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ADJUSTMENTS TO NEW EXPORT OPPORTUNITIES

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Working Paper 30729
<http://www.nber.org/papers/w30729>

NATIONAL BUREAU OF ECONOMIC RESEARCH
1050 Massachusetts Avenue
Cambridge, MA 02138
December 2022

We thank Adam Rivard, Colleen Spencer, Hanh Nyugen, Truong Thi Thu Trang, Rebecca Vermette, and Laura Walk for excellent research assistance and Nguyen Viet Phong at the General Statistics Office Vietnam, Edmund Malesky, and John Rand for assistance with understanding the data. We are grateful to the Economic Research Institute for ASEAN and East Asia (ERIA) for support. McCaig thanks the Social Sciences and Humanities Research Council of Canada (SSHRC) for support. An earlier draft was an output from a project funded by the UK Department for International Development (DFID) and the Institute for the Study of Labor (IZA) for the benefit of developing countries. The views expressed are not necessarily those of DFID or IZA. Additionally, we thank Bruce Blonigen, Jiayi Dong, Mark Colas, Anca Cristea, Quoc-Anh Do, Teresa Fort, Isabela Manelici, Peter Morrow, Stefania Garetto, and seminar and conference participants for helpful comments. The views expressed herein are those of the authors and do not necessarily reflect the views of the National Bureau of Economic Research.

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NBER Working Paper No. 30729
December 2022
JEL No. F13,F14,O14,O19

ABSTRACT

We investigate the long-term effects of export opportunities to a large destination market on multinational affiliates and domestic firms in a low-income host country. The US-Vietnam Bilateral Trade Agreement reduced US import tariffs on exports from Vietnam. Tariff reductions led to entry of foreign and private firms and to employment expansion in formal manufacturing, with foreign entrants contributing most to employment growth. State firms stall employment reallocation through slower contraction. Half of tariff-induced foreign entrant growth is post-entry and exporter-driven. Foreign entrants are from non-US sources, highlighting the importance of studying FDI from multiple source countries in a lower-income host.

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A data appendix is available at: <http://www.nber.org/data-appendix/w30729>

1 Introduction

Over recent decades, low- and middle-income countries have experienced a remarkable growth in FDI, receiving the majority of global FDI inflows (UNCTAD, 2014). A large literature has examined the implications of FDI inflows for technology transfers, productivity, and wage inequality in host countries (see Harrison and Rodríguez-Clare (2010) and Alfaro (2017) for surveys). Given limited growth of domestic firms in lower-income countries (Hsieh and Klenow, 2014), foreign affiliates could be an important source of jobs during structural transformation. Despite the importance of jobs for livelihoods in lower-income countries, the determinants of foreign affiliate entry and their contribution to employment growth, relative to domestic firms, have been less emphasized (Hjort and Poulsen, 2019; Toews and Vézina, 2022).

Recent trade policy changes, such as the U.S.-China trade war, have renewed interest in how trade policy shapes FDI and supply chains (Conconi et al., 2018; Handley, Kamal and Monarch, 2020; Flaaen and Pierce, 2019). The idea that trade policy can influence FDI has a long tradition in international economics, initially focusing on tariff-jumping motives for FDI (Brainard, 1997), the determinants of intermediates location by multinationals (Yi, 2003; Yeaple, 2003; Hanson, Mataloni Jr and Slaughter, 2005), and more recently on foreign affiliate entry and production in the context of export-oriented production (Tintelnot, 2017; Garetto, Oldenski and Ramondo, 2019). This suggests a potentially important role for trade policy to influence employment opportunities in a host country through foreign affiliates.

We investigate the long run impacts of a large change in trade policy, which reduced the exporting costs to a major export destination, on multinational affiliates and domestic firms in the emerging formal manufacturing sector of a low-income host country. The 2001 U.S.-Vietnam Bilateral Trade Agreement (the BTA) immediately reduced U.S. import tariffs applied to Vietnam, on average from 31.9% to 2.9%, leading to rapid Vietnamese export growth (Figure 1). The institutional features of the BTA provide a setting that allows us to address concerns about industry-specific trade policy changes being endogenous to FDI and other factors. We examine the effects of U.S. tariff reductions on shaping the composition of industry employment through firm entry, exit, and changes in incumbents in Vietnam. Our setting focuses on a single host country and its foreign affiliates from all source countries, not just from the U.S.

Our study makes several contributions. First, we examine the role of foreign affiliates in generating employment in formal manufacturing - which grew almost five fold between 1999 and

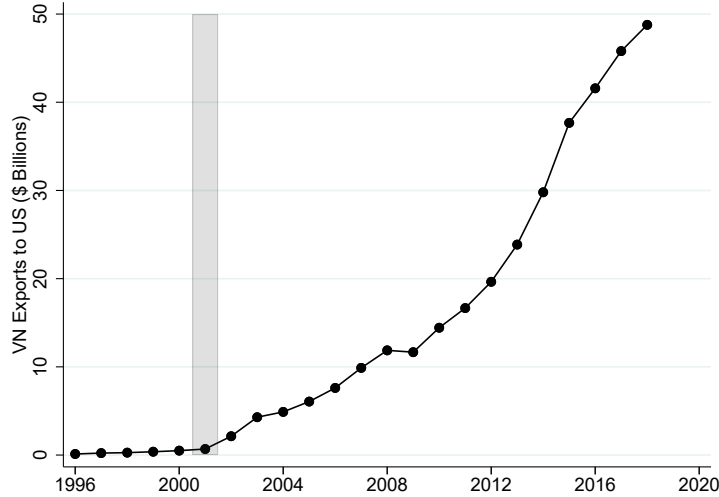


Figure 1: Vietnamese manufacturing exports to the US (billions of USD), 1996 to 2018

2017 (Figure 2) - relative to domestic firms in response to tariff cuts. Tariff cuts varied widely across industries and our study investigates whether these tariff cuts differentially affected employment across foreign-invested enterprises (FDIs), which are almost entirely greenfield, private domestic firms (PRIs), and state-owned enterprises (SOEs).¹ As we discuss in Section 2.3, foreign affiliates tend to have access to “special assets” of multinationals that cannot be easily transferred to unaffiliated firms and better connections to global supply chains relative to domestic firms (Antràs and Yeaple, 2014). We distinguish between private domestic firms and SOEs because politically unconnected domestic firms might be credit constrained or face other barriers to operation relative to SOEs. This leads to SOEs facing artificially lower operating costs or entry barriers relative to private domestic firms. A trade policy change can thus have differential effects on domestic private and state firms (Bai, Jin and Lu, 2019; Berthou et al., 2019; Atkin and Khandelwal, 2020; Khandelwal, Schott and Wei, 2013). In addition, using information on the source countries of foreign investment, we examine whether and how foreign affiliates from different source countries respond to lower tariffs on exports to a key export destination through entry and expansion of employment in a low-income production location. We bring a unique perspective to the literature: one with many FDI source countries, one location of production, and a large policy change in accessing a main export destination.²

Second, we investigate the long run impact of an immediate one-time (2001) trade policy

¹See McCaig and Pavcnik (2018) for a discussion of the reallocation of workers from the informal microenterprise sector to the formal registered sector in response to the U.S. tariff reductions in the short run.

²For example, most papers on U.S. multinationals rely on data that covers multinationals (and not domestic firms) and focuses on one source country of FDI, many locations for affiliates, and some export destinations.

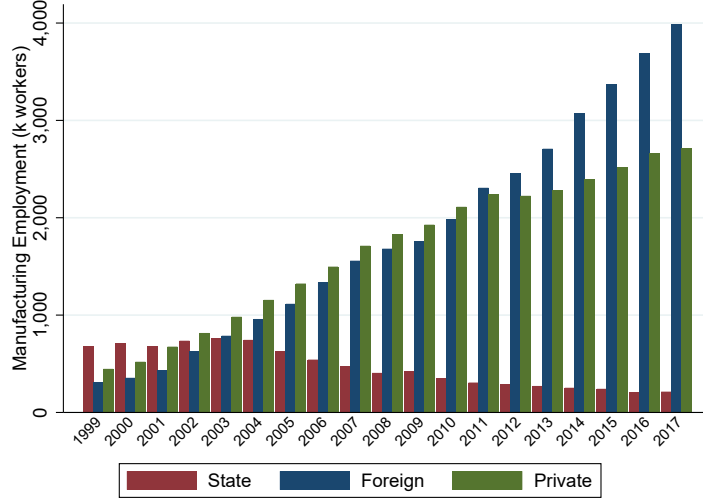


Figure 2: Vietnamese manufacturing employment by ownership, 1999 to 2017

change on employment of firms, spanning a period of 18 years from 1999 to 2017. Long run responses to trade policy could differ from shorter-term ones due to a variety of reasons, such as delayed adjustments of capital or labor, lumpy investment, or if firms face adjustment frictions (Dix-Carneiro and Kovak, 2017; Pierce and Schott, 2016, 2018). The longer term perspective might be of interest given concerns that some of the consequences of trade policy for foreign affiliates might be short lived if multinationals are footloose (Harrison and Scorse, 2010). The long 18-year period enables us to comprehensively track and study the cumulative effects of U.S. tariff cuts on continuing, exiting, and entering firms by ownership, as well as the post-entry employment growth of entering firms.³ Our period features large FDI and PRI entry in manufacturing, while SOEs retrenched (Figure 2). FDI employment expanded from 307 thousand to 4 million, with entrants accounting for 86% of foreign employment in 2017. Similarly, employment in PRIs grew from 448 thousand to 2.7 million employees with entrants responsible for 87% of private employment in 2017. Vietnam started off with a large state sector within manufacturing, which subsequently contracted. We study how U.S. tariff cuts affected the expansion of formal sector employment across FDIs, SOEs and PRIs through entry, exit, continuers, and post-entry growth.

We find that the number of firms, employment and revenue increase in industries experiencing greater declines in U.S. tariffs, consistent with predictions of neoclassical trade models. Firm entry is an important margin in response to the tariff cuts, primarily driven by foreign and private domestic firms. On the other hand, SOEs observe no tariff-induced firm count change. Furthermore,

³We invested considerable time verifying and cleaning the panel of manufacturing firms. See Section A.4 for details.

entering firms account for much of the tariff-induced employment growth. The tariff-induced employment growth among entering firms is concentrated primarily among foreign entrants. Despite tariff-induced private domestic entry, tariff reductions do not contribute to private domestic employment growth. On the other hand, employment in state firms contracts less in high tariff-cut industries. These differences in the response of industry outcomes across foreign firms, private domestic firms and SOEs are consistent with SOEs facing different incentives.

Our results suggest that it is important to consider longer-term effects of a one-time trade policy change. For example, the magnitudes of the cumulative effects of tariff cuts on foreign affiliate entry and employment increase over time and take a while to stabilize. Furthermore, about half of the cumulative tariff-induced growth in within-industry employment share among foreign entrants is due to employment growth after entry and this takes time to materialize. Our findings add to the literature emphasizing longer-term effects of trade policy or FDI (Dix-Carneiro and Kovak, 2017; Méndez-Chacón and Van Patten, forthcoming).

While Vietnam was already open to manufacturing FDI prior to the BTA and had relatively low wages, tariffs on its exports to the U.S.—a large export destination—were high on average at 31.9%. Adding on fixed costs of setting up an affiliate, the variable profits from exporting may not be enough to generate positive total profits prior to the BTA. After the BTA drastically reduced tariffs on Vietnamese exports to the U.S. on average to 2.9%, the increase in variable exporting profits might be sufficient to cover the fixed costs of setting up an affiliate in Vietnam, leading to foreign affiliate entry. Overall, we find that the vast majority of the tariff-cut induced increase in employment in foreign entrants reflects employment growth in exporting foreign affiliates (rather than non-exporters). This further links export opportunities to foreign affiliate entry.

Finally, most of the estimated tariff-induced employment growth of foreign entrants is driven by affiliates of non-U.S. multinationals (mainly from East Asia) rather than affiliates of U.S. multinationals. Consistent with this, the tariff-induced increase in exports to the U.S. is not mainly driven by affiliates of U.S. multinationals, but instead by firms unaffiliated with U.S. multinationals. Foreign affiliates from geographically closer countries with existing regional supply chain linkages might have been better positioned to respond to the tariff cuts (as in Head and Mayer (2019), Antràs et al. (2022)). Focusing solely on the FDI response from U.S. multinationals would have missed much of the foreign affiliate response. This highlights the importance of studying responsiveness of FDI from multiple sources, even in the context of a bilateral trade agreement.

We place our contributions and results in relationship to the literature. Our analysis contributes to the literature on how FDI impacts the emergence of formal manufacturing employment in low-income countries.⁴ The FDI literature on labor markets in lower-income host countries concentrates mainly on wage inequality among the employed, rather than jobs (Feenstra and Hanson, 1997; Javorcik, 2015; Alfaro-Urenña, Manelici and Vasquez, 2021). The evidence on MNCs and jobs instead comes predominately from high-income countries (Brainard, 1997; Yeaple, 2003; Hanson, Mataloni Jr and Slaughter, 2005; Desai, Foley and Hines, 2009; Muendler and Becker, 2010; Harrison and McMillan, 2011; Boehm, Flaaen and Pandalai-Nayar, 2020; Kovak, Oldenski and Sly, 2021). Foreign affiliates in host countries can be a source of jobs essential for structural transformation, yet the arrival of such jobs is not guaranteed. For example, Diao et al. (2021) notes that many large plants in lower-income countries are capital intensive and don't necessarily generate a lot of jobs, with Athukorala and Tien (2012) expressing a similar concern about foreign firms in Vietnam in the 1990s. We contribute evidence on the trade-policy induced expansion of formal manufacturing employment through foreign entrants in a low-income setting.⁵ We most closely relate to Toews and Vézina (2022), who finds job creation through FDI driven by natural resource discoveries, and Hjort and Poulsen (2019), who finds formal job creation in response to the introduction of new technology (fast-speed internet).

We also relate to the literature on the determinants of FDI entry or acquisition and the effects of resource reallocation between foreign and domestic firms in host countries. The literature on the determinants of FDI entry has emphasized the role of selection (Arnold and Javorcik, 2009; Guadalupe, Kuzmina and Thomas, 2012), financial constraints (Alfaro and Chen, 2018; Bilir, Chor and Manova, 2019), and bilateral tax treaties and trade agreements (Blonigen, Oldenski and Sly, 2014; Feinberg and Keane, 2006, 2009). We show that greenfield FDI entry in a low-income host is very responsive to reductions in tariffs on exports to a large export market. Importantly, we do so while addressing the concerns about the endogeneity of trade policy to FDI and other factors (Blanchard, 2007; Blanchard and Matschke, 2015; Blanchard, Bown and Johnson, 2021), by relying on the institutional features of the BTA (as discussed in Sections 2.1 and 4.2).⁶ Furthermore,

⁴This literature in low- and middle-income countries has mainly focused on spillovers from foreign to domestic firms (Harrison and Rodríguez-Clare, 2010; Poole, 2013; Kee, 2015; Newman et al., 2015; Abebe, McMillan and Serafinelli, 2022; Alfaro-Urenña, Manelici and Vasquez, 2022) and the aggregate effects of FDI on growth (Hansen and Rand, 2006).

⁵McCaig and Pavcnik (2018) find short-run trade-induced reallocation of workers from the informal to the formal sector. Our study examines long-term effects of trade policy on foreign affiliates and creation of formal manufacturing employment.

⁶The agreement lowered U.S. tariffs on imports from Vietnam by moving from one pre-existing tariff schedule, Column 2, to another, Most Favored Nation (MFN). Hence, neither U.S. nor Vietnamese industries had an oppor-

we connect the literature on resource reallocation between FDI and domestic firms (Aitken and Harrison, 1999; Alfaro and Chen, 2018; Bao and Chen, 2018) to the literature on firm performance and trade in the presence of politically connected firms (Khandelwal, Schott and Wei, 2013; Bai, Jin and Lu, 2019; Berthou et al., 2019). We find slower contraction of SOEs employment in industries with bigger tariff cuts in a major export market, adding to studies that show that SOEs are less likely to exit due to increased import competition (Brandt et al., 2017; Baccini, Impullitti and Malesky, 2019).

Finally, we relate to the literature on how global supply chains adjust to trade policy changes. Earlier studies have found production reallocation effects across countries in response to trade protection targeting a particular exporter country and industry (Blonigen, 2002; Head and Mayer, 2019; Flaaen, Hortaçsu and Tintelnot, 2020). Most examine intensive margin adjustment among existing firms to trade policy changes.⁷ We show that lower tariffs on exports to a large export destination impact foreign affiliate entry and their subsequent employment expansion. This highlights the responsiveness of multinationals to reductions in variable export costs in one host country and the relevance of foreign affiliate extensive and intensive margin adjustment. Most of the estimated tariff-induced employment growth of foreign entrants is driven by affiliates of non-U.S. multinationals (mainly from East Asia) rather than affiliates of U.S. multinationals. Our findings demonstrate the manufacturing-wide effects of foreign affiliate entry and expansion in the host country.

We provide a detailed discussion of the BTA and a conceptual framework in section 2. In section 3, we describe the data and highlight some key facts. We present the empirical methodology and results in sections 4 through 6. Section 7 concludes.

2 Institutional and Conceptual Background

We first present background on the BTA and foreign investment in Vietnam. We conclude with a discussion of a conceptual framework.

tunity to negotiate over industry-specific tariff reductions (McCaig, 2011). The variation in U.S. tariff reductions across industries is strongly correlated with growth of Vietnamese industry exports to the U.S., but not correlated with contemporaneous export demand shocks, export supply shocks, nor pre-existing export growth trends to the U.S. or other trade partners.

⁷Tintelnot (2017) focuses on intensive margin adjustments. Likewise, Head and Mayer (2019) focus on choices of export markets and product lines in response to trade agreements in existing affiliates. Garetto, Oldenski and Ramondo (2019) is an exception.

2.1 2001 U.S.-Vietnam Bilateral Trade Agreement

The BTA was implemented on December 10, 2001. The nature of the BTA makes it an excellent setting to study the causal impacts of U.S. tariffs reductions on exports from Vietnam on formal firm entry and employment in Vietnam.

First, the BTA’s main trade policy change was an immediate one-time permanent reduction in tariffs imposed on Vietnamese exports to the U.S. (STAR-Vietnam, 2003; McCaig, 2011). Prior to the BTA, Vietnam already offered MFN tariffs on imports from the U.S.⁸ However, Vietnamese exports were subject to the high Column 2 U.S. tariffs, which apply to countries without normal trade relations status with the U.S. The primary trade policy element was to reclassify Vietnamese exports from Column 2 to the Most Favored Nation (MFN) U.S. tariff schedule. With the BTA, the U.S. immediately switched to applying MFN tariffs on imports from Vietnam in December 2001. Thus, the U.S. tariff reductions are less likely to suffer from conventional concerns about tariff reductions being endogenous to industry lobbying, either in the U.S. or Vietnam. Indeed, the U.S. tariff cuts occurred through the movement from one pre-existing tariff schedule—Column 2—which originated with the Tariff Act of 1930 (Pregelj, 2005) and remained very stable before and after the BTA (McCaig, 2011), to another pre-existing tariff schedule—the MFN tariff schedule—which was negotiated among World Trade Organization members in 1995. Hence, the tariff cuts were presented as one package without room for negotiating over tariff reductions for specific industries.

A second key feature of the BTA is that the tariff reductions within manufacturing were large, on average, and varied across industries. We use ad valorem equivalents of the Column 2 and MFN tariff rates that prevailed in 2001 when the BTA was implemented.⁹ Across 119 4-digit traded manufacturing industries, the average tariff reduction was 29.0 percentage points, from 31.9 to 2.9 percentage points, with significant variation across industries, ranging from 0 to 63 percentage points. The standard deviation of industry tariff reductions is 15.6 percentage points. Our empirical strategy relies on this variation in tariff reduction sizes across industries.

Third, the U.S. tariff reductions had a large immediate impact on Vietnamese exports to the

⁸The BTA-induced reductions in Vietnamese tariffs on imports from the U.S. were therefore negligible. See STAR-Vietnam (2003) and McCaig and Pavcnik (2018).

⁹We follow McCaig (2011) and use detailed information on U.S. tariffs for both of these tariff schedules from the U.S. International Trade Commission’s online Tariff Information Center and compute the ad valorem equivalent of any specific tariffs. We then match the tariff lines to industries by the concordance provided by the World Bank via the World Integrated Trade Solution database to construct industry-level tariffs according to 4-digit International Standard Industrial Classification (ISIC) industry nomenclature.

U.S. The U.S. quickly became the most important manufacturing export market, accounting for 24% of Vietnamese manufacturing exports by 2003, becoming the leading export market in 2005 for the rest of the sample period (see detailed discussion in Appendix B.1.1 and Figures B1a to B1c). Prior to the BTA, Vietnam’s key export industries were footwear, food, and apparel (see Figure B2 and related discussion). The U.S. tariff reductions influenced the composition of Vietnamese manufacturing exports to the U.S.. Figure C2 shows the relationship between growth in Vietnamese manufacturing exports to the U.S. between 2000 and 2006 and BTA induced tariff changes across industries. There is a clear positive relationship: Vietnamese industries that experienced the largest decrease in U.S. tariffs saw exports to the U.S. rise more rapidly.¹⁰

Fourth, we rule out spurious correlation of the U.S. tariff reductions with industry-specific pre-BTA characteristics. For example, there is no relation of tariff cuts across initial industry employment prior to the BTA in year 2000. For visualization purposes only, Figure 3 reports average tariff cuts across 2-digit industries, sorted by their pre-BTA (2000) employment size. The figure clearly indicates that there is no systematic relationship between tariff cuts and initial industry employment. Figure C3 confirms the lack of a statistically significant relationship between pre-BTA employment size and BTA tariff cuts at the 4-digit industry level, with a partial correlation of -10.6 (31.3) using the level of employment and -1.50 (1.33) using the ln of employment.

Additionally, we show that the U.S. tariff reductions are not strongly correlated with initial conditions within formal manufacturing (Figure C4). The partial correlation between the share of 2000 employment within an industry for each ownership type and the change in the U.S. tariff is 0.15, -0.3, and 0.15 for foreign, state, and private firms, none of which are statistically significant at conventional levels. In Section 4.2, we examine in detail the short- and long-run responses of exports to the U.S. to these tariff cuts, as well as perform other specification checks to further confirm that industry tariff cuts are not correlated with industry-specific pre-existing trends, nor contemporaneous global supply and demand shocks, and that export responses to tariffs do not mainly reflect demand or supply conditions in initially larger exporting industries.

¹⁰Upon implementation of the BTA, Vietnamese exports of apparel and textiles did not face any import quotas to the U.S. as Vietnam was not subject to the Multi-Fibre Agreement due to being outside of GATT and WTO. As exports of such items were very low under Column 2 tariffs additional quotas were not necessary. In July 2003 a bilateral textile agreement came into force, which imposed quotas on Vietnamese textile and apparel exports to the U.S. The quotas were removed in 2007. In addition, in robustness check we show our main results are not sensitive to inclusion or exclusion of textile or apparel industry nor inclusion or exclusion of controls for quotas.

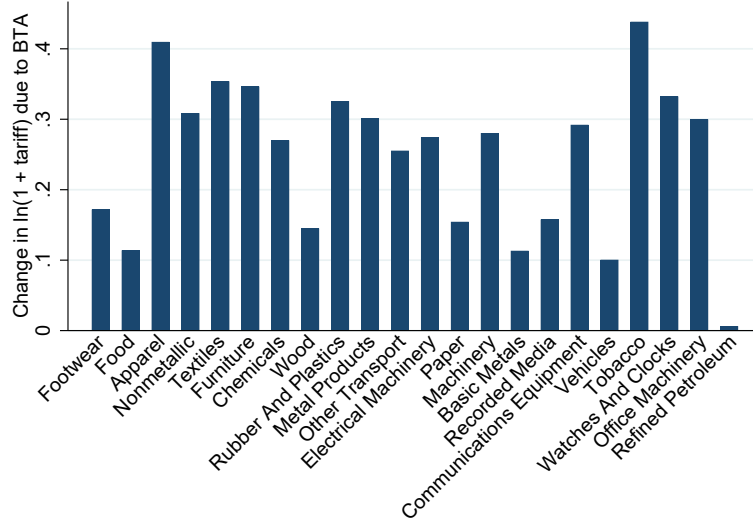


Figure 3: Tariff reductions due to the BTA

Note: 2-digit manufacturing industries are sorted by total employment in year 2000 (largest on the left and smallest on the right).

2.2 Foreign investment policy

Prior to the BTA, Vietnam was already relatively open to FDI in manufacturing as, following the 1996 Foreign Investment Law, very few manufacturing industries were subject to entry restrictions for foreign investment (tobacco, sugar and alcohol, chemicals, pharmaceuticals, and cement) (Malesky, Gueorguiev and Jensen, 2015).¹¹ A further amendment in 2000 allowed for automatic registration of export-oriented foreign firms as well as for more power for local governments to reduce administrative hurdles for FDI (Athukorala and Tien, 2012).¹²

In this relatively open foreign investment environment, the number of FDIs in manufacturing grew from 654 to 1048 between 1997 and 2000 (see Table B1 in Appendix Section B.1.4). FDI firms were also growing in terms of their importance for exports prior to the BTA, with their percentage of Vietnamese merchandise exports, excluding crude oil, growing from 17.1 in 1997 to 22.9% in 2000 (Vietnam Customs Handbook, 2017). The vast majority—77% of manufacturing foreign employment (67% of FDI firms) – were wholly-owned foreign enterprises in 2000, highlighting the relative openness of Vietnam to manufacturing FDI prior to the BTA.

The BTA included no industry-specific commitments to FDI investment within manufacturing in Vietnam, but it contained a commitment to open market access for U.S. FDI in services (STAR-Vietnam, 2003) and to eliminate government screening of FDI, removal of all trade-related

¹¹See Athukorala and Tien (2012) for a discussion of the first Foreign Investment Law in 1987.

¹²Using data from the Provincial Competitiveness Index surveys (Malesky, Ngoc and Thach, MY), we find little change in the median length of time required to receive an investment license for foreign invested enterprises. It was 30 days for each period 1995-1999, 2000-2004, 2005-2009, 2010-2014, and 2015-2019.

investment measures inconsistent with the WTO, such as local content requirements, and the removal of export performance requirements (Manyin, 2001). The 2006 Unified Investment Law abolished local content and export target requirements and provided foreign investors complete freedom in terms of entry mode (joint venture or full ownership) (Athukorala and Tien, 2012). None of these changes were industry-specific and, as noted above, manufacturing FDI was relatively open even prior to the BTA. By 2017, 95% of manufacturing employment in FDI firms was in wholly owned foreign-invested enterprises.

Finally, the U.S. is a very minor source of manufacturing FDI in Vietnam before and after the BTA. Figure 4 reports the share of FDI employment by source country from 1999 to 2017.¹³ Most foreign investment in manufacturing stems from East Asian economies, making up more than 80% of foreign employment during this period (82% in 1999 and 90% in 2017). The most common sources of funding are Taiwan (36%), South Korea (22%), Japan (13%), and Singapore (3%). The U.S. accounted for a relatively small share of source country funding—1.3% in 1999 and 1.5% by 2017. China started as a small source country in 1999, at 0.004%, but grew to 7% by 2017.

2.3 Conceptual Framework

Previous sections showed that the primary trade policy change due to the BTA was a reduction in tariffs on exports from Vietnam to a large export destination and these tariff cuts were particularly large in manufacturing. This presents an excellent setting to examine the role of foreign affiliates from all sources, relative to domestic firms, in generating employment in response to tariff cuts in the nascent formal manufacturing sector of a low-income country.

Conventional trade theory suggests that Vietnamese industries that experienced larger U.S. tariff reductions should expand relative to industries with smaller tariff reductions. In addition, these tariff reductions could differentially affect the performance and survival of existing firms as well as the entry decision of new firms within an industry. We start off in a setting with one dimension of firm heterogeneity, productivity, and extend it to additional differences across firms based on ownership.

In a typical Melitz framework (Melitz, 2003; Mrázová and Neary, 2019), firms differ in their productivity or marginal costs within an industry and face fixed costs of exporting. A reduction in the variable costs of accessing export markets is predicted to lead to expansion of the most productive continuing firms and contraction and/or exit of less productive firms due to selection

¹³The annual enterprise surveys, which we use for the analysis, contain information on funding by source country.

and reallocation. Thus, tariff-induced expansion of industry revenue and employment is expected to be dominated by continuing firms and increased firm exit. In our setting, two additional issues need to be considered. First, lower trade costs of accessing a large export destination provide an impetus for multinationals to adjust their participation in Vietnam. Second, the predictions above might differ in the presence of politically connected firms.

Entry and expansion of multinational affiliates Recent studies theoretically and quantitatively examine a broad set of foreign affiliate entry determinants (Garetto, Oldenski and Ramondo, 2019). Multinationals tend to have higher productivity than domestic firms and are therefore better positioned to serve foreign markets through an affiliate (Helpman, Melitz and Yeaple, 2004) or expand their affiliates in host countries to primarily serve third-country export markets (Tintelnot, 2017; Garetto, Oldenski and Ramondo, 2019).¹⁴ The literature on factors contributing to FDI affiliate establishment emphasizes variable trade costs (including trade policy), variable production costs (including wages and the costs of intermediate inputs), and additional fixed costs of setting up a new production facility (Antràs and Yeaple, 2014; Antras and Chor, Forthcoming). While Vietnam was already open to manufacturing FDI prior to the BTA and had relatively low wages (due to its comparative advantage), tariffs on its exports to the U.S. were high on average at 31.9%. With fixed costs of setting up an affiliate and high tariffs on Vietnamese exports to a large export destination, the variable profits from exporting may not be enough to generate positive total profits prior to the BTA. Once tariffs on Vietnamese exports to the U.S. have been drastically reduced, the variable profits from exporting to the U.S. and other countries might be sufficient for the multinational to cover fixed costs of setting up an affiliate in Vietnam, leading to foreign affiliate entry.

Furthermore, multinationals and their foreign affiliates tend to have access to foreign technology, “special assets” that cannot be easily transferred to unaffiliated firms, and connections to GVC networks relative to domestic firms (Antràs and Yeaple, 2014).¹⁵ FDI might also face fewer constraints than domestic firms in factor markets, with better access to international credit markets (Alfaro and Chen, 2018; Bilir, Chor and Manova, 2019). These characteristics might further

¹⁴In our setting, we also find that foreign affiliates are on average more productive than SOEs and private firms. Foreign firms are much more likely to be engaged in exporting than either SOEs or PRIs in Vietnam. In 2000, 72% of FDIs reported positive exports as compared to 32% of SOEs and 16% of PRIs. Both FDIs and PRIs have a high share of firms that are very intensively involved in exporting—66% of exporting FDIs and 58% of exporting PRIs report exports worth more than 80% of revenue.

¹⁵Antràs and Yeaple (2014) reference Hymer (1960) and Helpman (1984) with regards to multinational “ownership of special assets that confer a strategic advantage over indigenous firms in foreign markets...and the need for a direct involvement of the asset owner,” as well as tangible and intangibles of multinational firms.

enable FDIs to expand relative to domestic firms in Vietnam through new entry and expansion of incumbents in response to BTA-induced tariff cuts. The above mechanism does not require FDIs to directly compete with domestic firms in the domestic product market. Even if FDIs are mostly targeting export markets, their tariff-cut induced expansion can increase local labor demand and influence the labor costs for domestic-market-oriented firms.¹⁶

Presence of politically connected firms Many countries, including Vietnam, feature a prominent state-owned sector in manufacturing, which may be associated with distortions induced by preferential access to inputs for the state sector or entry barriers (Mishra, 2011; Khandelwal, Schott and Wei, 2013; Malesky, Gueorguiev and Jensen, 2015).¹⁷ Such preferential treatment might keep politically connected firms protected from new entrants, or subsidize and artificially lower their operating costs.

In the presence of these politically-connected SOEs, entry, exit, and reallocation of activity may be more complex than in standard heterogeneous firms and trade models (Khandelwal, Schott and Wei, 2013; Bai, Jin and Lu, 2019; Berthou et al., 2019). To the extent that SOEs face different market incentives due to distortions, this will differentially influence their entry, exit, and growth/contraction decisions in response to the U.S. tariff reductions, with effects depending on the strength of correlation between firms' political connection and underlying productivity. For example, low productivity SOEs could continue to operate rather than exit if distortions allow them to operate with a positive profit. This could hinder the overall reallocation of economic activity in response to the U.S. tariff reductions.

Our discussion highlights two main ideas, beyond the prediction that the tariff reductions in a large export market are expected to contribute to expansion of employment in the nascent formal manufacturing sector in Vietnam. First, there should be tariff-induced changes in the composition of employment across firms within an industry due to entry, exit, and adjustments of continuers. Second, the extent of entry, exit, and reallocation within industries in response to tariff-cuts is likely to differ by firm ownership, with foreign affiliates potentially better positioned to respond to tariff-cuts than private domestic firms and/or with SOEs adjustments differing due to political connections. This motivates our focus on these three firm types in our empirical work. How firm

¹⁶McCaig (2011) and Fukase (2013) find that the BTA-induced tariff cuts increase in wages. McCaig and Pavcnik (2018) find BTA-induced within industry reallocation of workers from informal microenterprises to registered firms.

¹⁷In Appendix B.1 we discuss the Vietnamese government's policy on state-owned firms. Specifically, there were no industry-specific SOE policies within manufacturing and the main domestic opponents to the BTA were the military, who owned significant assets in services, but they had no ability to influence the size of U.S. tariff reductions.

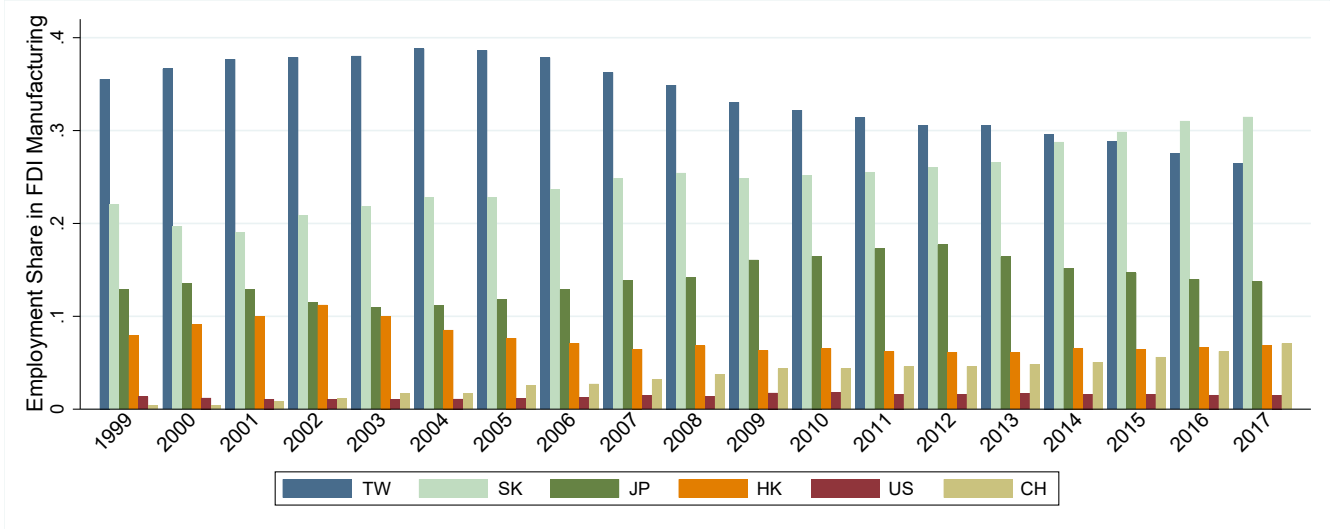


Figure 4: FDI Employment by Source Country, 1999-2017

margins of adjustment contributes to these outcomes is ultimately an empirical question, which we turn to next.

3 Data

Firm-level Data We use data from the annual enterprise survey conducted by the General Statistics Office (GSO) of Vietnam, covering the years 2000–the first year of the survey–through 2017. This survey covers all businesses in Vietnam registered as an enterprise according to the Enterprise Law. All state, collective, and foreign businesses must register as an enterprise to legally operate in Vietnam. A private business is legally required to register as an enterprise if it has more than 10 workers or operates in more than one location. However, many private businesses with less than 10 workers are registered.¹⁸ The data covers a long period of large expansion of the formal manufacturing sector, contributing to our understanding of the role of trade policy in the expansion and composition of nascent formal manufacturing employment.

The data contain the usual information on the industry of operation at the 4-digit ISIC level, employment, revenue, and fixed assets of the firms, and (for some years) whether (and how much) a firm exports. The surveys contain a number of key variables and features that we use in our analysis. First, we can consistently categorize firms by ownership as state-owned enterprises, foreign-invested enterprises, and private domestic enterprises. Our analysis relies on the initial firm

¹⁸See law No. 13-1999-QH10. The employment threshold for required registration changed over time. Prior to 2004, there was no employment size threshold (see Decree No. 02/2000/ND-CP) with the threshold specified as 10 or more workers from 2004 onward (see decree No. 109/2004/ND-CP). Unregistered (i.e. informal) firms have on average 1.6 workers (including the owner), well below this threshold (McCaig and Pavcnik, 2021).

ownership.¹⁹ Second, the data for foreign affiliates includes information on the source country of capital, allowing us to measure the main source countries of FDI over time and to examine the responses of FDI to trade policy across all source countries. Third, an important contribution of our study is the improvements of the data, especially tracking of firms over time.²⁰ The unique firm identifier allow us to track firms over time. This enables us to examine firm exit and entry, as well as changes in performance among continuing firms. Annually, an exiting firm is defined as a firm that operated in t , but not in $t + 1$. An entering firm is defined as a firm that operated in $t + 1$, but did not operate in t . A continuing firm is a firm that operated in t and $t + 1$. We focus on firms in traded manufacturing industries, as indicated by the main industry of operation at a 4-digit ISIC level.²¹ In our analysis, we use the industry reported by the enterprise in its first year in the dataset. We distinguish across 122 4-digit manufacturing industries, which is the level at which we link firms to tariffs. In the data appendix, Appendix A, we provide additional detail on the sampling framework and preparation of the data for analysis.

Firm data is available from 2000 (1999 for employment).²² We therefore use 2-digit industry data from 1995 to 2004 to examine the potential correlation of BTA-induced tariff cuts with pre-existing trends and the consistency of results using this more aggregate data in the post-BTA period. This data comes from various statistical yearbooks and tables from the 1998 Industrial Census produced by the GSO. See Section B.2.

Table 1 presents the summary statistics by firm ownership for years 2000 and 2017. The data includes over 750,000 firm-year observations (over 150,000 unique firms), with the number of firms growing from over 10,100 in 2000 to over 78,000 in 2017. In 2000, FDIs and SOEs on average employ more people compared to PRIs although there are many more PRI firms. FDIs have the highest average revenue per firm followed by SOEs, while PRIs have the lowest by an order of

¹⁹Changes in firm ownership mainly occur for SOEs due to privatization. Figure C1 replicates Figure 2 using initial rather than contemporary ownership. It yields a smaller decrease in SOE employment and a smaller increase in private domestic employment owing to SOE privatization. We perform robustness checks of key results with contemporary ownership definition.

²⁰See section A.4 for detailed discussion of verifying the tracking of enterprises over time. This is particularly important from 2000 to 2001 and among state-owned enterprises.

²¹The 2000 through 2010 data provide industry codes according to the 1993 Vietnam Standard Industrial Classification while the 2007 through 2017 data provide industry codes according to the 2007 Vietnam Standard Industrial Classification. We use the overlapping years to create a concordance and perform all analysis using the 1993 VSIC codes, which are identical to the International Standard Industrial Classification revision 3 within traded manufacturing.

²²We observe both the start and end of year employment, and use the end of year information to capture a firm's employment in that year. We use start of year employment in 2000 as a proxy for end of year employment in 1999. This allows us to extend our employment analysis one additional year prior to the BTA for specification checks. In years when the two employment estimates are both available, end of year employment in year $t - 1$ and start of year employment in year t are very strongly positively correlated across industries and time.

Table 1: Summary Statistics: Years 2000 and 2017

	Foreign	Private	State	Total
2000				
Employment	342 (1,033)	67.1 (249)	461 (754)	153 (511)
Revenue	201,295 (739,409)	13,502 (51,526)	125,416 (338,443)	48,994 (279,529)
Observations	1,019	7,596	1,497	10,112
2017				
Employment	515 (1,986)	32 (270)	389 (881)	84.6 (693)
Revenue	402,223 (5,995,239)	20,261 (226,966)	338,584 (1,886,141)	62,490 (1,895,996)
Observations	7,616	69,817	1,307	78,740

Note: The table reports mean employment and revenue by firm with standard deviations reported in parenthesis. Revenue is measured in millions of 2010 Vietnamese Dong. For comparison purposes, the exchange rate in 2010 was about 18,613 VND per USD according to World Development Indicators.

magnitude. The overall number of firms grows primarily due to an increase in private firms, but the number of foreign firms increased by more than seven fold from about 1,000 to 7,600, while the number of state firms contracts.²³

Trade Data We use international trade data from UN Comtrade for imports from Vietnam reported by Vietnam’s major trading partners, covering 23 years (1996-2018), including 5 years prior to the BTA.²⁴ In addition to using world exports from Vietnam, we also rely on exports to specific markets. Key markets include the U.S., the E.U., and East Asian partners (South Korea, Japan, China, and Hong Kong). These trading partners make up the majority of Vietnam’s manufacturing exports - 62% in 2000 and 69% by 2017 (see Appendix B.1.1 and Figure B1a).

Two key empirical patterns emerge from firm-level data and inform our empirical analysis.

Firm entry and exit were important firm-level margins of adjustment from 2000 to 2017. Table 2 reports the importance of entry and exit in the enterprise sector, overall, and for SOEs, FDIs and PRIs. In this table, exiting firms are defined as firms that operated in 2000,

²³Since our data tracks firms as ownership changes and we are basing our analysis on initial ownership, the rapid expansion of the number of foreign firms in Table 1 is due entirely to greenfield investment. Additionally, it appears that most new foreign enterprises are the first affiliate in Vietnam for the parent MNC. We can match about half of foreign enterprises from the annual enterprise survey operating in 2017 to data in Orbis. Among those that were matched, the vast majority have a unique global ultimate owner, suggesting they are the only affiliate of the owner operating in Vietnam.

²⁴This data is at the 3-digit International Standard Industrial Classification (ISIC) revision 3 code. We conduct our main trade analysis at the 3-digit industry level because many 4-digit industries report no exports to the U.S. prior to the BTA. However, our results are robust at the 4-digit and 2-digit levels.

Table 2: Entry and Exit of Firms between 2000 and 2017

Share of	Firms	Revenue	Employment
All ownership types			
Exiters	0.68	0.31	0.35
Entrants	0.96	0.81	0.81
Foreign affiliates			
Exiters	0.41	0.24	0.24
Entrants	0.92	0.84	0.86
Private domestic firms			
Exiters	0.78	0.58	0.56
Entrants	0.98	0.88	0.87
State-owned firms			
Exiters	0.36	0.25	0.26
Entrants	0.27	0.32	0.24

but not in 2017. Entrants are firms that operated in 2017, but not in 2000. 68 percent of firms that operated in 2000 exited by 2017, while 96 percent of firms in 2017 were not in operation in 2000. Exiters and entrants account for a sizable share of employment and revenue, with entrants accounting for 81 percent of employment and 81 percent of revenue in 2017. In addition, entry and exit rates differ widely across ownership. Private domestic firms exhibit the highest entry and exit rates, 98 and 78 percent respectively. FDIs have notably higher entry rates, 92 vs. 27 percent, and similar exit rates, 41 vs. 36 percent, compared to SOEs.

One potential issue is that entry of private domestic enterprises might reflect a new firm and formalization of an existing informal enterprise. Importantly, this issue does not influence the definition of entry for FDIs and SOEs because all FDIs and SOEs are required to register as an enterprise. Formalization among informal businesses in Vietnam, like in other countries, is rare (McCaig and Pavcnik, 2021). To the extent that some of the private entry is driven by formalization of previously informal firms, this changes the interpretation of entry to entail newly created domestic enterprises and newly registered firms that previously operated as a non-registered (i.e. informal) business. Both of these concepts are of interest as there is a large literature in development economics that examines the determinants of formalization or creation of formal jobs. Like most data sources, the annual enterprise data does not provide information on whether a private domestic business previously operated as an informal business. In section [A.5](#) we rely on information from Malesky and Taussig (2009), World Bank Enterprise Surveys, McCaig and Pavcnik (2021), and the reported year of establishment from our survey to evaluate this issue. Overall, this discussion suggests that most of the private domestic firms in the enterprise sector

did not start as informal firms (depending on the method/survey estimates range from 16 to 30% started as informal) and that most of those that did were only in the informal sector for 1 to 3 months (Malesky and Taussig, 2009).²⁵ This is not the pattern one would expect if most entry into the registered sector would reflect formalization of established informal businesses.

Post-entry employment growth of foreign entrants We find that post-entry employment growth, relative to the size at entry, is much larger for foreign entrants than for SOE and private domestic entrants. We examine the importance of post-entry employment growth by comparing employment at entry to post entry growth across foreign, state, and private firms. We focus on the cohort of firms that entered in 2001, the entry cohort that we can follow for the longest post-entry period, and track the surviving members of this entry cohort over time. For each year, we track the mean of employment at entry in 2001 across surviving entrants. This allows us to see whether the surviving entrants are larger on average than those that exit. We also track the mean of contemporary employment across surviving entrants. The difference between the two figures is how much surviving entrants have grown over time. The results are in Figure 5. Figure 5a demonstrates that employment in foreign entrants grows significantly after entry. Foreign entrants that survive are slightly larger, on average, than those that exit, as shown by the dashed blue line. However, this line slopes upward only slightly. It is subsequent growth after entry that drives the large increase in employment among foreign entrants. By 2017, foreign entrants that survive are on average more than 4 times larger in terms of employment than at entry.

Against this backdrop, post-entry employment growth, relative to the size at entry, differs considerably for state and private entrants. State firms are larger on average at entry than foreign firms (Figure 5b) and experience some growth in the first few years following entry, but then the growth declines and the surviving entrants contract relative to initial employment. Private entrants are the smallest on average, and show some post-entry growth, but much less so than for foreign entrants (Figure 5c).²⁶ Figure 5e summarizes the relative employment growth after entry among surviving entrants across foreign, state, and private, by normalizing their employment at entry at 1. Foreign entrants experience sustained growth relative to state or private entrants: 16 years after entry, a surviving foreign entrant is almost 5 times larger than when it entered and still growing. In contrast, surviving private entrants are only about 1.5 times larger after 16

²⁵Malesky and Taussig (2009) reports the highest rates of private enterprises starting as informal, 60%, but the vast share of these firms only spent 1 to 3 months as unregistered due to the registration process.

²⁶Importantly, the slower growth post entry for private is not due to a greater share of initially small entrants among private firms. If we restrict the sample of private entrants to those with 50 or more workers initially, we observe a similar pattern of more limited growth after entry in comparison to foreign entrants (Figure 5d)

years and have stopped growing on average while state entrants are smaller than at entry and declining.²⁷ Importantly, these longer-term employment pattern differences across firm ownership types motivate our interest in longer-term effects of trade policy in our empirical analysis.



Figure 5: Contemporary and initial employment among surviving entrants, 2001 entry cohort

²⁷The slow employment growth among private firms is consistent with patterns documented in other low- and middle-income countries, such as India and Mexico (Hsieh and Klenow, 2014).

4 Empirical Approach, Growth by Ownership, and Entry

We begin by highlighting the BTA tariff cuts' first order effects on trade flows and aggregate industry outcomes to show that our findings are consistent with the predictions of traditional trade theory. We then proceed with our analysis at the industry-firm ownership level.

4.1 Empirical Methodology

To study the relationship between the BTA industry tariff reductions and industry-level outcomes, we estimate the following regression:

$$Y_{jt} = \sum_{t'=t_0 \setminus 2000}^{t_N} \beta_{t'} \Delta BTA_j \mathbb{1}_{t'} + \lambda_j + \theta_t + \alpha_t C_{jt} + \varepsilon_{jt} \quad (1)$$

where Y_{jt} is the log outcome for industry j at year t , ΔBTA_j is defined as the log of 1+U.S. Column 2 tariff value minus the log of 1+MFN tariff value in industry j , indicator $\mathbb{1}_{t'}$ equals one for year t' where $t' \in [t_0, t_N]$, λ_j is an industry fixed effect, and θ_t is a year fixed effect. C_{jt} are industry-specific time-varying controls for other trade policy changes and include U.S. import quotas applied to clothing and textile imports from Vietnam and China respectively, Vietnam's MFN tariff reductions due to its WTO accession, and China-U.S. exports in year t .²⁸ The BTA is implemented in 2001. The base year for outcome changes is year 2000 and the key parameters of interest, $\beta_{t'}$, capture the cumulative impact of the BTA tariff cuts on the outcome by each year t' relative to 2000. A positive value of ΔBTA_j represents a tariff cut, so that a positive value of $\beta_{t'}$ implies an increase in the outcome in response to the U.S. tariff reductions. Standard errors are clustered by industry.

The identification of the causal effect of U.S. tariff reductions on the outcomes of interest in Vietnam consequently relies on the assumption that changes in U.S. tariffs are not correlated with unobserved time-varying industry-level factors. In section 2.1, we discussed that neither U.S. nor Vietnamese industries had the ability to influence the size of the BTA-induced U.S. tariff reductions: the cuts were based on moving Vietnam from one pre-existing tariff schedule to another. We also showed that these industry-level tariff changes are not correlated with baseline industry characteristics such as industry employment and the industry prevalence of the SOEs or FDI firms. Below, we further verify our identifying assumptions.

²⁸These controls are included because they control for immediate trade policy changes in Vietnam in the aftermath of the BTA. However, we show in Section 4.2 that our results are robust to the exclusion and each subsequent inclusion of these controls, as well as omission of each industry (including apparel and textiles, which were affected by the quotas).

4.2 Setting the Stage: BTA, Exports, and Industry Outcomes

We first establish that lower import tariffs have first-order effects on Vietnamese exports to the U.S. using pre- and post-BTA data covering 1996 to 2018. We estimate equation (1) with Vietnamese exports to the U.S. as the dependent variable and the coefficients on tariff change β_t are reported in Figure 6.²⁹ Positive and large estimates after 2001 suggest that tariff cuts are associated with an immediate and large increase in Vietnam’s exports to U.S. over the first six years, with the cumulative effects flattening out but continuing to slightly rise over the long run.

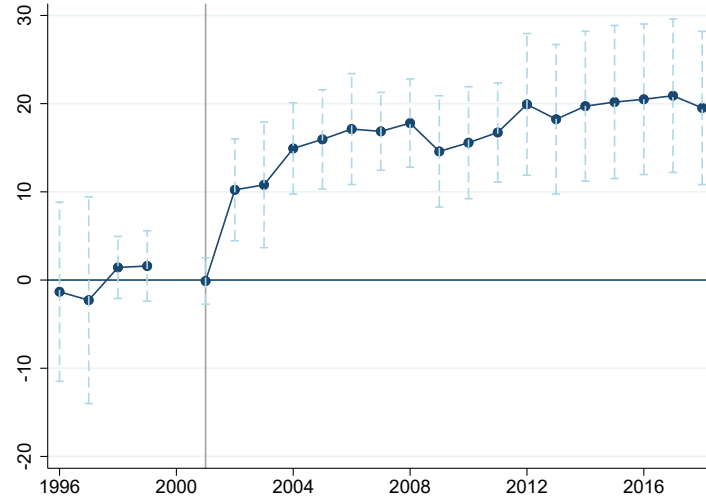


Figure 6: Vietnam Exports to the U.S. and BTA Tariffs, 1996-2018

Note: Each point reflects an individual regression coefficient, $\hat{\beta}_t$, following equation (1). The BTA was implemented in 2001 (indicated by the gray line) and the base year is 2000. Controls include 3-digit industry FEs, year FEs, the change in Vietnam’s MFN tariffs due to WTO accession, Chinese exports to the U.S. in year t , and U.S. import quotas on textiles and clothing applied to Vietnam and China respectively. Dashed lines show 95 percent confidence intervals. Standard errors clustered at the 3-digit industry level. Weighted by year 2000 Vietnam exports to the world.

This estimation is also the first in a series of specification checks that confirms that our results are not driven by spurious correlation between industry-specific tariff cuts and pre-existing trends such as industry-specific demand and supply changes. The estimates for years prior to 2001 are small in magnitude and statistically insignificant, ruling out spurious correlation between the BTA induced tariff changes and exports to the U.S. prior to the implementation of the agreement. In addition, the estimates in Figure 6 are robust to the exclusion of industry-specific controls for other trade policy changes taking place during our period of analysis (see Figures C5 and C8a) and to industry aggregation and disaggregation (Panels (a) and (b) respectively in Figure C6). Our results are also not sensitive to the omission of any one industry from estimation, further

²⁹We conduct our main analysis of trade flows at the 3-digit industry level because many 4-digit industries report no exports to the U.S. prior to the BTA. Our results are robust to industry aggregation—to 2-digit industries—and disaggregation—to 4-digit industries (Appendix Figure C6).

confirming that they are likely driven by BTA-induced tariff changes rather than by spurious correlation of tariff cuts with simultaneous developments in an influential industry (Figure C7).³⁰

Furthermore, to the extent these results would simply be driven by contemporaneous spurious global industry-specific demand on supply shocks, we would expect the U.S. tariff cuts to influence Vietnam’s exports to its major export markets before and immediately after the implementation of the BTA.³¹ However, this is not the case. For example, if growing demand for Vietnamese exports in high-income countries is driving our results, we would expect the effect of U.S. specific-tariff cuts to also influence exports to other major high-income trade partners such as the EU. However, when we estimate equation (1) for Vietnam’s exports to the EU as the dependent variable, the coefficients are small in magnitude and statistically insignificant before and in the immediate aftermath of the BTA (Figure 7a). Likewise, the estimates on the U.S. tariff cuts are not correlated with Vietnam’s exports to its major trading partners in East Asia, which also serve as sources of FDI to Vietnam, neither before nor in the immediate aftermath of the BTA’s implementation (Figure 7b).³² Both of these findings are also robust to the exclusion of industry-specific trade policy controls (Figures C8b and C8c respectively). Given the long period of our analysis after the BTA, we discuss some of the other changes in trade policy that occurred after the implementation of the BTA and show they are unlikely to drive our results (see footnote).³³

Moving from trade to industry outcomes, we find that the composition of industries in response to the tariff cuts changes consistently with predictions of the neoclassical trade models: Vietnamese industries subject to larger U.S. tariff reductions expand relative to industries with lower tariff cuts. The estimates of the coefficients on tariffs from specification (1) are reported in Figure 8 for three industry outcomes: number of firms, employment, and revenue (Figures 8a, 8b, and 8c respectively). Consistent with the results for exports, the number of firms, employment,

³⁰See Appendix B.1.1 for more detailed discussion of these robustness checks.

³¹In 2000, 31.2% of Vietnam’s manufacturing exports are to East Asian trading partners (South Korea, Japan, Hong Kong, and China), 27.3% to the E.U., and 5.4% to the U.S. See Appendix B.1.1 for detailed discussion.

³²Taiwan is excluded due to lack of trade data. South Korea, Japan, China, and Hong Kong make up almost 60% of Vietnam’s source funding for FDIs in 2017 (by employment, Figure 4)

³³In Appendix Section B.1.3 we first show that the BTA tariff changes are substantially larger than tariff changes in other agreements. Most importantly, while factors such as “future” trade policy changes can influence outcomes of interest, they would only potentially affect our results if they are spuriously correlated with industry-specific BTA tariff changes. We proceed to show that industry-specific BTA tariff changes are not correlated with “future” tariff changes with other trade partners. Importantly, our empirical work examining the cumulative annual effects of the U.S. tariff cuts with annual data covering a long period rather than relying on data at the start and end of our period, a period during which multiple agreements take place. To the extent that these agreements would be driving our results, we would expect them to influence the estimated coefficients at the time that these agreements come into effect. However, the magnitude of the effects of the BTA on U.S. exports (as well as other outcomes studied later) is relatively large in the immediate to medium run aftermath of the BTA implementation and we do not observe discrete increases in the magnitude of the coefficients when the other agreements are implemented.

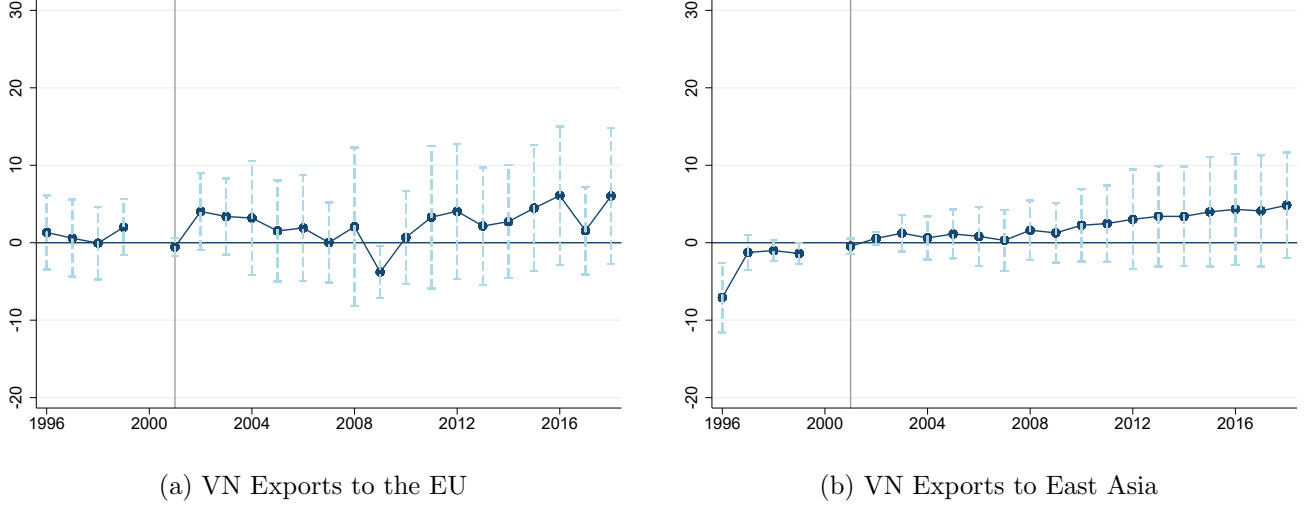


Figure 7: Vietnam exports to key trading partners and BTA tariffs, 1996-2018

Note: Each point reflects an individual regression coefficient, $\hat{\beta}_{it'}$, following equation (1). The dependent variable in Figure 7a is Vietnamese exports to the European Union (EU15 excluding Belgium and Luxembourg due to lack of data consistency). The dependent variable in Figure 7b is Vietnamese exports to 4 East Asian countries (South Korea, Japan, China, and Hong Kong). Taiwan is excluded due to lack of trade data. The BTA was implemented in 2001 (indicated by the gray line) and the base year is 2000. Controls include 3-digit industry FEs, year FEs, the change in Vietnam's MFN tariffs due to WTO accession, Chinese exports to the US in year t , and US import quotas on textiles and clothing applied to Vietnam and China respectively. Dashed lines show 95 percent confidence intervals. Standard errors clustered at the 3-digit industry level. Weighted by year 2000 Vietnam exports to the world.

and revenue expand more in industries with bigger tariff cuts. In Appendix section B.2.1, we discuss and confirm that these results hold at the 2-digit industry level after the BTA, but find no relationship between tariffs and industry outcomes in years prior to the BTA.

4.3 BTA, Entry and Employment: Differential Impact by Ownership

The discussion in Section 2.3 suggests that the foreign affiliates of multinationals might respond differentially to the effects of lower U.S. tariffs on Vietnamese exports compared to Vietnamese SOEs and private domestic firms. In this section, we investigate the differential impacts of BTA tariff cuts across firm ownerships, by estimating equation (1) individually for each ownership type o where $o \in \{FDI, SOE, PRI\}$. This is equivalent to estimating an augmented version of equation (1) with all ownership types that includes ownership-year and ownership-industry fixed effects and allows for ownership-specific coefficients on tariffs and industry-specific controls C_{jt} .³⁴ Our

³⁴ Our approach is equivalent to estimating the following regression:

$$Y_{jot} = \sum_{t'=t_0 \setminus 2000}^{t_N} \beta_{ot'} \Delta BTA_j \mathbb{1}_{t'} + \lambda_{oj} + \theta_{ot} + \alpha_{ot} C_{jt} + \varepsilon_{jot}$$

where Y_{jot} is the log outcome for firm type o in industry j at year t , ΔBTA_j is the change in log U.S. tariff applied to VN exports in industry j before and after the BTA, indicator $\mathbb{1}_{t'}$ equals one for year t' where $t' \in [t_0, t_N]$, λ_{oj} is an ownership-industry fixed effect, θ_{ot} is an ownership-year fixed effect, and C_{jt} are industry-specific time-varying controls included in (1).

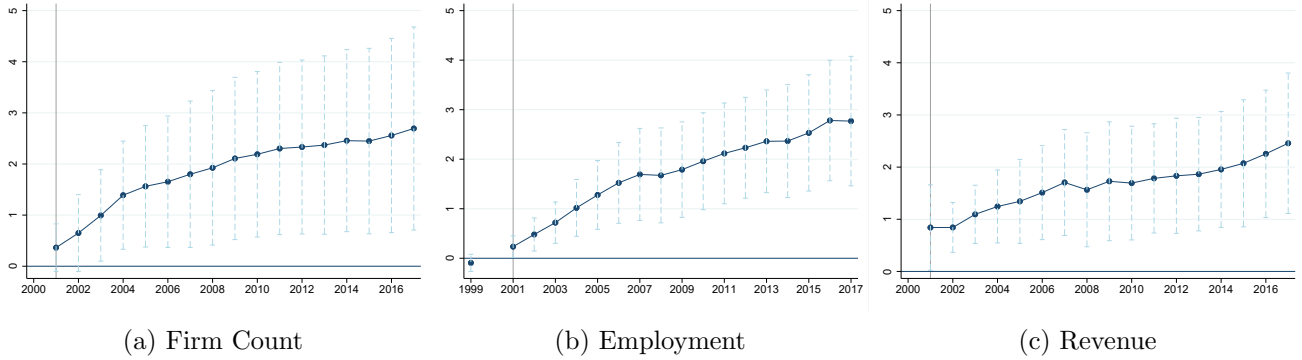


Figure 8: Firm count, employment, revenue and BTA tariffs, 1999-2017

Note: BTA was implemented in 2001 (indicated by gray line) and the base year is 2000. 4-digit industry and FEs year FEs are included. Dashed lines show 95 percent confidence intervals. Standard errors clustered at the 4-digit industry level. Weighted by year 2000 employment. Controls included in the regression are the change in Vietnam’s MFN tariffs due to WTO accession, Chinese exports to the US in year t , and an industry measure of US imports quotas applied to Vietnamese and Chinese exports of textiles and clothing.

approach controls for any ownership-specific secular trends or government policies that might also contribute to the declining presence of SOEs and increases in PRI and FDIs displayed in Figure 2. The key parameters of interest $\beta_{ot'}$ from equation (1) in this setting capture the cumulative impact of the BTA tariff cuts on the outcome for firm ownership o at time t' relative to 2000.

Overall, we find that the industry expansion in the number of firms and employment in response to tariff cuts is predominately driven by FDIs and the effects increase over time. One of the goals of our analysis is to study tariff-cut induced sources of employment expansion in formal manufacturing, through the number and composition of firms by ownership. As we showed in the data section, firm entry and exit are key dimensions of firm adjustment during this period, especially for foreign and private domestic firms. To that end, we first estimate equation (1) for the ln number of firms as a dependent variable for the three ownerships, with estimates of the coefficients on tariffs presented in Figure 9. Tariff cuts are associated with an increased number of FDIs and PRIs. The cumulative positive effect on number of FDI firms levels off 8 to 10 years after the BTA, such that the number of foreign firms grew by approximately 0.48 ln points (62%) in response to the mean U.S. tariff reduction, while the cumulative effect for PRI firms tapers off sooner—four years following the agreement, with gradual increases thereafter. SOEs have much more subdued adjustment in response to tariff cuts in terms of extensive firm margin relative to foreign and private firms. At the onset of the BTA, SOEs accounted for 47% of employment in formal manufacturing. We therefore examine the effects of trade policy on SOEs over a long time period in a setting that starts off with a higher presence of SOEs than in other studies (Khandelwal, Schott and Wei, 2013; Brandt et al., 2017; Baccini, Impullitti and Malesky, 2019). While the number of SOEs is decreasing in aggregate, we find no statistically significant relationship between



Figure 9: Firm count by ownership and BTA tariffs, 2000-2017

Note: Each point reflects an individual regression coefficient, $\hat{\beta}_{ot'}$, following equation (1) for each ownership type (see footnote 34). The dependent variable is the log annual number of firms in an industry for foreign (Panel (a)), state (Panel (b)), and private (Panel (c)), respectively. The BTA was implemented in 2001 (indicated by the gray line) and the base year is 2000. In separate ownership regressions for each panel, controls include 4-digit industry FEs, year FEs, the change in Vietnam’s MFN tariffs due to WTO accession, Chinese exports to the U.S. in year t , and U.S. import quotas on textiles and clothing applied to Vietnam and China respectively. Since we estimate equation (1) for each ownership type, this is equivalent to including ownership-year and ownership-industry FEs and allowing for ownership-specific coefficients on tariffs and industry-specific controls. Dashed lines show 95 percent confidence intervals. Standard errors clustered at the 4-digit industry level. Weighted by year 2000 employment.

the tariff cuts and changes in the number of SOEs. The magnitudes of the coefficients for SOEs become slightly positive 8 to 10 years after the BTA, suggesting a smaller contraction in the number of SOEs in high tariff-cut industries, but the magnitudes are substantially smaller than for FDIs and PRIs and insignificant.³⁵

We find substantial firm entry in response to tariff cuts. Figure 10 reports the estimates of the coefficients on tariff cuts when Equation (1) is estimated with the ln number of entrants in an industry, ln number of foreign entrants, and ln number of private domestic entrants, respectively. We do not separately analyze SOE entry because it is relatively rare, but incorporate that margin in analysis in Section 5. The positive magnitudes of the coefficients suggest that industries with larger tariff cuts observe an increase in entrants (Panel (a)). The cumulative effects of the BTA on entry, particularly of foreign firms, grow for 5-6 years after the BTA, after which they accumulate more slowly, but continue to rise (Figure 10b). We find similar but smaller effects for the private firms (Figure 10c).³⁶ A small share of private domestic entry could reflect formalization (see discussion in Section 3).

Overall, the coefficients on tariffs in Figure 10a, imply an elasticity of entry with respect to tariff of 0.27 in the short run 2 years post-BTA (2003) and 1.47 in the long run after 12 years

³⁵The main results in Figure 9 are robust to classifying firms by contemporary ownership rather than time-invariant ownership based on the first year the firm is observed in the data (Appendix Figure C11). The two mainly differ for SOEs due to privatization, with fewer SOEs using contemporary relative to initial ownership (compare Figures 2 and C1). The coefficients on tariff cuts for SOEs are more muted with initial than contemporaneous ownership, suggesting that SOEs are less likely to privatize in industries with bigger tariff cuts.

³⁶These results are robust to using contemporary ownership (Appendix Figure C9).

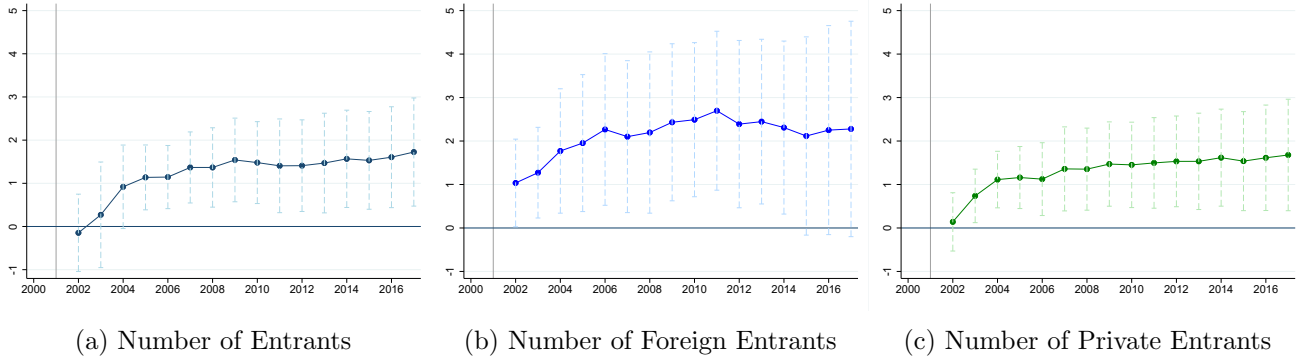


Figure 10: Number of entrants by ownership and BTA tariffs, 2000-2017

Notes: In Panel (a), the regression coefficient is $\hat{\beta}_t$, following equation (1) and the dependent variable is the log annual number of entrants overall in an industry. We define entry by the first year the firm appears in the dataset after year 2000. In Panels (b) and (c), the regression coefficient is $\hat{\beta}_{ot}$, following equation (1) for each ownership type (see footnote 34). The Panel (b) dependent variable is the log annual number of FDI entrants in an industry while the Panel (c) dependent variable is the log annual number of private entrants in an industry. The BTA was implemented in 2001 and the base year is 2001 due to our definition of entry (indicated by the gray line). In Panel (a) and in separate ownership regressions for Panels (b) and (c), controls include 4-digit industry FEs, year FEs, the change in Vietnam’s MFN tariffs due to WTO accession, Chinese exports to the U.S. in year t , and U.S. import quotas on textiles and clothing applied to Vietnam and China respectively. Since we estimate equation (1) for each ownership type, this is equivalent to including ownership-year and ownership-industry FEs and allowing for ownership-specific coefficients on tariffs and industry-specific controls. Dashed lines show 95 percent confidence intervals. Standard errors clustered at the 4-digit industry level. Weighted by year 2000 employment.

(2013). The estimates are larger for foreign affiliates (Figure 10b), with an elasticity of foreign entry with respect to tariff of 1.27 in the short run (2003), and 2.45 in the long run (2013). Recall that our definition of FDI entry is greenfield. As discussed in the conceptual framework, most models of FDI generally focus on the intensive margin of foreign affiliates (Tintelnot, 2017) or product entry (Head and Mayer, 2019). An important exception is Garetto, Oldenski and Ramondo (2019) which studies the dynamics of multinational entry.³⁷ Prior to the BTA, Vietnam might not have been as attractive of a production location for foreign affiliates aiming to export because of the large variable trade costs of reaching one of the largest global export destinations, the U.S. Once the U.S. lowered tariffs on exports from Vietnam, lowering the variable costs of exporting, the foreign affiliates were more likely to cover the fixed cost of setting up production in Vietnam. Our analysis highlights the responsiveness of greenfield foreign investment to tariff cuts.

Tariff cuts are associated with increases in industry-level employment through the effects on FDIs. The above analysis highlighted that tariff cuts had a differential impact on the entry of foreign firms, relative to PRIs and SOEs. To further examine the sources through which tariff cuts contributed to the expansion of employment in formal manufacturing, we estimate Equation (1) with industry employment as the dependent variable for the three firm ownerships,

³⁷In their model, the multinational’s decision of whether to set up an affiliate is driven by the interaction of firm-specific characteristics and multinational costs, as well as persistent aggregate productivity and demand shocks.

with estimates of the coefficients on tariffs presented in Figure 11. Tariff cuts are associated with increased employment in FDIs (Figure 11a).³⁸ The cumulative positive effect on the number of FDI entrants levels off 8 to 10 years after the BTA, whereas the cumulative effects on FDI employment continue to grow over time, suggesting that employment growth moves from the extensive (firm entry) to intensive margin (post-entry growth). We return to this issue in Section 5.2.

While tariff cuts are associated with increased entry of PRIs and increased number of PRI firms, tariff cuts are not associated with statistically significant increases in industry PRI employment (Figure 11c). The coefficients on tariffs are positive, but small in magnitude and very noisy. The lack of tariff-cut induced employment contribution of PRIs is consistent with the lack of employment growth in domestic firms in lower-income countries (Hsieh and Klenow, 2014).

The positive (albeit noisy) coefficients for SOEs in Figure 11b suggest that SOEs experience a steady, albeit imprecise, smaller contraction in employment in industries with larger tariff cuts.³⁹ Because SOE aggregate employment is declining, the positive coefficient implies slower declines in SOE employment in high tariff-cut industries. The lack of response of SOEs to tariff cuts in terms of firm count and slower contraction of employment is consistent with SOEs being less responsiveness to trade reform than FDIs, perhaps due to different market incentives discussed in Section 2.3. This is further confirmed by delayed employment reallocation in high tariff-cut industries due to stalled privatization. In particular, the coefficients on tariff cuts in employment regressions for SOEs are more muted with initial than contemporaneous ownership (see Figure C12), suggesting even slower employment declines in high-cut industries due to less privatization in these industries.⁴⁰ As such, our findings of slow adjustment of SOE contraction and employment with increased export market access adds to the literature on trade policy and SOEs, where the empirical work has mainly focused on lack of adjustment of SOEs to increased import competition.⁴¹

³⁸The coefficients on tariffs in 1999 are small and insignificant, confirming the lack of correlation between tariff cuts and pre-existing trends in employment by ownership. In addition, discussion in Appendix B.2.2 and Figure B12 shows that changes in industry employment between 1998 and 2000 by ownership are not correlated with the U.S. tariff reductions using 2-digit industry employment.

³⁹When we pool results into 8-year periods, we find a statistically significant positive coefficient in SOE employment from 2009-2017 (Appendix Table B3). See Appendix Section B.4 for further details.

⁴⁰Our employment results are robust to using contemporary ownership information for FDIs and PRIs (Figures C12. For comparison purposes, we also examine the link between tariff cuts and revenue and find differential responses by firm ownership, with the most pronounced (albeit noisy) increase in revenue in foreign firms and decline in PRI revenue (see Figures C10 and C13).

⁴¹Brandt et al. (2017) and Baccini, Impullitti and Malesky (2019) find that SOEs are not subject to the same competitive pressures due to increased import competition in response to WTO accession in China and Vietnam, with SOEs less likely to exit in response to import tariff cuts relative to domestic firms.

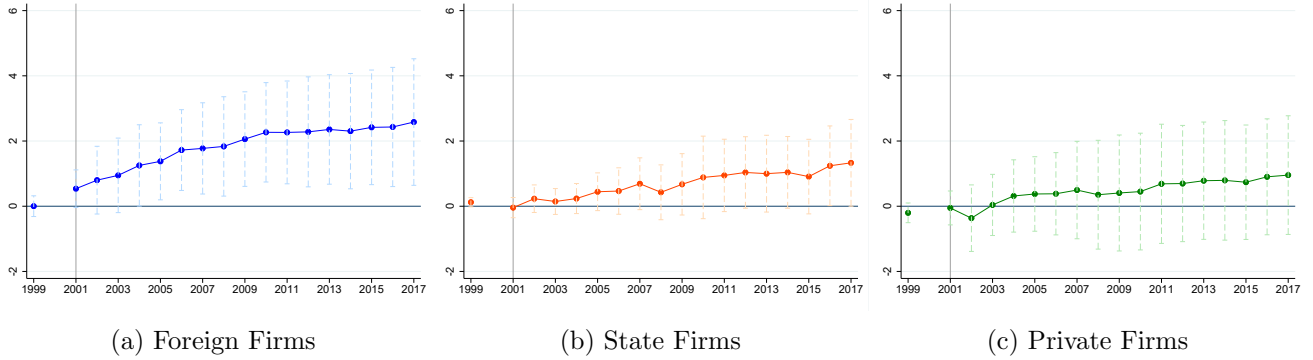


Figure 11: Employment by ownership and BTA tariffs, 1999-2017

Note: Each point reflects an individual regression coefficient, $\hat{\beta}_{ot'}$, following equation (1) for each ownership type (see footnote 34), where the independent variable is the change in U.S. tariff applied to Vietnamese exports in an industry before and after the BTA (ΔBTA_j). The dependent variable is the log annual employment in an industry for foreign in Panel (a), state in Panel (b), and private in Panel (c). BTA was implemented in 2001 (indicated by the gray line) and the base year is 2000. In separate ownership regressions for each panel, controls include 4-digit industry FEs, year FEs, the change in Vietnam's MFN tariffs due to WTO accession, Chinese exports to the U.S. in year t , and U.S. import quotas on textiles and clothing applied to Vietnam and China respectively. Since we estimate equation (1) for each ownership type, this is equivalent to including ownership-year and ownership-industry FEs and allowing for ownership-specific coefficients on tariffs and industry-specific controls. Dashed lines show 95 percent confidence intervals. Standard errors clustered at the 4-digit industry level. Weighted by year 2000 employment.

5 Employment: Sources of Within-Industry Reallocation

The previous section establishes that tariff cuts lead to large increases in the number of firms (and the number of entrants), especially among foreign and private domestic firms in an industry and that tariff-cut induced employment increases were concentrated mainly in foreign firms. This section systematically examines how the BTA tariff reductions impact changes in the allocation of employment shares within industries across ownership and across margins of firm adjustment status (i.e. continuers, entrants, and exiters). We find that tariff cuts favor entrants, particularly foreign entrants. In addition, ownership matters as tariff cuts favorably impact FDI employment over PRIs, and we find evidence consistent with slower SOE adjustment.

We construct the change in employment shares by firm ownership and status in each industry and year relative to base year 2000, the year prior to BTA implementation. That is, $\Delta es_{jost} = \frac{E_{jost}}{E_{jt}} - \frac{E_{jos,2000}}{E_{j,2000}}$ where E_{jost} is total employment in firms of initial ownership o and status s in industry j in year t , and E_{jt} is total employment in industry j in year t . A continuing firm is defined as one that operates in both year t and the base year, 2000. We focus on cumulative entry and exit up to year t relative to 2000. Exiters in year t are firms that were present in 2000, but not in year t . Entrants in year t are firms that appear in year t , but were not present in 2000.⁴²

⁴²The change in employment share for exiters (entrants) is necessarily negative (positive) since their employment share in year t (2000) is 0. The employment share changes sum to 0 in each industry-year. As before, we define a firm's industry and ownership type based on its initial industry and ownership.

We estimate the following specification for each ownership o , status s , and $t > 2000$:

$$\Delta es_{jost} = \beta_0 + \beta_{ost} \Delta BTA_j + \alpha_{ost} C_{jt} + \varepsilon_{jost} \quad (2)$$

where ΔBTA_j is the change in US tariff applied to imports from Vietnam in industry j before and after the BTA and C_{jt} is a vector of our usual industry controls.⁴³ The coefficients on ΔBTA_j , β_{ost} , capture the cumulative BTA impact on the outcome by each ownership-status-year combination, ost , relative to the base year, 2000. A positive value of ΔBTA_j represents a tariff-cut, so that a positive value of β_{ost} implies an expansion in employment share in response to the U.S. tariff reductions. The specification in Equation (2) is similar to our earlier specification, but it is estimated separately for each year relative to the baseline (e.g., 2001 and 2000, 2002 and 2000, etc.). This allows us to update the definition of whether a firm that operated in 2000 is a continuer in year t or an exiter in year t . For example, a firm that operates in 2000 and exits in 2006, would be defined as a continuer for years 2001 through 2005 and as an exiter thereafter.

Equation (2) is estimated separately for each ownership-status, os . This flexibly allows for each ownership-status combination to be on its own time path, allowing, for example, for underlying aggregate differences in patterns of foreign entry or SOE exit. We weight by industry employment in 2000. The estimation results are presented in figures below, which report the series of coefficient estimates of β_{ost} , with 95 percent confidence intervals. Each series of coefficients is estimated from 17 individual regressions for each outcome of interest.

5.1 Entry, Exit, and Continuing Firms: Overall and Foreign Firms

The analysis demonstrates that tariff reductions were associated with a shift in within-industry employment shares to foreign firms, to entrants, and particularly to entering foreign firms. We present our findings gradually in three steps, to highlight the importance of tariff-cut induced increases in employment shares of foreign entrants for more aggregate effects.

To begin with, Figure 12 reports the estimates of the coefficients on tariff cuts from equation (2) for the three firm ownerships. The results show a cumulative shift of employment toward foreign firms with tariff cuts. It is important to recall that overall employment in SOEs is contracting during this period. Thus, the positive coefficients on tariff cuts for SOEs reflect slower contraction

⁴³Controls include the change in Vietnam's MFN tariffs due to WTO accession measured as the change in \ln of $1+\text{MFN}$ between 2007 and 2013, the change in \ln Chinese exports to the US in year t relative to 2000, and industry measures of US imports quotas applied to Vietnamese and Chinese exports of textiles and clothing. We show in Section 5.1 that our results are robust to the exclusion and each subsequent inclusion of these industry-level controls.

of employment shares in SOEs in industries with higher tariff cuts relative to less affected industries. Tariff cuts are also associated with decreased employment share of private firms, although for most years we cannot reject a null effect.⁴⁴ The implied cumulative reallocation is considerable. By 2017, relative to an industry that experienced no tariff reduction, an industry that experienced the mean tariff reduction saw the foreign share of employment increase by 8.3 percentage points, SOE share of employment increase by 9.5 percentage points, and the private share decrease by 17.7 percentage points. While the post-BTA effects are large, the point estimates in 1999 in Figure 12 are very close to 0 and statistically insignificant. This confirms that changes in within-industry employment shares by firm ownership prior to the BTA (i.e. between 1999 and 2000) are not correlated with the BTA tariff cuts prior to the implementation of the agreement in 2001, consistent with the lack of pre-existing trends in trade flows and industry outcomes in Section 4.2. Figure B13 further shows that changes in within-industry employment shares by ownership between 1998 and 2000 are not correlated with the U.S. tariff reductions using 2-digit industry employment. See Section B.2.2 for further discussion.

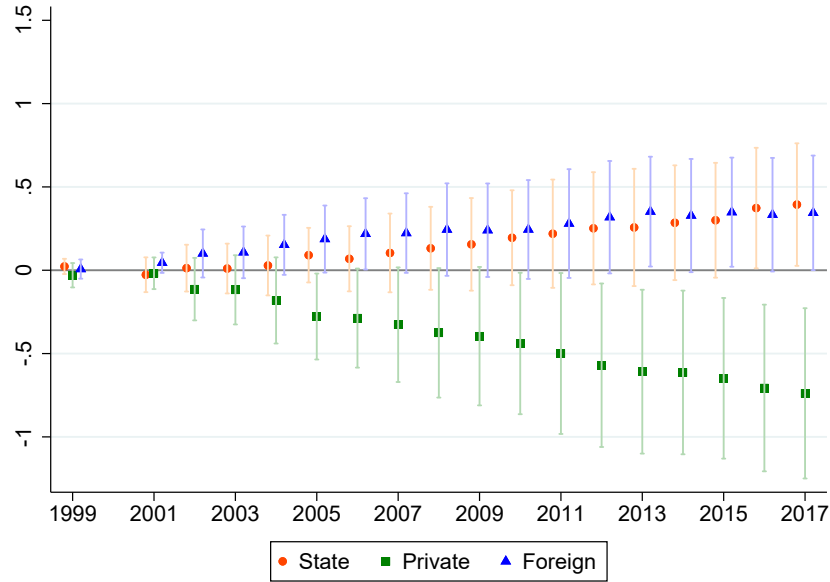


Figure 12: Changes in within-industry employment shares for state, private, and foreign and BTA tariff cuts

Note: Each point reflects an individual regression coefficient, β_{ost} , following equation (2). The base year is 2000 and the observations are weighted by 2000 employment. Controls include the change in Vietnam's MFN tariffs due to WTO accession, the change in ln Chinese exports to the US in year t relative to 2000, and industry measures of US import quotas applied to Vietnamese and Chinese exports of textiles and clothing.

⁴⁴When we pool results into 8-year periods, we find a statistically significant positive coefficient in the shift towards FDI employment share from 2001-2008 and 2009-2017 (Appendix Table B5, Column (1)). We also find a statistically significant negative coefficient in PRI employment share for both 8-year periods (Appendix Table B7, Column (1)). The coefficient in SOE employment share is positive but not statistically significant for both periods (Appendix Table B6, Column (1)). See Appendix Section B.4 for further details.

Second, tariff cuts lead to a pronounced expansion of the within-industry employment share of entrants. Figure 13 reports the estimates of the coefficients on tariff cuts from Equation (2) for continuers, exiters, and entrants (while abstracting from firm ownership). Declines in US tariffs are associated with a large increase in the employment share of entering firms, a decline in the employment share of continuers, and no significant change in the employment share of exiting firms. The mean reduction in \ln tariffs was 0.24. This implies that entrants in an industry that received the mean tariff reduction expanded their employment share by 7.8 percentage points by 2004, only 3 years after implementation, relative to entrants in an industry that received no tariff reductions. This estimated tariff-cut induced reallocation continued to grow to about 11.8 percentage points by 2009 and then remained relatively unchanged. This increase is offset by declines in the employment share of continuers by 10.9 percentage points respectively by 2009, with no noticeable tariff-induced change in employment share of exiting firms.

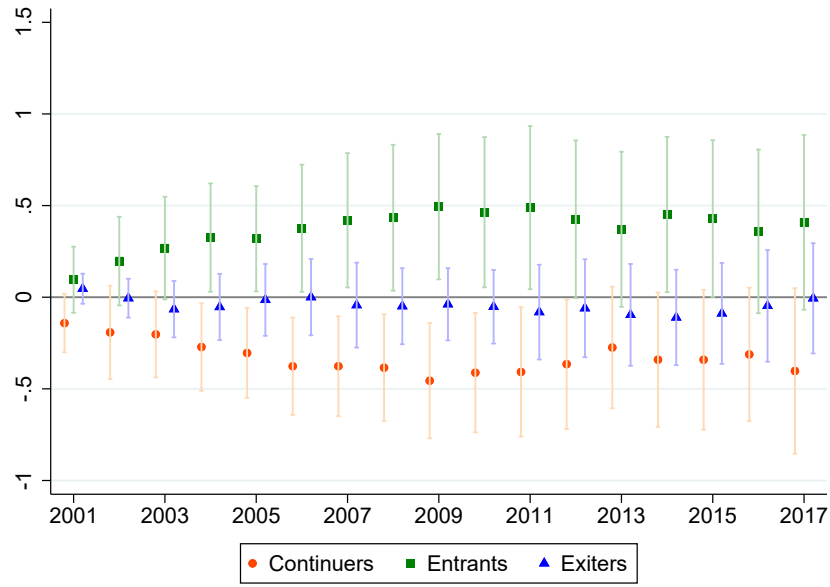


Figure 13: Changes in within-industry employment shares for continuers, entrants, and exiters and BTA tariff cuts

Note: Each point reflects an individual regression coefficient, β_{ost} , following equation (2). The base year is 2000 and the observations are weighted by 2000 employment. Controls included in the regression are the change in Vietnam's MFN tariffs due to WTO accession, the change in \ln Chinese exports to the US in year t relative to 2001, and an industry measure of US imports quotas applied to Vietnamese exports of textiles and clothing.

Finally, foreign entrants are driving the above tariff-cut induced expansion of employment share among foreign firms and among entrants. Figure 14 displays the estimates of the coefficients on tariff cuts from Equation (2) for foreign continuers, entrants, and exiters. Tariff cuts are associated with a large, sustained increase in employment shares of foreign entrants, a decline in employment share of foreign continuers, and little effect due to foreign exiters. By 2017, relative to an industry

that experienced no tariff reduction, an industry that experienced the mean tariff reduction saw the employment share in foreign entrants grow by 19.3 percentage points. The shift toward foreign entrants occurs as the share of employment in foreign continuers falls by 8.6 percentage points. Hence, the entry of foreign firms is partly offset by the relative contraction (i.e., not expanding as fast as overall industry employment) of continuing foreign firms. These results are not particularly sensitive to the exclusion of industry-specific controls in C_{jt} in Equation (2) (Appendix Figure C14) nor omission of any one industry (Appendix Figure C15). In Section B.3 and Figures B14 and B15 we also show that the results are robust to alternative definitions of firm entry.

The evidence on tariff-induced shift in employment toward foreign entrants is consistent with the setting discussed in Section 2.3, where a decision to establish an FDI affiliate in a location weighs the variable trade costs of exporting from that destination, variable production costs, and additional fixed costs of setting up a new production facility. As discussed in Section 2.1 Vietnam was already open to manufacturing FDI prior to the BTA, but tariffs on its exports to the U.S., a large export destination, were high on average at 31.9%, relative to US tariffs on its imports from other countries which faced much lower MFN tariffs at 2.9%. Consequently in this setting, Vietnam might not have been as attractive of a production location for foreign affiliates aiming to export because of the large variable trade cost of reaching a key export destination. Once the U.S. lowered tariffs on exports from Vietnam, the foreign affiliates were more likely to cover the fixed cost of setting up production in Vietnam. We provide further evidence on the link between exporting, foreign affiliate entry, and source countries of foreign affiliates in Section 6.

Tariff cuts and employment share reallocation for state and private domestic firms

It is instructive to compare the tariff-cut induced changes in within industry employment shares of foreign affiliates to results for SOEs and PRIs by the three margins of adjustment. Recall from Figure 12, tariff cuts were associated with smaller contraction in the employment share of SOEs (albeit at times noisily estimated) and decreases in employment shares of PRIs. Figures 15a and 15b report the estimates of the coefficients on tariff cuts from Equation (2) for SOEs and PRIs by status, respectively. The magnitudes of the coefficients on tariffs are smaller than for FDI entry and imprecisely estimated.

Recalling that overall employment shares in SOEs is contracting during this period, the positive coefficients on tariff cuts for SOE continuers and exiters reflect slower contraction among continuers and less employment contraction through exit for SOEs in industries with higher tariff cuts relative to less affected industries. For private firms, tariff-induced increased entry of PRIs noted in earlier

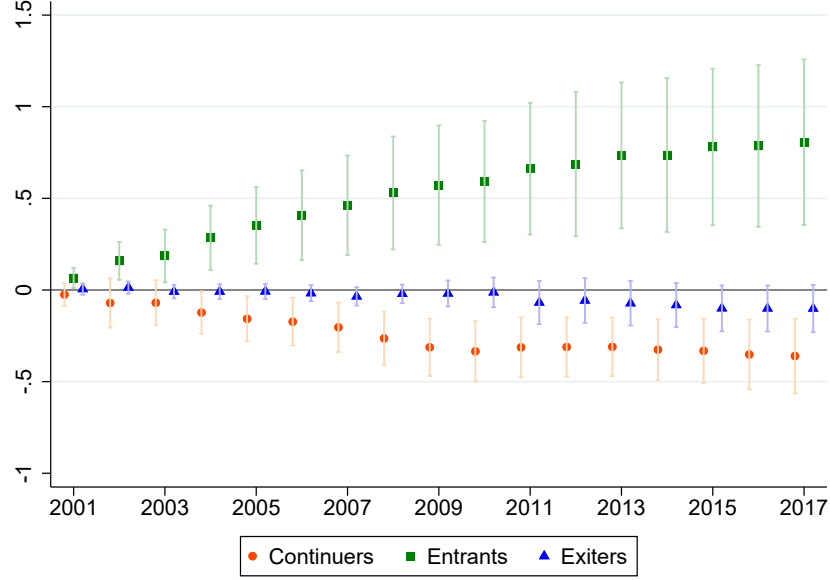


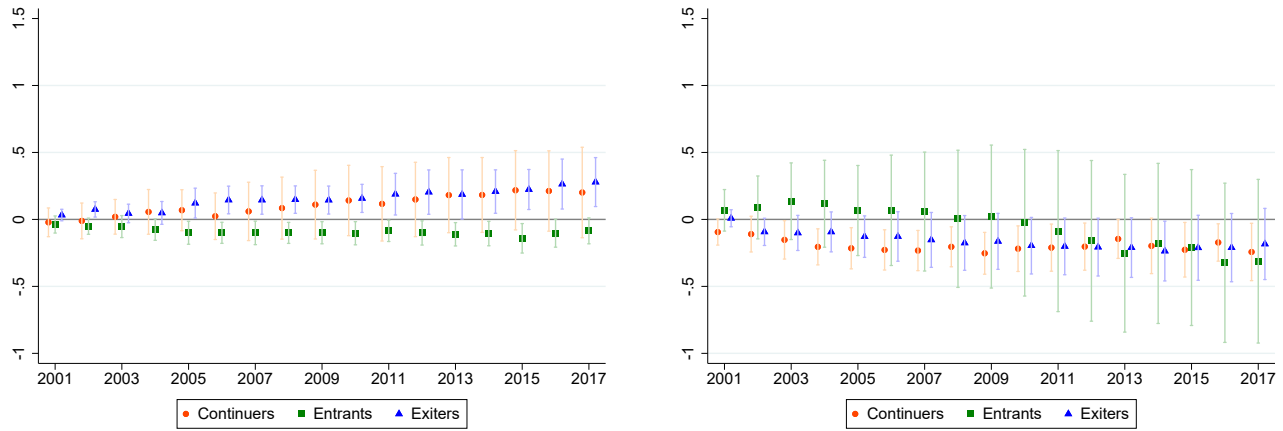
Figure 14: Changes in within-industry employment shares for foreign continuers, entrants, and exiters and BTA tariff cuts

Note: Each point reflects an individual regression coefficient, β_{ost} , following equation (2). The base year is 2000 and the observations are weighted by 2000 employment. Controls include the change in Vietnam's MFN tariffs due to WTO accession, the change in ln Chinese exports to the US in year t relative to 2000, and industry measures of US import quotas applied to Vietnamese and Chinese exports of textiles and clothing.

analysis does not translate into sustained gains in employment shares within industries, relative to foreign firms and SOEs. We show in Figure 15b that tariff cuts induced employment to shift away from private firms due to a combination of declines in employment shares of continuers, entrants, and exiters, albeit each channel is individually imprecisely estimated.⁴⁵

In summary, Table 3 reports the estimated coefficients on the tariff cuts from the end of our period, 2017, which all measure the cumulative effects of tariff cuts relative to 2000. Most importantly, this table highlights the dominant role of tariff-cut induced shifts in the allocation of employment shares toward foreign entrants, over the long run, relative to continuing and exiting firms. This is consistent with the foreign affiliates being potentially best positioned to respond to tariff cuts, as discussed in Section 2.3, contributing to the expanding formal manufacturing. Furthermore, the positive coefficients on tariff cuts for SOE continuers and exiters reflect less employment contraction in incumbents and through exit for SOEs in industries with higher tariff cuts relative to less affected industries. This suggests SOEs might face different incentives than

⁴⁵The negative coefficient on the entry might be puzzling at first. Recall from Section 4 that tariff cuts are associated with increased entry of private firms, but the magnitude of the coefficient is much smaller than for foreign entrants. In addition, the magnitudes of the coefficients on tariff cuts for employment effects for private firms is positive, but substantially smaller in magnitude (and statistically insignificant) than for foreign firms (see Figure 11). Hence the negative coefficients mainly reflect relative expansion of foreign firms (and smaller contraction of SOEs) in high tariff-cut industries rather than an absolute decline in employment among private entrants.



(a) State

(b) Private

Figure 15: Changes in within-industry employment shares for state and private continuers, entrants, and exiters and BTA tariff cuts

Note: Each point reflects an individual regression coefficient, β_{ost} , following equation (2). The base year is 2000 and the observations are weighted by 2000 employment. Controls include the change in Vietnam's MFN tariffs due to WTO accession, the change in \ln Chinese exports to the US in year t relative to 2000, and industry measures of US import quotas applied to Vietnamese and Chinese exports of textiles and clothing.

Table 3: Employment share reallocation coefficients in 2017

	All	Foreign	State	Private
Continuers	-0.403* (0.228)	-0.360*** (0.103)	0.201 (0.170)	-0.243** (0.108)
Entrants	0.409* (0.240)	0.806*** (0.228)	-0.086* (0.049)	-0.312 (0.308)
Exiters	-0.006 (0.152)	-0.101 (0.065)	0.279*** (0.092)	-0.183 (0.134)
Total		0.345** (0.173)	0.394** (0.185)	-0.739*** (0.258)

Note: * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$. Each coefficient represents an estimate of β_{ost} from equation (2) using the change in employment share between 2000 and 2017.

private and foreign firms.

5.2 Long Term Effects on FDIs: Entry vs Subsequent Growth

The results suggest that industries with higher tariff cuts experience increases in employment mainly through foreign entrants, with the cumulative effects of tariff cuts increasing over longer time periods. Given the sizable long run post-entry employment growth among FDI entrants (recall Figure 5a), we examine how within-industry employment shifted strongly toward foreign entrants in higher tariff cut industries.

In particular, we analyze how much of the effects of tariff cuts on the change in the employment share of foreign entrants is driven by the effect of tariffs on employment size at entry versus on post-

entry employment growth. We decompose the employment share change Δes_{jost} into the change in the employment share due to initial employment at entry and due to subsequent changes to employment after entry. A specific example will help clarify the approach. Consider employment in industry j in year t accounted for by firms of ownership type o that have entered since 2000. The quantity E_{jost} is the sum of initial employment in the year of entry plus subsequent changes $E_{jost} = E_{jost} - E_{jost^e} + E_{jost^e}$ where we use the subscript t^e to denote the year of entry. Hence, for entrants we can rewrite the change in employment share as: $\Delta es_{jost} = \left(\frac{E_{jost} - E_{jost^e}}{E_{jt}} \right) + \left(\frac{E_{jost^e}}{E_{jt}} - \frac{E_{jos,2000}}{E_{j,2000}} \right)$ where the first bracketed term captures the change in employment since the year of entry and the second bracketed term measures the change in the employment share due to initial entry. In other words, if entrants did not grow after initial entry, the change in employment share would only be due to the second bracketed term.

We estimate equation (2) for foreign entrants, with the above two components as dependent variables separately, thereby decomposing the foreign entrant coefficients in Figure 14 into these two components. Figure 16a shows the estimates of the tariff cut effects that operate through the contribution of initial employment (second bracketed term, above decomposition) and Figure 16b shows the estimates that operate through the contribution of growth after entry (first bracketed term in the decomposition above). The effects through employment at entry dominate initially, but plateau in terms of contribution to reallocation around 2009 or 2010. The large magnitude of the effects through employment at entry suggests that the affiliates start big, which is consistent with Garetto, Oldenski and Ramondo (2019). The effects of tariff cuts through subsequent growth among foreign entrants start off smaller in magnitude, but continue to expand the overall contribution of foreign entrants to within industry employment reallocation post 2010, stabilizing by 2015. By 2017 more than half of the effects of tariff cuts are due to post-entry employment growth. This highlights the importance of studying adjustment of firm employment over a long period and the importance of tariff-induced post-entry employment growth among foreign entrants.

6 Foreign Entrants, Exports, and Sources of Capital

The literature on factors contributing to FDI affiliate establishment emphasizes variable trade costs (including trade policy), variable production costs (including wages and the costs of other inputs), and additional fixed costs of setting up new production facilities. As discussed in Section 2.1, Vietnam was already open to manufacturing FDI prior to the BTA, but tariffs on its exports to the U.S., a large export destination, were high on average at 31.9%, relative to U.S. tariffs

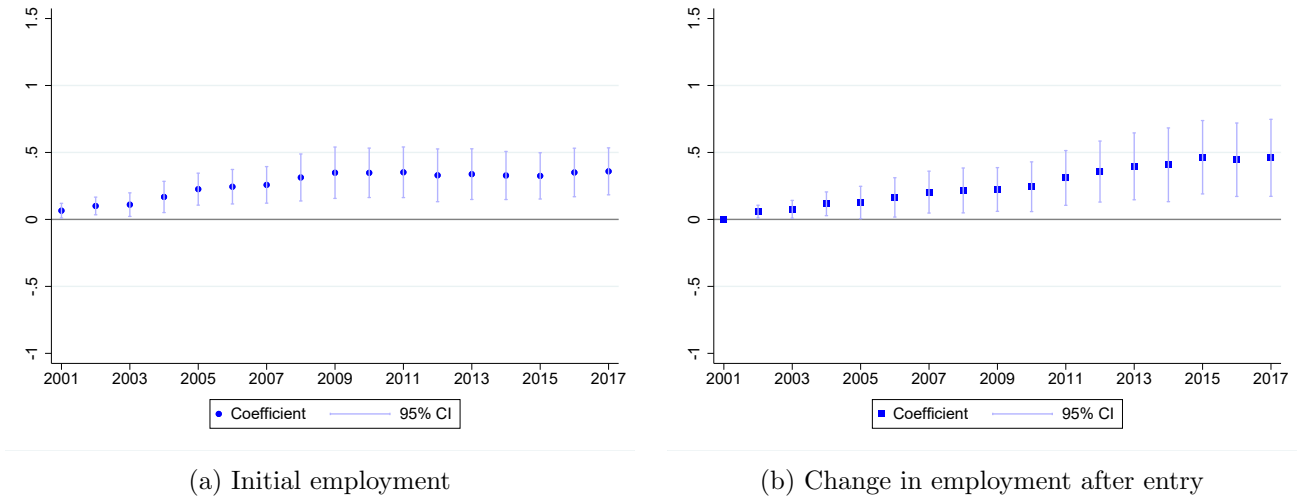


Figure 16: Decomposing changes in within-industry employment shares for foreign entrants by initial and subsequent employment and BTA tariff cuts

Note: Each point reflects an individual regression coefficient, β_{ost} , following equation (2). The base year is 2000 and the observations are weighted by 2000 employment. Controls include the change in Vietnam's MFN tariffs due to WTO accession, the change in \ln Chinese exports to the US in year t relative to 2000, and industry measures of US import quotas applied to Vietnamese and Chinese exports of textiles and clothing.

on its imports from other countries which faced much lower MFN tariffs at 2.9%. Consequently in this setting, despite low wages, Vietnam might not have been as attractive of a production location for foreign affiliates aiming to export because of the large variable trade cost of reaching this key destination. Our results in previous sections show that the reductions in U.S. tariffs on Vietnamese exports were associated with the entry and employment expansion by affiliates of foreign multinationals.

We provide further evidence that the observed association between tariff cuts, FDI entry, and subsequent employment growth among foreign entrants is closely linked to exporting, particularly of FDI firms, and discuss the origin countries of FDI that are driving these responses.

Exporters drive tariff cut-induced increase in employment share of foreign entrants

Figure 17 decomposes the estimates of the tariff coefficients from equation (2) for foreign entrants in Figure 14 into exporters and non-exporters for years where data on exporter status is available.⁴⁶ If entering foreign firms are not influenced by the BTA tariff cuts through exporting, we would expect the coefficient on tariffs to be small in magnitude and statistically insignificant for exporter entrants (or similar in magnitude to non-exporters). Instead, we find that the coefficients on tariffs for the exporter entrants are similar in magnitude to the tariff coefficients on the overall foreign

⁴⁶Exporting status is based on year t . The annual enterprise survey does not report firm-level exports by destination country and the Vietnam Customs office does not share transaction-level import and export data with researchers.

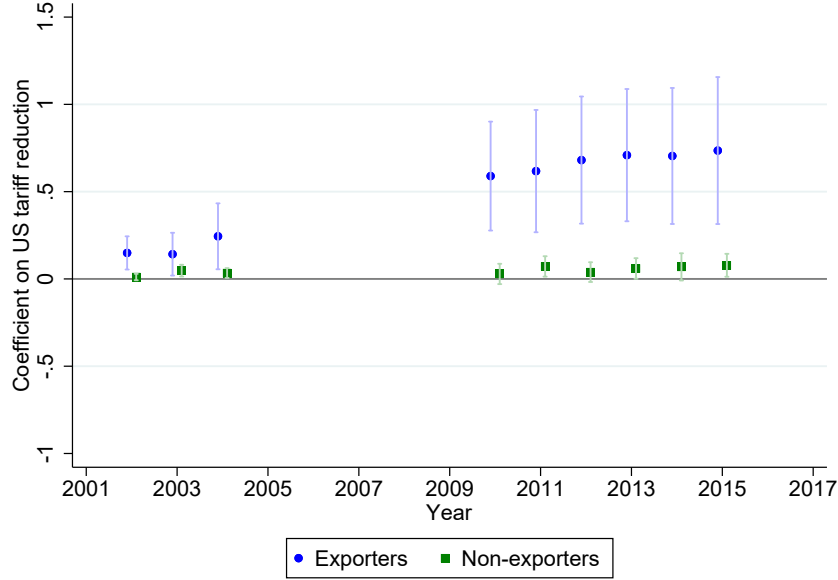


Figure 17: Changes in foreign entrant employment shares for exporters and non-exporters and BTA tariff cuts

Note: Each point reflects an individual regression coefficient, β_{ost} , following equation (2). Exporter status is only observed for a subset of years. The base year is 2000 and the observations are weighted by 2000 employment. Controls include the change in Vietnam's MFN tariffs due to WTO accession, the change in \ln Chinese exports to the US in year t relative to 2000, and industry measures of US import quotas applied to Vietnamese and Chinese exports of textiles and clothing.

entrants from Figure 14, while the coefficients for non-exporter entrants are small in magnitude and mostly statistically insignificant.⁴⁷

This pattern is also consistent with the post-entry employment growth in foreign firms being concentrated among the exporters. Appendix Figure C16 repeats the analysis from Figure 5a by separately tracking initial and post entry employment of the cohort of foreign firms that entered in 2001, split into those that exported in 2002 and those that did not export.⁴⁸ At time of entry there is a relatively small difference in mean employment. However, the cumulative employment growth after entry is much stronger for foreign firms that are exporting in 2002 than for those

⁴⁷The use of overall exporter status (rather than status as an exporter to U.S.) might potentially be problematic because it does not provide direct evidence that these exporters export to the U.S. To the extent the exports to the U.S. do not play a role in exporting for FDI entrants, we would expect the magnitude of the coefficient on tariffs for exporters to be small in magnitude and statistically insignificant. However, the coefficients are large in magnitude and statistically significant. This is consistent with regression results in Figure 6, which illustrated with industry-level data, Vietnamese exports expanded due to US tariff cuts, with the cumulative effects increasing over time. Furthermore, in Appendix B.1.2, we use the 2009 Vietnam Technology and Competitiveness Survey, which includes information on exporting by destination for a subsample of foreign and private firms from the annual enterprise survey, and show that almost a quarter of foreign firms that export (accounting for 41% of workers in foreign firms) list the U.S. as either their primary or secondary export market.

⁴⁸We focus on exporter status in 2002 because that is the first year in which firms report exporting status. We find similar results for entry and export cohorts of other years (Figure C17). In particular, this pattern holds for the 2001 entry cohort based on exporting in 2004 or not, the 2001 entry cohort based on exporting in 2010 or not, and the 2005 entry cohort based on exporting in 2010 or not.

that are not, with the difference increasing over time.

Sources of FDI responding to trade policy change in a host country While the source country of FDI in a host country is often not observed, our data contains this information. We find that the tariff-induced employment expansion is due to foreign affiliates from countries other than the U.S., highlighting the importance of studying the responsiveness of all sources of FDI, even if one of the source countries is the large export destination experiencing the trade policy change. The information on the source country of FDI in our data indicates that non-U.S. multinationals account for most of manufacturing FDI in Vietnam prior to the BTA (as noted in Figure 4 earlier). When we separately estimate the tariff cut effects on employment share changes of foreign entrants by U.S. and non-U.S. sources of FDI in equation (2), most of the effects are driven by affiliates of non-U.S. multinationals. Figure 18 decomposes employment share of foreign entrants from Figure 14 into U.S. and non-U.S. sources of FDI and shows that tariff declines are mainly associated with increased employment in FDI entrants of non-U.S. sourced FDI, with U.S.-sourced FDI playing only a very minor role. Appendix Figure C18 presents the decomposition by Japan, South Korea, Taiwan, and other FDI source countries and shows that FDI from Japan and South Korea accounts for most of the tariff-cut induced employment share reallocation toward foreign entrants.

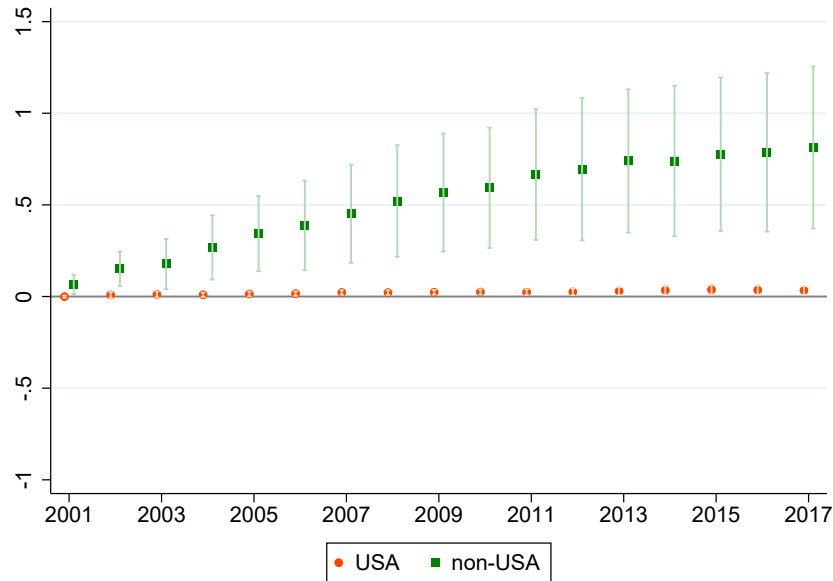


Figure 18: Changes in foreign entrant employment shares for US and non-US source FDI and BTA tariff cuts, 2000-2017

Note: Each point reflects an individual regression coefficient, β_{ost} , following equation (2). The foreign entrant is defined as US and non-US based on the FDI source country. The base year is 2000 and the observations are weighted by 2000 employment. Controls include the change in Vietnam's MFN tariffs due to WTO accession, the change in \ln Chinese exports to the US in year t relative to 2000, and industry measures of US import quotas applied to Vietnamese and Chinese exports of textiles and clothing.

Consistent with tariff-induced expansion of employment in non-U.S. FDI affiliates, we show that the tariff-induced increase in exports to the U.S. is not mainly driven by affiliates of U.S. multinationals.⁴⁹ Using data from Antras (2015), Figure 19a reports the share of Vietnam’s manufacturing exports to the U.S. from affiliates of U.S. multinationals (i.e. related party trade) and from non-U.S. affiliated firms (i.e non-related party trade). The non-U.S. affiliated firms make up the majority of Vietnamese exports to the U.S. from 2000-2011. In 2000, non-U.S. affiliated firms account for 96.2% of exports while U.S. affiliates account for only 3.8%. By 2011, the share of exports by non-U.S. affiliates decreases slightly to 83.1% while U.S. affiliates account for 16.9% (13.3 and 2.7 billion dollars respectively). This is consistent with low shares of FDI from the U.S. throughout the period (Figure 4).⁵⁰ Figures 19b and 19c examine the tariff cut effects on Vietnamese exports to the U.S. from Figure 6 by estimating equation (1) separately for exports from U.S. and non-U.S. affiliates. While lower tariffs are associated with increased exports for both affiliated and non-affiliated firms, the coefficients on tariffs in the affiliated firms sample are smaller in magnitude and less precise. The coefficients on tariffs from firms that are not affiliated with U.S. multinationals are always statistically significant and larger in magnitude over time (Figure 19c). Jointly, these three figures show that most of the increase in BTA-tariff induced exports stem from non-U.S. affiliated trade. Focusing solely on the response of FDI from U.S. multinationals to the BTA-induced tariff cuts would miss much of how foreign firms and multinationals respond in terms of entry, employment and exports when facing lower export variable costs to a large destination market.

As discussed in Section 2, the most common sources of FDI to Vietnam during this period are Taiwan, South Korea, and Japan. These East Asian countries make up the majority share of FDI sources before and after the trade agreement (82% in 1999 and 90% in 2017, Figure 4). Once the agreement reduced the tariffs on Vietnam’s exports to a key export destination, Vietnam became a

⁴⁹Categorized by the Census Bureau as related party trade, these transactions include trade by U.S. companies with their subsidiaries abroad as well as trade by U.S subsidiaries of foreign companies with their parent companies. See notes in Figure 19 for more information.

⁵⁰The lack of export destination data precludes us from quantifying the exact contribution of non-U.S. FDI firms (relative to private firms and SOEs) to non-affiliate exports to the U.S. Although private firms and SOEs also export, we show in Appendix B.1.2 that FDI firms play a substantially larger role in exporting, including exporting to the U.S.. This is due to higher propensity to export, higher export intensity, and exporting more immediately upon the start of operations relative to domestic private firms and SOEs. As we show and discuss in Appendix B.1.2, 65-75% of foreign firms export (accounting for 90% of workers in foreign firms) and 66% of foreign exporters export at least 80% of their sales. In addition, foreign entrants are much more likely to start exporting in the first year of operation, with 85% of them reporting exporting within one year from the start of operations. The corresponding numbers are substantially lower for private domestic firms. That, combined with the evidence above on the importance of exporting FDI in explaining the trade-induced increase in employment among FDI entrants, suggest that FDI entry from third countries plays an important role.

more attractive production country and foreign affiliates from geographically closer countries with existing regional supply chain linkages might have been better positioned to respond to the tariff cuts (see, for example Head and Mayer (2019), Antràs et al. (2022)). Our findings are related to studies that have found production reallocation effects across countries in response to trade policy, focusing on a particular industry (see Flaaen, Hortaçsu and Tintelnot (2020) for evidence from the washing machine market, Head and Mayer (2019) for cars, and Blonigen (2002)). We show the impact of trade policy changes on the entry and subsequent employment expansion of FDI affiliates in a host country, highlighting the role of affiliates of multinationals from third countries in a manufacturing-wide setting.⁵¹

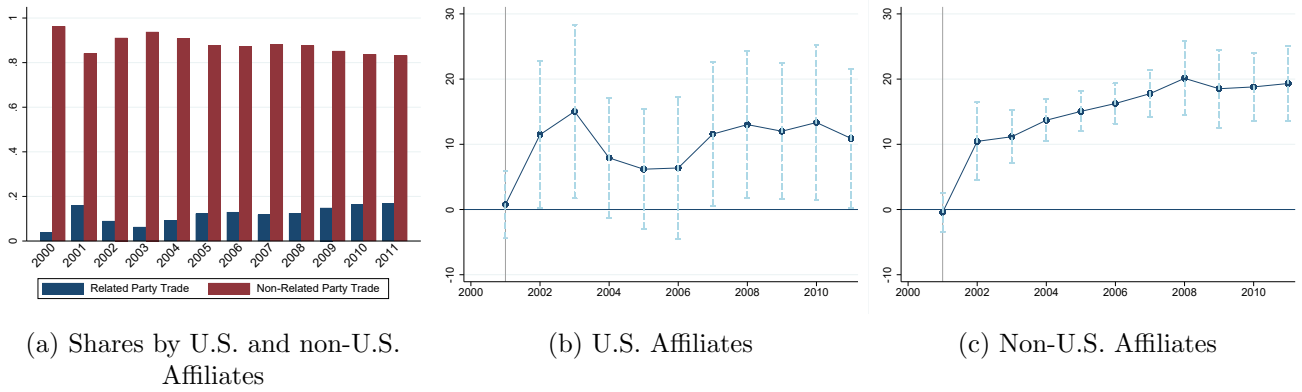


Figure 19: Vietnam-U.S. exports by U.S. and non-U.S. affiliates and BTA tariffs, 2000-2011

Note: Panel (a) reports the share of Vietnamese manufacturing exports to the U.S. by U.S. and non-U.S. affiliates. Exports by U.S. affiliates are also known as Related Party Trade. These are transactions which includes any person directly or indirectly owning, controlling, or holding with power to vote, $\geq 5\%$ of the outstanding voting stock or shares of any organization and such organization (U.S. Census Bureau). In Panels (b) and (c), each point reflects an individual regression coefficient, $\hat{\beta}_t$, following equation (1). In Panel (b), the dependent variable is log Vietnamese exports to the U.S. from U.S. affiliates. In Panel (c), the dependent variable is log Vietnamese exports to the U.S. from non-U.S. affiliates (Non-Related Party Trade). BTA was implemented in Dec 2001, as indicated by the gray line, and the base year is 2000. Controls include 3-digit industry FEs, year FEs, the change in Vietnam's MFN tariffs due to WTO accession, the change in ln Chinese exports to the US in year t relative to 2000, and US import quotas on textiles and clothing applied to Vietnam and China respectively. Dashed lines show 95 percent confidence intervals. Standard errors clustered at the 3-digit industry level. Weighted by year 2000 total Vietnamese exports to the US.

Tariff cuts induce export growth to other countries in the long run The BTA initially led to increases in Vietnamese exports to the U.S. in industries with bigger tariff cuts. However, over time, Vietnamese export growth in industries with bigger tariff cuts also expands to the rest of the world, highlighting the longer-term effects of trade policy. Figure 20 reports the coefficients on tariff cuts from estimating equation (1) for Vietnamese total world exports, Panel (a), and Vietnamese total world exports less the U.S., Panel (b). The coefficients on tariffs in Panel (b) increase in magnitude and become statistically significant about 10 years after the implementation of the BTA. While this is beyond the scope of the current paper, these results on Vietnam's exports

⁵¹Tintelnot (2017) focuses on intensive margin adjustments. Likewise, Head and Therier (2019) focus on choices of export markets and product lines in response to trade agreements in existing affiliates.

to the world without the U.S. are consistent with the presence of scale spillovers to other markets. In addition, this pattern of tariff-induced export expansion is consistent with (1) the foreign entry responses and (2) the subsequent longer-term employment growth responses in foreign entrants to tariff cuts in Section 5.2.

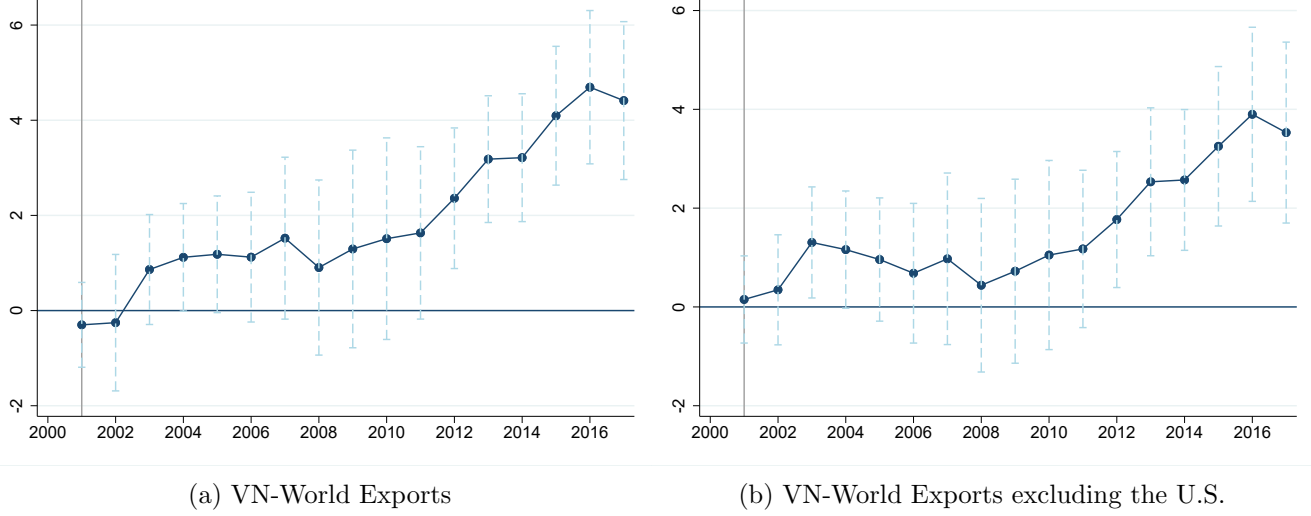


Figure 20: Vietnam-World exports including and excluding the US and BTA tariffs, 2000-2017

Note: Each point reflects an individual regression coefficient, $\hat{\beta}_{it}$, following equation (1). In Panel (a), the dependent variable is log Vietnamese exports to the world in an industry. In Panel (b), the dependent variable is Vietnamese exports to the world in an industry excluding the U.S. BTA was implemented in 2001, as indicated by the gray line, and the base year is 2000. Controls include 3-digit industry FEs, year FEs, the change in Vietnam’s MFN tariffs due to WTO accession, Chinese exports to the US in year t , and US import quotas on textiles and clothing applied to Vietnam and China respectively. Dashed lines show 95 percent confidence intervals. Standard errors clustered at the 3-digit industry level. Weighted by year 2000 Vietnamese exports to the world.

Overall, this section further highlights the importance of tariff-induced export opportunities in a key export destination encouraging foreign entry and subsequent employment growth in foreign entrants and the important role played by third country parties in this process.

7 Conclusion

Recent changes in trade policy have renewed the interest in how trade policy shapes global supply chains and foreign direct investment. Our study focuses on a particular slice of global supply chains: a lower-income host country facing tariff declines in reaching a large export market. Our analysis highlights the impact of this policy change on FDI—from multiple sources—and the interaction between foreign, private domestic, and state-owned firms. Overall, our analysis emphasizes that firm entry and firm ownership are important factors for understanding the short and long-term impacts of lower trade costs of reaching export markets. We find that foreign and private domestic firms primarily drive the firm-entry margin in response to tariff cuts.

Second, entering firms account for much of the observed employment growth in response to

tariff cuts. The tariff-induced employment growth among entering firms is concentrated primarily among the foreign entrants. Despite tariff-induced private domestic entry, these entrants do not contribute to overall employment growth. We acknowledge that the question remains as to why these private domestic firms enter small and do not subsequently grow. On the other hand, state firms stall the reallocation through lower contraction of incumbents and less exit in industries with bigger tariff cuts. Our analysis shows that from a perspective of a lower-income host country, the employment growth due to FDI entry is not just a source of capital and exports, but also a source of formal sector jobs.

About half of the tariff-induced growth in employment share among foreign entrants is due to employment growth after entry, which takes substantial time to materialize. Shorter-term analysis would have missed the longer-term cumulative effects of trade policy. Most of this is driven by post-entry employment growth in exporting foreign firms, further highlighting the link between foreign affiliate entry and BTA-induced export opportunities. Finally, most of this export growth stems primarily from trade not related to U.S. multinationals. Focusing solely on the response of FDI from the U.S. multinationals to BTA-induced tariff cuts would have missed much of how foreign multinationals responded to export opportunities from Vietnam. This highlights the importance of studying FDI from several sources in a lower-income host setting.

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