <i>,</i> f-p-j	f-t <i>,</i> f-p-j	f-t <i>,</i> f-p-j	f-t, f-p-j	f-t, f-p-j	f-t, f-p-j	f-t, f-p-j			

Table 9: Extensive Margin of Firm-level Imports - Heterogeneous Effects of Single-Product Firm

Note: This table estimates Equation 2 for firm f in importing country i of product p from origin country j in year t. The sample covers firm-level import data from 34 countries in the appendix table A1, excluding India. Single product firms import a unique product per vc. Columns (1–8) show coefficients standardized with zero mean and unit standard deviation in their respective sample. Three additional control variables and their interactions with firm types are included in the regression:  $PTA_{i,j,t}$ ,  $Ln(1+Non-Green Tariff)_{i,j,t-1}$  and  $Ln(Market Size)_{i,j,p,t}$ . Clustered standard errors at the origin-destination-HS6 product level are presented in parentheses; \*\*\*, \*\*, and \* denote significance at the 1%, 5%, and 10% levels, respectively.

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# Appendix

# A Data and Stylized facts

Importing	World Bank	Year	% Share of	Import	Tariff
Country	Region		Observations	Quantity	Source
Albania	Europe and Central Asia	2017-2021	1.0	Yes	MacMap
Benin	Sub-Saharan Africa	2017-2021	0.2	Yes	MacMap
Burundi	Sub-Saharan Africa	2017-2021	0.1	Yes	MacMap
Cambodia	East Asia and Pacific	2017-2021	0.5	Yes	MacMap
Cabo Verde	Sub-Saharan Africa	2017-2021	0.5	Yes	WTO-IDB
Chile	Latin America and Caribbean	2017-2021	4.1	No	MacMap
Colombia	Latin America and Caribbean	2017-2021	4.4	Yes	MacMap
Comoros	Sub-Saharan Africa	2017-2021	0.1	Yes	MacMap
Costa Rica	Latin America and Caribbean	2017-2021	3.9	Yes	MacMap
Côte d'Ivoire	Sub-Saharan Africa	2017-2021	1.4	Yes	MacMap
Dominican Republic	Latin America and Caribbean	2017-2021	3.1	Yes	WTO-IDB
Ecuador	Latin America and Caribbean	2017-2021	3.4	Yes	MacMap
El Salvador	Latin America and Caribbean	2017-2021	1.9	Yes	MacMap
Ethiopia	Sub-Saharan Africa	2017-2021	1.2	Yes	MacMap
Gabon	Sub-Saharan Africa	2017-2021	0.7	Yes	WTO-IDB
Georgia	Europe and Central Asia	2017-2021	1.9	Yes	WTO-IDB
India	South Asia	2017-2021	13.0	No	MacMap
Kenya	Sub-Saharan Africa	2017-2021	1.6	Yes	MacMap
Lao PDR	East Asia and Pacific	2017-2021	0.1	Yes	MacMap
Malawi	Sub-Saharan Africa	2017-2021	0.5	Yes	MacMap
Mauritius	Sub-Saharan Africa	2017-2021	1.4	Yes	MacMap
Mexico	Latin America and Caribbean	2017-2021	21.4	Yes	WTO-IDB
Pakistan	South Asia	2019-2021	1.5	Yes	WTO-IDB
Paraguay	Latin America and Caribbean	2017-2021	1.2	Yes	MacMap
Peru	Latin America and Caribbean	2017-2021	4.9	Yes	MacMap
Senegal	Sub-Saharan Africa	2017-2020	0.6	Yes	MacMap
South Africa	Sub-Saharan Africa	2017-2021	9.2	Yes	WTO-IDB
Sri Lanka	South Asia	2017-2021	2.3	Yes	MacMap
Tanzania	Sub-Saharan Africa	2017-2021	1.6	Yes	MacMap
Timor-Leste	East Asia and Pacific	2017-2021	0.2	Yes	WTO-IDB
Togo	Sub-Saharan Africa	2018-2021	0.2	Yes	MacMap
Uganda	Sub-Saharan Africa	2017-2020	0.7	Yes	MacMap
Uruguay	Latin America and Caribbean	2017-2021	2.0	Yes	MacMap
Viet Nam	East Asia and Pacific	2018-2021	8.6	Yes	MacMap
Zambia	Sub-Saharan Africa	2017-2021	1.0	Yes	MacMap

### Table A1: Country Coverage

Value Chain Segment	Definition
Raw Materials	Basic, unprocessed materials that are mined, extracted or harvested
	from the earth. Value added comes from extracting, harvesting, and
	preparing raw materials for international marketing in substantial
	volumes.
	Wind: Lumber, balsa (HS 440722)
	<b>Solar</b> : Silicon >99.999% pure (HS 280461)
	EV: Nickel ore and concentrates (HS 260400)
Processed Materials	Materials that have been transformed or refined from basic raw
	materials as an intermediate step in the manufacturing process. Value
	added comes from processing raw materials into precursors that can be
	easily transported, stored and used for downstream subcomponent
	fabrication.
	Wind: Bar/rod iron or non-alloy steel, indented or twisted (HS 721420)
	Solar: Float glass sheets, absorbent or reflecting layer (HS 700510)
	EV: Nickel sulphates (HS 283324)
Subcomponents	Unique constituent parts or elements that contribute to a finished
	product. Value is added by transforming materials into
	subcomponents, which are then assembled into final products.
	Wind: Electric conductors, 80-1,000 volts, no connectors (HS 854459)
	Solar: Glass mirrors, framed (HS 700992)
	<b>EV</b> : Parts of electric accumulators, including separators (HS 850790)
End Products	The finished product of the manufacturing process, assembled from
	subcomponents and ready for sale to customers as a completed item.
	Value added comes from assembling components into a marketable
	product that customers value.
	Wind: Towers and lattice masts, iron or steel (HS 730820)
	Solar: Photosensitive/photovoltaic/LED semiconductor devices (HS
	854140)
	EV: Lead-acid electric accumulators (vehicle) (HS 850710)

Table A2: Description of Value Chain Segments and Examples

Table A3: Number of HS 2017 6-digit products, by value chain and segment

VC	Raw Materials	Processed Materials	Sub- Components	End Products	Total
Electric Vehicles	9	23	6	8	46
Solar	12	22	57	1	92
Wind	4	60	43	3	110
Total	25	105	106	12	248

Variable	Ν	Mean	Std. Dev.	Min.	Max.
Panel A - Intensive Margin of Imports					
Ln(Import Value) <sub><i>i</i>,<i>f</i>,<i>j</i>,<i>p</i>,<i>t</i></sub>	2,160,566	8.328	2.69	-9.2	22.1
$Ln(1+Tariff)_{i,j,p,t-1}$	2,160,566	0.027	0.05	0.0	0.3
$Ln(1+AVE SPS)_{i,j,p,t-1}$	2,160,566	0.010	0.16	-9.5	4.6
$Ln(1+AVE TBT)_{i,i,p,t-1}$	2,160,566	0.013	0.09	-6.8	4.1
$PTA_{i,j,t}$	2,160,566	0.607	0.49	0.0	1.0
$Ln(1 + Non-Green Tariff)_{i,i,t-1}$	2,160,566	0.046	0.05	0.0	0.2
$Ln(Market Size)_{i,i,p,t}$	2,160,566	13.430	2.05	-6.9	18.6
I[Single Product <sub>f,vc</sub> ]	2,160,566	0.041	0.20	0.0	1.0
SPS count <sub><i>i</i>,<i>i</i>,<i>p</i>,<i>t</i>-1</sub>	2,160,566	0.309	0.93	0.0	8.0
TBT count <sub><i>i</i>,<i>j</i>,<i>p</i>,<i>t</i>-1</sub>	2,160,566	5.260	6.85	0.0	40.0
$I[SPS_{i,j,p,t-1}]$	2,160,566	0.122	0.33	0.0	1.0
$I[TBT_{i,j,p,t-1}]$	2,160,566	0.694	0.46	0.0	1.0
Panel B - Extensive Margin of Imports					
Probability of Importing $_{i,f,j,p,t}$	17,797,628	0.368	0.48	0.0	1.0
$Ln(1+Tariff)_{i,j,p,t-1}$	17,797,628	0.039	0.06	0.0	0.8
$Ln(1+AVE SPS)_{i,j,p,t-1}$	17,797,628	0.013	0.18	-9.5	4.6
$Ln(1+AVE TBT)_{i,j,p,t-1}$	17,797,628	0.013	0.10	-9.6	4.5
$PTA_{i,j,t}$	17,797,628	0.514	0.50	0.0	1.0
$Ln(1 + Non-Green Tariff)_{i,j,t-1}$	17,797,628	1.530	1.01	0.0	3.0
$Ln(Market Size)_{i,j,p,t}$	17,797,628	13.096	2.29	-6.9	18.6
I[Single Product <sub>f,vc</sub> ]	17,797,628	0.165	0.37	0.0	1.0
SPS count <sub><i>i</i>,<i>j</i>,<i>p</i>,<i>t</i>-1</sub>	17,797,628	0.236	0.87	0.0	8.0
TBT count <sub><i>i</i>,<i>j</i>,<i>p</i>,<i>t</i>-1</sub>	17,797,628	4.310	6.17	0.0	40.0
$I[SPS_{i,j,p,t-1}]$	17,797,628	0.092	0.29	0.0	1.0
$I[TBT_{i,i,p,t-1}]$	17,797,628	0.650	0.48	0.0	1.0

Table A4: Summary Statistics including India

This table presents descriptive statistics for all variables in Panel A for the sample used in the estimations of the intensive margin, import value, regressions, and in Panel B for the sample used in the estimations of the extensive margin, the probability of importing.

Dependent variable: Ln(Import Value) <sub><i>i</i>,<i>f</i>,<i>j</i>,<i>p</i>,<i>t</i></sub>		
	With India	Without India
$Ln(1+Tariff)_{i,j,p,t-1}$	-0.0092	-0.0071
	(0.003)***	(0.003)**
$Ln(1+Tariff)_{i,j,p,t-1} \cdot I[Raw Materials_p]$	0.0009	-0.0002
	(0.004)	(0.003)
$Ln(1+Tariff)_{i,j,p,t-1} \cdot I[Proccessed Materials_p]$	-0.0111	-0.0068
	(0.006)*	(0.005)
$Ln(1+Tariff)_{i,j,p,t-1} \cdot I[Subcomponents_p]$	-0.0049	-0.0137
	(0.005)	(0.004)***
$Ln(1+Tariff)_{i,j,p,t-1} \cdot I[End-product_n]$	-0.0046	-0.0037
	(0.005)	(0.005)
$Ln(1+AVE SPS)_{i,j,p,t-1}$	-0.0005	-0.0008
	(0.001)	(0.001)
$Ln(1+AVE SPS)_{i,j,p,t-1} \cdot I[Raw Materials_p]$	-0.0002	0.0001
	(0.001)	(0.000)
$Ln(1+AVE SPS)_{i,j,p,t-1} \cdot I[Processed Materials_p]$	-0.0001	0.0000
	(0.001)	(0.001)
$Ln(1+AVE SPS)_{i,j,p,t-1} \cdot I[Subcomponents_p]$	0.0006	0.0008
	(0.001)	(0.001)
$Ln(1+AVE SPS)_{i,j,p,t-1} \cdot I[End-product_p]$	-0.0002	0.0001
	(0.001)	(0.001)
$Ln(1+AVE TBT)_{i,j,p,t-1}$	-0.0001	-0.0006
	(0.001)	(0.001)
$Ln(1+AVE TBT)_{i,j,p,t-1} \cdot I[Raw Materials_p]$	-0.0011	-0.0004
	(0.000)**	(0.000)
$Ln(1+AVE TBT)_{i,j,p,t-1} \cdot I[Proccessed Materials_p]$	0.0002	0.0001
	(0.000)	(0.000)
$Ln(1+AVETBT)_{i,j,p,t-1} \cdot I[Subcomponents_p]$	-0.0010	-0.0009
	(0.001)*	(0.001)
$Ln(1+AVE TBT)_{i,j,p,t-1} \cdot I[End-product_p]$	-0.0012	-0.0010
	(0.001)**	(0.001)*
Observations	14 148 676	12 718 663
Adjusted R2	0.84	0.84
Fixed Effects	f-t, f-p-i	f-t, f-p-i

Table A5: Intensive Margin of Firm-level Imports - Heterogeneous Effects of Green Products - By Segment

Note: This table estimates Equation 1 for firm f in importing country i of product p from origin country j in year t. Column (1) covers firm-level import data from 35 countries in the in the appendix table A1. Column (2) excludes India from the sample of importing countries. Coefficients are standardized with zero mean and unit standard deviation. Additional controls include  $PTA_{i,j,t}$  and  $Ln(Market Size)_{i,j,p,t}$ . Clustered standard errors at the origin-destination-HS6 product level are presented in parentheses; \*\*\*, \*\*, and \* denote significance at the 1%, 5%, and 10% levels, respectively.

Table A6: Two-sample t-test with equal variances - share of homogeneous products at the HS 4-d	igit
subsector	

Group	Obs	Mean	Std. Err.	Std. Dev.	95% Conf. Interval
Subsectors w/o Green Value Chain Products	830	0.3772	0.0166	0.4794	[0.3446, 0.4099]
Subsectors with Green Value Chain Products	98	0.4426	0.0506	0.4955	[0.3433, 0.5419]
Combined	928	0.3841	0.0158	0.4813	[0.3531, 0.4151]
Difference		-0.0654	0.0514		[-0.1662, 0.0355]

t-statistic Degrees of Freedom p-value

-1.2720 926 0.2037

Note: These tables present the results of a two-sample t-test with equal variances, comparing the share of homogeneous products at the HS 4-digit subsector level. We use the classification of differentiated products from (Rauch, 1999), covering 928 HS4 headings.

Table A7: Two-sample t-test with equal variances - share of intermediate products at the HS 4-digit subsectors

Group	Observations	Mean	Std. Dev.	95% Conf. Interval
Subsectors w/o Green Value Chain Products	1,100	0.6317	0.4582	[0.6046, 0.6588]
Subsectors with Green Value Chain Products	123	0.8061	0.3608	[0.7417, 0.8705]
Combined	1,223	0.6492	0.4523	[0.6238, 0.6746]
Difference		-0.1744		[-0.2582, -0.0906]

t-statistic Degrees of Freedom p-value

-4.0819 1221 0.0000

Note: These tables present the results of a two-sample t-test with equal variances, comparing the share of intermediate products at the HS 4-digit subsector level. The BEC classification is used to identify Intermediates (categories 21, 22, 111, and 121), including Parts and Accessories (categories 42 and 53).





Note: Each node represents the average import value share for a given country and value chain in the first and last year of the sample. The first year with information is 2018 for Timor-Leste, Togo, and Viet Nam and 2019 for Lao PDR and Pakistan. The last year of information is 2020 for Senegal and Uganda. Node size represents the number of green value chain products imported in the most recent year. For countries and value chain segments whose differences between periods are most prominent, the dot with the country's name and the segment name is labelled.



Figure A2: Firm-Level Import Diversification, 2017 vs. 2021

Note: Each node represents the average of a country-value chain segment in the first and last year of the sample. The first year with information is 2018 for Timor-Leste, Togo, and Viet Nam and 2019 for Lao PDR and Pakistan. The last year of information is 2020 for Senegal and Uganda. For countries and value chain segments whose differences between periods are most prominent, the dot with the country's name and the segment name is labelled.





Note: Top 10 countries in terms of imports in green value chains are defined by the number of observations in the sample. Average tariffs across all products in a green value chain are shown for each country.

### **B** Robustness Checks – Intensive margin

Dependent variable: Ln(Import Value) <sub>i,f,j,p,t</sub>										
	All	V	Value Chaiı	ı			Segments			
		EV	Solar	Wind	Raw	Processed	Subcomponents	End-product		
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)		
$Ln(1+Tariff)_{i,j,p,t-1}$	-0.0463	0.1479	-0.0540	-0.0407	-0.1777	-0.0651	-0.0344	-0.7211		
	(0.016)***	(0.326)	(0.026)**	(0.023)*	(0.369)	(0.052)	(0.016)**	(0.238)***		
$Ln(1+AVE SPS)_{i,j,p,t-1}$	0.0046	-0.0218	0.0063	-0.0001	-0.0584	0.0016	0.0051	0.0338		
	(0.002)**	(0.025)	(0.004)*	(0.003)	(0.037)	(0.004)	(0.002)**	(0.060)		
$Ln(1+AVE TBT)_{i,i,v,t-1}$	-0.0018	0.0229	-0.0042	-0.0010	0.0341	-0.0002	-0.0008	-0.0456		
	(0.002)	(0.023)	(0.003)	(0.002)	(0.045)	(0.005)	(0.003)	(0.028)		
Observations	1,097,697	10,436	496,280	516,206	2,920	160,890	858,798	9,237		
Adjusted R2	0.80	0.82	0.80	0.78	0.84	0.79	0.79	0.77		
Fixed Effects	f-t, f-p-j	f-t, f-p-j	f-t, f-p-j	f-t, f-p-j	f-t, f-p-j	f-t, f-p-j	f-t, f-p-j	f-t, f-p-j		

Table B1: Intensive Margin of Firm-level Imports - Excluding negative AVE NTMs

Dependent variable: Ln(Import Value) <sub>i,f,j,p,t</sub>										
	All		Value Chain	l			Segments			
		EV	Solar	Wind	Raw	Processed	Subcomponents	End-product		
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)		
$Ln(1+Tariff)_{i,j,p,t-1}$	-0.0327	-0.0604	-0.0425	-0.0235	-0.3285	-0.0746	-0.0173	-0.3295		
	(0.011)***	(0.124)	(0.018)**	(0.017)	(0.280)	(0.032)**	(0.013)	(0.133)**		
$Ln(1+AVE SPS)_{i,i,p,t-1}$	0.0022	-0.0182	0.0066	-0.0007	-0.0461	0.0036	0.0009	0.0072		
.,,,,	(0.001)	(0.018)	(0.002)***	(0.002)	(0.032)	(0.004)	(0.002)	(0.012)		
$Ln(1+AVE TBT)_{i,i,p,t-1}$	-0.0032	0.0101	-0.0067	-0.0009	0.0569	-0.0025	-0.0025	-0.0135		
	(0.001)**	(0.009)	(0.002)***	(0.002)	(0.041)	(0.003)	(0.002)	(0.011)		
Observations	1,911,864	22,961	908,830	868,615	5,017	307,773	1,444,775	37,894		
Adjusted R2	0.80	0.82	0.80	0.79	0.85	0.80	0.79	0.79		
Fixed Effects	f-t, f-p-j	f-t, f-p-j	f-t, f-p-j	f-t, f-p-j	f-t, f-p-j	f-t, f-p-j	f-t, f-p-j	f-t, f-p-j		

Table B2: Intensive Margin of Firm-level Imports - Standard Errors Clustered at firm level

Dependent variable: Ln(Import Value) <sub>i,f,j,p,t</sub>									
	All		Value Chair	l			Segments		
		EV	Solar	Wind	Raw	Processed	Subcomponents	End-product	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	
$Ln(1+Tariff)_{i,j,p,t-1}$	-0.0326	-0.0544	-0.0422	-0.0232	-0.2864	-0.0749	-0.0171	-0.3379	
	(0.013)**	(0.182)	(0.022)*	(0.021)	(0.516)	(0.047)	(0.015)	(0.221)	
$Ln(1+AVE SPS)_{i,j,p,t-1}$	0.0032	-0.0080	0.0084	-0.0002	-0.0332	0.0046	0.0025	-0.0004	
	(0.002)*	(0.027)	(0.003)***	(0.002)	(0.057)	(0.004)	(0.002)	(0.018)	
$Ln(1+AVE TBT)_{i,j,p,t-1}$	-0.0026	0.0105	-0.0052	-0.0007	0.0603	-0.0013	-0.0020	-0.0230	
	(0.002)	(0.018)	(0.003)*	(0.002)	(0.050)	(0.004)	(0.002)	(0.017)	
Observations	1,917,756	23,165	911,962	870,975	5,124	308,613	1,448,432	38,989	
Adjusted R2	0.80	0.82	0.80	0.78	0.85	0.80	0.79	0.80	
Fixed Effects	f-t, f-p-j	f-t, f-p-j	f-t, f-p-j	f-t, f-p-j	f-t, f-p-j	f-t, f-p-j	f-t, f-p-j	f-t, f-p-j	

Table B3: Intensive Margin of Firm-level Imports - Bootstrapped Standard Errors

Dependent variable: Ln(Import Value) <sub>i,f,j,p,t</sub>											
	All	<u>_</u>	Value Chain			Segments					
		EV	Solar	Wind	Raw	Processed	Subcomponents	End-product			
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)			
$Ln(1+Tariff)_{i,i,p,t-1}$	-0.0325	-0.0551	-0.0421	-0.0229	-0.2782	-0.0753	-0.0171	-0.3368			
	(0.012)***	(0.128)	(0.019)**	(0.019)	(0.248)	(0.040)*	(0.012)	(0.133)**			
SPS count <sub><i>i</i>,<i>j</i>,<i>p</i>,<i>t</i>-1</sub>	0.0233	0.0000	0.0309	-0.1517	0.0000	-0.5006	0.0240	0.0118			
.,.,.	(0.015)	(.)	(0.022)	(0.094)	(.)	(0.351)	(0.017)	(0.001)***			
TBT count <sub><i>i</i>,<i>j</i>,<i>p</i>,<i>t</i>-1</sub>	0.0128	0.0070	0.0459	0.0132	-0.0695	-0.0083	-0.0010	-0.2577			
	(0.020)	(0.081)	(0.031)	(0.023)	(0.089)	(0.018)	(0.023)	(0.106)**			
Observations	1,917,756	23,165	911,962	870,975	5,124	308,613	1,448,432	38,989			
Adjusted R2	0.80	0.82	0.80	0.78	0.85	0.80	0.79	0.80			
Fixed Effects	f-t, f-p-j	f-t, f-p-j	f-t, f-p-j	f-t, f-p-j	f-t, f-p-j	f-t, f-p-j	f-t, f-p-j	f-t, f-p-j			

Table B4: Intensive Margin of Firm-level Imports - Count variables for SPS and TBT measures

Dependent variable	Dependent variable: Ln(Import Value) <sub>i,f,j,p,t</sub>											
	All	<u>_</u>	Value Chain			Segments						
		EV	EV Solar Wind		Raw	Processed	Subcomponents	End-product				
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)				
$Ln(1+Tariff)_{i,i,p,t-1}$	-0.0325	-0.0549	-0.0420	-0.0232	-0.2826	-0.0760	-0.0168	-0.3316				
	(0.012)***	(0.128)	(0.019)**	(0.019)	(0.248)	(0.040)*	(0.012)	(0.132)**				
I[SPS $_{i,i,p,t-1}$ ]	0.1448	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0117				
	(0.129)	(.)	(.)	(.)	(.)	(.)	(.)	(0.001)***				
$I[TBT_{i,i,p,t-1}]$	-0.0208	0.0469	-0.0241	-0.0092	-0.1661	-0.0303	-0.0234	0.2660				
	(0.009)**	(0.076)	(0.010)**	(0.023)	(0.174)	(0.029)	(0.010)**	(0.157)*				
Observations	1,917,756	23,165	911,962	870 <i>,</i> 975	5,124	308,613	1,448,432	38,989				
Adjusted R2	0.80	0.82	0.80	0.78	0.85	0.80	0.79	0.80				
Fixed Effects	f-t, f-p-j	f-t, f-p-j	f-t, f-p-j	f-t, f-p-j	f-t, f-p-j	f-t, f-p-j	f-t, f-p-j	f-t, f-p-j				

Table B5: Intensive Margin of Firm-level Imports - Indicator variables for SPS and TBT measures

Dependent variable: Ln	(Import Val	ue) <sub>i,f,j,p,t</sub>							
	All	V	Value Chain			Segments			
		EV	EV Solar Wind		Raw	Processed	Subcomponents	End-product	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	
$Ln(1+Tariff)_{i,j,p,t-1}$	-0.0324	-0.0542	-0.0425	-0.0228	-0.2951	-0.0757	-0.0168	-0.3414	
	(0.012)***	(0.128)	(0.019)**	(0.019)	(0.263)	(0.040)*	(0.012)	(0.132)***	
$Ln(1+AVE SPS)_{i,j,p,t-1}$	-0.0010	-0.0111	-0.0001	0.0004	-0.0406	-0.0030	0.0000	0.0094	
	(0.002)	(0.009)	(0.003)	(0.002)	(0.018)**	(0.005)	(0.003)	(0.002)***	
$Ln(1+AVE TBT)_{i,j,p,t-1}$	-0.0035	0.0291	-0.0069	-0.0002	0.0232	-0.0030	-0.0026	-0.0153	
	(0.001)**	(0.011)**	(0.002)***	(0.002)	(0.032)	(0.004)	(0.002)	(0.011)	
Observations	1,916,961	23,145	911,391	870,753	5,090	308,488	1,447,829	38,960	
Adjusted R2	0.80	0.82	0.80	0.78	0.85	0.80	0.79	0.80	
Fixed Effects	f-t, f-p-j	f-t, f-p-j	f-t, f-p-j	f-t, f-p-j	f-t, f-p-j	f-t, f-p-j	f-t, f-p-j	f-t, f-p-j	

Table B6: Intensive Margin of Firm-level Imports - SPS and TBT AVEs set to zero if their count variables equals zero

		Intensive Margin			Extensive Margin	
	$Ln(1+Tariff)_{i,j,p,t-1}$	$Ln(1+AVE SPS)_{i,j,p,t-1}$	Ln(1+AVE TBT) <sub><i>i</i>,<i>j</i>,<i>p</i>,<i>t</i>-1</sub>	$Ln(1+Tariff)_{i,j,p,t-1}$	$Ln(1+AVE SPS)_{i,j,p,t-1}$	Ln(1+AVE TBT) <sub><math>i,j,p,t-1</math></sub>
	(1)	(2)	(3)	(4)	(5)	(6)
$Ln(1+Tariff)_{i',j,p,t-1}$	0.0300	-0.0157	-0.0102	0.0262	0.0598	-0.0732
	(0.016)*	(0.078)	(0.058)	(0.014)*	(0.066)	(0.046)
$Ln(1 + AVE SPS)_{i', i, p, t-1}$	-0.0003	0.5471	0.0015	-0.0004	0.5129	0.0047
	(0.000)*	(0.063)***	(0.007)	(0.000)***	(0.049)***	(0.005)
$Ln(1 + AVE TBT)_{i',i,v,t-1}$	-0.0003	0.0085	0.3540	0.0007	0.0263	0.3888
	(0.000)*	(0.016)	(0.080)***	(0.000)**	(0.019)	(0.056)***
Observations	1,828,402	1,828,402	1,828,402	14,383,553	14,383,553	14,383,553
Adjusted R2	0.9883	0.4858	0.3252	0.9866	0.4652	0.3757
Fixed Effects	f-t, f-p-j	f-t, f-p-j	f-t, f-p-j	f-t, f-p-j	f-t, f-p-j	f-t, f-p-j

#### Table B7: Control Function Estimates

Note: This table estimates Equation 3 for each trade policy instrument t issued by importing country *i* on origin country *j* and product *p* in year *t*. The sample covers firm-level import data from 34 countries in the appendix table A1, excluding India. Each column presents the estimation of trade policy measures based on the average intensity in three closest countries *i'*. Three additional control variables are included in the regression:  $PTA_{i,j,t}$ ,  $Ln(1 + Non-Green Tariff)_{i,j,t-1}$  and  $Ln(Market Size)_{i,j,p,t}$ . Clustered standard errors at the origin-destination-HS6 product level are presented in parentheses; \*\*\*, \*\*, and \* denote significance at the 1%, 5%, and 10% levels, respectively.

Dependent variable: Ln	(Import Val	ue) <sub>i,f,j,p,t</sub>								
	All		Value Chain			Segments				
		EV	EV Solar Wind		Raw	Processed	Subcomponents	End-product		
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)		
$Ln(1+Tariff)_{i,j,p,t-1}$	-0.0329	-0.0026	-0.0395	-0.0264	-0.3699	-0.0818	-0.0140	-0.2540		
	(0.013)***	(0.097)	(0.021)*	(0.019)	(0.308)	(0.036)**	(0.014)	(0.107)**		
$Ln(1+AVE SPS)_{i,j,p,t-1}$	0.0026	-0.0205	0.0069	0.0002	-0.9292	0.0054	0.0001	0.0034		
	(0.002)	(0.012)*	(0.003)**	(0.003)	(0.566)	(0.006)	(0.003)	(0.003)		
$Ln(1+AVE TBT)_{i,j,p,t-1}$	-0.0030	0.0100	-0.0066	-0.0005	0.0139	-0.0037	-0.0025	-0.0198		
	(0.002)*	(0.020)	(0.002)***	(0.002)	(0.010)	(0.004)	(0.002)	(0.017)		
Observations	1,828,402	20,813	869,719	831,742	4,425	292,600	1,383,926	36,291		
Adjusted R2	0.80	0.81	0.80	0.78	0.84	0.79	0.79	0.79		
Fixed Effects	f-t, f-p-j	f-t, f-p-j	f-t <i>,</i> f-p-j	f-t, f-p-j	f-t, f-p-j	f-t, f-p-j	f-t, f-p-j	f-t, f-p-j		

Table B8: Intensive Margin of Firm-level Imports - Controlling for Inverse Mills Ratio

Note: This table estimates Equation 1 for firm f in importing country i of product p from origin country j in year t. The sample covers firm-level import data from 34 countries in the appendix table A1, excluding India. Columns (1)-(8) show coefficients standardized with zero mean and unit standard deviation in their respective sample. All columns include controls for three Inverse Mills Ratios, each corresponding to a trade policy instrument. These ratios are based on OLS estimates, using the average intensity of the three nearest countries, as specified in Equation 3. Three additional control variables are included in the regression:  $PTA_{i,j,t}$ ,  $Ln(1 + Non-Green Tariff)_{i,j,t-1}$  and  $Ln(Market Size)_{i,j,p,t}$ . Clustered standard errors at the origin-destination-HS6 product level are presented in parentheses; \*\*\*, \*\*, and \* denote significance at the 1%, 5%, and 10% levels, respectively.

### **C** Robustness Checks – Extensive margin

Dependent variable: Pro	Dependent variable: Probability of Importing <sub><i>i</i>,<i>f</i>,<i>j</i>,<i>p</i>,<i>t</i></sub>										
	All	,	Value Chain			Segments					
		EV	EV Solar Wind		Raw	Processed	Subcomponents	End-product			
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)			
$Ln(1+Tariff)_{i,j,p,t-1}$	-0.0086	0.0017	-0.0082	-0.0075	-0.1193	-0.0206	-0.0049	-0.0143			
	(0.003)**	(0.028)	(0.004)*	(0.005)	(0.066)*	(0.010)**	(0.003)	(0.033)			
$Ln(1+AVE SPS)_{i,j,p,t-1}$	0.0005	-0.0072	0.0010	-0.0001	0.0031	0.0029	-0.0001	-0.0007			
	(0.000)	(0.003)***	(0.001)	(0.001)	(0.005)	(0.001)*	(0.000)	(0.005)			
$Ln(1+AVE TBT)_{i,j,p,t-1}$	-0.0009	-0.0014	-0.0005	-0.0012	0.0016	-0.0012	-0.0010	0.0036			
	(0.000)***	(0.003)	(0.001)	(0.000)***	(0.007)	(0.001)	(0.000)***	(0.002)			
Observations	9,340,713	128,049	4,189,079	4,523,911	25,587	1,524,571	7,204,900	109,148			
Adjusted R2	0.23	0.02	0.21	0.20	-0.02	0.16	0.23	0.01			
Fixed Effects	f-t, f-p-j	f-t, f-p-j	f-t, f-p-j	f-t, f-p-j	f-t, f-p-j	f-t, f-p-j	f-t, f-p-j	f-t, f-p-j			

Table C1: Extensive Margin of Firm-level Imports - Excluding negative AVE NTMs

Dependent variable: Pro	Dependent variable: Probability of Importing <sub>i,f,j,p,t</sub>										
	All		Value Chain			Segments					
		EV	EV Solar Wind		Raw	Processed	Subcomponents	End-product			
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)			
$Ln(1+Tariff)_{i,j,p,t-1}$	-0.0069	-0.0010	-0.0056	-0.0092	-0.0032	-0.0175	-0.0054	0.0041			
	(0.001)***	(0.013)	(0.002)***	(0.002)***	(0.034)	(0.003)***	(0.001)***	(0.009)			
$Ln(1+AVE SPS)_{i,j,p,t-1}$	-0.0000	0.0048	0.0007	-0.0009	0.0017	0.0003	-0.0008	0.0029			
	(0.000)	(0.001)***	(0.000)***	(0.000)***	(0.004)	(0.000)	(0.000)***	(0.001)***			
$Ln(1+AVE TBT)_{i,i,p,t-1}$	-0.0008	-0.0018	-0.0008	-0.0006	-0.0099	-0.0012	-0.0009	0.0020			
	(0.000)***	(0.001)	(0.000)***	(0.000)**	(0.004)***	(0.000)***	(0.000)***	(0.001)*			
Observations	15,396,435	289,004	7,366,189	7,055,080	41,735	2,748,228	11,448,457	415,215			
Adjusted R2	0.24	0.12	0.24	0.22	0.13	0.21	0.24	0.15			
Fixed Effects	f-t, f-p-j	f-t, f-p-j	f-t <i>,</i> f-p-j	f-t, f-p-j	f-t, f-p-j	f-t, f-p-j	f-t, f-p-j	f-t, f-p-j			

Table C2: Extensive Margin of Firm-level Imports - Standard Errors Clustered at Firm Level

Dependent variable: Pro	Dependent variable: Probability of Importing <sub><i>i</i>,<i>f</i>,<i>j</i>,<i>p</i>,<i>t</i></sub>										
	All		Value Chain			Segments					
		EV	EV Solar Wind H		Raw	Processed	Subcomponents	End-product			
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)			
$Ln(1+Tariff)_{i,j,p,t-1}$	-0.0066	-0.0017	-0.0056	-0.0087	0.0021	-0.0173	-0.0051	0.0028			
	(0.001)***	(0.017)	(0.002)***	(0.002)***	(0.056)	$(0.004)^{***}$	(0.002)***	(0.014)			
$Ln(1+AVE SPS)_{i,j,p,t-1}$	-0.0001	0.0042	0.0004	-0.0008	0.0025	0.0008	-0.0009	0.0018			
	(0.000)	(0.002)**	(0.000)	(0.000)**	(0.005)	(0.001)	(0.000)***	(0.001)			
$Ln(1+AVE TBT)_{i,i,p,t-1}$	-0.0007	-0.0005	-0.0006	-0.0006	-0.0034	-0.0008	-0.0009	0.0026			
	(0.000)***	(0.002)	(0.000)**	(0.000)**	(0.005)	(0.000)*	(0.000)***	(0.001)*			
Observations	15,458,958	293,057	7,400,535	7,077,715	42,602	2,754,879	11,491,035	425,567			
Adjusted R2	0.24	0.12	0.24	0.22	0.14	0.21	0.24	0.15			
Fixed Effects	f-t, f-p-j	f-t, f-p-j	f-t, f-p-j	f-t, f-p-j	f-t, f-p-j	f-t, f-p-j	f-t, f-p-j	f-t, f-p-j			

Table C3: Extensive Margin of Firm-level Imports - Bootstrapped Standard Errors

Dependent variable	Dependent variable: Probability of Importing <sub><i>i</i>,<i>f</i>,<i>j</i>,<i>p</i>,<i>t</i></sub>										
	All		Value Chain			Segments					
		EV	EV Solar Wind		Raw	Processed	Subcomponents	End-product			
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)			
$Ln(1+Tariff)_{i,j,p,t-1}$	-0.0066	-0.0017	-0.0047	-0.0087	0.0074	-0.0170	-0.0049	0.0037			
.,.,.	(0.003)**	(0.014)	(0.003)	(0.005)*	(0.033)	(0.010)*	(0.003)*	(0.011)			
SPS count <sub><i>i</i>,<i>j</i>,<i>p</i>,<i>t</i>-1</sub>	0.0080	0.0008	0.0176	-0.0051	-0.0169	-0.0030	0.0121	0.0002			
	(0.002)***	(0.007)	(0.003)***	(0.001)***	(0.015)	(0.004)	(0.002)***	(0.002)			
TBT count <sub><i>i</i>,<i>j</i>,<i>p</i>,<i>t</i>-1</sub>	-0.0070	-0.0277	0.0016	-0.0097	-0.0329	-0.0020	-0.0132	-0.0191			
	(0.003)**	(0.009)***	(0.004)	(0.003)***	(0.015)**	(0.002)	(0.004)***	(0.008)**			
Observations	15,458,958	293,057	7,400,535	7,077,715	42,602	2,754,879	11,491,035	425,567			
Adjusted R2	0.24	0.12	0.24	0.22	0.14	0.21	0.24	0.15			
Fixed Effects	f-t, f-p-j	f-t, f-p-j	f-t, f-p-j	f-t, f-p-j	f-t, f-p-j	f-t, f-p-j	f-t, f-p-j	f-t, f-p-j			

Table C4: Extensive Margin of Firm-level Imports - Count variables for SPS and TBT measures

Dependent variable	Probability	of Importing	Bi,f,j,p,t						
	All		Value Chain	l		Segments			
		EV	EV Solar Wind		Raw	Processed	Subcomponents	End-product	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	
$Ln(1+Tariff)_{i,j,p,t-1}$	-0.0067	-0.0022	-0.0053	-0.0087	0.0034	-0.0172	-0.0053	0.0036	
	(0.003)**	(0.014)	(0.003)	(0.005)*	(0.033)	(0.010)*	(0.003)*	(0.011)	
I[SPS $_{i,i,p,t-1}$ ]	-0.0032	0.0048	0.0093	-0.0039	-0.0248	-0.0049	-0.0025	-0.0019	
	(0.003)	(0.006)	(0.004)**	(0.001)***	(0.014)*	(0.004)	(0.004)	(0.002)	
$I[TBT_{i,i,p,t-1}]$	-0.0065	-0.0206	-0.0049	-0.0115	0.0028	-0.0083	-0.0059	-0.0254	
	(0.001)***	(0.005)***	(0.001)***	(0.001)***	(0.015)	(0.002)***	(0.001)***	(0.005)***	
Observations	15,458,958	293,057	7,400,535	7,077,715	42,602	2,754,879	11,491,035	425,567	
Adjusted R2	0.24	0.12	0.24	0.22	0.14	0.21	0.24	0.15	
Fixed Effects	f-t, f-p-j	f-t, f-p-j	f-t, f-p-j	f-t, f-p-j	f-t, f-p-j	f-t, f-p-j	f-t, f-p-j	f-t, f-p-j	

Table C5: Extensive Margin of Firm-level Imports - Indicator variables for SPS and TBT measures

Dependent variable: Pro	Dependent variable: Probability of Importing <sub><i>i</i>,<i>f</i>,<i>j</i>,<i>p</i>,<i>t</i></sub>										
	All		Value Chain			Segments					
		EV	EV Solar Wind		Raw	Processed	Subcomponents	End-product			
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)			
$Ln(1+Tariff)_{i,j,p,t-1}$	-0.0066	-0.0023	-0.0057	-0.0086	0.0009	-0.0174	-0.0050	0.0029			
	(0.003)**	(0.014)	(0.003)*	(0.005)*	(0.032)	(0.010)*	(0.003)*	(0.010)			
$Ln(1+AVE SPS)_{i,j,p,t-1}$	0.0010	0.0004	0.0012	-0.0006	0.0059	-0.0007	0.0014	0.0010			
	(0.001)**	(0.001)	(0.001)*	(0.000)	(0.004)*	(0.001)	(0.001)**	(0.001)*			
$Ln(1+AVE TBT)_{i,i,p,t-1}$	-0.0001	-0.0006	-0.0007	0.0005	-0.0025	0.0005	-0.0002	0.0001			
	(0.000)	(0.002)	(0.000)*	(0.000)	(0.004)	(0.000)	(0.000)	(0.002)			
Observations	15,458,958	293,057	7,400,535	7,077,715	42,602	2,754,879	11,491,035	425,567			
Adjusted R2	0.24	0.12	0.24	0.22	0.14	0.21	0.24	0.15			
Fixed Effects	f-t, f-p-j	f-t, f-p-j	f-t, f-p-j	f-t, f-p-j	f-t, f-p-j	f-t, f-p-j	f-t, f-p-j	f-t, f-p-j			

Table C6: Extensive Margin of Firm-level Imports - AVEs equal to zero if count equal zero

Dependent variable: Pro	obability of Iı	nporting <sub>i,f,j</sub>	,p,t						
	All	,	Value Chain			Segments			
		EV	EV Solar Wind		Raw	Processed	Subcomponents	End-product	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	
$Ln(1+Tariff)_{i,j,p,t-1}$	-0.0062	-0.0021	-0.0053	-0.0090	0.0045	-0.0147	-0.0052	0.0018	
	(0.003)*	(0.010)	(0.004)	(0.005)*	(0.034)	(0.009)	(0.003)*	(0.009)	
$Ln(1+AVE SPS)_{i,j,p,t-1}$	0.0001	0.0028	0.0004	-0.0005	0.0314	0.0012	-0.0005	0.0009	
	(0.000)	(0.001)***	(0.000)	(0.001)	(0.073)	(0.002)	(0.000)	(0.001)	
$Ln(1+AVE TBT)_{i,i,p,t-1}$	-0.0005	-0.0021	-0.0004	-0.0006	-0.0030	-0.0014	-0.0006	0.0030	
	(0.000)*	(0.004)	(0.000)	(0.000)	(0.002)*	(0.001)**	(0.000)	(0.002)*	
Observations	14,383,553	262,817	6,893,291	6,586,374	35,969	2,555,706	10,705,352	388,952	
Adjusted R2	0.24	0.12	0.24	0.23	0.14	0.21	0.24	0.15	
Fixed Effects	f-t, f-p-j	f-t, f-p-j	f-t, f-p-j	f-t, f-p-j	f-t, f-p-j	f-t, f-p-j	f-t, f-p-j	f-t, f-p-j	

Table C7: Extensive Margin of Firm-level Imports - Controlling for Inverse Mills Ratio

Note: This table estimates Equation 1 for firm f in importing country i of product p from origin country j in year t. The sample covers firm-level import data from 34 countries in the appendix table A1, excluding India. Columns (1)-(8) show coefficients standardized with zero mean and unit standard deviation in their respective sample. All columns include controls for three Inverse Mills Ratios, each corresponding to a trade policy instrument. These ratios are based on OLS estimates, using the average intensity of the three nearest countries, as specified in Equation 3. Three additional control variables are included in the regression:  $PTA_{i,j,t}$ ,  $Ln(1 + Non-Green Tariff)_{i,j,t-1}$  and  $Ln(Market Size)_{i,j,p,t}$ . Clustered standard errors at the origin-destination-HS6 product level are presented in parentheses; \*\*\*, \*\*, and \* denote significance at the 1%, 5%, and 10% levels, respectively.

## D Intensive Margin of Firm-level Imports - Results by Region

Dependent variable: Ln(Import	Dependent variable: Ln(Import Value) <sub><i>i</i>,<i>f</i>,<i>j</i>,<i>p</i>,<i>t</i></sub>									
	East Asia	Europe and	Latin America	South Asia	Sub-Saharan					
	and Pacific	Central Asia	and Caribbean		Africa					
	(1)	(2)	(3)	(4)	(5)					
$Ln(1+Tariff)_{i,j,p,t-1}$	0.0024	-0.0443	-0.0314	0.0224	-0.0836					
	(0.025)	(0.165)	(0.012)***	(0.022)	(0.045)*					
$Ln(1+AVE SPS)_{i,i,v,t-1}$	0.0057	0.0026	0.0027	-0.0010	-0.0021					
	(0.007)	(0.007)	(0.002)	(0.004)	(0.004)					
$Ln(1+AVE TBT)_{i,i,p,t-1}$	0.0048	-0.0117	-0.0019	-0.0063	-0.0085					
	(0.005)	(0.011)	(0.002)	(0.005)	(0.003)***					
PTA <sub>i,i,t</sub>	0.0182	-0.0612	0.0223	0.5578	0.0224					
.,.	(0.011)*	(0.106)	(0.015)	(0.112)***	(0.018)					
$Ln(1 + \overline{Non-Green Tariff})_{i,i,t-1}$	-0.0395	-2.2506	-0.1106	0.0068	0.0576					
	(0.044)	(2.317)	(0.041)***	(0.059)	(0.178)					
Ln(Market Size) <sub>i.i.v.t</sub>	0.2481	0.2635	0.2413	0.0807	0.2357					
	(0.086)***	(0.093)***	(0.028)***	(0.044)*	(0.038)***					
Observations	167,912	47,252	1,279,760	303,277	362,365					
Adjusted R2	0.79	0.74	0.80	0.77	0.77					
Fixed Effects	f-t, f-p-j	f-t, f-p-j	f-t, f-p-j	f-t, f-p-j	f-t, f-p-j					

Table D1: Intensive Margin of Firm-level Imports - By region

Note: This table estimates Equation 1 for firm f in importing country i of product p from origin country j in year t. The sample covers firm-level import data from 35 countries in the appendix table A1. Columns (1)–(5) show coefficients standardized with zero mean and unit standard deviation in their respective sample. Clustered standard errors at the origin-destination-HS6 product level are presented in parentheses; \*\*\*, \*\*, and \* denote significance at the 1%, 5%, and 10% levels, respectively.

Dependent variable: Ln(Import Value) <sub>i,f,j,p,t</sub>									
	All	Ι	alue Chain	l	Segments				
		EV	Solar	Wind	Raw	Processed	Subcomponents	End-product	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	
$Ln(1+Tariff)_{i,j,p,t-1}$	0.0024	-0.0200	-0.0252	0.0259	-0.3048	-0.0460	0.0272	-0.1867	
	(0.025)	(0.221)	(0.042)	(0.045)	(0.470)	(0.071)	(0.031)	(0.152)	
$Ln(1+AVE SPS)_{i,j,p,t-1}$	0.0057	-0.0751	0.0182	-0.0108	-0.0914	0.0163	-0.0025	0.1095	
	(0.007)	(0.065)	(0.010)*	(0.008)	(0.148)	(0.011)	(0.006)	(0.049)**	
$Ln(1+AVE TBT)_{i,j,p,t-1}$	0.0048	0.0460	-0.0037	0.0079	0.0031	0.0150	0.0018	0.0628	
	(0.005)	(0.034)	(0.009)	(0.007)	(0.051)	(0.012)	(0.006)	(0.034)*	
$PTA_{i,j,t}$	0.0182	0.0843	0.0281	0.0023	0.2334	0.0344	0.0113	-0.0434	
·	(0.011)*	(0.091)	(0.016)*	(0.017)	(0.134)*	(0.023)	(0.013)	(0.113)	
$Ln(1 + \overline{Non-Green Tariff})_{i,j,t-1}$	-0.0395	-0.6838	-0.0161	-0.0367	-0.0762	0.0190	-0.0648	0.5062	
	(0.044)	(0.262)***	(0.056)	(0.076)	(0.441)	(0.097)	(0.048)	(0.221)**	
Ln(Market Size) <sub>i,j,p,t</sub>	0.2481	0.2395	0.2525	0.2536	-0.1973	0.2717	0.2237	0.7092	
	(0.086)***	(0.383)	(0.126)**	(0.114)**	(0.394)	(0.137)**	(0.110)**	(0.309)**	
Observations	167,912	2,004	84,297	69,106	781	36,950	114,552	2,611	
Adjusted R2	0.79	0.80	0.78	0.77	0.82	0.77	0.78	0.78	
Fixed Effects	f-t, f-p-j	f-t <i>,</i> f-p-j	f-t, f-p-j	f-t, f-p-j	f-t, f-p-j	f-t <i>,</i> f-p-j	f-t, f-p-j	f-t, f-p-j	

Table D2: Intensive Margin of Firm-level Imports - East Asia and Pacific

Note: This table estimates Equation 1 for firm f in importing country i of product p from origin country j in year t. The sample covers firm-level import data from 4 countries in East Asia and the Pacific listed in the appendix table A1. Columns (1)-(8) show coefficients standardized with zero mean and unit standard deviation in their respective sample. Clustered standard errors at the origin-destination-HS6 product level are presented in parentheses; \*\*\*, \*\*, and \* denote significance at the 1%, 5%, and 10% levels, respectively.

Dependent variable: Ln(Import Value) <sub>i,f,j,p,t</sub>										
	All	,	Value Chain			Segments				
		EV	Solar	Wind	Raw	Processed	Subcomponents	End-product		
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)		
$Ln(1+Tariff)_{i,j,p,t-1}$	-0.0443	0.0000	-0.0292	0.0875	•	-0.1194	0.0460	0.0000		
	(0.165)	(.)	(0.129)	(0.280)		(0.332)	(0.056)	(.)		
$Ln(1+AVE SPS)_{i,j,p,t-1}$	0.0026	-0.0785	-0.0072	0.0031	•	0.0036	0.0048	0.1179		
	(0.007)	(0.290)	(0.012)	(0.010)		(0.028)	(0.009)	(0.084)		
$Ln(1+AVE TBT)_{i,j,p,t-1}$	-0.0117	-0.0554	-0.0048	-0.0182	•	-0.0519	-0.0070	-0.0239		
	(0.011)	(0.085)	(0.010)	(0.019)		(0.038)	(0.009)	(0.099)		
PTA <sub><i>i</i>,<i>j</i>,<i>t</i></sub>	-0.0612	-0.5749	-0.1717	0.2021		0.0726	-0.0931	-0.3716		
	(0.106)	(0.256)**	(0.105)	(0.265)		(0.364)	(0.104)	(0.046)***		
$Ln(1 + \overline{Non-Green Tariff})_{i,j,t-1}$	-2.2506	14.3055	-1.6247	0.0558		-4.9553	-1.0806	2.4611		
	(2.317)	(8.301)*	(3.262)	(4.337)		(4.043)	(2.958)	(16.294)		
Ln(Market Size) <sub><i>i</i>,<i>j</i>,<i>p</i>,<i>t</i></sub>	0.2635	0.3055	0.4117	0.1783		0.1125	0.4004	-0.0211		
	(0.093)***	(0.989)	(0.130)***	(0.158)	•	(0.263)	(0.108)***	(0.794)		
Observations	47,252	393	23,203	18,306		9 <b>,</b> 251	31,711	520		
Adjusted R2	0.74	0.84	0.74	0.70		0.69	0.74	0.82		
Fixed Effects	f-t <i>,</i> f-p-j	f-t, f-p-j	f-t <i>,</i> f-p-j	f-t, f-p-j	f-t, f-p-j	f-t, f-p-j	f-t, f-p-j	f-t, f-p-j		

Table D3: Intensive Margin of Firm-level Imports - Europe and Central Asia

Note: This table estimates Equation 1 for firm f in importing country i of product p from origin country j in year t. The sample covers firm-level import data from 2 countries in Europe and Central Asia listed in the appendix table A1. Columns (1)-(8) show coefficients standardized with zero mean and unit standard deviation in their respective sample. There are not enough observations for Column (5). Clustered standard errors at the origin-destination-HS6 product level are presented in parentheses; \*\*\*, \*\*, and \* denote significance at the 1%, 5%, and 10% levels, respectively.

Dependent variable: Ln(Import Value) <sub>i,f,j,p,t</sub>										
	All		Value Chain			Segments				
		EV	Solar	Wind	Raw	Processed	Subcomponents	End-product		
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)		
$Ln(1+Tariff)_{i,j,p,t-1}$	-0.0314	-0.0651	-0.0428	-0.0172	-0.2913	-0.0541	-0.0227	-0.0897		
	(0.012)***	(0.142)	(0.020)**	(0.016)	(0.270)	(0.039)	(0.012)*	(0.130)		
$Ln(1+AVE SPS)_{i,j,p,t-1}$	0.0027	-0.0160	0.0061	0.0022	-0.0625	0.0046	0.0012	0.0029		
	(0.002)	(0.020)	(0.002)***	(0.002)	(0.038)	(0.004)	(0.002)	(0.013)		
$Ln(1+AVE TBT)_{i,j,p,t-1}$	-0.0019	0.0130	-0.0042	-0.0008	0.0605	-0.0010	-0.0014	-0.0180		
	(0.002)	(0.012)	(0.003)	(0.002)	(0.038)	(0.004)	(0.002)	(0.019)		
PTA <sub>i,j,t</sub>	0.0223	-0.0576	0.0195	0.0312	0.0241	0.0273	0.0256	-0.0161		
	(0.015)	(0.090)	(0.020)	(0.023)	(0.243)	(0.049)	(0.015)*	(0.054)		
$Ln(1 + \overline{Non-Green Tariff})_{i,j,t-1}$	-0.1106	-0.2428	-0.0825	-0.1188	0.0020	-0.1328	-0.0861	-0.3771		
	(0.041)***	(0.364)	(0.059)	(0.060)**	(0.364)	(0.098)	(0.046)*	(0.408)		
Ln(Market Size) <sub>i,j,p,t</sub>	0.2413	0.1028	0.2997	0.1990	0.1435	0.2101	0.2834	-0.0138		
	(0.028)***	(0.117)	(0.049)***	(0.033)***	(0.171)	(0.057)***	(0.034)***	(0.130)		
Observations	1,279,760	13,360	611,589	588,337	3,406	201,983	979,878	23,652		
Adjusted R2	0.80	0.82	0.80	0.79	0.83	0.81	0.80	0.80		
Fixed Effects	f-t, f-p-j	f-t, f-p-j	f-t, f-p-j	f-t, f-p-j	f-t, f-p-j	f-t <i>,</i> f-p-j	f-t, f-p-j	f-t, f-p-j		

Table D4: Intensive Margin of Firm-level Imports - Latin America and the Caribbean

Note: This table estimates Equation 1 for firm f in importing country i of product p from origin country j in year t. The sample covers firm-level import data from 10 countries in Latin America and the Caribbean listed in the appendix table A1. Columns (1)-(8) show coefficients standardized with zero mean and unit standard deviation in their respective sample. Clustered standard errors at the origin-destination-HS6 product level are presented in parentheses; \*\*\*, \*\*, and \* denote significance at the 1%, 5%, and 10% levels, respectively.

Dependent variable: Ln(Import	Value) <sub>i,f,j,p,i</sub>	t							
	All		Value Chain	l	Segments				
		EV	Solar	Wind	Raw	Processed	Subcomponents	End-product	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	
$Ln(1+Tariff)_{i,j,p,t-1}$	0.0224	-0.0744	0.0177	-0.0629	0.3016	-0.2132	0.0224	-1.2612	
	(0.022)	(0.222)	(0.031)	(0.032)**	(0.478)	(0.157)	(0.023)	(0.450)***	
$Ln(1+AVE SPS)_{i,j,p,t-1}$	-0.0010	-0.0233	0.0050	-0.0090	-0.1237	0.0001	0.0002	0.0209	
	(0.004)	(0.050)	(0.006)	(0.007)	(0.046)***	(0.016)	(0.006)	(0.039)	
$Ln(1+AVE TBT)_{i,j,p,t-1}$	-0.0063	-0.0306	-0.0160	0.0043	-0.0441	0.0007	-0.0018	0.0076	
	(0.005)	(0.025)	(0.006)***	(0.007)	(0.043)	(0.014)	(0.005)	(0.058)	
PTA <sub><i>i</i>,<i>j</i>,<i>t</i></sub>	0.5578	0.0000	0.6063	0.0000	0.0000	0.0000	0.5182	0.0000	
	(0.112)***	(.)	(0.122)***	(.)	(.)	(.)	(0.129)***	(.)	
$Ln(1 + \overline{Non-Green Tariff})_{i,i,t-1}$	0.0068	0.6181	0.0052	0.0021	-0.0848	0.0735	0.0203	1.1237	
	(0.059)	(0.286)**	(0.079)	(0.092)	(0.298)	(0.185)	(0.065)	(0.442)**	
Ln(Market Size) <sub>i,j,p,t</sub>	0.0807	0.0352	0.0700	0.0714	0.1765	0.0601	0.0769	0.0353	
	(0.044)*	(0.110)	(0.069)	(0.077)	(0.123)	(0.099)	(0.061)	(0.264)	
Observations	303,277	5,582	150,035	126,702	2,569	42,323	232,688	5,387	
Adjusted R2	0.77	0.84	0.75	0.77	0.85	0.77	0.76	0.73	
Fixed Effects	f-t, f-p-j	f-t, f-p-j	f-t, f-p-j	f-t, f-p-j	f-t, f-p-j	f-t, f-p-j	f-t, f-p-j	f-t, f-p-j	

Table D5: Intensive Margin of Firm-level Imports - South Asia

Note: This table estimates Equation 1 for firm f in importing country i of product p from origin country j in year t. The sample covers firm-level import data from 3 countries in South Asia listed in the appendix table A1. Columns (1)-(8) show coefficients standardized with zero mean and unit standard deviation in their respective sample. Clustered standard errors at the origin-destination-HS6 product level are presented in parentheses; \*\*\*, \*\*, and \* denote significance at the 1%, 5%, and 10% levels, respectively.

Dependent variable: Ln(Import Value) <sub>i,f,i,v,t</sub>										
A	All		Value Chai	n	Segments					
		EV	Solar	Wind	Raw	Processed	Subcomponents	End-product		
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)		
$Ln(1+Tariff)_{i,j,p,t-1}$	-0.0836	-0.1525	-0.0380	-0.1506	0.0000	-0.1605	-0.0598	-1.0248		
	(0.045)*	(0.184)	(0.074)	(0.082)*	(.)	(0.132)	(0.061)	(0.298)***		
$Ln(1+AVE SPS)_{i,j,p,t-1}$	-0.0021	-0.0158	0.0013	-0.0054	-0.0089	-0.0023	-0.0008	-0.0058		
	(0.004)	(0.031)	(0.007)	(0.005)	(0.044)	(0.009)	(0.005)	(0.025)		
$Ln(1+AVE TBT)_{i,j,p,t-1}$	-0.0085	-0.0090	-0.0130	-0.0024	0.1297	-0.0107	-0.0061	-0.0213		
	(0.003)***	(0.020)	(0.003)***	(0.005)	(0.060)**	(0.009)	(0.004)	(0.015)		
PTA <sub>i,j,t</sub>	0.0224	-0.0875	0.0228	0.0151	-0.0864	-0.0350	0.0309	-0.0210		
	(0.018)	(0.129)	(0.026)	(0.027)	(0.324)	(0.051)	(0.020)	(0.105)		
$Ln(1 + \overline{Non-Green Tariff})_{i,j,t-1}$	0.0576	-1.3348	-0.2186	0.2973	1.0820	0.2285	-0.0003	-1.5095		
	(0.178)	(1.670)	(0.245)	(0.297)	(1.036)	(0.497)	(0.213)	(1.594)		
Ln(Market Size) <sub>i,j,p,t</sub>	0.2357	0.1304	0.2392	0.2355	0.1736	0.0017	0.3316	0.0214		
	(0.038)***	(0.223)	(0.059)***	(0.055)***	(0.484)	(0.093)	(0.047)***	(0.157)		
Observations	362,365	6,674	163,644	169,785	582	52,104	276,994	10,622		
Adjusted R2	0.77	0.81	0.77	0.76	0.91	0.77	0.76	0.76		
Fixed Effects	f-t, f-p-j	f-t <i>,</i> f-p-j	f-t <i>,</i> f-p-j	f-t, f-p-j	f-t, f-p-j	f-t <i>,</i> f-p-j	f-t, f-p-j	f-t, f-p-j		

Table D6: Intensive Margin of Firm-level Imports - Sub-Saharan Africa

Note: This table estimates Equation 1 for firm f in importing country i of product p from origin country j in year t. The sample covers firm-level import data from 16 countries in Sub-Saharan Africa listed in the appendix table A1. Columns (1)-(8) show coefficients standardized with zero mean and unit standard deviation in their respective sample. Clustered standard errors at the origin-destination-HS6 product level are presented in parentheses; \*\*\*, \*\*, and \* denote significance at the 1%, 5%, and 10% levels, respectively.

## E Extensive Margin of Firm-level Imports - Results by Region

Dependent variable: Probability of Importing <sub><i>i</i>,<i>f</i>,<i>j</i>,<i>p</i>,<i>t</i></sub>										
	East Asia	Europe and	Latin America	South Asia	Sub-Saharan					
	and Pacific	Central Asia	and Caribbean		Africa					
$Ln(1+Tariff)_{i,j,p,t-1}$	-0.0084	0.0013	-0.0090	-0.0043	0.0034					
	(0.007)	(0.002)	(0.002)***	(0.004)	(0.004)					
$Ln(1+AVE SPS)_{i,j,p,t-1}$	-0.0028	0.0012	0.0003	-0.0002	0.0002					
	(0.001)*	(0.001)	(0.000)	(0.001)	(0.000)					
$Ln(1+AVE TBT)_{i,i,p,t-1}$	-0.0038	-0.0017	-0.0002	-0.0010	-0.0005					
	(0.002)**	(0.001)	(0.000)	(0.001)*	(0.000)					
PTA <sub><i>i</i>,<i>j</i>,<i>t</i></sub>	0.0098	-0.0117	0.0140	-0.0204	0.0040					
	(0.002)***	(0.005)**	(0.003)***	(0.026)	(0.002)*					
$Ln(1 + \overline{Non-Green Tariff})_{i,i,t-1}$	0.0087	-0.8708	-0.0878	0.0254	0.0154					
	(0.010)	(0.563)	(0.011)***	(0.009)***	(0.009)*					
Ln(Market Size) <sub><i>i</i>,<i>j</i>,<i>v</i>,<i>t</i></sub>	0.0429	0.0277	0.0506	0.0199	0.0214					
	(0.013)***	(0.009)***	(0.005)***	(0.006)***	(0.004)***					
Observations	1,728,781	519,541	8,350,983	3,221,239	3,977,084					
Adjusted R2	0.20	0.25	0.26	0.22	0.21					
Fixed Effects	f-t, f-p-j	f-t, f-p-j	f-t, f-p-j	f-t, f-p-j	f-t, f-p-j					

Table E1: Extensive Margin of Firm-level Imports - By region

Note: This table estimates Equation 1 for firm f in importing country i of product p from origin country j in year t. The sample covers firm-level import data from 35 countries in the appendix table A1. Columns (1)–(5) show coefficients standardized with zero mean and unit standard deviation in their respective sample. Clustered standard errors at the origin-destination-HS6 product level are presented in parentheses; \*\*\*, \*\*, and \* denote significance at the 1%, 5%, and 10% levels, respectively.

Dependent variable: Probability of Importing <sub>i f i n t</sub>										
1 ,	All		Value Chair	۱	Segments					
		EV	Solar	Wind	Raw	Processed	Subcomponents	End-product		
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)		
$Ln(1+Tariff)_{i,j,p,t-1}$	-0.0084	0.0087	-0.0098	-0.0111	0.0310	-0.0201	-0.0059	0.0201		
	(0.007)	(0.013)	(0.007)	(0.010)	(0.048)	(0.019)	(0.006)	(0.010)**		
$Ln(1+AVE SPS)_{i,j,p,t-1}$	-0.0028	0.0028	0.0001	-0.0047	-0.0166	-0.0060	-0.0047	0.0199		
	(0.001)*	(0.006)	(0.002)	(0.002)**	(0.011)	(0.003)**	(0.001)***	(0.014)		
$Ln(1+AVE TBT)_{i,j,p,t-1}$	-0.0038	0.0094	-0.0028	-0.0047	-0.0331	-0.0071	-0.0045	0.0239		
	(0.002)**	(0.005)*	(0.002)	(0.003)	(0.009)***	(0.003)***	(0.003)	(0.011)**		
$PTA_{i,i,t}$	0.0098	0.0018	0.0095	0.0105	-0.0005	0.0051	0.0104	-0.0116		
	(0.002)***	(0.012)	(0.003)***	(0.004)***	(0.021)	(0.005)	(0.003)***	(0.012)		
$Ln(1 + \overline{Non-Green Tariff})_{i,j,t-1}$	0.0087	0.0478	0.0097	0.0089	0.0045	0.0307	0.0031	0.0161		
	(0.010)	(0.024)**	(0.010)	(0.015)	(0.056)	(0.023)	(0.010)	(0.019)		
Ln(Market Size) <sub>i,j,p,t</sub>	0.0429	-0.0519	0.0555	0.0574	0.0721	0.0635	0.0302	0.0359		
	(0.013)***	(0.031)*	(0.019)***	(0.019)***	(0.055)	(0.022)***	(0.017)*	(0.041)		
Observations	1,728,781	23,473	844,542	791,913	6,817	399,406	1,209,697	33,358		
Adjusted R2	0.20	0.09	0.19	0.18	0.13	0.17	0.20	0.13		
Fixed Effects	f-t, f-p-j	f-t, f-p-j	f-t, f-p-j	f-t, f-p-j	f-t, f-p-j	f-t, f-p-j	f-t, f-p-j	f-t, f-p-j		

Table E2: Extensive Margin of Firm-level Imports - East Asia and Pacific

Note: This table estimates Equation 1 for firm f in importing country i of product p from origin country j in year t. The sample covers firm-level import data from 4 countries in East Asia and the Pacific listed in the appendix table A1. Columns (1)-(8) show coefficients standardized with zero mean and unit standard deviation in their respective sample. Clustered standard errors at the origin-destination-HS6 product level are presented in parentheses; \*\*\*, \*\*, and \* denote significance at the 1%, 5%, and 10% levels, respectively.

	All		Value Chain			Segments				
		EV	Solar	Wind	Raw	Processed	Subcomponents	End-product		
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)		
$Ln(1+Tariff)_{i,j,p,t-1}$	0.0013	0.0000	0.0019	-0.0012	0.0000	0.0056	-0.0022	0.3723		
	(0.002)	(.)	(0.002)	(0.012)	(.)	(0.003)*	(0.004)	(0.063)***		
$Ln(1+AVE SPS)_{i,j,p,t-1}$	0.0012	0.0234	0.0004	-0.0006	0.1323	0.0047	0.0008	0.0163		
	(0.001)	(0.010)**	(0.001)	(0.001)	(0.095)	(0.002)**	(0.001)	(0.007)**		
$Ln(1+AVE TBT)_{i,j,p,t-1}$	-0.0017	-0.0142	-0.0005	-0.0037	-0.0542	-0.0066	-0.0011	0.0001		
	(0.001)	(0.009)	(0.001)	(0.002)*	(0.035)	(0.004)	(0.001)	(0.007)		
PTA <sub><i>i</i>,<i>j</i>,<i>t</i></sub>	-0.0117	-0.0180	-0.0083	-0.0225	-0.3762	-0.0102	-0.0107	-0.0705		
	(0.005)**	(0.038)	(0.006)	(0.007)***	(0.180)**	(0.006)	(0.006)*	(0.019)***		
$Ln(1 + \overline{Non-Green Tariff})_{i,i,t-1}$	-0.8708	3.8307	-1.0920	-0.8741	2.0573	-0.2032	-1.2318	0.8339		
	(0.563)	(4.045)	(0.775)	(0.822)	(10.870)	(1.184)	(0.625)**	(3.402)		
Ln(Market Size) <sub>i.i.v.t</sub>	0.0277	0.0915	0.0297	0.0191	-0.0618	0.0188	0.0314	-0.0604		
,,, <b>,</b> ,	(0.009)***	(0.064)	(0.013)**	(0.014)	(0.095)	(0.022)	(0.011)***	(0.059)		
Observations	519,541	6,914	264,880	213,167	516	120,486	350,233	9,642		
Adjusted R2	0.25	0.01	0.22	0.23	-0.15	0.21	0.23	0.00		
Fixed Effects	f-t, f-p-j	f-t, f-p-j	f-t, f-p-j	f-t <i>,</i> f-p-j	f-t, f-p-j	f-t, f-p-j	f-t, f-p-j	f-t, f-p-j		

Table E3: Extensive Margin of Firm-level Imports - Europe and Central Asia

Note: This table estimates Equation 1 for firm f in importing country i of product p from origin country j in year t. The sample covers firm-level import data from 2 countries in Europe and Central Asia listed in the appendix table A1. Columns (1)-(8) show coefficients standardized with zero mean and unit standard deviation in their respective sample. There are not enough observations for Column (5). Clustered standard errors at the origin-destination-HS6 product level are presented in parentheses; \*\*\*, \*\*, and \* denote significance at the 1%, 5%, and 10% levels, respectively.

	All		Value Chair	L	Segments				
		EV	Solar	Wind	Raw	Processed	Subcomponents	End-product	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	
$Ln(1+Tariff)_{i,j,p,t-1}$	-0.0090	-0.0125	-0.0093	-0.0085	-0.0380	-0.0179	-0.0074	-0.0071	
	(0.002)***	(0.022)	(0.004)**	(0.003)***	(0.043)	(0.006)***	(0.003)***	(0.013)	
$Ln(1+AVE SPS)_{i,j,p,t-1}$	0.0003	0.0078	0.0006	-0.0003	0.0033	0.0026	-0.0003	-0.0001	
	(0.000)	(0.002)***	(0.001)	(0.001)	(0.005)	(0.001)**	(0.000)	(0.002)	
$Ln(1+AVE TBT)_{i,j,p,t-1}$	-0.0002	-0.0028	0.0002	-0.0005	-0.0027	-0.0007	-0.0002	0.0002	
	(0.000)	(0.002)	(0.000)	(0.000)	(0.004)	(0.001)	(0.000)	(0.003)	
$PTA_{i,j,t}$	0.0140	0.0072	0.0138	0.0133	0.0361	0.0150	0.0124	0.0194	
	(0.003)***	(0.014)	(0.004)***	(0.003)***	(0.022)*	(0.007)**	(0.003)***	(0.009)**	
$Ln(1 + \overline{Non-Green Tariff})_{i,i,t-1}$	-0.0878	-0.0886	-0.0981	-0.0775	0.0679	-0.0949	-0.0876	-0.0865	
.,	(0.011)***	(0.049)*	(0.018)***	(0.013)***	(0.092)	(0.026)***	(0.012)***	(0.041)**	
Ln(Market Size) <sub>i.i.v.t</sub>	0.0506	-0.0055	0.0671	0.0459	0.0020	0.0487	0.0612	-0.0005	
	(0.005)***	(0.014)	(0.008)***	(0.006)***	(0.028)	(0.010)***	(0.006)***	(0.013)	
Observations	8,350,983	138,496	3,984,893	3,906,223	24,261	1,438,646	6,322,786	210,341	
Adjusted R2	0.26	0.13	0.26	0.24	0.16	0.22	0.26	0.16	
Fixed Effects	f-t, f-p-j	f-t, f-p-j	f-t, f-p-j	f-t, f-p-j	f-t, f-p-j	f-t, f-p-j	f-t, f-p-j	f-t, f-p-j	

Table E4: Extensive Margin of Firm-level Imports - Latin America and the Caribbean

Note: This table estimates Equation 1 for firm f in importing country i of product p from origin country j in year t. The sample covers firm-level import data from 10 countries in Latin America and the Caribbean listed in the appendix table A1. Columns (1)-(8) show coefficients standardized with zero mean and unit standard deviation in their respective sample. Clustered standard errors at the origin-destination-HS6 product level are presented in parentheses; \*\*\*, \*\*, and \* denote significance at the 1%, 5%, and 10% levels, respectively.

	All		Value Chair	l	Segments					
		EV	Solar	Wind	Raw	Processed	Subcomponents	End-product		
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)		
$Ln(1+Tariff)_{i,j,p,t-1}$	-0.0043	-0.0133	-0.0069	-0.0115	-0.1092	-0.0598	-0.0044	0.0585		
	(0.004)	(0.043)	(0.005)	(0.007)	(0.061)*	(0.017)***	(0.003)	(0.049)		
$Ln(1+AVE SPS)_{i,j,p,t-1}$	-0.0002	0.0069	-0.0000	-0.0006	-0.0431	-0.0040	0.0006	-0.0006		
	(0.001)	(0.003)**	(0.001)	(0.001)	(0.008)***	(0.002)**	(0.001)	(0.005)		
$Ln(1+AVE TBT)_{i,i,p,t-1}$	-0.0010	-0.0014	-0.0023	0.0003	-0.0058	0.0009	-0.0015	0.0014		
	(0.001)*	(0.002)	(0.001)**	(0.001)	(0.004)	(0.001)	(0.001)**	(0.004)		
$PTA_{i,j,t}$	-0.0204	0.0000	-0.0220	-0.0040	0.0000	-0.0059	-0.0263	0.0000		
	(0.026)	(.)	(0.042)	(0.027)	(.)	(0.024)	(0.033)	(.)		
$Ln(1 + \overline{Non-Green Tariff})_{i,i,t-1}$	0.0254	0.0648	0.0284	0.0233	-0.0104	0.0428	0.0260	-0.0500		
	(0.009)***	(0.043)	(0.010)***	(0.013)*	(0.070)	(0.021)**	(0.008)***	(0.040)		
Ln(Market Size) <sub>i.i.n.t</sub>	0.0199	-0.0349	0.0392	0.0081	-0.0179	0.0241	0.0252	-0.0018		
· · · ///F/·	(0.006)***	(0.013)***	(0.010)***	(0.009)	(0.030)	(0.010)**	(0.007)***	(0.037)		
Observations	3,221,239	67,764	1,629,859	1,379,642	21,233	502,375	2,471,751	73,330		
Adjusted R2	0.22	0.15	0.21	0.20	0.16	0.17	0.22	0.13		
Fixed Effects	f-t, f-p-j	f-t, f-p-j	f-t, f-p-j	f-t, f-p-j	f-t, f-p-j	f-t, f-p-j	f-t, f-p-j	f-t, f-p-j		

Table E5: Extensive Margin of Firm-level Imports - South Asia

Note: This table estimates Equation 1 for firm f in importing country i of product p from origin country j in year t. The sample covers firm-level import data from 3 countries in South Asia listed in the appendix table A1. Columns (1)-(8) show coefficients standardized with zero mean and unit standard deviation in their respective sample. Clustered standard errors at the origin-destination-HS6 product level are presented in parentheses; \*\*\*, \*\*, and \* denote significance at the 1%, 5%, and 10% levels, respectively.

	All		Value Chai	n	Segments				
		EV	Solar	Wind	Raw	Processed	Subcomponents	End-product	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	
$Ln(1+Tariff)_{i,j,p,t-1}$	0.0034	-0.0066	0.0071	0.0005	0.5467	0.0031	0.0008	-0.0183	
	(0.004)	(0.025)	(0.005)	(0.006)	(0.338)	(0.011)	(0.004)	(0.016)	
$Ln(1+AVE SPS)_{i,j,p,t-1}$	0.0002	-0.0014	0.0011	-0.0003	0.0036	-0.0012	-0.0007	0.0043	
	(0.000)	(0.002)	(0.001)**	(0.001)	(0.010)	(0.001)	(0.000)*	(0.002)**	
$Ln(1+AVE TBT)_{i,j,p,t-1}$	-0.0005	-0.0027	-0.0016	0.0011	0.0010	0.0013	-0.0009	0.0009	
	(0.000)	(0.002)	(0.001)***	(0.001)**	(0.008)	(0.001)	(0.000)**	(0.002)	
$PTA_{i,j,t}$	0.0040	-0.0071	0.0024	0.0058	0.0510	0.0044	0.0036	0.0050	
	(0.002)*	(0.013)	(0.003)	(0.003)**	(0.087)	(0.005)	(0.002)	(0.011)	
$Ln(1 + \overline{Non-Green Tariff})_{i,i,t-1}$	0.0154	0.0321	0.0106	0.0153	0.3079	-0.0017	0.0143	0.0413	
.,	(0.009)*	(0.053)	(0.014)	(0.014)	(0.133)**	(0.021)	(0.011)	(0.055)	
Ln(Market Size) <sub>i,j,p,t</sub>	0.0214	0.0012	0.0338	0.0130	0.0032	0.0147	0.0254	-0.0040	
	(0.004)***	(0.019)	(0.006)***	(0.005)***	(0.034)	(0.008)*	(0.005)***	(0.018)	
Observations	3,977,084	106,718	1,878,443	1,768,458	7,737	660,821	2,936,771	143,494	
Adjusted R2	0.21	0.11	0.19	0.19	0.01	0.17	0.20	0.15	
Fixed Effects	f-t, f-p-j	f-t, f-p-j	f-t, f-p-j	f-t <i>,</i> f-p-j	f-t, f-p-j	f-t <i>,</i> f-p-j	f-t, f-p-j	f-t, f-p-j	

Table E6: Extensive Margin of Firm-level Imports - Sub-Saharan Africa

Note: This table estimates Equation 1 for firm f in importing country i of product p from origin country j in year t. The sample covers firm-level import data from 16 countries in Sub-Saharan Africa listed in the appendix table A1. Columns (1)-(8) show coefficients standardized with zero mean and unit standard deviation in their respective sample. Clustered standard errors at the origin-destination-HS6 product level are presented in parentheses; \*\*\*, \*\*, and \* denote significance at the 1%, 5%, and 10% levels, respectively.