How FDI Reshapes Host Market's Trade Profile and Politics*

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Abstract

A fast-growing literature indicates that firms' engagement in foreign direct investment (FDI) and trade is key to understanding deepening global value chains and their political implications. However, existing studies have mainly focused on the ramifications for FDI home countries while often overlooking the *firm-product-level* interactions between FDI and trade, where their interdependencies manifest. This study examines how firms' FDI reshapes host countries' trade profiles at this level, empowering new political coalitions for trade liberalization. Analyzing greenfield FDI projects globally since 2003, we find that hosts experienced an average increase of over 45 export products in the following year. To overcome the challenges of connecting firms to products, we link FDI data with Vietnamese customs records. We find that Vietnamese export (import) volumes of FDI-related products increased by 90% (30%) within four years of initial investments. Importantly, these products also benefited from more substantial tariff cuts in bilateral Free Trade Agreements.

Key Words: foreign direct investment, global value chains, multinational corporations, trade politics

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1 Introduction

One of the most critical developments in the global economy in the past half-century is the enormous growth in international trade driven by fragmented global production (Bernard et al., 2012). Such changes have had profound implications on geopolitics (Farrell and Newman, 2022; Miller, 2022), immigration politics (Peters, 2017; Helms, 2024), environmental politics (Cory, Lerner and Osgood, 2021), labor rights (Malesky and Mosley, 2018), and globalization backlash (Mansfield and Rudra, 2021).

The primary driving force behind this transformation of the global trade environment is the proliferation of global value chains (GVCs) organized by multinational corporations (MNCs) through their foreign direct investment (FDI). As a result, a growing body of literature seeks to enhance our understanding of the connections between FDI, GVCs, and trade policymaking (e.g., Manger, 2009; Baccini, Pinto and Weymouth, 2017; Osgood, 2018; Anderer, Dür and Lechner, 2020; Zeng, Sebold and Lu, 2020). Nonetheless, the majority of this research focuses on shifts in trade patterns and policies in countries originating FDI (i.e., home countries) rather than in the countries receiving FDI (i.e., host countries) (e.g., Blanchard and Matschke, 2015). This represents a notable gap, as FDI can significantly reshape trade and trade politics not only back home but also in the host country, or even beyond bilateral home-host country pairs. Moreover, most empirical analyses of FDI's impact on trade patterns and policy have been limited to indirect assessments at a highly aggregated country level (e.g., Büthe and Milner, 2008), despite the theoretical importance of firms and products emphasized in the literature (Bernard et al., 2012). For many researchers, this limitation has been primarily due to the empirical challenges in directly linking FDI with

trade at the firm-product level. Consequently, comprehensive empirical investigations of FDI's political effects on trade policymaking, especially through GVCs, are still scarce.

To address these gaps, we examine how deepening GVCs can reshape trade policymaking in host markets at the level of firms and products. First, we study how MNCs' manufacturing FDI fundamentally changes host countries' import and export trade profiles. We anticipate that host countries will expand their trade in sectors and products *directly* related to MNCs' FDI activities. Second, we argue that this transformation in trade profiles will foster and empower new political coalitions between domestic suppliers and foreign MNCs that influence host countries' trade policies (e.g., Manger, 2012; Osgood, 2018). This political coalition will be broad-based, as firms within the same value chain will develop common interests in advocating for liberal trade policies beyond their own products, industries, or countries. The broad political coalition facilitates host governments' negotiations on trade liberalization with their partners, especially concerning exporting or importing highly differentiated products directly tied to MNCs. Importantly, we argue that MNCs' FDI activities influence not only trade patterns and policies between the host and home but also between the host and third parties, as MNCs and their GVC partners would benefit from access to larger markets.

To test the implications of our argument, we construct new data sets that carefully link FDI and trade activities. We first identify all manufacturing greenfield FDI projects made

by MNCs globally between 2003 and 2017 based on proprietary fDi Markets data[1] and investigate whether FDI substantially alters the extensive margins of trade in host countries. Consistent with our expectations, the analyses show that countries with new inward greenfield manufacturing FDI projects tend to expand their number of unique exported products by over 45 in the subsequent year. Notably, the results suggest that these newly exported products stem from MNCs' FDI activities rather than from host countries' inherent factors of production, such as labor and capital, with which hosts are abundantly endowed.

Next, we extend the analysis to evaluate our theory more precisely at the firm-product level—the level at which cross-country firm-level activities actually transpire. Linking firms to products, however, is a notoriously difficult task because such information is generally confidential and unobservable to researchers. As a result, it has been one of the main obstacles to scholars seeking to study trade and FDI together. To overcome this empirical challenge, we focus on the case of Vietnam, where unique firm-product level customs data are available. Specifically, we parse through a massive amount of Vietnamese customs data and identify the exact Harmonized System (HS) codes of products traded by individual firms. We then manually link the exporting or importing firms in the customs data to MNCs' greenfield

[1] Greenfield FDI is a type of FDI in which MNCs establish new production facilities or offices in a different country. fDi Markets (`https://www.fdimarkets.com/`) covers greenfield investment reports for all countries and sectors worldwide and is one of the most comprehensive databases available. The data improves upon the balance-of-payments FDI flow data commonly used by researchers and known to introduce severe biases in empirical studies (Kerner, 2014; Jung, Owen and Shim, 2021).

FDI projects in Vietnam between 2003 and 2017. Beyond data advantages, Vietnam is also an optimal case to test our theory as it is one of the most rapidly growing economies with substantial increases in inward FDI and changing local political dynamics (Malesky, 2008; Malesky, Gueorguiev and Jensen, 2015).

Using the new data, we investigate the effect of FDI on Vietnam's intensive margin of trade. To account for a potential selection bias whereby MNCs choose to invest in Vietnam given its pre-existing trade environment and political institutions, we use the difference-in-differences (DiD) identification strategy combined with a matching estimator (Imai, Kim and Wang, 2023). Specifically, we match each product exported/imported by an MNC with other products similar in terms of various pre-FDI characteristics (e.g., trade volume, product differentiation, upstreamness, etc.). The results suggest that FDI's effect on Vietnam's intensive margins was substantial. Compared to similar Vietnamese products, the export volume of products related to MNCs and their affiliates increased by 90% within four years of initial investments, while the import volume of MNC-related products grew by 30%.

Lastly, but most importantly, we examine whether products linked to FDI tend to enjoy deeper trade liberalization. Focusing on the 2015 Free Trade Agreement (FTA) between Vietnam and one of its fastest-growing export and import markets, South Korea, we find that FDI led to tariff cuts, with a more pronounced effect associated with MNCs' earlier and more established FDI projects. Compared to other similar products within the same industry, products related to FDI received 30% and 19% larger import tariff cuts from the Vietnamese and Korean governments, respectively. Furthermore, the tariff reduction effects were not confined to investments made by MNCs headquartered in FTA partner countries, suggesting that FDI can influence trade politics and policy beyond its host and home country.

To the best of our knowledge, our study is the first to show that product-level trade policies are directly linked to prior inward FDI projects. We then assess the generalizability of our findings by examining trade agreements signed by almost forty host countries, although at a more aggregated industry level due to data availability. Consistently, we find deeper liberalization associated with FDI. Altogether, the results provide supportive evidence for our argument that political coalitions built around MNCs' GVCs are influential, and coalition members are thus more capable of obtaining liberal trade policies for their input or output products.

Overall, this study contributes to our understanding of the politics of economic globalization in three main ways. First, complementing a large literature that shows how trade agreements increase FDI inflows (e.g., Büthe and Milner, 2008; Jamison and Pevehouse, 2021), we show how the relationship can also hold in the opposite direction: MNCs' FDI activities shape product-specific policies within trade agreements. While some studies have used MNCs' FDI to explain the creation or proliferation of preferential trade agreements (e.g., Chase, 2003; Manger, 2012), our contribution lies in examining its effect on the variation in product-level trade liberalization *within* such agreements. Furthermore, by demonstrating FDI's effects in *host* countries as well as third-party nations connected via GVCs, we extend earlier research that has focused on FDI's impact on home countries' trade liberalization (e.g., Milner, 1988; Osgood, 2018; Blanchard and Matschke, 2015). Second, our findings also contribute to the broader debate on the externalities of FDI for host countries. The literature on FDI's effects on macroeconomic outcomes in host countries (e.g., growth) has been generally mixed (Alfaro et al., 2010), while micro-level evidence of its effects on trade has been sparse (Kastratović, 2020). Our findings based on firm and product-level data

contribute by showing positive FDI effects on both extensive and intensive margins of trade in host countries. More broadly, we extend existing research on the organization of MNCs' supply chains within and across industries (e.g., Helpman, 2006; Alfaro and Charlton, 2009) by developing and testing their implications for product-level trade patterns and policies. Finally, responding to calls in the field to promote empirical research at the intersection of trade and FDI (Pandya, 2016), we developed an accompanying open-source R software package, `concordance`, that provides various automated tools to link products and investments that, unfortunately, are recorded based on distinct classification schemes.

2 The Effects of FDI on Host Country Trade Politics

In this section, we develop a theoretical framework for examining how FDI shapes host countries' trade policies toward *products* directly tied to MNCs. We first explore how host governments allocate resources in favor of MNC-related activities through industrial policies, aligning domestic firms' economic activities with MNCs' global trade networks and influencing both product diversity and trade volume. We then illustrate how this reallocation of resources can further drive the liberalization of GVC-related products in trade policymaking. Altogether, our framework integrates the new-new trade theory and firm-centered theories of trade politics (Kim and Osgood, 2019) with the literature on industrial policy in the era of global production (Harrison and Rodríguez-Clare, 2010).

2.1 FDI Reallocates Resources to MNC-related Activities

Our theory is motivated by the empirical observation that trade flows are significantly influenced by *firms'* transnational investment activities, which rapidly reorganize factors of

production globally. For example, Vietnam is now the world's second-largest cellphone exporter after China, exporting $35.5 billion in 2019. Given its relative abundance in labor, why has Vietnam risen as a top producer of cell phones, a capital-intensive product? One of the main reasons is that SAMSUNG, a South Korean conglomerate, has made significant greenfield and R&D investments in Vietnam since its first plant opened in the Bac Ninh province in 2008, transforming Vietnam's industry structure. In contrast, as SAMSUNG phones are now assembled in Vietnam, South Korea has become only the world's 8th largest exporter of cell phones in 2019, with merely around 10% of Vietnam's export volume (United Nations Statistics Division, 2024). FDI has also changed Vietnam's import profile. Since local companies are not yet ready to produce or supply complex electronic components for high-tech MNCs (e.g., INTEL and SAMSUNG) at the required quality standards, Vietnam has now begun to import a large volume of such intermediate goods. Hence, with the influx of FDI, labor-abundant developing countries such as Vietnam have moved beyond their traditional reliance on the export of raw materials and labor-intensive goods in international trade. Instead, they have increasingly focused on producing and exporting sophisticated upstream and downstream manufactured products to participate in GVCs, combining cheaper labor and land with substantial foreign capital and MNC-specific intermediate goods.

Building on such observations, we argue that FDI changes host countries' resource allocation for two main reasons. First, FDI will boost local supply chain partners' productivity, which can lead to the business expansion of the local partners. This productivity enhancement can occur through various channels. For instance, it is well documented that MNCs often demand higher product quality, leading them to not only transfer production knowledge and technologies but also assist in improving production management and enhancing

local partners' quality control systems (e.g., Sahoo and Dash, 2022). Although evidence on direct technological spillovers from foreign to host countries as a whole remains inconclusive (e.g., Ashraf, Herzer and Nunnenkamp, 2016), numerous studies have found significant productivity gains among local production chain partners of MNCs (e.g., Javorcik, 2004). Such productivity increases can then lead to the expansion of local supply chain partners' sales, operations, and employment (e.g., Calligaris et al., 2023).

Second, given the potential benefits for local employment, finance, and tax revenue, FDI may prompt host governments to redirect resources in ways that favor MNCs and their local partners (e.g., Danzman, 2019). Increasingly, governments also recognize the positive externalities of industrial agglomeration, such as local input-output linkages, labor market pooling, and knowledge spillovers (Ellison, Glaeser and Kerr, 2010), especially when local firms are integrated into global production chains. Such benefits of localized collaboration between domestic and foreign companies further incentivize host governments to support MNC-related activities. Empirical evidence from Danzman and Slaski (2022) shows that MNCs embedded in local markets are more likely to receive policy incentives, underscoring the strategic importance governments place on fostering these partnerships. These incentives take various forms, such as the construction of special economic zones (SEZs) equipped with state-of-the-art facilities and connectivity, often located near major transportation hubs for MNCs like ports, airports, and highways. Other measures include subsidies, streamlined business registration processes, relaxed labor laws, and guarantees against expropriation. Such preferential policies can significantly lower operating costs for MNCs and their local supply chain partners, giving them a competitive edge over purely domestic firms. In the context of the "new industrial policy" literature (Juhász, Lane and Rodrik, 2023), FDI

prompts the provision of public inputs customized to firms' needs and adapted to the new market dynamics created by FDI.

We argue that such FDI-induced resource shifts give host countries a new source of comparative advantage that substantially broadens their trade margins in both product variety (extensive) and volume (intensive). In addition to the direct effect of MNCs' on-site production on imports and exports of their inputs and outputs, the productivity boost in local firms directly linked to MNCs and supported by favorable host government policies enables host countries to export and import a broader range of products than would be possible when relying solely on their locally abundant production factors. Building on the canonical Ricardian model by Dornbusch, Fischer and Samuelson (1977), we formally demonstrate that the set of products a country produces under competitive equilibrium grows as the relative productivity of foreign capital connected local firms increases (see Appendix A.1, p.1–2). Consequently, we predict that countries with higher levels of FDI inflows will exhibit a more diverse array of exported and imported products compared to those with similar initial levels of trade engagement but lower levels of FDI inflows (extensive margin, **Hypothesis 1**).

Furthermore, we expect the presence of MNCs in a host country to increase the host's volume of imports and exports, particularly for products tied to the MNCs' operations. This is because MNCs' access to vast foreign markets and their global distribution networks, alongside the synergistic partnerships between locally abundant factors and foreign capital, can enhance trade's intensive margin through economies of scale and experience. To be clear, empirical research across various countries generally confirms FDI's positive effect on export volumes, but these studies often limit their focus to macroeconomic or sectoral levels (Kastratović, 2020). Our approach diverges and improves upon existing work by positing

that FDI increases the trade volume of inputs and outputs directly associated with MNC's on-site activities at the product level. In particular, we anticipate that the volume of exports (or imports) of products linked to MNCs' FDI activities in host countries will grow more significantly over time compared to similar products unrelated to FDI, even within the same industry (intensive margin, **Hypothesis 2**).

2.2 FDI Creates and Empowers New Political Coalitions in Trade

We contend that FDI-induced changes in production activities and resource allocation in the host country, as discussed previously, create and empower new political coalitions in trade liberalization across various firms connected to GVCs while weakening the political influence of unconnected firms and industries.

To begin with, GVC linkages create common interests for *product-specific* trade liberalization among a large group of host country constituents participating in the GVC. These constituents include MNCs and their upstream suppliers and downstream users or distributors. A key reason for such common interests is that firms participating in GVCs are connected through intertwined contractual relations, and thus upstream trade barriers can increase the input costs for GVC firms operating downstream, and downstream trade barriers can also reduce the demand for outputs produced by GVC firms operating upstream (see, e.g., Meckling and Hughes, 2017). Therefore, although GVC firms may span various industries, such interdependencies help unite GVC firms' preferences toward trade liberalization on products used or produced in the GVC network, creating common interests beyond their

own products or industry (Manger, 2012; Osgood, 2018).[2]

These new and broad GVC coalitions can be politically influential in host trade policymaking for several reasons. First, GVC coalitions suffer less from collective action problems than firms outside GVCs. It is well known that large firms such as MNCs benefit more from free trade (e.g., Milner, 1988; Jensen, Quinn and Weymouth, 2015) and are thus more willing to lead lobbying for trade liberalization due to their differentiated products and concentrated benefits, regardless of whether others contribute or not (e.g., Kim and Osgood, 2019).[3] In addition, the contractual GVC connections discussed earlier further reduce free-rider problems among GVC participants by incentivizing collective organization among the firms in the network (Manger, 2012; Kim and Osgood, 2019). Specifically, even if domestic producers do not directly serve foreign markets, they are still incentivized to advocate for trade liberalization on behalf of their downstream MNC partners who operate in larger markets. This is because domestic suppliers to MNCs can indirectly benefit from increased economies

[2] Our argument builds on and extends arguments about shared interests formed along GVCs in areas of investment protection (Johns and Wellhausen, 2016), WTO trade disputes (Kim and Spilker, 2019), or climate action (Cory, Lerner and Osgood, 2021).

[3] For example, MNCs have independently played a heavy role in Vietnamese trade policymaking. Media reports indicate that SAMSUNG had directly requested the Prime Minister for "preferential tax treatment for its new Samsung CE Complex" (Vietnam Briefing, 2015).

of scale.[4] Such mitigated collective action problems among firms connected through GVCs contrast sharply with the various domestic cleavages that can exist among social groups, which often hinder coalition-building (Doner and Schneider, 2016).

Second, GVC coalitions face lower domestic political opposition to trade liberalization on GVC-related products, largely due to the diffuse costs such liberalization imposes on non-GVC firms and industries. This stems from the fact that the final products MNCs produce in the host country, or the intermediate goods required by GVCs as inputs, are often highly differentiated, proprietary, or of exceptionally high quality.[5] As a result, few domestic firms produce, or are capable of producing, similar or substitutable goods that compete directly with the MNCs and their GVC partners (Kim, 2017). This expectation naturally follows our earlier discussion on the extensive margin, where FDI often broadens the trade profile of host countries by introducing entirely new product categories. The fact that the products are new suggests minimal competition from domestic firms in those specific product spaces. Consequently, domestic firms' opposition to the liberalization of GVC-related products is likely weak or entirely absent.

Third, MNCs are well known to be politically influential. An extensive literature, mostly

[4] For instance, a tight network exists between Vietnamese domestic packaging companies and the MNCs in Vietnam they supply with packaging materials (CafeF, 2020). The Vietnam Packaging Association, whose members include some of these domestic suppliers, notes that "the opportunity is huge" with the 17 trade agreements (Vietnam Packaging Association, 2023).

[5] For example, Intel in Vietnam claimed that they had difficulty finding local suppliers that meet "the quality requirements that Intel products demand" (Du et al., 2018).

focusing on developed countries, documents how large firms such as MNCs excel in influencing policy outcomes through lobbying and political donations (e.g., de Figueiredo and Richter, 2014; Lee, 2023). This is because larger firms have more financial resources to expend and the scale to make investments in political influence profitable (Kim and Osgood, 2019). Consistent with this literature, a fast-growing body of research shows that MNCs have been largely successful in shaping developed FDI home countries' trade policies towards products produced by MNCs' foreign affiliates (e.g., Blanchard and Matschke, 2015).

MNCs also enjoy bargaining advantages in developing FDI host countries, which increase their policy influence. A well-established literature on FDI and expropriation risks shows that MNCs can leverage their size and the many benefits they bring (e.g., jobs, higher wages, technology, and tax revenue) to shape host country policies in ways that protect their long-term investments (e.g., Kobrin, 1987; Wellhausen, 2015). MNCs also have the advantage of being politically adept, given their abundant political experience at home and abroad. For example, MNCs are known to increase their bargaining power through promises of new investment or threats to withdrawal (Nye, 1974), making alliances with local leaders (Malesky, 2008) and host governments (Pinto and Pinto, 2008), building political ties with host-country policymakers (Faccio, 2006), integrating into GVCs (Johns and Wellhausen, 2016), and even requesting home government assistance (Wellhausen, 2015). While existing studies have focused mainly on MNCs' use of bargaining advantages and strategies in shaping host investment policies, we argue that similar advantages and strategies can also increase MNCs' influence on trade policies in host countries.

Finally, GVC partners further increase MNCs' policy influence in the host country. The longer and more established an MNC is in the host country, the deeper and wider its re-

lationship networks are between the MNC and local GVC partners. This enhances MNCs' bargaining power in policymaking (Kobrin, 1987), as the growth of interest groups and constituents who benefit from GVCs offer MNCs additional leverage in policy negotiations against the host government. Furthermore, given the common interests and contractual connections discussed earlier, MNCs can more easily mobilize and coordinate GVC partners in their lobbying campaigns (Manger, 2012), boosting GVC coalitions' political influence over potential domestic opposition from unconnected firms and industries.

Taken together, we expect host governments to have strong incentives to push for more liberal trade policies (e.g., lower tariffs on exports and imports) on products *directly* linked to MNCs' inward FDI activities when negotiating agreements with their trade partners (**Hypothesis 3**). Importantly, our expectation about FDI's effect on product-specific trade liberalization should not be limited to cases involving the FDI host-home country pair. Instead, it should also apply to FDI from third-party countries, as their MNCs and their GVC partners should also benefit from access to larger markets.[6] Our argument thus extends existing studies focusing only on how MNCs shape trade patterns and policies between the host and home country (e.g., Blanchard and Matschke, 2015). Our argument also joins emerging research that extends the literature's focus from explaining GVC participants' preferences (e.g., Meckling and Hughes, 2017; Osgood, 2018) to explaining GVC effects on trade policy outcomes (e.g., Blanchard and Matschke, 2015; Anderer, Dür and Lechner,

[6] For example, the US-Vietnam FTA led to an increase in multinationals in Vietnam, especially from East Asian countries, as they saw an export opportunity to the U.S. market (McCaig, Pavcnik and Wong, 2022).

2020).

3 Data and Measures

Testing our theory's implications requires data that link firms' FDI and trade activities. Yet, researchers have faced considerable empirical challenges when constructing such data. Most importantly, granular firm-level data on investments and trade transactions are often unavailable to researchers. On the one hand, firms do not publicly disclose their international transactions at the product level out of concern that their competitors could take advantage of the information and undercut their prices or even deter their market entry. On the other hand, while researchers can easily calculate aggregate country-level FDI flows using data on countries' balance of payments, detecting FDI at the firm level is more difficult, especially when investment activities occur strictly within a firm's boundary.

Furthermore, even when granular investment and trade data are available, the lack of standard industry- and product-level classification systems puts enormous constraints on connecting FDI and trade activities. For example, the United States uses the North American Industry Classification System (NAICS) to categorize domestic business establishments (including FDI), whereas the standard tariff nomenclature for internationally traded products is the Harmonized System (HS). Again, this is because firms do not necessarily disclose the set of specific products associated with their investment decisions. Below, we discuss how we use granular information on greenfield investments and declaration-level Vietnamese customs data to construct data sets that overcome these challenges.

3.1 Greenfield FDI Data

In this study, we focus on greenfield FDI because it tends to introduce dramatic changes in production technologies, such as new facilities and production lines, and thus allows us to more directly investigate the relationships between foreign investments and subsequent trade consistent with our theoretical framework. Furthermore, it has been the main mode of FDI inflow for developing countries (Antràs and Yeaple, 2014).[7]

To measure greenfield FDI, we obtained data from fDi Markets, which covers all reports of new cross-border greenfield projects since 2003. The data include detailed information such as the name, location, and industry of the parent/subsidiary, as well as project-specific business activities. To the best of our knowledge, it is the most comprehensive and reliable source of greenfield FDI available and has been used by several recent studies (e.g., Andrews, Leblang and Pandya, 2018; Jung, Owen and Shim, 2021) and in the annual World Investment

[7] Another important but smaller mode of FDI in developing countries involves foreign Mergers & Acquisitions (M&A) of host firms (Antràs and Yeaple, 2014). We note that the absence of M&A in our data should have two main implications for our findings. Our extensive margin estimates should be upper bounds since FDI through M&A acquire existing firms and production facilities instead of create new ones and should thus introduce fewer completely new products compared to greenfield FDI. However, our intensive margin estimates should be lower bounds, as MNCs' M&A may also expand existing host firms' operation and production through capital infusion, technology transfer, and economies of scale (e.g., Guadalupe, Kuzmina and Thomas, 2012; Wang and Wang, 2015).

Report of the United Nations Conference on Trade and Development (2023).

We further refine the fDi Markets data in two ways. First, since fDi Markets codes FDI projects based on news announcements, some projects may not realize. While fDi Markets verifies and removes such projects, it can take time to happen.[8] To be more conservative in counting FDI projects, we thus only use data from fDi Markets up to 2017.[9] Second, among these verified greenfield FDI projects, we only focus on those related to manufacturing. This is because we are mainly interested in FDI that is likely to affect a host country's export or import profile, rather than FDI engaging in service activities and targeting the host country's domestic market (e.g., finance, construction, and retail).[10] We classify a project as manufacturing if it meets the following two criteria: (1) fDi Markets codes its investment activity as "Manufacturing," and (2) its assigned 3-digit NAICS code falls under "Manufacturing" according to the NAICS classification (i.e., 2-digit NAICS codes 31, 32,

[8] Our communication with fDi Markets representatives confirms this. Note also that announcement records in fDi Markets include both the start of operations (or completion of investment) and plans to build new facilities. While the former should begin to have some effect on trade, the latter may take longer. See Appendix B.1 (p.6) for details.

[9] We acquired data for all host countries up to 2013 in 2017 and additional data from 2014 to 2017 in 2022.

[10] Data are also more limited for non-manufacturing industries. Although we believe that investments in other sectors (e.g., services) will also affect trade profiles and policymaking, it is notoriously difficult to gather such data at the firm and product levels.

or 33).[11] This ensures that we use a conservative definition of manufacturing that excludes greenfield investment activities that simply establish sales or marketing offices for goods in the manufacturing industry but do not involve production. Out of 189,553 greenfield FDI projects that fDi Markets recorded between 2003 and 2017, our criteria yields 43,949 manufacturing-related projects.[12] See Appendix B.1 (p.6) for further discussion of the data.

3.2 Linking Greenfield FDI and Trade Data

Country-Level Data. To evaluate whether FDI increases host countries' extensive margins, we first construct a country-level panel data set that links greenfield manufacturing FDI projects to the number of unique products host countries export. Specifically, we use the fDi Markets data to identify all new greenfield manufacturing investment projects made by MNCs across countries between 2003 and 2017 and to construct measures of total new FDI projects for each country and year. We then trace the number of unique HS 6-digit products exported by countries in the UN Comtrade data set between 2004 and 2017 (the time frame lagged one year after the FDI data). To ensure the comparability of products across time and space, we use our `concordance` package to link each product to its latest nomenclature in HS Revision 2017. We then use 100 USD as a threshold for counting whether a product is exported from a country in a given year to reduce data noise stemming from unusual small transactions (e.g., test shipment or non-business private shipment) or measurement errors. Additionally, we narrowed our sample to countries that consistently reported exports

[11] We use NAICS to minimize any potential measurement errors, as it is the categorization system used by fDi Markets.

[12] See Appendix Table B.4 (p.5) for the breakdown of FDI projects by host country.

of at least 100 manufacturing products (out of 4,746 potential manufacturing products at the HS 6-digit level) throughout the period in order to reduce the influence of countries that under-report or do not report at all in some years. Lastly, we merge the two measures with additional country-level control covariates (GDP, population size, regime type, and export volume), yielding a balanced panel data set of 105 countries from 2004 to 2017.[13]

Exploring the data, we find several cases where host countries began to export new products after receiving new greenfield FDI in related industries. For example, Vietnam exported 2,825 unique manufacturing products in 2003, and in ten years, by 2013, the number had increased to 3,580. The set of added products included "clock or watch parts; dial"(HS 911430), the top exported product of Rhythm Precision Vietnam, a subsidiary of the Japanese clock-making firm Rhythm Watch which first invested and built its manufacturing plant in Hanoi back in November 2005. In Section 4, we conduct a more systematic test of the effect of FDI on extensive margins using a broader set of host countries.

Product-Level Data in Vietnam. To examine whether FDI increases intensive margins or trade liberalization at a more granular product level, we turn to the case of Vietnam and link project-level manufacturing greenfield FDI to HS 6-digit trade volumes and tariff rates using customs data provided by Datamyne, a commercial database. The data contains records of all export and import products that passed through Vietnamese ports, including detailed information such as exporter/importer firm names, product HS codes at the 8-digit

[13] We rely on the World Bank's World Development Indicators for data on GDP and population, Marshall and Gurr (2017) for polity2 scores, and UN Comtrade for data on export volume.

level, and invoice values between January 2018 and April 2020. With this declaration-level data, we can thus observe the set of products each firm exported and imported from Vietnam. For example, the top three exporters in 2018 identified in this customs data include Intel Products (a subsidiary of Intel, headquartered in the United States), Samsung Electronics (South Korea), and Fuhong Precision Component (a subsidiary of Focus PC Enterprises, Hong Kong).

To be sure, data missingness is often a concern when relying on customs declarations. Thus, we check whether the Vietnamese customs data are consistent with existing measurements of trade volume. Appendix Figure B.1 (p.3) shows that export volumes from the customs data are consistent with those obtained from UN Comtrade at the aggregated HS 2-digit product level, with only a few exceptions involving shipbuilding industries (HS 89) and security-sensitive products.

Matching firm names across multiple data sources is another challenging task. Although the customs data come with the exporting/importing firm names, they are often only available in Vietnamese, while firm names in fDi Markets are in English. What makes the task even more challenging is that firm names are not necessarily consistent within or across the two datasets (e.g., 'British American Tabacco' vs. 'BAT'), and many similar firm names exist (e.g., 'Samsung' and 'Samsun CSA'). Furthermore, firm names may change over time (e.g., 'Matsushita' to 'Panasonic'). To address these issues, we carefully matched individual firm names between the FDI data and the customs data manually. Using the exporter-name (importer-name) search function in Datamyne, we searched for firm names that appeared in fDi Markets data. When there were multiple results in the customs data that contained our search term, we Google-searched each of the exporter (importer) names

to ensure that they were linked to the MNC of interest. As a result, we were able to find export products for 243 parent MNCs involved in 365 manufacturing greenfield FDI projects and import products for 323 parent MNCs engaged in 449 projects.

Using the linkage information above between products and FDI projects through specific MNCs, we were then able to compute a product-level measure of the total number of new manufacturing greenfield FDI projects associated with each product in a given year. For our intensive margin analysis, we then create a dichotomous version of the measure, where a value of one indicates that there exists at least one new manufacturing greenfield FDI project associated with a product before a given year and zero otherwise.

We merge our product-level measures of FDI association with measurements of other product-level characteristics used in our analyses. These measures include product differentiation, upstreamness/downstreamness, intermediateness, etc. Note that constructing product-specific covariates requires researchers to navigate across various classification systems carefully. For example, Rauch (1999) classifies each 4-digit Standard International Trade Classification (SITC) code by whether it is "differentiated" or not. Building on Rauch's classification, we measure the level of product differentiation for each HS 6-digit product by matching HS codes to SITC codes and then computing the share of matched codes classified as "differentiated." To measure upstreamness/downstreamness, we rely on the estimates from Antràs et al. (2012) for 40 countries between 1995 and 2011. Since these estimates were computed at the International Standard Industrial Classification (ISIC) 2-digit level, we matched HS 6-digit codes to ISIC 2-digit codes and then computed the

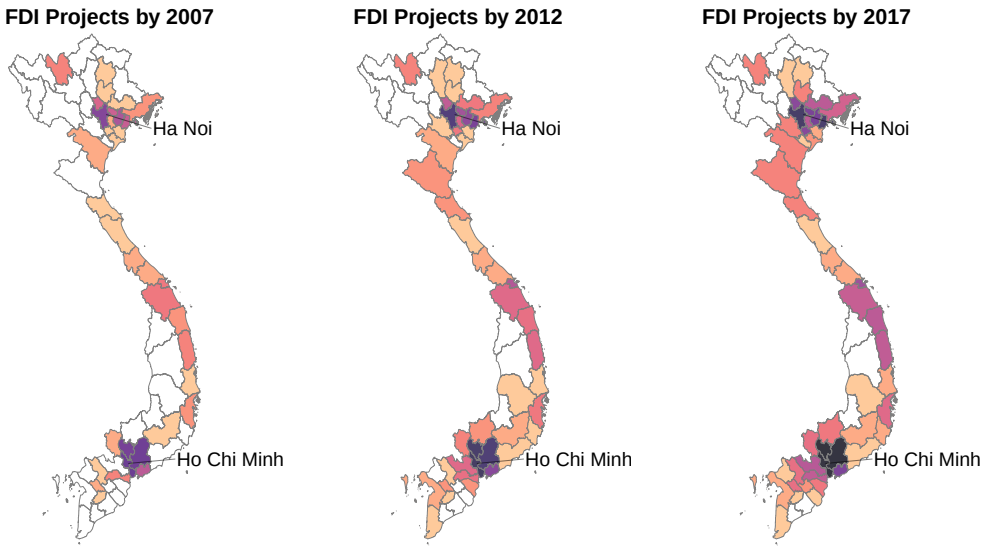

Figure 1: **Increase in Manufacturing Greenfield FDI Projects in Vietnam, 2003–2017**. The color scale corresponds to the cumulative count (log) of new greenfield FDI projects observed in each province in the period 2003–2007 (left), 2003–2012 (center), and 2003–2017 (right).

weighted average of the estimates for each of our HS products.[14] We calculate intermediateness based on the share of HS 6-digit codes that include either the word "part(s)", "intermediate", or "component" in its description. We make all measures publicly available through our concordance package. Overall, our product-level panel data set consists of 5,115 unique HS 6-digit products across 15 years (2003–2017).[15]

Empirical advantages aside, Vietnam represents a theoretically important case to focus on because Vietnam has become one of the top recipients of greenfield FDI and an integral part of GVCs (Malesky, Gueorguiev and Jensen, 2015). According to fDi Intelligence, Vietnam was by far the top-ranked emerging economy in their Greenfield FDI Performance Index in

[14] Since our panel extends beyond 2011, we use 2011 estimates for all subsequent years.

[15] Products missing product differentiation and upstreamness/downstreamness measurements (270 products in total) are omitted from the panel. See Appendix Table B.2 (p.4) for summary statistics.

2014 and 2015, receiving around 6.5 times more greenfield FDI compared to the size of its economy (Financial Times, 2016). Figure 1 illustrates the increase and regional concentration of these FDI projects in Vietnam over time. Meanwhile, the volume of Vietnamese trade also exponentially increased over this period. As shown in Appendix Figure B.2 (p.4), our data indicate that Vietnam scores high on both its total number of incoming greenfield FDI projects relative to the size of its economy and its growth in total export volume. Lastly, Vietnam has actively sought preferential trade agreements after joining the World Trade Organization (WTO) in 2007. Appendix Table B.3 (p.4) shows that Vietnam is now deeply embedded in a network of bilateral and regional free trade agreements.

4 Empirical Findings

We present below empirical analyses of our data. In Section 4.1, we first investigate whether new greenfield manufacturing FDI projects expand the number of unique HS 6-digit exports at the country level (i.e., the extensive margin) using our country-level panel data set. Next, we examine whether they increase trade volume at the product level (i.e., the intensive margin). To accurately evaluate this, we focus on the case of Vietnam and use our product-level data. Section 4.2 examines whether products directly associated with greenfield FDI in Vietnam, made by MNCs from various home countries between 2003 and 2014, enjoyed deeper tariff cuts in Vietnam's 2015 bilateral free trade agreement with South Korea. To assess the external validity of our findings, we also expand the analysis to include trade agreements signed by 36 host countries.

4.1 Effects of FDI on Trade Profiles

4.1.1 Extensive Margin

We begin by evaluating whether countries with new inward FDI projects were more likely to experience an expansion in their extensive margins of trade. To be sure, the expansion of extensive margins should depend on the baseline number of traded goods and other economic factors. For example, countries that have already received significant foreign investments, such as China, the United States, India, and Russia, tend to have less room for expansion in the variety of goods exported as they are already exporting a wide variety of products (see Appendix Figure C.1, p.6). To address this issue, we fit a set of regression models to the country-level panel data (2004–2017) discussed in Section 3.2 and estimate the effect of inward FDI on a country's extensive margin in the following year, controlling for the extensive margin in the previous year and other covariates as follows:

$$Y_{it} = \beta X_{i,t-1} + \rho Y_{i,t-1} + \delta \mathbf{Z}_{i,t-1} + \gamma_t + \epsilon_{it}, \tag{1}$$

where Y_{it} is the number of unique HS 6-digit products that country i exported (imported) at time t, the binary indicator $X_{i,t-1}$ denotes whether country i had at least one new inward manufacturing greenfield FDI project at $t-1$, and $Y_{i,t-1}$ denotes the dependent variable lagged by one year to account for baseline levels of extensive margins.[16] Variables $\mathbf{Z}_{i,t-1}$ include a set of covariates for country i at $t-1$ (logged GDP, logged population, polity 2, and logged total export volume in USD), and γ_t denotes year fixed-effects. We cluster standard errors by country to account for within-country correlations of errors.

Consistent with **Hypothesis 1**, we find that countries with at least one new inward

[16] To test for unit root, we conducted the Augmented Dickey-Fuller test for panel data and rejected the null that all series are unit roots.

DV:	Extensive Margin (t)				Δ Extensive Margin (%)	
	(1)	(2)	(3)	(4)	(5)	(6)
FDI (t-1, binary)	46.988***	45.237***	56.298*	53.646*	3.703*	3.630*
	(12.666)	(12.823)	(26.105)	(25.433)	(1.670)	(1.653)
Extensive Margin (t-1)	0.973***	0.970***			−0.004*	−0.004*
	(0.008)	(0.008)			(0.002)	(0.002)
GDP (t-1, logged)	13.001*	7.336	240.729	344.089*	0.880	0.644
	(6.227)	(6.486)	(153.122)	(158.062)	(0.906)	(0.894)
Population (t-1, logged)	−5.538	−4.375	281.140	348.429	0.041	0.085
	(3.810)	(3.807)	(468.910)	(491.091)	(0.375)	(0.379)
Polity 2 (t-1)	−0.741	−0.496	−9.442	−9.486	0.089	0.099
	(0.849)	(0.838)	(6.883)	(6.932)	(0.131)	(0.129)
Export value (t-1, logged)	−2.359	4.233	30.237	50.729	0.058	0.350
	(6.010)	(6.521)	(33.254)	(49.879)	(1.220)	(1.213)
Constant	−123.353				−15.356	
	(79.368)				(9.859)	
N	1470	1470	1470	1470	1470	1470
Countries	105	105	105	105	105	105
Years	14	14	14	14	14	14
FE: year		✓		✓		✓
FE: iso3c			✓	✓		
R^2	0.99	0.99	0.98	0.98	0.037	0.046
Adj. R^2	0.99	0.99	0.979	0.979	0.033	0.033
BIC	18616.5	18687.5	20342.1	20417.4	12311.9	12393.7
Log Likelihood	-9282.7	-9270.8	-9770	-9760.2	-6130.4	-6123.9

Note: standard errors clustered by country in parentheses. + p < 0.1, * p < 0.05, ** p < 0.01, *** p < 0.001

Table 1: **New Greenfield FDI and the Expansion of Export Extensive Margins**. Using the country-level panel data set described in Section 3.2, we find that new inward manufacturing greenfield FDI projects are associated with larger extensive margins (HS 6-digit products) in the following year. Columns (1) to (4) show coefficients estimated using OLS regressions with/without a lagged dependent variable and with/without year and country fixed-effects. Columns (5) and (6) present results with the dependent variable operationalized as the percent change in a country's extensive margin between $t-1$ and t.

manufacturing greenfield FDI project in a given year add over 45 more HS 6-digit products to their export extensive margins in the subsequent year, holding other factors constant. For countries with the mean export extensive margin of 2917, this represents at least an approximately 2% increase in extensive margins in the next year. Table 1 summa-

rizes the results across various model specifications.[17] Note that our main specifications in columns (1) and (2) do not include country fixed-effects. This is because it is well known that the OLS estimate of β will suffer from significant "Nickell bias" if we include both country fixed-effects and a lagged dependent variable in models covering relatively short time periods (Nickell, 1981). As a robustness check, therefore, we analyze results only exploiting within-country variation by including country fixed-effects without the lagged dependent variable in columns (3) and (4). Our findings are robust to these model specifications. Furthermore, using the fixed effects counterfactual estimator known to be more reliable than the two-way fixed effects estimator (column (4)) when treatment timing is different and treatment effects are heterogeneous (Liu, Wang and Xu, 2024), we find consistent and even larger overall effects of new greenfield FDI (≈ 89), with more sizable and precisely estimated effects for countries that are treated for longer periods.[18] Additionally, when we use the within-country change in extensive margin from the previous year as an alternative measure of the dependent variable (columns (5) and (6)), we find that new inward greenfield FDI projects in a country are associated with an around 4% increase in the country's export extensive margin. Using the Heckman treatment effect model (see Greene, 2003) to more explicitly model and account for potential biases due to FDI's selection into countries, we find consistent results

[17] We also estimate effects using a two-year lag instead of one, which allows more time for FDI effects to materialize but reduces our sample size due to fDi Markets data availability. The results are mostly consistent with our main findings in Table 1, with generally larger point estimates but less precise estimates in the country fixed-effects models. See Appendix Table C.2 (p.7) for details.

[18] See Appendix Figure C.2 (p.8) for details.

with larger estimates for export extensive margins (≈ 58) and similar estimates for year-over-year percentage changes in export extensive margins ($\approx 4\%$).[19] Lastly, we find similar, albeit slightly less precise, effects on import extensive margins (see Appendix C.1.2, p.10–11). Altogether, these results provide evidence suggesting a positive effect of new greenfield FDI on extensive margins.

4.1.2 Intensive Margin

Next, we turn to the Vietnamese product-level panel data (2003–2017) discussed in Section 3.2 to conduct a close within-country test of FDI's effect on trade volume (**Hypothesis 2**). One main concern when examining the product-level effect of FDI on trade volume is that MNCs may choose to invest in a country given its pre-existing trade environment (Büthe and Milner, 2008) and political institutions (Li, Resnick et al., 2003; Jensen, 2008; Pandya, 2014; Pinto, 2013), leading to a potential selection bias. To address this concern, we use a DiD identification strategy combined with a matching method to account for any confounding due to pre-treatment covariates and time trends (Imai, Kim and Wang, 2023).

Difference-in-Differences. The outcome variable Y_{kt} is the annual export (import) volume of product k in year t from (by) Vietnam to (from) the world. The treatment variable X^*_{kt} is a dichotomous variable indicating whether, since the beginning of our study in 2003, there has been at least one new greenfield investment associated with product k before year t. Formally, $X^*_{kt} = \mathbb{1}\{\sum_{t'=2003}^{t} X_{kt'} > 0\}$, where X_{kt} denotes the total number of greenfield FDI projects associated with product k in year t. In other words, we consider the very first year of MNC investments related to product k as the treatment while taking the "staggered

[19] See Appendix Tables C.3 and C.4 (p.9–10) for details.

adoption" approach for our estimation. This is because we are interested in analyzing the long-term effects of FDI as trade volume tends to grow gradually over time once a manufacturing facility is established. Note that because fDi Markets data only started in 2003, products associated with greenfield investments made before 2003 are considered unrelated to FDI at the outset of our analyses and will only be considered treated when additional FDI projects are associated with the product after 2003. As such, the approach will give us a more conservative estimate of the effect of FDI. When the outcome is Vietnamese export volume, we measure X_{kt} based on the exports of each FDI firm. In contrast, when the outcome is Vietnamese import volume, we measure X_{kt} through import declarations of each FDI firm. Moreover, in the latter case, when associating FDI projects to imports, we only link imports of products above the median level of upstreamness (discussed in Section 3) to be consistent with our theoretical framework.

For each treated product k whose treatment status changes from 0 to 1 in year t, we create a set of control products k' based on the history of treatment status:

$$\mathcal{M}_{kt} = \{k' : k' \neq k, X_{k't'} = 0 \ \forall t' \leq t\}. \tag{2}$$

That is, we compare each FDI-associated product against a set of other products with no connections to greenfield investments. To make a tighter comparison, we restrict and refine this matched set based on their similarity in pre-treatment covariates. First, we draw products from those in the same HS section. For example, the control set for product HS 854231 (electronic integrated circuits) consists of other similar products within the HS Section XVI category for machinery and mechanical appliances. Second, we put heavier weights (see $w_{k't}$ in equation (3)) on products that are similar regarding the following pre-

treatment characteristics: Vietnamese average MFN tariff rate, import/export volume in the rest of the world (logged), mean import/export volume across all importing/exporting countries (logged), the number of countries Vietnam imports from or exports to, product differentiation, intermediateness, and upstreamness/downstreamness.

Given the matched set for each FDI-related product, we then use the following non-parametric DiD estimator to evaluate the effect of FDI on the changes in trade volume:

$$\hat{\beta} = \frac{1}{\sum D_{kt}} \sum_{k \in K} \sum_{t=L+1}^{T-F} D_{kt} \left\{ (Y_{k,t+F} - Y_{k,t-1}) - \sum_{k' \in \mathcal{M}_{kt}} w_{k't} (Y_{k',t+F} - Y_{k',t-1}) \right\} \tag{3}$$

where $D_{kt} = 1$ if X^*_{kt} changed from 0 to 1 in year t, L represents the number of years for which we match treatment history (lag), and F is the future year we estimate the effects (lead). We weight each control unit using the weights $w_{k't}$ obtained by the covariate balancing propensity score (CBPS, Imai and Ratkovic, 2014) method that balances the full set of covariates and the lagged dependent variable. Appendix Figures C.3 and C.4 (p.12–13) show that the proposed refinement method significantly improves the covariate balance between the products associated with FDI projects and those in the matched sets that are not associated with any projects.

Consistent with **Hypothesis 2**, we find that new manufacturing greenfield FDI projects increase both the export and import volume of FDI-related products in subsequent years. Moreover, the effects are persistent and grow over time. As shown in the left panel of Figure 2, a new manufacturing greenfield FDI project made at year t increases the export volume of associated HS 6-digit products from around 15% at time t to 90% at time $t+4$ (see Appendix Table C.8, p.13, for details). While the effect size is more moderate for imports, a new FDI project is still estimated to increase the import volume of associated upstream products by

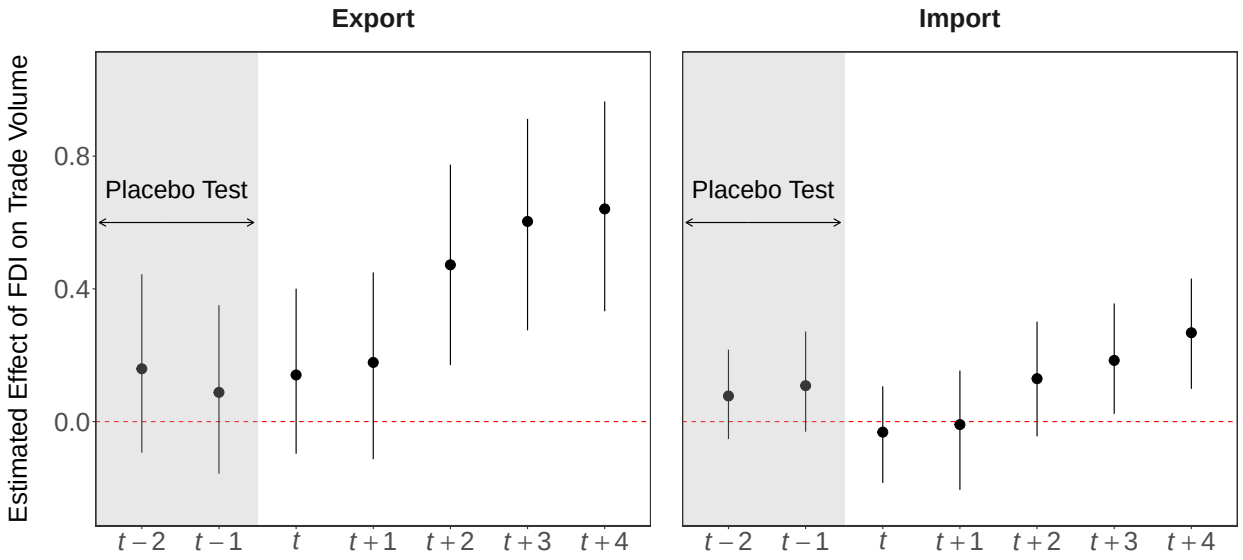

Figure 2: **Effects of FDI on Trade Volume**. We present the estimated effects of a new manufacturing greenfield FDI project on the logged export volume (left) and import volume (right) of associated HS 6-digit products at $t + k$ for $k \in \{0, 1, 2, 3, 4\}$. The vertical bars represent 95% confidence intervals. Results show that a new manufacturing greenfield FDI project is estimated to increase the export volume of associated products by up to 90% within four years while increasing the import volume by up to 30%. In contrast, point estimates for time placebo tests (shaded in grey) are indistinguishable from zero.

approximately 30% at time $t+4$. To ensure the validity of the parallel trend assumption, we also conduct a set of time placebo tests. Here, we estimate the effect of greenfield investment at time t on the differences in trade volume in the pre-treatment periods at $t-1$ and $t-2$. As expected, we find that the pre-treatment trend is indistinguishable from zero.

Overall, we find that new manufacturing greenfield FDI projects lead to increased trade of FDI-associated products between Vietnam and the rest of the world. Together with the cross-country evidence on the extensive margin, the findings support our theory that greenfield investments change both the extensive and intensive margins of trade for host countries.

4.2 Effects of FDI on Trade Liberalization

We turn to investigate the effect of FDI on trade liberalization. We begin by analyzing product-level tariff cuts in the 2015 Korea–Vietnam bilateral FTA.[20] In the ten years between 2009 and 2019, South Korea has become Vietnam's third-fastest-growing export market (after the U.S. and China) and second-fastest-growing import market (after China) (OEC, 2020). Furthermore, as discussed in Section 3, examples of MNCs investing in Vietnam to facilitate final product exports to and intermediate product imports from large markets abound. As such, the FTA is a valuable case to test whether FDI has influenced trade policy outcomes through GVCs in ways consistent with our theoretical framework.

We conduct two analyses, one focusing on Korea's tariff cuts for Vietnamese products and the other on Vietnam's tariff cuts for Korean products. We fit the Tobit model below to a subset (2003–2014) of our product-level data discussed in Section 3.2:

$$
\begin{aligned}
Y_k^* &= \alpha_{j[k]} + \beta X_{kt} + \delta \boldsymbol{Z}_k + \epsilon_k, \\
Y_k &= \begin{cases} Y_k^* & \text{if } Y_k^* > 0 \\ 0 & \text{if } Y_k^* \leq 0 \end{cases}
\end{aligned} \tag{4}
$$

where the outcome variable Y_k^* measures the depth of liberalization based on the logged difference between the MFN tariff rate and the FTA preferential rate. Following our theory, we focus on Vietnamese tariff reduction for their imported products from Korea while also analyzing the changes in Korean import tariffs towards Vietnamese exports. We compute our

[20] The FTA was signed on May 5th, 2015, and entered into force on December 20th, 2015.

measures based on the tariff-line data from Barari and Kim (2022).[21] To facilitate consistent product comparisons across the two countries, we compute the mean tariff cut for HS 6-digit product k using the rates of all HS 10-digit tariff-line products within the same HS 6-digit category. We then log-transform the measure to account for the skewed distribution of the variable. Note that the outcome variable is time-invariant, and thus our analysis leverages the variation across products.

The variable $\alpha_{j[k]}$ represents industry fixed-effects at the HS section level (HS section j corresponding to HS 6-digit product k) that account for industry-level characteristics that may affect both FDI inflows and tariff cuts. The key predictor X_{kt} is a dichotomous variable measuring whether there were any new greenfield manufacturing FDI projects in Vietnam associated with product k for the first time in period t. The variables $\boldsymbol{Z}_k$ represent an array of product-level controls aggregated over time by taking their mean values between 2003 and 2014. They include Vietnamese import/export volume (logged), import/export volume in the rest of the world (logged), mean import/export volume across all importing/exporting countries (logged), the number of countries Vietnam imports from or exports to (logged), product differentiation, intermediateness, and upstreamness/downstreamness. We compute heteroskedasticity-robust standard errors to account for non-constant variance in the errors.

Consistent with our expectations, we find that HS 6-digit products linked to greenfield manufacturing FDI projects in Vietnam generally enjoy larger tariff cuts from both Korea

[21] The authors compile product-level tariff data from UNCTAD's Trade Analysis Information System (TRAINS) and the World Bank's World Integrated Trade Solution (WITS) database.

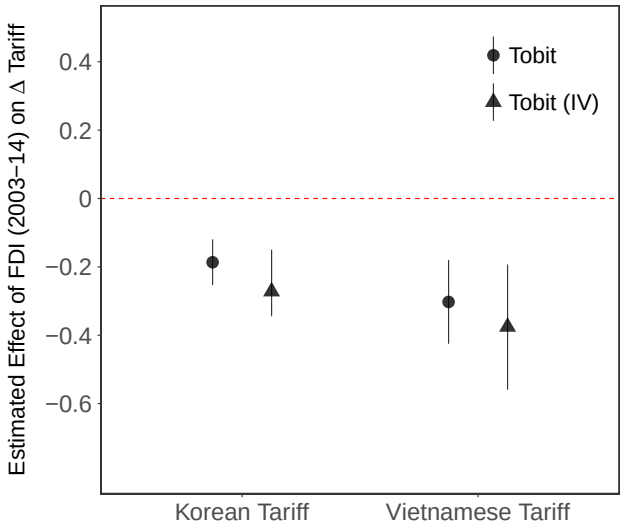

Figure 3: **Effects of FDI on Tariff Cuts.** We present the effect of greenfield manufacturing FDI projects (2003–2014) on the average HS 6-digit product-level tariff cut (logged) in the 2015 South Korea-Vietnam FTA. The figure shows point estimates and 95% confidence intervals from Tobit and instrumental variable (IV) analyses. Vietnamese export products linked to MNCs' FDI projects received deeper Korean tariff cuts (left), while Vietnamese import products tied to these projects experienced deeper Vietnamese tariff cuts (right).

and Vietnam in the 2015 FTA. Figure 3 presents the effect of FDI across the entire period between 2003 and 2014 and shows that FDI-associated Vietnamese export products received 19% deeper tariff cuts from Korea compared to similar products unrelated to FDI. Similarly, FDI-associated Vietnamese import products received 30% deeper tariff cuts from Vietnam. To address potential selection bias by firms entering the Vietnamese market due to expectations about future trade policies, we conducted an instrumental variable analysis. Following an identification strategy similar to Autor, Dorn and Hanson (2013), we used the average number of new FDI projects in the *same* NAICS industry in the rest of the world as an instrument. This approach captures exogenous global technological shocks driving FDI while assuming they influence Vietnamese trade policy only indirectly through increased investment in the same industry. The results, shown in Figure 3, remain statistically and

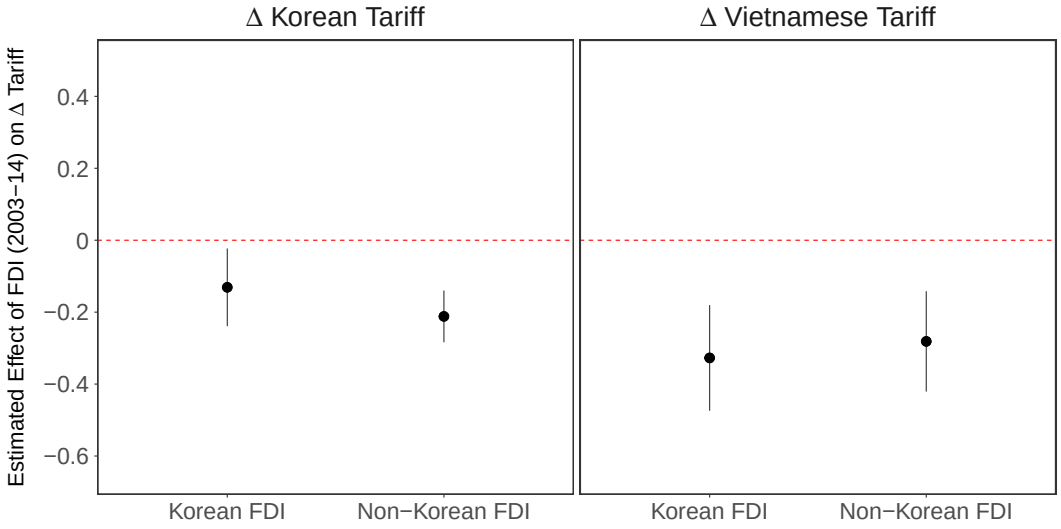

Figure 4: **Effects of Korean and Non-Korean FDI in Vietnam on Tariff Cuts.** We present the overall estimated effect of FDI occurrence (2003–2014) on tariff cuts by FDI origin. The left estimate in each panel focuses on the effect of Korean MNCs' FDI, while the right estimate focuses only on the effect of FDI from non-Korean MNCs. The panels present point estimates and 95% confidence intervals.

substantively robust (see Appendix Section D.1, p.14–16, for details). Finally, we also estimate time-varying effects and find stronger results among products linked to earlier FDI projects. This aligns with the argument that earlier MNC entrants are more likely to have established value chain networks, fostering stronger political coalitions and influence (see Appendix Section D.2, p.16–19, for details).

Importantly, we show in Figure 4 that the tariff reduction effect we find is not simply driven by Korean MNCs' FDI in Vietnam. Disaggregating the overall effect of FDI by origin, Korean vs. non-Korean, we find that both types led to tariff cuts in the 2015 FTA. The left panel shows that Vietnamese export products associated with Korean FDI enjoyed deeper Korean tariff cuts by about 13% compared to those unrelated to any FDI projects. Meanwhile, Vietnamese export products associated only with non-Korean FDI experienced tariff cuts by about 21%. The right panel shows that Vietnamese import products associated

with Korean FDI (only non-Korean FDI) experienced Vietnamese tariff cuts by around 33% (28%). These results suggest that MNCs' FDI activities can influence trade politics and policy outcomes in third-party countries beyond the host-home country pair.

Lastly, we evaluate the external validity of our findings by expanding our analysis to include trade agreements signed by thirty-six host countries between 2003 and 2015. We identify these countries based on hosts with at least one FTA entered into force during the sample period, product-level variation in inward FDI projects, and available data for host or partner covariates.[22] For each host country, we focus on its latest FTA during the sample period and estimate the effect of inward FDI projects on the host and partner's tariff cuts in the FTA. We focus on the latest FTA because our FDI data only started in 2003, and as discussed earlier, it takes time for FDI's effects to realize. However, unlike the Korea-Vietnam FTA case, we could not match FDI projects to tariffs at a fine-grained firm-product level without systematic customs data across countries. Consequently, we rely on the concordance between NAICS 3-digit industry codes and HS 4-digit product codes to obtain HS products corresponding to each FDI project. Since this approach can be noisier, we fit the following varying-intercept model to leverage information across industries and countries (i.e., partial pooling) while accounting for our data's complex hierarchical structure:

$$Y_{ig} \sim N(\alpha + \eta_i + \theta_{h[g]} + \beta \mathbf{X}_i + \gamma \mathbf{Z}_g, \sigma_y^2), \tag{5}$$

where Y_{ig} is the mean logged tariff cut of HS 4-digit product g in host country i's latest

[22] For FTA data, we rely on the Design of Trade Agreements (DESTA) Database. See `https://www.designoftradeagreements.org/`. Appendix Table D.5 (p.19) shows the list of the hosts and their FTAs included in the analysis.

FTA during our sample period.[23] The fixed intercept is denoted by α, the varying intercept for each HS 2-digit group $h[g]$ that g belongs to is represented by $\theta_{h[g]}$, and η_i denotes the varying intercept for host country i. The covariates $\mathbf{X_i}$ include the key predictor, cumulative binary FDI (up to the year before the FTA entered into force), as well as the GDP per capita (logged) and polity2 scores of host and partner countries (in the year before the FTA entered into force). The HS 4-digit level covariates $\mathbf{Z_g}$ include mean import/export volume across all importing/exporting countries (logged), total world export volume (logged), product differentiation, intermediateness, and upstreamness/downstreamness.[24]

Consistent with our previous findings, we find substantial tariff reductions by both host and partner countries across products associated with host countries' inward FDI. Figure 5 shows the posterior distributions and the 95% credible intervals (vertical line) of FDI's effects estimated with Bayesian inference. The results suggest that, on average, FDI-associated products experienced 6.2% deeper tariff cuts from the host country and 6.9% deeper cuts from the partner country. Taken together, our findings provide strong empirical support for **Hypothesis 3**, suggesting that governments are more inclined to liberalize trade policies for products directly linked to MNCs' FDI activities, even when compared to similar products within the same industry.

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[23] To account for any potential tariff phase-outs, we use 2021 preferential tariff rates from the WITS database. Appendix Table D.5 (p.20) shows similar results when using the deepest instead of mean tariff cuts, which further helps reduce noise due to less precise concordances between FDI projects and HS products.

[24] Appendix D.3.2 (p. 19–20) presents further details about the multilevel model, implementation, and convergence diagnostics.

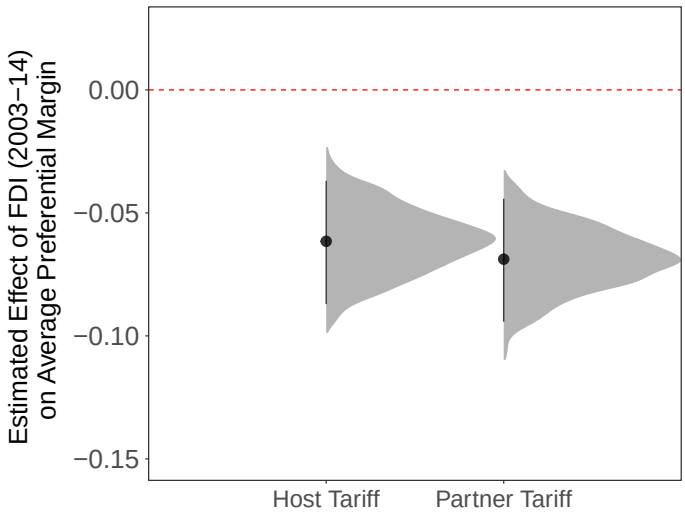

Figure 5: **Effects of FDI on Mean Tariff Cuts: 36 Host Countries and their Latest FTAs between 2003 and 2015.** We present the estimated effects of FDI on the mean HS 4-digit product-level tariff cut (logged) in a host country's FTA. The left estimate shows the impact on the host's tariffs, and the right on the partner's tariffs. In both cases, FDI-linked products received deeper cuts. The figure includes point estimates, posterior distributions, and 95% credible intervals from Bayesian estimates.

5 Conclusion

To what extent and how does MNCs' FDI influence host countries' trade patterns and policies? Using data that capture linkages between FDI and trade activities at the firm-product level, we find that greenfield FDI substantially changes hosts' trade profile and volume. We also find that it affects the host country's trade agreements with and market access to not just the home country but even third-party countries. Specifically, Vietnamese trade margins significantly expanded due to increased FDI from many developed countries. Moreover, the products imported and exported by these MNCs received substantially deeper tariff cuts in the bilateral FTA between Vietnam and South Korea. We further confirm these findings based on large-scale cross-country analyses.

Further research is needed to explore the implications of our study. First, a key impli-

cation of our findings is that employment ties with MNCs, and consequently their GVCs, may play an increasingly critical role in shaping individual trade attitudes. This stands in contrast to earlier studies that emphasized the importance of factor ownership (Scheve and Slaughter, 2001), occupation (Owen and Johnston, 2017), or sector (Hiscox, 2002). Instead, our findings are more consistent with the growing perspective that individual trade preferences are closely tied to the interests of their employing firms (Owen and Quinn, 2016; Lee and Liou, 2022). More work at the individual level is needed to disentangle the relative influence of GVC connections vis-a-vis the other factors above. Additionally, since GVCs incentivize local labor, foreign capital, and their partners to advocate for open trade policies collectively, the traditional focus on domestic political cleavages along factoral or sectoral lines may become increasingly outdated. Therefore, scholars should seek to assess the distributional consequences of trade both within and outside GVCs. A promising approach for more accurately capturing domestic trade preferences could involve utilizing data and measures on the composition of FDI across industries.

Second, our theory suggests that governments face unique political pressures when formulating policies for goods or services with significant value chain linkages. However, observing firm-level political activities is highly challenging, especially in developing country contexts. We are thus constrained in our ability to measure the formation of MNC-led political coalitions and directly test their impact on trade policymaking. To be sure, new studies have begun to examine joint political activities among firms connected through GVCs, but they tend to focus on developed countries and have yet to directly examine the impact of such coalitional forces on trade policies (e.g., Zhang, Forthcoming). Our study thus complements this important emerging literature, but further research that examines the causes and conse-

quences of GVC political coalitions more directly and in different contexts is sorely needed.

Lastly, by revealing substantial differences in trade policies towards goods produced and exported by MNCs compared to other domestically produced products, our findings suggest that trade policymaking goes far beyond national and product boundaries. Future research should strive to close the gap between studies of FDI and international trade by directly incorporating network structures formed by MNCs and their upstream and downstream partners or products.

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Online Appendix

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Appendix A Theory

A.1 Effect of Inward FDI on Extensive Margins

In Section 2.1, we argue that inward FDI leads to an expansion in extensive margins due to changes in host countries' resource allocation and an increase in their relative productivity. We further illustrate the argument based on the canonical Ricardian model developed by Dornbusch, Fischer and Samuelson (1977). To focus on the implications of FDI on the extensive margins of trade, we adopt this framework with a single factor of production: labor.[1] We assume that there are two countries (H and W) that produce a continuum of goods denoted by $z \in [0, 1]$.[2] Without loss of generality, we order the products according to host country H's comparative advantage. Specifically, the smaller the value of z, the more efficient H is in producing the good z than the rest of the world W. We denote $a(z)$ and $a^*(z)$ as the amount of labor required to produce product z by H and W, respectively. We can then denote the relative productivity between H and W by:

$$A(z) \equiv \frac{a^*(z)}{a(z)}, \tag{6}$$

where $A(z)$ is a decreasing function of z.[3] That is, $A(z)$ takes a higher value if H is relatively more productive in producing the good z. Suppose that the price of good z in a competitive equilibrium is $p(z)$, i.e., every country takes the price as given. Then, it is straightforward to show that there exists a product $\tilde{z}$ such that H produces all products $z < \tilde{z}$, while W specializes in producing all products $z > \tilde{z}$.

Next, we consider a simple demand structure whereby the two countries have identical and homothetic Cobb-Doublas demand functions, where $b(z)$ denotes the Cobb-Douglas elasticities: $\int_0^1 b(z)dz = 1$. Under this demand structure, we can re-express $b(z)$ in terms of the ratio of expenditure spent on commodity z to income:

$$b(z) = \frac{p(z)c(z)}{wL} = \frac{p^*(z)c^*(z)}{w^*L^*} \tag{7}$$

where $c(z)$, w, and L denote the consumptions of good z, wage, and labor endowment in H, respectively,

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[1] In the Ricardian model, multiple factors can be seen as substitutes in the production function.

[2] Dornbusch, Fischer and Samuelson (1977)'s model has been further extended to a more complex setting in which researchers consider more than two countries (e.g., Eaton and Kortum, 2002).

[3] This is because we assumed that H has a comparative advantage in producing smaller z.

while the variables with asterisks denote the analogous quantities for W. Let us denote by $\theta(\tilde{z}) \equiv \int_0^{\tilde{z}} b(z)dz$ the fraction of income spent on goods produced by H, i.e., $z \in [0, \tilde{z}]$. Then, by trade balance, the relative wage between H and W can be written as:

$$B(\tilde{z}) \equiv \omega = \frac{w}{w^*} = \frac{\theta(\tilde{z})}{1-\theta(\tilde{z})}\left(\frac{L^*}{L}\right). \tag{8}$$

Note that the relative wage $B(z)$ can be interpreted as global demand for H's labor, and it is increasing in z, as $\theta(\tilde{z})$ increases when z increases.

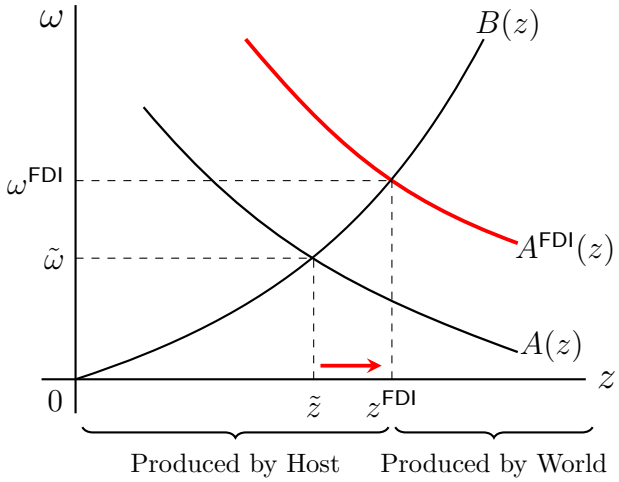

Figure A.1: **Expansion of the Product Profile after FDI**. This figure illustrates the consequences of domestic production as a result of foreign investments following the Ricardian framework developed by Dornbusch, Fischer and Samuelson (1977). Specifically, it shows that the set of products produced by the host country expands from $\tilde{z}$ to z^{FDI} as the relative production productivity of the host country increases following foreign investments, i.e., shift from $A(z)$ to $A^{\mathsf{FDI}}(z)$. It also shows that the relative wage of the host country increases.

Figure A.1 shows that this canonical model is useful to understand the expansion of products produced by the host country following increased FDI. As noted above, the competitive equilibrium under the setup is that the host country H produces all products $z < \tilde{z}$, while the other country W specializes in producing all the other products $z > \tilde{z}$. Suppose that the relative productivity of H, in the sector/product associated with MNC activities, increases with FDI. Then, $A(z)$ moves upward towards $A^{\mathsf{FDI}}(z)$ as the relative productivity of H compared to W increases. This will then change the equilibrium such that H expands the set of products it produces from $\tilde{z}$ to z^{FDI} as indicated by the red arrow.

Appendix B Data

Figure	Data Source
Figure 1	FDI
Figure 2	FDI, TRD, CUST, TRF, COV
Figure 3	FDI, TRD, CUST, TRF, COV
Figure 4	FDI, TRD, CUST, TRF, COV
Figure 5	FDI, TRD, CUST, TRF, WITS, DESTA, COV
Figure B.1	CUST, TRD
Figure B.2	FDI, TRD, COV
Figure C.1	FDI, TRD
Figure C.2	FDI, TRD, COV
Figure C.3	FDI, TRD, CUST, TRF, COV
Figure D.1	FDI, TRD, CUST, TRF, COV
Figure D.2	FDI, TRD, CUST, TRF, COV
Figure D.3	FDI, TRD, CUST, TRF, COV
Figure D.4	FDI, TRD, CUST, TRF, WITS, DESTA, COV
Figure D.5	FDI, TRD, CUST, TRF, WITS, DESTA, COV

Table	Data Source
Table 1	FDI, TRD, COV
Table B.2	FDI, TRD, CUST, COV
Table B.4	FDI
Table C.1	FDI, CUST, TRD
Table C.2	FDI, TRD, COV
Table C.3	FDI, TRD, COV, WGI
Table C.4	FDI, TRD, COV, WGI
Table C.5	FDI, TRD, COV
Table C.6	FDI, TRD, COV
Table C.7	FDI, TRD, CUST, TRF, COV
Table C.8	FDI, TRD, CUST, TRF, COV
Table D.1	FDI, TRD, CUST, TRF, COV
Table D.2	FDI, TRD, CUST, COV
Table D.3	FDI, TRD, CUST, TRF, COV
Table D.4	DESTA

Table B.1: **List of Figures/Tables with Data Sources.** Legend of abbreviations as follows. FDI (FDI projects from fDi Markets); TRD (Trade data from UN Comtrade); CUST (Vietnamese customs data from Datamyne); TRF (Tariff-line data from Barari and Kim (2022)); WITS (MFN and preferential tariff rates from UNCTAD's TRAINS database and downloaded from WITS); DESTA (FTA data from Design of Trade Agreements (DESTA) Database); COV (Covariates from the World Bank's World Development Indicators, Polity IV Project (Marshall and Gurr (2017)), and product level data from concordance package based on Rauch (1999), Antràs et al. (2012) and Antràs and Chor (2018)); WGI (Worldwide Governance Indicators via the World Bank).

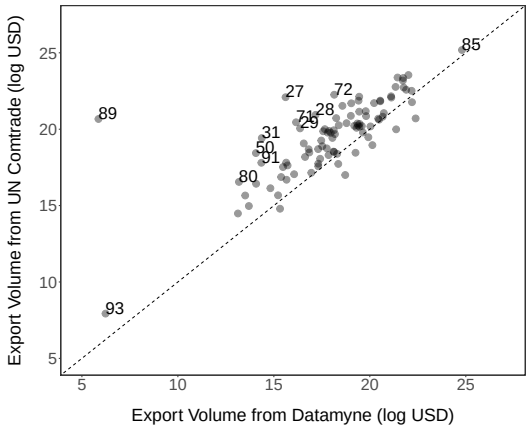

Figure B.1: **Validating Vietnamese Customs Data Against UN Comtrade Data, 2018**. This figure plots 2018 log export volumes at the HS 2-digit level from UN Comtrade data (y-axis) against those obtained through Datamyne's export declarations (x-axis). Data from the two sources are largely consistent as most products fall along the 45-degree line. The only exceptions are HS 89 (Ships, boats and floating structures) and security-sensitive products.

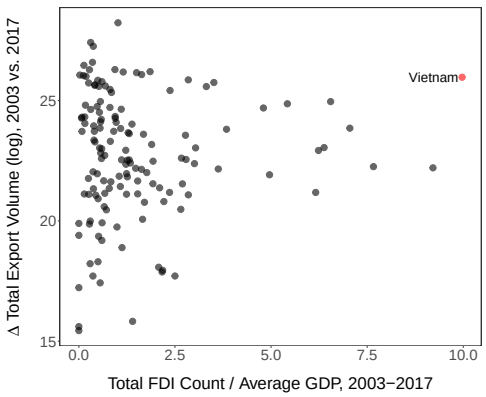

Figure B.2: **Greenfield FDI and Growth in Export Volumes**. This figure plots the change in a country's three-year average export volume in 2003 vs. 2017 (y-axis) against the total number of greenfield manufacturing FDI projects it received during the same period normalized by its average GDP in billion USD (x-axis).

Statistic	N	Mean	St. Dev.	Median	Min	Max
Export volume (logged)	76,725	10.743	5.305	11.756	0.000	24.113
Import volume (logged)	76,725	13.391	3.667	14.002	0.000	23.445
Export-related FDI (cumulative binary, Customs)	76,725	0.111	0.315	0	0	1
Import-related FDI (cumulative binary, Customs)	76,725	0.253	0.435	0	0	1
ROW export volume (logged)	76,725	19.981	1.803	20.014	6.738	28.045
ROW import volume (logged)	76,725	20.006	1.762	20.023	1.386	28.177
Mean export (logged)	76,725	15.696	1.542	15.688	6.046	23.433
Mean import (logged)	76,725	15.179	1.603	15.143	1.386	23.235
Number of countries Vietnam exports to	76,725	8.881	14.720	3	0	120
Number of countries Vietnam imports from	76,725	10.536	9.637	8	0	80
Vietnamese average MFN tariff rate	76,681	12.398	14.808	5.000	0.000	140.000
Intermediateness	76,725	0.055	0.229	0	0	1
Upstreamness	76,725	2.195	0.627	2.026	1.221	3.644
Downstreamness	76,725	2.458	0.278	2.463	1.724	2.996
Differentiation (Rauch-N)	76,725	0.594	0.484	1.000	0.000	1.000
Homogeneous goods (Rauch-W)	76,725	0.070	0.253	0.000	0.000	1.000

Table B.2: **Summary Statistics for Product-Level Panel Data.** The data consist of 5,115 unique HS 6-digit products (HS Revision 2017) over 15 years (2003–2017).

Name	Entry Into Force
Association of Southeast Asian Nations (ASEAN) FTA: Vietnam accession	1995
Association of Southeast Asian Nations (ASEAN) FTA: Laos and Myanmar accession	1997
Association of Southeast Asian Nations (ASEAN) FTA: Cambodia accession	1999
United States–Vietnam	2001
Association of Southeast Asian Nations (ASEAN)–China	2005
Association of Southeast Asian Nations (ASEAN)–China on Services	2007
Association of Southeast Asian Nations (ASEAN)–Japan	2008
Association of Southeast Asian Nations (ASEAN)–Korea on Services	2009
Japan–Vietnam	2009
Association of Southeast Asian Nations–Australia–New Zealand FTA (AANZFTA)	2010
Association of Southeast Asian Nations (ASEAN): Trade in Goods (ATIGA)	2010
Association of Southeast Asian Nations (ASEAN)–India	2010
Association of Southeast Asian Nations (ASEAN)–Korea	2010
Chile–Vietnam	2014
Korea–Vietnam	2015
Eurasian Economic Union (EAEU)–Vietnam	2016
Comprehensive and Progressive Agreement for Trans-Pacific Partnership (CPTPP)	2018
Association of Southeast Asian Nations (ASEAN) FTA: Hong Kong accession	2019
European Union (EU)–Vietnam	2020
Cuba–Vietnam	2020
United Kingdom–Vietnam	2021

Table B.3: **FTAs Signed by Vietnam, 1995–2021**.

Host Country	Total	Manufacturing
United States	20173	4692
China	18644	6335
United Kingdom	14392	1328
India	11372	2583
Germany	11039	1303
France	7662	1311
Spain	6079	840
Russia	5618	1743
Mexico	4916	2027
Singapore	4875	386
Australia	4821	295
Poland	4521	1352
Brazil	4497	1451
Canada	4257	681
Romania	3554	823
Vietnam	3275	1186
Japan	2779	150
Ireland	2719	268
Netherlands	2703	233
Malaysia	2618	627
Thailand	2613	1195
Italy	2487	251
Belgium	2319	454
Hungary	2253	893
Czechia	2132	683
Turkey	2058	684
Indonesia	1935	658
South Africa	1832	302
Switzerland	1804	109
South Korea	1786	385
Philippines	1710	288
Bulgaria	1629	350
Saudi Arabia	1439	229
Colombia	1413	162
Argentina	1347	391
Sweden	1346	154
Austria	1321	221
Ukraine	1304	226
Denmark	1183	51
Slovakia	1177	479
Finland	1168	98
Chile	1075	119
Morocco	969	259
Egypt	947	191
Portugal	904	131
Peru	793	86
Lithuania	725	153
Bahrain	672	49
New Zealand	606	61
Croatia	603	73
Oman	597	63
Kazakhstan	570	141
Costa Rica	551	113

Host Country	Total	Manufacturing
Latvia	520	80
Israel	498	37
Greece	484	23
Estonia	478	137
Norway	475	30
Pakistan	471	108
Tunisia	428	118
Algeria	421	110
Cambodia	416	74
Azerbaijan	392	37
Sri Lanka	375	77
Jordan	349	38
Georgia	318	34
Luxembourg	310	20
Belarus	305	71
Tanzania	303	42
Slovenia	296	61
North Macedonia	290	85
Uganda	254	39
Uruguay	242	48
Dominican Republic	231	26
Zambia	221	53
Armenia	216	12
Ethiopia	203	92
Guatemala	181	24
Ecuador	172	30
Côte d'Ivoire	171	34
El Salvador	162	29
Namibia	143	19
Cyprus	142	6
Rwanda	140	16
Moldova	137	44
Nicaragua	134	34
Albania	116	24
Botswana	116	14
Senegal	112	18
Zimbabwe	107	21
Mauritius	105	6
Bolivia	102	12
Cameroon	87	18
Paraguay	85	30
Jamaica	78	7
Kyrgyzstan	51	11
Madagascar	48	8
Fiji	43	2
Burundi	34	1
Malawi	28	2
Guyana	23	4
Eswatini	22	5
Gambia	18	2
Benin	17	2
Suriname	9	3

Table B.4: **Total and Manufacturing Inward Greenfield FDI Projects by Host Country, 2003–2017**. This table shows the number of total greenfield FDI projects (second column) and manufacturing projects (third column) between 2003–2017 recorded in fDi Markets data for each of the 105 host countries used in the analyses in Table 1.

B.1 FDI Data Collection

We collected data on greenfield FDI projects from fDi Markets, a database of news announcements about FDI projects worldwide. The data offer a unique opportunity to identify firms and activities associated with investment projects, and to the best of our knowledge, is the best resource currently available to researchers and has been widely used in both academic and policy research (e.g., Jung, Owen and Shim 2021; Andrews, Leblang and Pandya 2018; United Nations Conference on Trade and Development 2023). Nevertheless, there are two main caveats to consider when using the data. We discuss each below and how we address them in our study.

First, announcement records may not always reflect the exact timing at which each greenfield operation started. Some are announcements about a new factory beginning operations in the host country, while others are merely announcements that the firm is going to build a new factory in the host country. Additionally, as discussed in the main text, it may take time for fDi Markets to verify whether the latter projects materialize and remove them from the dataset if not. As such, we only use data downloaded at least three years and at most fourteen years after the time of entry into the dataset. This approach mitigates potential mis-measurement due to fDi Markets' varying timing of data collection. Furthermore, we also conducted analyses with additional time lags and dynamic treatment effects to assess longer-term effects.

Second, the data may not provide accurate information on the size of each FDI project. For example, the value of investment or the number of jobs created provided in fDi Markets are often estimated numbers based on the announcement. To address this, we use the occurrence or the number of FDI projects in each host country rather than the size of each project. See Jung, Owen and Shim (2021) for a further discussion on why this approach is more robust.

Appendix C Effects of FDI on Trade Profiles

C.1 Extensive Margin

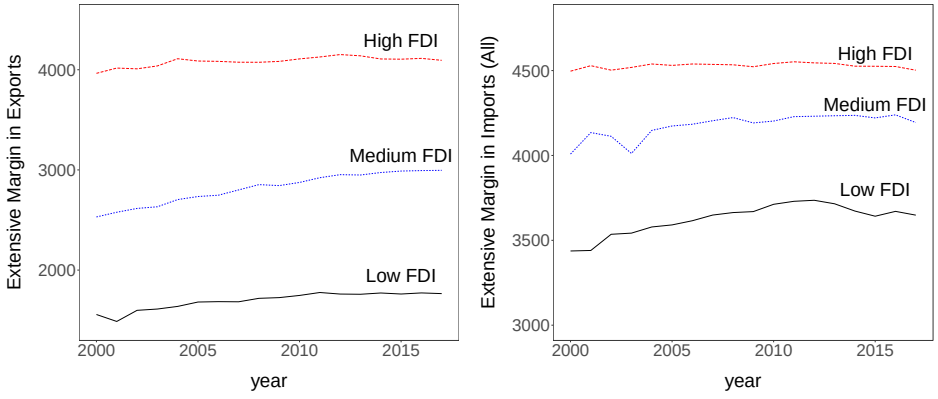

Figure C.1: **Extensive Margins in Trade across Years by Levels of Inward FDI**. This figure shows the average extensive margin in manufacturing exports (left panel) and imports (right panel) each year for each country group. FDI country groupings are created based on terciles of total inward FDI projects between 2003 and 2017. Countries with more total inward FDI projects had, on average, larger extensive margins in exports and imports of manufacturing products to begin with. Over time, countries with high levels of FDI also saw smaller growth in both newly exported and imported products compared to those with medium or low FDI. Extensive margin is measured based on the number of unique HS 6-digit products. The country sample includes 105 countries used in the analyses for Table 1.

Year	Extensive margin	New products (t - $t-1$)	FDI	No FDI	FDI-related (%)
2003	2825	536	9	527	1.68
2004	3029	617	6	611	0.97
2005	3174	479	13	466	2.71
2006	3321	489	20	469	4.09
2007	3345	372	21	351	5.65
2008	3291	359	20	339	5.57
2009	3344	369	14	355	3.79
2010	3365	334	23	311	6.89
2011	3406	319	17	302	5.33
2012	3591	419	17	402	4.06
2013	3580	261	14	247	5.36
2014	3672	309	13	296	4.21
2015	3787	301	10	291	3.32
2016	3905	272	9	263	3.31
2017	3920	220	2	218	0.91

Table C.1: **Vietnam's Extensive Margin Expansion By Year and FDI Ties**. The table shows the unique number of products exported by Vietnam each year from 2003 to 2017 (second column), the number of products that were exported in year t but not in year $t-1$ (third column), and how many of the products within them are tied or not with greenfield FDI projects in the previous years based on customs data (fourth and fifth column). The last column shows the percentage of new products that received FDI projects in the previous years.

C.1.1 Export Effects

DV:	Extensive Margin (t)				Δ Extensive Margin ($t-2$ to t, %)	
	(1)	(2)	(3)	(4)	(5)	(6)
FDI (t-2, binary)	67.647***	63.835***	40.448+	36.341	4.670*	4.421*
	(16.509)	(17.140)	(22.545)	(22.407)	(2.191)	(2.178)
Extensive Margin (t-2)	0.947***	0.943***			−0.007*	−0.007*
	(0.016)	(0.017)			(0.003)	(0.003)
GDP (t-2, logged)	21.543+	12.024	236.759	307.417+	1.617	1.084
	(11.975)	(12.526)	(166.122)	(167.567)	(1.886)	(1.882)
Population (t-2, logged)	−9.620	−7.515	241.181	303.886	0.058	0.171
	(7.535)	(7.605)	(489.879)	(517.200)	(0.762)	(0.776)
Polity 2 (t-2)	−1.285	−0.867	−9.214	−8.790	0.164	0.187
	(1.678)	(1.660)	(6.641)	(6.634)	(0.279)	(0.277)
Export value (t-2, logged)	−0.061	10.584	24.770	51.771	0.197	0.813
	(11.900)	(12.595)	(39.285)	(58.095)	(2.530)	(2.540)
Constant	−254.919				−28.377	
	(160.859)				(19.210)	
N	1365	1365	1365	1365	1365	1365
Countries	105	105	105	105	105	105
Years	13	13	13	13	13	13
FE: year		✓		✓		✓
FE: iso3c			✓	✓		
R^2	0.981	0.981	0.981	0.981	0.063	0.068
Adj. R^2	0.981	0.981	0.979	0.979	0.059	0.056
BIC	18137.9	18202.5	18885	18955.3	12275.7	12355
Log Likelihood	-9043.7	-9032.7	-9045.4	-9037.3	-6112.6	-6108.9

Note: standard errors clustered by country in parentheses. + p < 0.1, * p < 0.05, ** p < 0.01, *** p < 0.001

Table C.2: **New Greenfield FDI and the Expansion of Export Extensive Margins (with a two-year lag)**. Using the country-level panel data set described in Section 3.2, we find that new inward manufacturing greenfield FDI projects are also associated with larger extensive margins (HS 6-digit import products) two years later. Columns (1) to (4) show coefficients estimated using OLS regressions with/without a lagged dependent variable and with/without year and country fixed-effects. Columns (5) and (6) present results with the dependent variable operationalized as the percent change in a country's extensive margin between $t-1$ and t. The results are mostly consistent with our main findings in Table 1, with generally larger point estimates but less precise estimates in the country fixed-effects models given a smaller sample size.

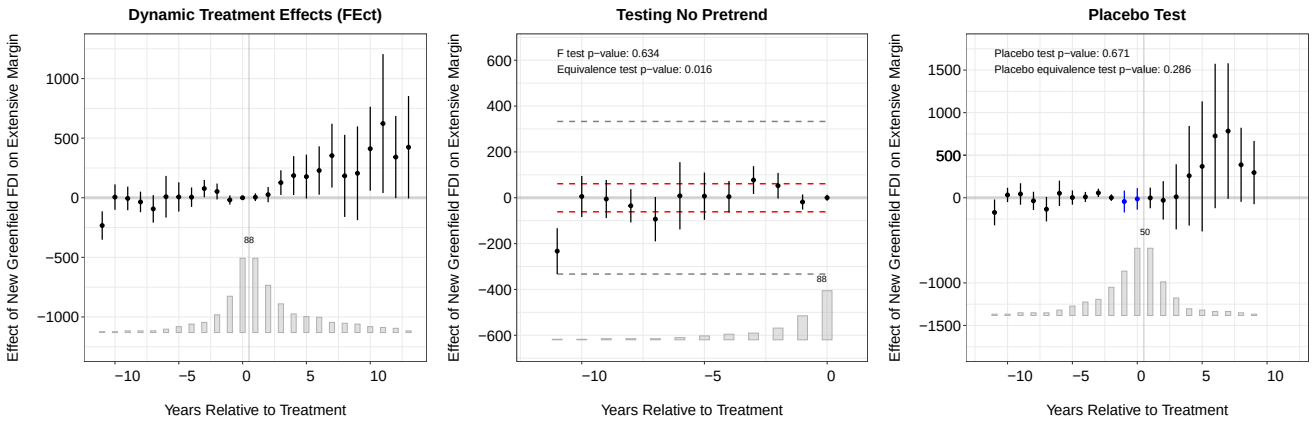

Figure C.2: **Counterfactual Estimator Results: New Greenfield FDI and Export Extensive Margins**. We apply recent advances in counterfactual estimation for causal inference to investigate further the relationship between new greenfield FDI and extensive margins. In particular, we present here results based on the fixed effects counterfactual (FEct) estimator. As discussed by Liu, Wang and Xu (2024), two-way fixed effects (TWFE) estimates may be biased when treatment timing is different and treatment effects are heterogeneous. Counterfactual estimators are shown to provide more reliable causal estimates by addressing the negative weights problem of TWFE and allowing for heterogeneous treatment effects (see Liu, Wang and Xu 2024 for details). We find that the effect of new greenfield FDI increases substantially for countries that are treated for longer periods. The left panel shows period-specific average treatment effects on the treated (ATT) with 95% confidence intervals (C.I.s) based on 1000 block boot-straps. The barplot shows the number of treated countries in the given period. For countries treated briefly at t+1 (one year after new FDI entry, 88 treated countries), the effect is positive but relatively small and imprecisely estimated (4.583, 95% C.I. = -27.458 to 36.624). However, the effect reaches a precisely estimated 126.889 (95% C.I. = 23.282 to 230.496) at t+3 and a maximum estimate of 622.726 (95% C.I. = 40.053 to 1205.398) at t+11. When treated observations are weighted equally, the overall ATT based on the FEct estimator is 88.503 (95% C.I. = 4.185 to 172.821), which is consistent and even larger than the 53.646 TWFE estimate we find in column (4) of Table 1. The increase in ATT is also consistent with the larger estimates we find when lagging new greenfield FDI by two years instead of one (see Table C.2). Substantively, these findings are consistent with the fact that some new greenfield FDI may not be fully operational one year after their announcement (see Appendix B.1), and their effects on export extensive margins may take a few more years to materialize and observe. A visual inspection suggests that pre-treatment estimates are mostly flat and close to zero, which is important for ruling out pretrending effects. The only exception is the precisely estimated negative effect at t−11 driven entirely by Fiji, the only treated unit that had 11 years of control observations before its treatment. Following Liu, Wang and Xu (2024), we probe the validity of the identifying assumptions of the FEct estimator with pretrends and placebo tests. The results in the middle panel suggest limited evidence of pretrends. The F test does not reject the null of no pretrend (p = 0.634) and the two one-sided tests (TOST) reject the null of inequivalence (p = 0.016). The placebo test results in the right panel are more ambiguous. They show that the placebo effect is statistically indistinguishable from zero (p = 0.671), passing the difference-in-means (DIM) test. However, we are unable to reject the null that the placebo effect is outside the equivalence range (p = 0.286) using the default value of 0.36 times the standard deviation of the residualized untreated outcome (-60 $\leq$ ATT^p $\leq$ 60).

	Baseline		Augmented		Year FE	
	Selection	Outcome	Selection	Outcome	Selection	Outcome
	(1)	(2)	(3)	(4)	(5)	(6)
FDI (t-1, binary)		57.763***		57.061***		58.381***
		(14.554)		(15.498)		(14.889)
GDP (t-1, logged)	0.083	11.436+	−0.257	9.578	−0.261	−4.750
	(0.182)	(6.681)	(0.204)	(6.986)	(0.205)	(7.089)
Population (t-1, logged)	0.237**	−4.717	0.289*	−5.641	0.292*	−4.649
	(0.090)	(3.786)	(0.134)	(4.069)	(0.134)	(4.011)
Export value (t-1, logged)	0.411**	−1.750	0.127	−5.470	0.128	−7.685
	(0.127)	(6.283)	(0.164)	(8.063)	(0.164)	(8.346)
Polity 2 (t-1)	0.003		−0.007		−0.007	
	(0.015)		(0.015)		(0.016)	
Extensive Margin (t-1)		0.971***		0.968***		0.961***
		(0.008)		(0.008)		(0.009)
Political Stability (t-1)			0.109		0.110	
			(0.168)		(0.168)	
Rule of Law (t-1)			0.009		0.013	
			(0.174)		(0.174)	
Import value (t-1, logged)			0.699***	8.648	0.702***	30.768**
			(0.188)	(9.551)	(0.188)	(9.916)
GDP Growth (t-1, annual %)			0.040**	0.919	0.040**	0.463
			(0.014)	(0.937)	(0.014)	(1.023)
Total Natural Resources Rents (t-1, % of GDP)			0.002	−0.220	0.002	−0.139
			(0.009)	(0.701)	(0.009)	(0.685)
Constant	−14.088***	−119.159	−16.463***	−170.481*	−16.475***	−226.117*
	(1.551)	(75.132)	(1.643)	(85.601)	(1.639)	(89.119)
N	1,470	1,470	1,470	1,470	1,470	1,470
Years	14	14	14	14	14	14
FE: Year					✓	✓
rho	-0.051 (0.033)		-0.058 (0.043)		-0.08 (0.044)	
Log Likelihood	−9,691.587		−9,672.906		−9,657.301	

Note: standard errors clustered by country in parentheses. + p < 0.1, * p < 0.05, ** p < 0.01, *** p < 0.001.

Table C.3: **Heckman Model Results: Export Extensive Margin (t) as the Outcome**. We use the Heckman treatment effect model (Greene, 2003; Toomet and Henningsen, 2008) to estimate the effect of receiving new greenfield FDI on extensive margins by explicitly modeling and accounting for FDI's selection into countries. Odd-number columns present results for the selection equation with FDI (t-1, binary) as the dependent variable. Even-number columns show results for the outcome equation with Extensive Margin (t) as the dependent variable. The baseline model includes the same covariates as column (1) in Table 1. Here, Polity 2 is included as a predictor for FDI in the selection equation but excluded from the outcome equation to meet the exclusion restriction. The augmented model adds several additional predictors to the selection and outcome equations. The year FE model further adds year fixed-effects to the outcome equation (coefficients for year FEs are excluded to ease presentation). Regardless of the model specification, we find that the Heckman estimates for FDI are consistent with our OLS estimates in Table 1 and are even larger in magnitude.

	Baseline		Augmented		+ Year FE	
	Selection	Outcome	Selection	Outcome	Selection	Outcome
	(1)	(2)	(3)	(4)	(5)	(6)
FDI (t-1, binary)		3.634*		3.589*		3.679*
		(1.816)		(1.803)		(1.775)
GDP (t-1, logged)	0.078	1.109+	−0.258	0.569	−0.259	−0.370
	(0.181)	(0.662)	(0.205)	(0.663)	(0.205)	(0.661)
Population (t-1, logged)	0.238**	−0.096	0.286*	−0.196	0.287*	−0.106
	(0.090)	(0.300)	(0.134)	(0.309)	(0.134)	(0.322)
Export value (t-1, logged)	0.414**	−0.140	0.126	−1.041	0.126	−1.231
	(0.126)	(0.972)	(0.165)	(1.572)	(0.165)	(1.580)
Polity 2 (t-1)	0.003		−0.007		−0.007	
	(0.015)		(0.015)		(0.015)	
Extensive Margin (t-1)		−0.004**		−0.004*		−0.004*
		(0.001)		(0.002)		(0.002)
Political Stability (t-1)			0.110		0.110	
			(0.168)		(0.168)	
Rule of Law (t-1)			0.0002		0.001	
			(0.174)		(0.174)	
Import value (t-1, logged)			0.704***	1.983*	0.704***	3.464**
			(0.189)	(1.007)	(0.189)	(1.311)
GDP Growth (t-1, annual %)			0.040**	0.081	0.040**	0.010
			(0.014)	(0.072)	(0.014)	(0.077)
Total Natural Resources Rents (t-1, % of GDP)			0.002	−0.024	0.002	−0.016
			(0.009)	(0.116)	(0.009)	(0.115)
Constant	−14.030***	−14.317+	−16.465***	−24.010*	−16.463***	−28.946*
	(1.539)	(8.603)	(1.650)	(11.534)	(1.649)	(12.103)
N	1,470	1,470	1,470	1,470	1,470	1,470
Years	14	14	14	14	14	14
FE: Year					✓	✓
rho	0.002 (0.015)		-0.004 (0.017)		-0.012 (0.016)	
Log Likelihood	−6,539.549		−6,520.216		−6,512.142	

Note: standard errors clustered by country in parentheses. + p < 0.1, * p < 0.05, ** p < 0.01, *** p < 0.001

Table C.4: **Heckman Model Results: Δ Export Extensive Margin (%) as Outcome**. Following Appendix Table C.3, we estimate here the effect of receiving new greenfield FDI on percentage changes in extensive margins. Again, Odd-number columns present results for the selection equation with FDI (t-1, binary) as the dependent variable. Even-number columns now show results for the outcome equation with Δ Extensive Margin (%) as the dependent variable. The baseline model includes the same covariates as column (5) in Table 1. Again, Polity 2 is included as a predictor for FDI in the selection equation but excluded from the outcome equation to meet the exclusion restriction. The augmented model adds several additional predictors to the selection and outcome equations. The year FE model further adds year fixed-effects to the outcome equation (coefficients for year FEs are excluded to ease presentation). Across models, we find that the Heckman estimates for FDI are consistent with our OLS estimates in Table 1 and similar in magnitude.

C.1.2 Import Effects

Regarding import extensive margins, we anticipate the effects to be subtler than those observed on the extensive margin of exports for two main reasons. First, MNCs may self-select into markets that hold resource advantages and only import proprietary input goods that cannot be sourced locally, reducing the extensive margin effect for imports (e.g., Helpman, 2006). Second, the initial extensive margin level is typically higher for imports than for exports, making further increases empirically more difficult. Overall, we find analogous yet slightly less precise estimates for the extensive margin of imports (see Appendix Tables C.5 for results based on all products and C.6 for results focusing on upstream products).

DV:	Extensive Margin (t)				Δ Extensive Margin (%)	
	(1)	(2)	(3)	(4)	(5)	(6)
FDI (t-1, binary)	46.816+	45.887+	49.883+	45.171+	8.739	8.444
	(25.243)	(24.027)	(26.398)	(24.262)	(7.612)	(7.293)
Extensive Margin (t-1)	0.876***	0.869***			−0.027	−0.028
	(0.078)	(0.079)			(0.024)	(0.024)
GDP (t-1, logged)	10.820	1.563	68.932	218.242**	2.033	0.687
	(8.877)	(7.930)	(73.332)	(70.579)	(2.306)	(1.920)
Population (t-1, logged)	−6.248	−4.308	149.727	278.758	−2.187	−1.897
	(7.058)	(6.462)	(156.011)	(171.204)	(2.043)	(1.837)
Polity 2 (t-1)	−0.831	−0.515	3.466	3.623	−0.113	−0.069
	(0.773)	(0.777)	(3.541)	(3.452)	(0.188)	(0.188)
Export value (t-1, logged)	12.351	22.024	26.424	40.879	4.066	5.437
	(14.350)	(17.774)	(22.254)	(29.490)	(4.175)	(5.254)
Constant	18.975				−6.887	
	(53.464)				(12.576)	
N	1484	1484	1484	1484	1484	1484
Countries	106	106	106	106	106	106
Years	14	14	14	14	14	14
FE: year		✓		✓		✓
FE: iso3c			✓	✓		
R^2	0.96	0.962	0.963	0.966	0.105	0.119
Adj. R^2	0.96	0.961	0.961	0.963	0.101	0.108
BIC	18423.7	18454.9	19057.3	19054.3	13946.8	14017.9
Log Likelihood	-9186.3	-9154.4	-9123.3	-9074.4	-6947.9	-6935.9

Note: standard errors clustered by country in parentheses. + p < 0.1, * p < 0.05, ** p < 0.01, *** p < 0.001

Table C.5: **New Greenfield FDI and the Expansion of Import Extensive Margins (All Products)**. Using the country-level panel data set described in Section 3.2, we find that new inward manufacturing greenfield FDI projects are associated with larger extensive margins (HS 6-digit import products) in the following year. Columns (1) to (4) show coefficients estimated using OLS regressions with/without a lagged dependent variable and with/without year and country fixed-effects. Columns (5) and (6) present results with the dependent variable operationalized as the percent change in a country's extensive margin between $t-1$ and t.

DV:	Extensive Margin (t)				Δ Extensive Margin (%)	
	(1)	(2)	(3)	(4)	(5)	(6)
FDI (t-1, binary)	24.524+	24.451+	27.811+	25.719+	7.676	7.505
	(14.285)	(13.674)	(15.074)	(13.872)	(6.763)	(6.540)
Extensive Margin (t-1)	0.884***	0.874***			−0.040	−0.042
	(0.074)	(0.076)			(0.035)	(0.036)
GDP (t-1, logged)	4.898	0.151	0.180	94.444*	1.723	0.454
	(4.999)	(4.505)	(39.622)	(36.386)	(2.014)	(1.680)
Population (t-1, logged)	−2.232	−1.205	107.928	180.410+	−1.448	−1.161
	(3.276)	(2.977)	(88.461)	(98.692)	(1.430)	(1.249)
Polity 2 (t-1)	−0.533	−0.372	0.264	0.204	−0.156	−0.114
	(0.472)	(0.451)	(1.916)	(1.829)	(0.186)	(0.174)
Export value (t-1, logged)	7.879	13.235	15.800	22.207	3.537	4.898
	(7.694)	(9.910)	(12.410)	(16.717)	(3.548)	(4.641)
Constant	−19.991				−15.003	
	(39.015)				(16.690)	
N	1484	1484	1484	1484	1484	1484
Countries	106	106	106	106	106	106
Years	14	14	14	14	14	14
FE: year		✓		✓		✓
FE: iso3c			✓	✓		
R^2	0.963	0.964	0.965	0.968	0.101	0.117
Adj. R^2	0.962	0.964	0.963	0.965	0.097	0.106
BIC	16755.1	16774.7	17400.6	17390.1	13558.6	13625.8
Log Likelihood	-8352	-8314.3	-8295	-8242.3	-6753.8	-6739.9

Note: standard errors clustered by country in parentheses. + p < 0.1, * p < 0.05, ** p < 0.01, *** p < 0.001

Table C.6: **New Greenfield FDI and the Expansion of Import Extensive Margins (Upstream Products)**. Using the country-level panel data set described in Section 3.2, we find that new inward manufacturing greenfield FDI projects are associated with larger extensive margins of imports in upstream products (HS 6-digit import products, only counting the number of products that are above median upstreamness) in the following year. Columns (1) to (4) show coefficients estimated using OLS regressions with/without a lagged dependent variable and with/without year and country fixed-effects. Columns (5) and (6) present results with the dependent variable operationalized as the percent change in a country's extensive margin between $t-1$ and t.

C.2 Intensive Margin

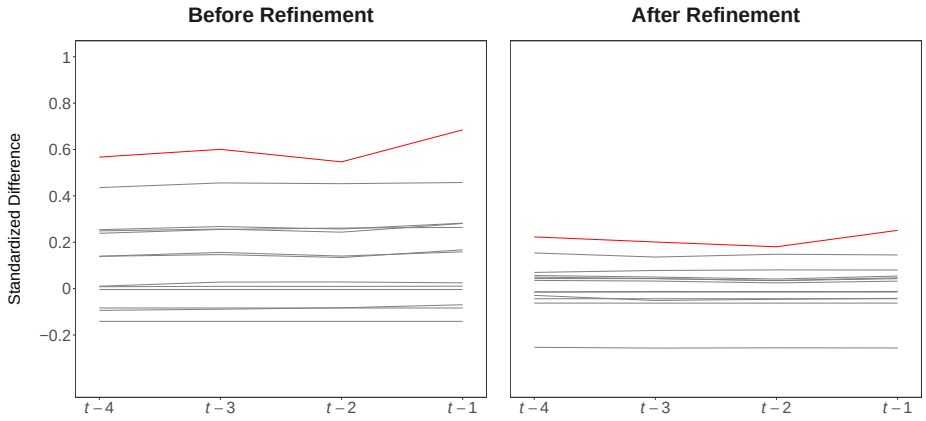

Figure C.3: **Improved Covariate Balance Using CBPS Weighting: Export Analysis**. The figure shows the average covariate balance (standardized difference) between each treated unit and control units (y-axis) at each pre-treatment period (x-axis) for various covariates. Red lines indicate the average balance for the outcome variable (logged export volume), while grey lines represent the balance for the set of pre-treatment covariates discussed in Section 4.1.2. The left panel shows substantial differences between the two types of goods before the refinement. In fact, the mean differences for some of the covariates, such as the number of importing countries, exceed 0.7 standard deviations in terms of their respective variability. Furthermore, without the refinement, the outcome variable logged export volume (red line) shows an increasing trend, suggesting a potential violation of the parallel trend assumption. In contrast, the right panel shows that mean covariate differences, including those for the outcome variable, are substantially smaller after the refinement, with relatively flat changes across the four pre-treatment periods. These results further justify the DiD identification strategy. See Appendix Table C.7 below for details.

	Before refinement				After refinement			
Variable	$t-4$	$t-3$	$t-2$	$t-1$	$t-4$	$t-3$	$t-2$	$t-1$
Export volume (logged, $t-1$)	0.74	0.75	0.71	0.82	0.02	0.00	0.02	0.05
Mean export volume (logged)	0.59	0.60	0.60	0.60	0.05	0.05	0.05	0.05
Mean import volume (logged)	0.62	0.63	0.64	0.64	0.05	0.05	0.05	0.05
Number of countries Vietnam exports to	0.34	0.36	0.38	0.40	0.01	0.02	0.04	0.04
Number of countries Vietnam imports from	0.64	0.62	0.66	0.70	0.09	0.10	0.10	0.09
ROW export volume (logged)	0.70	0.72	0.72	0.72	0.05	0.05	0.05	0.05
ROW import volume (logged)	0.69	0.71	0.71	0.71	0.05	0.06	0.06	0.06
Vietnamese average MFN tariff rate	0.21	0.20	0.20	0.19	0.01	0.01	0.00	−0.01
Intermediateness	0.11	0.11	0.11	0.11	0.01	0.01	0.01	0.01
Upstreamness	0.06	0.07	0.07	0.07	0.04	0.04	0.04	0.04
Downstreamness	0.08	0.07	0.08	0.08	0.00	−0.01	−0.01	−0.01
Differentiation (Rauch-N)	0.08	0.08	0.08	0.08	−0.05	−0.05	−0.05	−0.05
Homogeneous goods (Rauch-W)	−0.04	−0.04	−0.04	−0.04	0.03	0.03	0.03	0.03

Table C.7: **Improved Covariate Balance Using CBPS Weighting: Export Analysis**. This table presents the average covariate balance (standardized difference) between treated and control units across various variables at different pre-treatment periods before and after refinement.

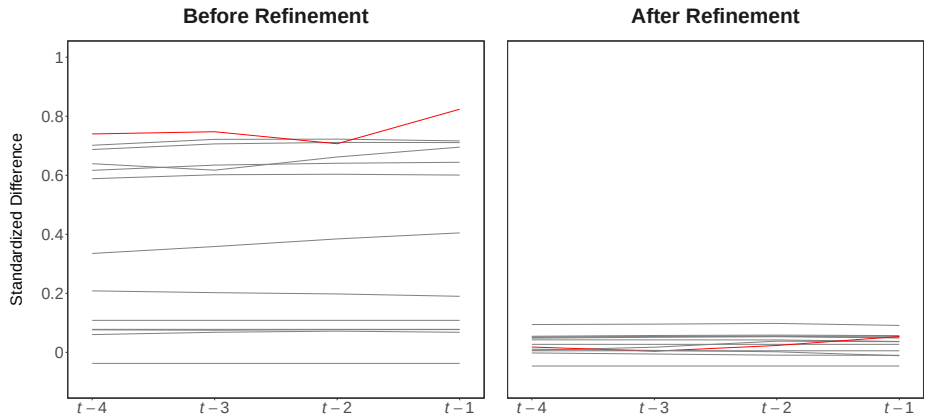

Figure C.4: **Improved Covariate Balance Using CBPS Weighting: Import Analysis**. This figure shows the average covariate balance (standardized difference) between treated and control units (y-axis) at each pre-treatment period (x-axis) for various covariates. Red lines indicate the average balance for the outcome variable (logged import volume), while grey lines represent the balance for the set of pre-treatment covariates discussed in subsection 4.1.2. Similar to Appendix Figure C.3, this figure shows that standardized differences shrink substantially when applying the CBPS weighting method to control units.

	Export	Import
$t-2$	0.159	0.077
	(0.134)	(0.070)
$t-1$	0.088	0.108
	(0.125)	(0.076)
t	0.141	−0.032
	(0.125)	(0.072)
$t+1$	0.178	−0.009
	(0.145)	(0.091)
$t+2$	0.472	0.129
	(0.155)	(0.087)
$t+3$	0.603	0.184
	(0.164)	(0.088)
$t+4$	0.641	0.268
	(0.167)	(0.088)

Note: Bootstrapped standard errors in parentheses.

Table C.8: **Effects of FDI on Trade Volume: Estimates**. This table presents the estimated effects of a new manufacturing greenfield FDI project on the logged export volume (second column) and import volume (third column) of associated HS 6-digit products plotted in Figure 2.

Appendix D Effects of FDI on Trade Liberalization

D.1 Korea-Vietnam FTA Analysis

	ΔKorean Tariff	ΔVietnamese Tariff	ΔVietnamese Tariff
FDI (export-related), 2003-14	−0.187***		
	(0.034)		
FDI (import-related), 2003-14		−0.303***	-0.167***
		(0.062)	(0.050)
Previous tariff cut (preferential - MFN)			0.087***
			(0.004)
ROW export (logged)	−0.112	−0.572***	-0.233*
	(0.101)	(0.147)	(0.113)
ROW import (logged)	−0.434***	−1.018***	-0.497***
	(0.112)	(0.178)	(0.140)
Mean export (logged)	0.083	0.521***	0.152
	(0.099)	(0.142)	(0.108)
Mean import (logged)	0.566***	1.206***	0.691***
	(0.106)	(0.167)	(0.133)
Vietmanese export (logged)	0.008	−0.023*	-0.029***
	(0.005)	(0.009)	(0.008)
Vietmanese import (logged)	0.014	0.021	-0.022+
	(0.010)	(0.014)	(0.012)
Num. of exporting countries (logged)	−0.012	−0.256***	-0.076**
	(0.022)	(0.034)	(0.029)
Num. of importing countries (logged)	−0.021	0.503***	0.224***
	(0.035)	(0.054)	(0.047)
Rauch-N	−0.078*	−0.465***	-0.323***
	(0.037)	(0.053)	(0.046)
Rauch-W	−0.045	−0.142+	-0.205***
	(0.072)	(0.074)	(0.058)
Intermediateness	−0.200***	0.095	0.023
	(0.047)	(0.099)	(0.078)
Upstreamness	0.024	0.743***	0.438***
	(0.051)	(0.096)	(0.079)
Downstreamness	−0.745***	−0.606***	0.027
	(0.132)	(0.129)	(0.096)
RMSE	1.04	0.98	0.83
N	5115	5115	5110
BIC	12561.6	13724.7	12353.4
Log Likelihood	-6127.1	-6708.6	-6018.7

Note: Heteroskedasticity-robust standard errors in parentheses.
+ p < 0.1, * p < 0.05, ** p < 0.01, *** p < 0.001

Table D.1: **Effects of FDI (2003–2014) on Tariff Cuts: Estimates**. We present the estimated effect of the occurrence of greenfield manufacturing FDI projects between 2003 and 2014 on the average HS 6-digit product-level tariff cut (logged) in the 2015 Korea–Vietnam FTA. The first column corresponds to the left Tobit estimate of Figure 3 and the second column corresponds to the right Tobit estimate. The third column shows that the effect of FDI on Vietnam's tariff cuts for Korean export products is robust to controlling for the level of previous preferential tariff cuts Vietnam offered to other countries prior to the Korea–Vietnam FTA (i.e., the difference between the MFN rate and the lowest preferential tariff rate as of 2014 for each product). The models include HS section fixed effects.

Instrumental Variable (IV) Analysis. To instrument for the occurrence of FDI projects in Vietnam, we use the average number of new FDI projects in the rest of the world (ROW) within the *same* NAICS 3-digit industry—excluding Vietnam—as an instrument, serving as a proxy for global technological shocks driving FDI activities. We assume these ROW investments influence Vietnamese trade policy only indirectly through increased investment in the same industry. Our identification strategy thus aligns with Autor, Dorn and Hanson (2013)'s analysis of the "China Shock," in which they instrument for the growth in US imports from China with the Chinese import growth in non-US high-income markets. To link products to FDI industries in the ROW, we leverage customs data on MNCs' export/import products in Vietnam merged with fDi Markets data on MNC investment projects' NAICS 3-digit industries. The assumption is that FDI projects made in the rest of the world within a certain NAICS 3-digit industry are likely to export/import similar sets of HS 6-digit products as FDI projects in Vietnam in the same industry.

	Vietnamese FDI (Export)	Vietnamese FDI (Import)
FDI to ROW (export-related), 2003-14	2.797***	
	(0.102)	
FDI to ROW (import-related), 2003-14		1.557***
		(0.060)
ROW export (logged)	−0.444	−0.482
	(0.308)	(0.311)
ROW import (logged)	−0.131	1.036*
	(0.338)	(0.425)
Mean export (logged)	0.478	0.481
	(0.295)	(0.297)
Mean import (logged)	0.122	−1.102**
	(0.322)	(0.405)
Vietmanese export (logged)	0.029	−0.001
	(0.023)	(0.016)
Vietmanese import (logged)	−0.033	0.063*
	(0.029)	(0.029)
Num. of exporting countries (logged)	0.188*	0.146*
	(0.082)	(0.067)
Num. of importing countries (logged)	0.505***	0.560***
	(0.120)	(0.100)
Rauch-N	−0.328**	−0.098
	(0.119)	(0.102)
Rauch-W	0.249	−0.596*
	(0.193)	(0.246)
Intermediateness	0.236	−0.238+
	(0.151)	(0.131)
Upstreamness	0.013	3.928***
	(0.153)	(0.204)
Downstreamness	0.180	3.009***
	(0.367)	(0.490)
N	5115	5115
BIC	1502.0	2176.7
Log Likelihood	−601.576	−938.903
F-stats	30.265	35.527
RMSE	0.17	0.22

Note: Standard errors in parentheses. + p < 0.1, * p < 0.05, ** p < 0.01, *** p < 0.001

Table D.2: **IV Analysis: First Stage Results**. The first column shows that the average number of FDI projects related to an export product in the ROW positively correlates with the occurrence of FDI projects related to the export product in Vietnam ($p < 0.001$). Similarly, the second column shows that the average number of FDI projects related to an import product in the ROW positively correlates with the occurrence of FDI projects related to the import product in Vietnam ($p < 0.001$). Furthermore, the F-statistic is above 10 in both models, suggesting that the instruments are strong.

To strengthen the conditional ignorability assumption and address potential alternative channels, we also control for observable confounders, including Vietnamese import/export volumes (logged), ROW trade volumes (logged), product differentiation, intermediateness, and upstreamness/downstreamness. Additionally, to address potential functional form biases, we implement the IV analysis within the Tobit estimation framework, following a similar approach to Wooldridge (2015). The first stage is estimated with the probit model,

$$\hat{X}_k = \Phi(\eta U_k + \zeta \boldsymbol{Z}_k + \lambda_{j[k]}), \tag{9}$$

where $\hat{X}_k$ is the predicted binary indicator of whether there were any new greenfield manufacturing FDI projects in Vietnam associated with product k between 2003–2014, U_k is the average number of FDI projects in the ROW in the NAICS 3-digit industry that are associated with product k, $\mathbf{Z}_k$ is a set of control variables described in Section 4.2, and $\lambda_{j[k]}$ represents industry fixed-effects at the HS section level (HS section j corresponding to HS 6-digit product k). We present results from the first stage in Appendix Table D.2. The instruments (average number of FDI in the ROW) are positively correlated with the treatments (occurrence of FDI in Vietnam) for both exports and imports at a statistically significant level ($p < 0.001$), indicating that the instrument is not weak. The F-statistic is also above 10, suggesting a strong instrument. The identifying exclusion restriction is that FDI to the ROW should be positively correlated with FDI to Vietnam in the same industry and should only affect tariff cuts for related products by Vietnam or Korea in the Korea-Vietnam FTA through similar investments into Vietnam.

The second stage is estimated with the Tobit model using the fitted probabilities $\hat{X}_k$ and residuals $(X_k - \hat{X}_k)$ from the first stage,

$$
\begin{aligned}
Y_k^* &= \alpha_{j[k]} + \beta \hat{X}_k + \gamma(X_k - \hat{X}_k) + \delta \boldsymbol{Z}_k + \epsilon_k, \\
Y_k &= \begin{cases} Y_k^* & \text{if } Y_k^* > 0 \\ 0 & \text{if } Y_k^* \leq 0 \end{cases}
\end{aligned} \tag{10}
$$

where the outcome variable Y_k^* measures the depth of liberalization based on the logged difference between the MFN tariff rate and the FTA preferential rate, and the key predictor X_k is a dichotomous variable measuring whether there were any new greenfield manufacturing FDI projects in Vietnam associated with product k between 2003–2014. The variable $\alpha_{j[k]}$ represents industry fixed-effects at the HS section level, and the variables $\boldsymbol{Z}_k$ represent the same array of product-level controls as in the first stage. We use the bootstrap method (1,000 times) to compute standard errors in the second stage.

We present the second-stage results from the instrumental variable analysis side-by-side with our main results in Figure 3 in the main text. Consistent with our main results, we find that HS 6-digit Vietnamese export products associated with MNCs' FDI projects in Vietnam between 2003–2014, instrumented by FDI projects in the ROW and in the same industry, received deeper tariff cuts from Korea. Similarly, Vietnamese import products from Korea associated with MNCs' FDI projects in Vietnam also received deeper Vietnamese tariff cuts. Overall, the IV estimates are larger and statistically significant, albeit with larger confidence intervals due to increased uncertainties in the two-stage regression.

D.2 Time-varying Effects

Since it takes time for the political coalitions we identified in Section 2.2 to materialize, we expect a stronger effect of FDI on trade liberalization for the products associated with earlier FDI projects. Thus, we estimate the effect of FDI across four separate periods (β_t) to distinguish short-term and long-term effects. Estimating time-varying effects would also allow us to empirically examine whether the timing of FDI matters and rule out any potential sorting effects, e.g., observing any spurious correlations due to MNC's investment in anticipation of FTA signing. Similar to the main analyses, we link products to FDI projects based on the customs data.

$$
\begin{aligned}
Y_k^* &= \alpha_{j[k]} + \sum_{t=l}^{L} \beta_t X_{kt} + \delta \boldsymbol{Z}_k + \epsilon_k, \\
Y_k &= \begin{cases} Y_k^* & \text{if } Y_k^* > 0 \\ 0 & \text{if } Y_k^* \leq 0 \end{cases}
\end{aligned} \tag{11}
$$

We find more pronounced effects among the products tied to earlier FDI projects. As shown in Appendix Figure D.1, Vietnamese exports to Korea associated with earlier greenfield manufacturing FDI projects (i.e., between 2003 and 2005) tend to receive 27% deeper tariff cuts (far left estimate in the left panel). Meanwhile, Korean exports to Vietnam associated with earlier FDI projects enjoy 44% deeper tariff cuts (far left estimate in the right panel). These large substantive effects provide supportive evidence for links between FDI and trade policymaking. Products associated with recent FDI projects, on the other hand, demonstrate weaker effects. For example, products linked to FDI projects made between 2012 and 2014 (or just 1–3 years before the FTA) receive only a 16% larger tariff cut from Korea. Furthermore, Vietnam's tariff cuts for Korean products linked to recent FDI projects turn statistically indistinguishable from zero. See Appendix Table D.3 for further details. Note that using 3-year windows yields a more reasonable sample size in each period t to estimate the effects precisely (see Appendix Table D.4 for details). However, we also find similar patterns when estimating the effects by year (see Appendix Figure D.2).

There are two potential reasons for this difference over time. First, consistent with our argument, building political coalitions with local contractors and other MNCs within the host country takes time.

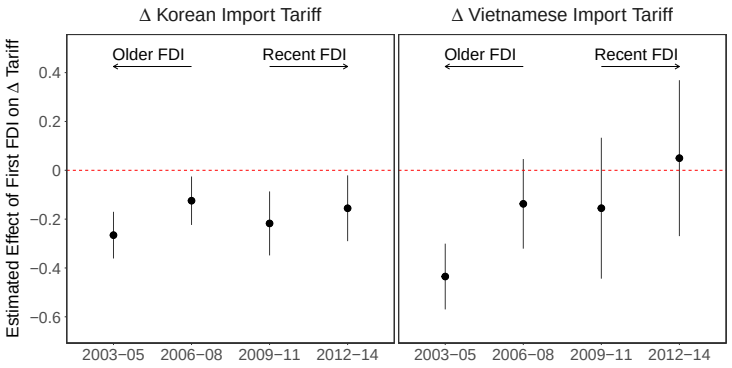

Figure D.1: **Effects of FDI on Tariff Cuts by Period**. We present the estimated effect of the first occurrence of greenfield manufacturing FDI projects (x-axis) on the average HS 6-digit product-level tariff cut (logged) in the 2015 Korea–Vietnam FTA. The left panel shows that Korea offered larger tariff cuts to Vietnamese export products that were linked to MNCs' FDI projects in Vietnam. The right panel shows a similar effect regarding Vietnam's tariff cuts for Korean export (i.e., Vietnamese import) products. In both cases, products associated with FDI made first in 2003–2005 experienced deeper tariff cuts than those associated with recent FDI in 2012–2014. The panels present point estimates and 95% confidence intervals based on heteroskedasticity-robust standard errors.

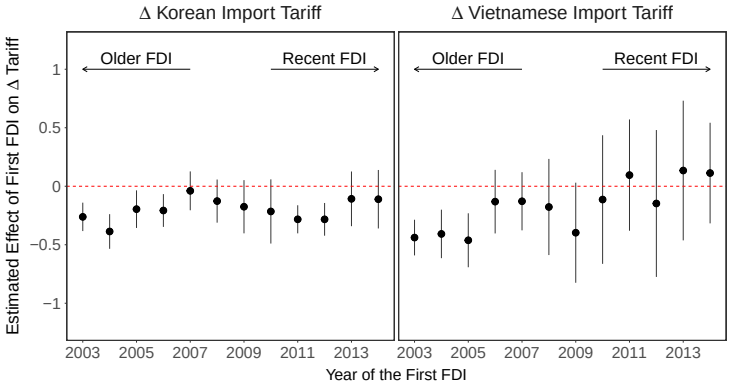

Figure D.2: **Effects of FDI on Tariff Cuts by Year.** We present the estimated effect of the first occurrence of greenfield manufacturing FDI projects on the average HS 6-digit product-level tariff cut (logged) in the 2015 South Korea–Vietnam FTA. The left panel shows that Vietnamese export products linked to earlier FDI projects in Vietnam generally received deeper tariff cuts from Korea. The right panel shows a similar effect when focusing on Vietnam's tariff cuts for Korean export products (i.e. Vietnamese import products). The panels present point estimates and 95% confidence intervals based on heteroskedasticity-robust standard errors.

That is, MNCs are likely to have more established value chain networks the longer they participate in the local economy, which will, in turn, help them build more extensive and stronger political coalitions (Manger, 2012). Given that our FDI data draws on project announcements, effects may take even longer to observe, as project implementation also needs time. Second, MNCs may select into investing in Vietnam based not only on the current level of import tariffs but also on their anticipated tariff benefits or cuts in subsequent years. In fact, the Vietnamese government frequently offers low or zero import tariffs on newly investing foreign firms' inputs (see, e.g., Vietnam Briefing, 2015), which lowers MNCs' incentives to engage in political activities to reduce trade barriers in the short term. Overall, however, the aggregate tariff reduction effect of FDI across our entire sample period is precisely estimated (Figure 3).

	ΔKorean Tariff	ΔVietnamese Tariff
FDI (export-related), 2003-05	−0.266***	
	(0.049)	
FDI (export-related), 2005-08	−0.125*	
	(0.051)	
FDI (export-related), 2009-11	−0.218**	
	(0.067)	
FDI (export-related), 2012-14	−0.156*	
	(0.069)	
FDI (import-related), 2003-05		−0.435***
		(0.069)
FDI (import-related), 2005-08		−0.137
		(0.094)
FDI (import-related), 2009-11		−0.155
		(0.147)
FDI (import-related), 2012-14		0.050
		(0.163)
ROW export (logged)	−0.106	−0.527***
	(0.102)	(0.147)
ROW import (logged)	−0.444***	−1.072***
	(0.112)	(0.178)
Mean export (logged)	0.078	0.476***
	(0.099)	(0.142)
Mean import (logged)	0.576***	1.261***
	(0.106)	(0.167)
Vietmanese export (logged)	0.008	−0.025**
	(0.005)	(0.009)
Vietmanese import (logged)	0.015	0.019
	(0.010)	(0.014)
Num. of exporting countries (logged)	−0.011	−0.246***
	(0.022)	(0.034)
Num. of importing countries (logged)	−0.023	0.519***
	(0.035)	(0.055)
Rauch-N	−0.078*	−0.459***
	(0.037)	(0.053)
Rauch-W	−0.043	−0.136+
	(0.072)	(0.074)
Intermediateness	−0.195***	0.099
	(0.047)	(0.098)
Upstreamness	0.023	0.765***
	(0.051)	(0.096)
Downstreamness	−0.743***	−0.589***
	(0.132)	(0.129)
RMSE	1.04	0.98
N	5115	5115
BIC	12583.1	13728.2
Log Likelihood	-6125	-6697.6

Note: Heteroskedasticity-robust standard errors in parentheses.
+ p < 0.1, * p < 0.05, ** p < 0.01, *** p < 0.001

Table D.3: **Effects of FDI (three-year window) on Tariff Cuts: Estimates**. This table presents the estimated effect of the first occurrence of greenfield manufacturing FDI projects in each three-year period on the average HS 6-digit product-level tariff cut (logged) in the 2015 Korea–Vietnam FTA. The first column corresponds to the left panel of Figure D.1, and the second column corresponds to the right panel. The models include HS section fixed effects.

Year	Export-Related FDI	Import-Related FDI
2003	90	584
2004	62	222
2005	102	152
2006	114	138
2007	114	142
2008	70	51
2009	55	45
2010	22	35
2011	40	44
2012	31	28
2013	33	19
2014	42	59

Table D.4: **Products Newly Associated with FDI Projects in Vietnam.** We show the number of products linked to FDI projects in Vietnam for the first time through MNCs' export/import activities.

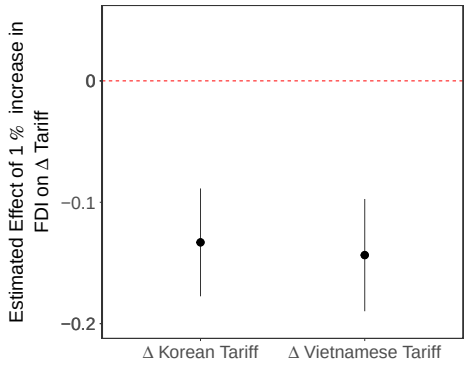

Figure D.3: **Effects of Cumulative FDI Counts on Tariff Cuts**. This figure presents the estimated effect of a 1% increase in the number of greenfield manufacturing FDI projects (x-axis) on the average HS 6-digit product-level tariff cut (logged) in the 2015 Korea–Vietnam FTA. The left estimate shows that Korea offered larger tariff cuts to Vietnamese export products that were linked to MNCs' FDI projects in Vietnam. The right estimate shows a similar effect regarding Vietnam's tariff cuts for Korean export (i.e., Vietnamese import) products. In both cases, products associated with more FDI cases during the 2003–2014 period experienced deeper tariff cuts. The panels present point estimates and 95% confidence intervals based on heteroskedasticity-robust standard errors.

D.3 Cross-country Analysis

D.3.1 Data Sample

Host	Partner	Year
Albania	Turkey	2008
Australia	China	2015
Bahrain	United States	2006
Belarus	Serbia	2009
Canada	Honduras	2014
Switzerland	China	2014
Chile	Thailand	2015
Colombia	Mexico	2011
Costa Rica	Peru	2013
Cuba	El Salvador	2012
Algeria	Tunisia	2010
Ecuador	Guatemala	2013

Host	Partner	Year
Egypt	Turkey	2007
Georgia	Turkey	2008
Guatemala	Ecuador	2013
Honduras	Canada	2014
Indonesia	Pakistan	2013
Israel	Jordan	2006
Jordan	Canada	2012
Japan	Australia	2015
South Korea	New Zealand	2015
Mexico	Panama	2015
Mozambique	Malawi	2006
Nicaragua	Taiwan	2008

Host	Partner	Year
New Zealand	South Korea	2015
Oman	United States	2009
Pakistan	Indonesia	2013
Peru	Mexico	2012
Philippines	Japan	2008
Singapore	Taiwan	2014
El Salvador	Cuba	2012
Turkey	Malaysia	2015
Taiwan	Singapore	2014
Uruguay	Venezuela	2009
United States	Panama	2012
Vietnam	South Korea	2015

Table D.5: **36 Host Countries and their Latest FTAs Between 2003 and 2015.**

D.3.2 Bayesian Multilevel Model Details

In the model described in equation (5), we use weakly informative priors, employing improper flat priors for each element of β and γ, t-distribution for the population intercept α, and half-t distribution for each standard deviation as follows:

$$\eta_i \sim N(0, \sigma_\eta^2), \quad \theta_{h[g]} \sim N(0, \sigma_\theta^2)$$
$$\beta_m \sim U(-\infty, \infty), \quad \gamma_n \sim U(-\infty, \infty)$$
$$\alpha \sim T(\nu_\alpha, \mu_\alpha, \tau_\alpha)$$
$$\sigma_y \sim T(\nu_y, \mu_y, \tau_y), \quad \sigma_\eta \sim T(\nu\theta, \mu_\eta, \tau_\eta), \quad \sigma_\theta \sim T(\nu\theta, \mu_\theta, \tau_\theta),$$

where we set degrees of freedom at 3 for each of $\nu_\alpha, \nu_y, \nu_\eta, \nu_\theta$, the mode at 0 for $\mu_y, \mu_\eta, \mu_\theta$, -1.1 (0) for μ_α in the host tariff (partner tariff) analysis reflecting the median of Y_{ig}, and the scale parameters at

2.5 for $\tau_\alpha, \tau_y, \tau_\eta, \tau_\theta$. The coefficients are estimated with 5 chains with 3000 iterations each (among which 1000 are used as a warmup, and the posteriors are thinned by 10). The potential scale reduction factors ($\hat{R}$) are all below 1.05, indicating convergence. The trace plots below for the main effects (Appendix Figure D.4) also suggest convergence.

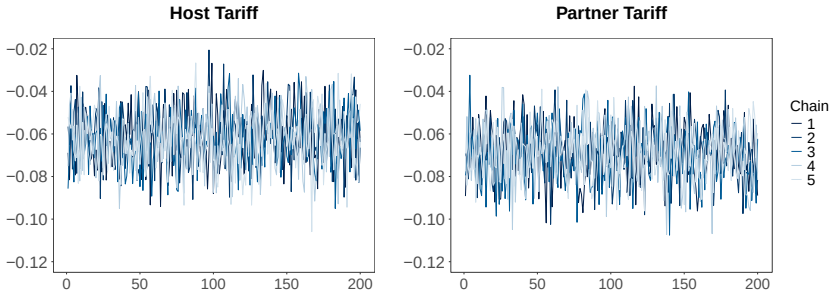

Figure D.4: **Trace Plots for Estimated Effects of FDI.** This figure presents the sampled values of the estimated effect of FDI (y-axis) across each thinned iteration after the burn-in period (x-axis) for each chain. The left panel presents those for the host tariff analysis, and the right panel represents those for the partner tariff analysis. In both cases, the trace plots suggest convergence.

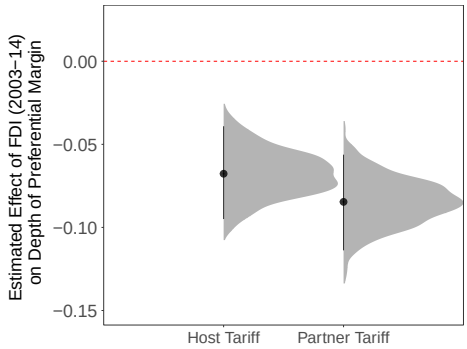

Figure D.5: **Effects of FDI on Deepest Tariff Cuts: 36 Hosts and their Latest FTAs between 2003 and 2015.** We present the estimated effects of FDI's occurrence on the deepest HS 4-digit product-level tariff cut (logged) implemented in a host country's FTA, i.e., $Y_{ig} = -\max_{\forall g_k \in g} \{\log((MFN_{ig_k} - applied_{ig_k}) + 1)\}$, where g_k represents 6-digit product k within each 4-digit category g. The left estimate shows the effect on the host's tariffs, and the right estimate shows the effect on the FTA partner's tariff. In both cases, FDI-associated products enjoyed larger tariff cuts. We present point estimates, posterior distributions, and 95% credible intervals based on the Bayesian estimates.