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Trading places: How trade policy is reshaping multinational firms' location

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Trading Places: How Trade Policy Is Reshaping Multinational Firms' Location*

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Abstract

The recent changes in trade policy have significantly impacted trade flows. There is an ongoing debate on whether and to what extent firms may have also reacted to the new trade barriers by modifying the spatial organization of their multinational production to circumvent them. This paper aims to provide new evidence on whether such a tariff-induced shift in the location patterns of multinational firms has actually taken place. To do so, we exploit the changes in U.S. import tariffs in 2018-2019. The evidence indicates that firms have indeed responded to these new tariffs by adjusting the extensive margin of their multinational production across countries and that both structural factors and trade agreements played an important role in shaping these adjustments.
Keywords: Multinational Firms, Foreign Direct Investment, Trade Policy, Tariffs
JEL-Codes: F13, F21, F23

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1. Introduction

The global economy has recently witnessed a major shift in the trade policy stance. Thus, starting in 2018, the U.S. gradually implemented several increases in tariffs on imports of specific products and from specific countries (Fajgelbaum et al. (2020)). These policy changes are economically important. The new tariffs enacted by the U.S. on imports from China covered about USD 350 billion in trade (Fajgelbaum and Khandelwal (2022)) and have affected significantly bilateral trade between U.S. and China and with bystander countries (Fajgelbaum et al. (2024), Alfaro and Chor (2023), Freund et al. (2024)). Such policies can have non-trivial effects on other economic activity. In particular, as firms adapt their supply chains and re-optimize buying and selling decisions in response to higher trade costs, they may adjust their networks of foreign affiliates across countries. Have location patterns of multinational firms been altered by the new U.S. tariffs? To what extent have these trade policy changes affected differentially the expansion of networks of affiliates multinationals in certain countries with certain underlying characteristics? This paper aims to address these questions. In so doing, we use the introduction of new U.S. tariffs on imports from China (hereafter, "U.S. tariffs" for simplicity) as a natural experiment to study the effects of trade policy changes on multinational activity.

There is anecdotal evidence of the reallocation of multinational activity taking place following the U.S.-China trade war. While the number of cross-border investment projects announced in China dropped by 44.0% in 2017-2022 relative to 2011-2016, such announcements in Mexico increased by 21.0%, rising the country's global market share by 0.4 percentage points.[1] The share of such announcements by Chinese firms in some countries has also skyrocketed: increasing by 165% in Mexico and 162% in Vietnam. Yet, announcements of investment projects may not accurately capture the reallocation of firms' global operations. There is an ongoing heated debate –among governments and international orga-

[1] Data on announcements of cross-border investments sourced from the FT's fDi Markets.

nizations[2], and in academia[3], business circles[4], and the press[5]– on the effects of the new tariffs on cross-border investment and the ability of firms to circumvent these trade barriers through establishment of foreign affiliates in countries that are not or less subject to them. Yet, so far, to the best of our knowledge, there is no thorough cross-country evidence on the effects of tariff-induced changes on the location of multinational enterprises (MNEs).

In this paper, we assess the effects of the new U.S. tariffs on the location patterns of Chinese multinational firms. More specifically, we use the introduction of such tariffs as a shock to explore whether and to what extent these firms increased their foreign affiliates in third countries in response to such tariffs and the mechanisms through which this adjustment took place, including those associated with structural and policy factors.

In so doing, we utilize the theoretical framework proposed by and the respective theory-based estimates reported in Fajgelbaum et al. (2024) as a starting point. They allow for establishing key characteristics of countries that would likely benefit most from the new U.S. tariffs. Consistent with these framework and estimates, we examine the extent to which Chinese multinational firms expanded more in countries that i) are substitutes to China, i.e., they are similar to China in terms of economic structure; and ii) operate along a downward-sloping supply curve/with economies of scale, i.e., they could profitably expand exports to third countries once production is reallocated to serve the US. In addition, we consider the role of trade agreements, which have been argued to be a channel

[2] For example, on September 17, 2024, several U.S. senators wrote a letter to the President asking for policy action in light of increased trade and investment of Chinese firms in Mexico as "(...) *Chinese firms are exploiting this nearshoring trend to avoid paying tariffs on goods they export to the U.S. market*." The share of words devoted to the coverage of U.S.-China trade tensions in the IMF country reports spiked after 2017 (IMF, 2023).

[3] According to Scopus, there are 725 articles in Economics, Econometrics and Finance in 2016-2024 identified searching for "trade war" compared to 39 in 2000-2015. While 214 articles in 2016-2024 study the effects of U.S-China trade war on trade (i.e., "trade war" AND "effects" AND "trade"), 7 consider the effects on foreign direct investment (i.e. "trade war" AND "effects" AND "foreign direct investment").

[4] For example, the number of keywords related to reshoring, nearshoring, onshoring, nearshoring, and related terms mentioned in firms' earning calls (i.e., conference calls to discuss firms' financial results) more than tripled in 2018-2023 (Gopinath et al. (2024))

[5] According to Factiva, a global news monitoring service, the number of press articles on the trade war in 2016-24 was 13 times higher than in 2000-15, and those mentioning investment 25-fold higher.

permitting MNEs to shift their activities to locations from which they can benefit from tariff-free trade with the U.S.

To implement this empirical approach, we first build a dataset that combines several databases including data on: (i) location of foreign affiliates of multinational firms globally from the Dun & Bradstreet's *WorldBase*, which allows us trace the patterns of reallocation across nearly 50 host and home countries and sectors over time within manufacturing at a level of disaggregation that is unattainable with the official FDI statistics; (ii) countries' categorization in substitute or complete to China and operating along a downward-sloping supply or an upward-sloping supply curve from Fajgelbaum et al. (2024); (iii) measures of sectoral exposure to the new U.S. tariffs, which are constructed using the data on the increase in US tariffs to China on specific products from Fajgelbaum et al. (2020) after 2018; (iv) trade agreements from the Office of the United States Trade Representative (USTR) and the WTO; and (iv) tariff levels that U.S. threatened to impose on China before the country's WTO accession in 2001 from Handley and Limão (2017c).

The raw data is indicative of patterns of reallocation of MNE activity towards countries that can serve as China's substitutes, especially when they operate along a downward-sloping supply curve (Figure 1). To more formally test whether this has been the case, we estimate a gravity-based specification that relates the number of multinational firms' foreign affiliates at the country-pair-sector-year level with relevant country attributes (i.e., being substitute or complement to china and operating along with a downward- or upward-sloping supply curve) and sector characteristics (i.e., being more or less exposed to U.S. tariff increases) using Poisson Pseudo Maximum Likelihood (PPML). We control for confounding factors at the country-pair-sector, home-country-sector-year, and host-country-sector-year level through fixed effects and the country-pair-year level through country-pair linear trends and a binary indicator that captures time-variant bilateral coverage by trade agreements. Robust standard errors are clustered at the country-pair level.

Changes in U.S. tariffs may have been anticipated and even endogenous to

the location patterns of Chinese multinational firms. We account for these potential anticipation effects and endogeneity bias by estimating a reduced-form equation whereby sectoral exposure to actual tariffs is replaced by exposure to the tariffs that the U.S. could impose on imports from China before the country accessed the WTO in 2001 (i.e., Column 2 tariffs). We show that the pre-accession Column 2-MFN tariff margin at the sectoral level contains information about how U.S. tariffs on Chinese imports deviated from MFN in 2018-2020. Employing the Column 2-MFN tariff margins from the year 2000 also reduces concerns on endogenous trade policy, given that they correspond to a period in which China barely had multinational firms with foreign affiliates.

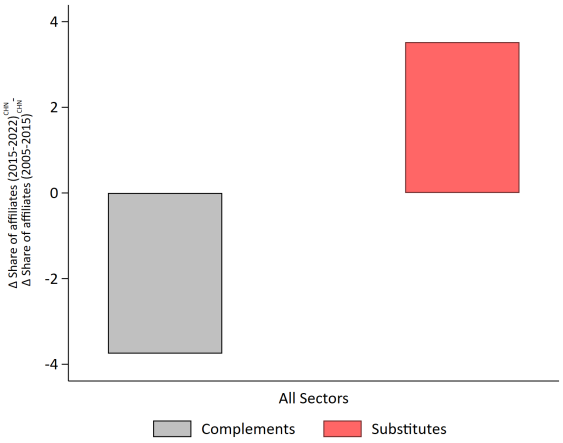
We find that countries that are substitutes to China and those that face a downward-sloping supply curve experienced a statistically significant increase in the number of affiliates of Chinese multinational firms they host relative to other countries in response to the new U.S. tariffs. This result is in line with the empirical results in Fajgelbaum et al. (2024) in the context of multinational production. The adjustment has been particularly notable for the sectors highly exposed to the new U.S. tariffs. More precisely, estimates suggest that third countries that are substitutes to China and face a downward-sloping supply curve attracted 14.0% more affiliates from Chinese MNEs in the sectors highly exposed to the new U.S. tariffs relative to other countries after these tariffs were introduced.

Our results also reveal that there seems to have been anticipation effects, whereby Chinese multinational firms already started establishing foreign affiliates in countries that are substitutes to China and operate along a downward-slopping supply curve. This was particularly the case in sectors that later experienced more tariff increases in the U.S. *and* sectors which could have faced higher U.S. tariffs before accessing the WTO. Moreover, once anticipation effects are accounted for and conditional on the prevalence of these favorable structural factors, countries covered by trade agreements with the U.S. experienced a stronger expansion of Chinese multinational firms than countries without such agreements in the most tariff-exposed sectors. The opposite is also true: condi-

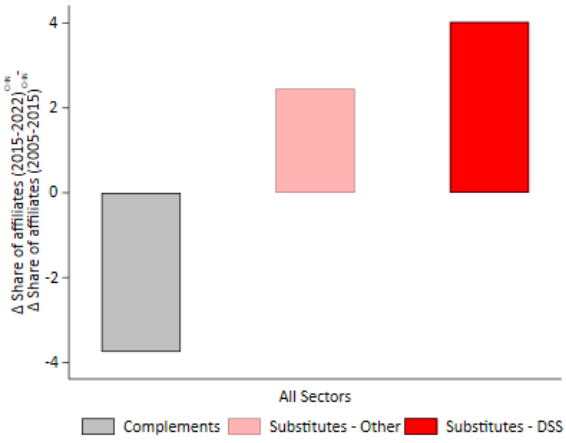
tional on the presence of a trade agreement with the United States, host countries with favorable structural conditions experienced a statistically significantly stronger expansion of Chinese multinational firms than the countries with such characteristics. At the same time, countries covered by a PTA with the United States but lacking auspicious structural conditions did not experience a statistically significant rise in multinational activity after the new U.S. tariffs were imposed. Finally, all our results hold when we use the tariffs that the U.S. could have applied on Chinese imports before China joined the WTO instead of the U.S. actual tariffs to capture sectoral exposure.

Figure 1: Reallocation of MNE Activity Across Types of Countries

(a): The Role of Substitutability of China



(b): The Role of Supply Curve



Note: The figure shows the mean difference between the change in the share of affiliates of multinational firms from China in 2015-2022 and the change in the share of affiliates of multinational firms from China in 2005-2015 across countries within the following groups: Complements, Substitutes, Substitutes with downward-sloping supply curve (DSS) following the classifications from Fajgelbaum et al. (2024).

This study contributes to three main streams of the literature. First, it is related to a large number of papers that examine factors influencing MNE activity and patterns of foreign direct investment (FDI).[6] A sub-stream of this literature

[6] e.g., Carr et al. (2001b), Helpman et al. (2004), Ramondo and Rodriguez-Clare (2013), Alfaro and Chen (2014), Ramondo et al. (2015), Conconi et al. (2016), Tintelnot (2017), Garetto et al. (2019), Antràs et al. (2022) For a review, see e.g., Blonigen and Piger (2014), Blonigen (2005) and Antràs and Yeaple (2014).

considers the role of policies in influencing MNE activity, including the effects of trade and other policies.[7] For example, several studies find theoretical and empirical evidence of tariff-jumping FDI (e.g., Brainard (1997), Feinberg and Keane (2006), Blonigen and Feenstra (1997), Blonigen (2002)).[8] More recently, Alfaro et al. (2016) study the impact of tariff reductions on firm boundaries and McCaig et al. (2022) on entry of foreign MNEs. This is also highlighted as undeveloped but growing field of study in Antràs and Chor (2022). We contribute to this literature by exploiting the new tariffs imposed by U.S. in 2018-2019 as a natural experiment to study the effects of trade policy changes on location decisions of MNEs from affected home countries.

Second, this paper is directly linked to the rich literature studying the consequences of the 2018-2019 U.S.-China trade war, including the effects of the tariff hikes on trade patterns, prices and welfare.[9] Several studies look at the effect of those tariffs on trade reallocation towards bystander countries (Alfaro and Chor (2023), Freund et al. (2024), Fajgelbaum et al. (2024), Iyoha et al. (2024)). They find that the drops in the U.S. import share from China were associated with gains by other countries (Alfaro and Chor (2023), Freund et al. (2024); and that their exports increased to the United States and elsewhere (Fajgelbaum et al. (2024)).[10] In particular, evidence on Mexico indicates that the effects have been strongest in products most exposed to US-China tariffs and for firms engaged in global value chains, which are mostly foreign-owned (Utar et al. (2023)).[11] These findings could be suggestive of potential tariff-induced pick-up in FDI activity in bystander countries. Yet, to the best of our knowledge, the relationship between the new U.S. tariffs and adjustments in MNE location has not been explicitly

[7] This includes FDI promotion (Harding and Javorcik (2011)) and international agreements (Chen (2009).

[8] There is also related literature on endogeneity of trade policy to FDI (e.g., Blanchard and Matschke (2015).

[9] See Fajgelbaum and Khandelwal (2022) for a review. The evidence points to large drops in U.S. imports and exports (Amiti et al. (2019), Fajgelbaum et al. (2020), Handley et al. (2023)), a high pass-through of tariffs to importer prices (Cavallo et al. (2021), Amiti et al. (2020), Flaaen et al. (2020)), and negative effects on U.S. welfare (Amiti et al. (2019, 2020), Fajgelbaum et al. (2020), Grossman et al. (2024)), employment (Flaaen and Pierce (2019), Javorcik et al. (2022)), real wages (Fajgelbaum et al. (2020)), stock prices (Amiti et al. (2021)), and political outcomes (Blanchard et al. (2024), Autor et al. (2024)), among others.

[10] Other papers also examine the effects of other U.S. trade policies on trade (Conconi et al. (2021), Corsetti et al. (2024)).

[11] Xue (2024) studies the link between U.S. tariffs, trade and FDI using a model of trade and FDI diversion.

examined in a cross-country setting.

Third, this paper is also linked to a wider literature on the role of uncertainty in cross-broader trade and investment. While we do not primarily focus on this channel, some of our results are suggestive of the possible effect of uncertainty prior to the enactment of the new U.S. tariffs. Existing studies investigate the impact of exogenous changes in trade policy uncertainty surrounding specific events, including China's entry into the WTO (Handley and Limão (2017b, 2022)), Brexit (Graziano et al. (2020)), and the U.S.-China tariff hikes (e.g., Benguria et al. (2022)). Several papers explore changes in cross-border trade and FDI in response to broad geopolitical shifts (e.g., Gopinath et al. (2024), Aiyar et al. (2024). This paper considers the effects of a major specific trade-policy event within that broad political environment on changes in patterns in global MNE activity.

The remainder of the paper is structured as follows: Section 2 briefly outlines the U.S. new tariff policy towards China. Section 3 introduces the data used in the empirical analysis. Section 4 examines the role of country structural factors and sectoral exposure to tariffs in the reallocation of multinational activity. Section 5 turns into the role played by trade agreements. Section 6 studies anticipation effects. Section 7 concludes.

2. The Changes in U.S. Tariffs

The imposition of tariffs by the U.S. in 2018-2019 marked a sharp departure from the earlier trend of low and stable tariffs in the U.S. (Fajgelbaum et al. (2020)). Tariff increases were first limited to few import items (e.g., aluminum, steel, washing machines, solar panels) in early 2018 and were then subsequently extended to cover a broader range of imported products. In particular, average tariffs increased from 3.7% to 25.8% and raised tariffs on import transactions corresponded to about 2.6% of GDP (Fajgelbaum and Khandelwal (2022)).[12] Importantly, this shock was largely asymmetric across origin countries (Mattoo and

[12] In January 2020, the U.S. and China signed the so-called Phase-One Agreement with the aim to de-escalate the measures, but bilateral tariffs remained high.

Staiger (2019)).[13] Such an event therefore offers a unique experiment consisting of an important trade cost shock that can impact location of multinational firms. Specifically, MNEs may increase their affiliates' presence in third countries that may serve as alternatives to China and offer lower trade costs with the United States as means of reducing the negative effect of new U.S. tariffs on their activities.

3. Data

We build a rich dataset that combines three main types of data from various sources:

- **Multinational Activity:** We use data on MNE global networks of foreign affiliates from Dun & Bradstreet's (D&B) *WorldBase*, which covers private and public firms in over 200 countries and territories and allows us to compute the number of MNE affiliates by country-pair-sector in a given year over the period 2005-2022.[14] In particular, we focus on manufacturing and observe 27 3-digit level NAICS sectors across 2400 country pairs. This level of aggregation allows us to analyze reallocation of MNE activity in different manufacturing sectors across countries in ways that would be impossible with the official cross-country FDI data that remain highly aggregated.[15]

- **Trade Policy Change:** We build on prior studies that identify a shift in the U.S. trade policy associated with the introduction (and threats) of tariffs targeting specific countries in 2018-2019 (e.g., Mattoo and Staiger (2019), Fajgelbaum and Khandelwal (2022)). In our analysis, 2018-2022 therefore

[13] Due to its nature, the shock has been referred to firms' input shock (Grossman et al. (2024)).

[14] This data has been extensively in the empirical literature on multinational activity and firm boundaries (e.g., Alfaro and Charlton (2009), Acemoglu et al. (2016), Alfaro et al. (2019, 2024)).

[15] Among others, NAICS 3-digit level sectors include 334 - Computer and Electronic Product Manufacturing, 335 - Electrical Equipment, Appliance, and Component Manufacturing; 336 - Transportation Equipment Manufacturing; while FDI statistics are reported for the manufacturing as a whole (i.e. 311-339 NAICS level sectors).

corresponds to the period of policy treatment whose effects on the reallocation of multinational activity in third countries. In addition, building on the insights in Handley and Limão (2017a, 2022), we identify the period of 2016-2017, covering the U.S. presidential campaign and the start of the term of the new administration, as the anticipation period. We discuss those two periods in Section 6.

- **Country Characteristics:** We adopt the theory-based empirical classification of countries that serve as China's substitutes or complements and that plausibly operate with downward-sloping supply curves from Fajgelbaum et al. (2024). We complement it with the data on countries' coverage by a PTA with the United States from the Office of the United States Trade Representative (USTR)[16] and on bilateral coverage by other PTAs from the World Trade Organization (WTO). Table A1.1 in the Appendix provides the list of countries in the different categories.

- **Sector Characteristics:** We also construct metrics of sector-(country-)-level exposure to the new U.S. tariffs. Specifically, using the data on tariffs from Fajgelbaum et al. (2020), we calculate the share of Chinese export products affected by U.S. import tariff increases within each (3-digit NAICS) sector. Sectors are considered as highly exposed if they have above the median share of products affected by tariff hikes (see Table A1.2 in the Annex.) In the last section on anticipation effects, we also exploit the data on tariff levels that U.S. threatened to impose on China before the country's WTO accession in 2001, which we obtain from Handley and Limão (2017c).

Our combined dataset is a panel with a country-pair-sector-year as the unit of observation. The data covers 48 host and home countries (28 of which are China's substitutes and 20 China's complements) plus China and the US as home countries for the years 2005-2022.[17] These countries jointly account for 96% of

[16] The data is publicly available on the USTR website [last accessed on October, 6, 2024].

[17] Our sample starts in 2005 to cover at least a decade prior to the start of the U.S. administration that enacted the tariffs and to avoid conflating the effects of China's WTO accession. We cannot include 2023 because lack data on multinational firms.

the multinational firms and 68% of the foreign affiliates worldwide.

4. Did Chinese Multinationals Enter Countries with Favorable Structural Characteristics?

To answer this question, we focus on countries that experienced larger relative increases in trade flows as a result of changes in 2018-2019 tariffs according to the existing estimates. More precisely, we use the theory-based estimates of the tariff elasticity of exports to the US and third countries from Fajgelbaum et al. (2024) to identify: (i) whether a country's exports substitute or complement China, as determined by their relative production and trade structures, and (ii) whether a country operates along a downward- or upward-sloping supply curve, as determined by the nature of its supply capacity and specifically the possibility to profitably expand production and trade to third countries. This framework offers an attractive starting point to study patterns of adjustment of multinational firms for two main reasons. First, the ability to substitute exports from China and do it along a downward-slopping supply curve reveals comparative advantages of a given location. Second, multinational firms account for a large share of global trade.

To consistently guide our empirical investigation of the changes in multinational firms' networks in response to the new U.S. tariffs, we develop the following testable hypotheses:

Hypothesis 1 *Chinese multinational firms expanded their affiliates in countries that due to their structural similarities can serve as China's substitutes.*

Hypothesis 2 *Chinese multinational firms expanded their affiliates in countries that can serve as China's substitutes and face a downward-sloping supply curve.*

Hypothesis 3 *Chinese multinational firms' expansion took place mainly in the sectors with high exposure to U.S. tariff increases.*

To empirically test Hypotheses 1 and 2, we estimate, respectively, the follow-

ing equations at the country-pair-sector-year level using PPML:

$$N_{ijkt} = \exp\left\{\beta \mathbb{1}\{\Omega_{ij} = 1, s_j = 1, d_j = 1, \eta_t = 1\} + \alpha PTA_{ijt} + \mathbf{FE}\right\} + v_{ijkt} \quad (1)$$

where the dependent variable (N_{ijt}) is the number of multinational affiliates from a given home country i in the host country j in sector k in the time t. The indicator $\mathbb{1}\{\Omega_{ij} = 1, s_j = 1, d_j = 1, \eta_t = 1\}$ takes a value of 1 if four conditions are fulfilled. First, it captures the activity of multinational firms whose home country is China in third-countries other than China and the United States (i.e., $\Omega_{ij} = \mathbb{1}\{i = CN, j \neq \{CN, US\}\}$ where CN denotes China and US denotes the United States).[18] Second, s_j identifies host countries that can serve as substitutes for China's imports (as opposed to complements). Third, d_j identifies those countries with a downward-sloping supply curve and can raise sales to the rest of the world. Both s_j and d_j come from the classification of countries resulting from the theory-based estimation of the trade effects of U.S. tariffs by Fajgelbaum et al. (2024).[19] Fourth, $\eta_t = 1$ corresponds to the period in which the new U.S. tariffs were in place, i.e. $t = \{2018, ..., 2022\}$. β is the main coefficient of interest and captures the differential effect of the U.S. tariffs on the establishment of foreign affiliates by Chinese multinationals in third countries with certain structural characteristics. Specifically, if $\beta > 0$, then Chinese multinationals have expanded their activity relatively more in countries with those structural characteristics following the enactment of the new U.S. tariffs.

The rest of the terms are controls and fixed effects. In particular, PTA_{ijt} is a binary indicator that takes the value of 1 if there is a preferential trade agreement between a given country pair in time t, and $\mathbf{FE} \equiv \delta_{ijk}^{IJK} + \delta_{ikt}^{IKT} + \delta_{jkt}^{JKT} + \delta_{ij}^{IJ,trend} \times t$ where δ_{ijk}^{IJK} is a set of country-pair sector fixed effects, δ_{ikt}^{IKT} is set of home-country-sector-year effects, δ_{jkt}^{JKT} is a set of host-country-sector-year fixed effects, and $\delta_{ij}^{IJ,trend} \times t$ are country-pair linear trends. The country-pair-sector fixed effects (δ_{ijk}^{IJK}) control for time-invariant factors related to country-, country-pair-

[18] We exclude the U.S. as a host country since we are interested in the effects of third countries.
[19] see Table A1.1 in the Annex for the full list.

or sector-characteristics and may affect MNE activity, including distance, common language, cultural ties, country comparative advantages related to natural resource endowments, or standard knowledge-capital model determinants of multinational activity (Carr et al. (2001a)).[20] The home-country-sector-year fixed effects (δ_{ikt}^{IKT}) account for any time-variant characteristics of the home country and the sector of the investor, including national and sectoral outward investment promotion schemes and investment protection guarantees, industrial policies or overall market dynamics in the sector of the MNE. The host-country-sector-year fixed effects (δ_{jkt}^{JKT}) control for any analogous time-variant characteristics of the host country and sector in which MNE can locate its affiliates. These can include national or sectoral inward investment promotion programs or other national or sector-level policies or economic factors. Country-pair linear time trends additionally account for potentially omitted FDI bilateral pretrends correlated with structural determinants in the receiving country, such as those arising from bilateral investment cooperation.[21] These sets of fixed effects and linear trends imply that identification comes from within country-par-sector variations that deviate from bilateral trends, including investment trends before the US imposed tariffs on China in 2018. Finally, we cluster standard errors at the country-pair level.

To test Hypothesis 3 and explore potential heterogeneous effects across sectors with differential exposure to the increase in U.S. tariffs, we slightly modify the estimation equation above. More specifically, we redefine the indicator variable to include an additional term (τ_k^h) that takes a value of 1 for sectors with high tariff exposure (i.e., if a sector has above the median share of products affected by the increase in U.S. tariffs), or 0 otherwise; and allow the coefficient β to vary depending on sector's tariff exposure (β_κ) where κ is the type of sector.

[20] For example, differences in real GDP and differences in human capital between a country pair.

[21] Linear trends also help control for the secular increase of trade between countries and the secular expansion of multinational production across countries.

This results in the following equation:

$$N_{ijkt} = \exp\left\{ \sum_{\kappa=0}^{1} \beta_\kappa \mathbb{1}\{\Omega_{ij} = 1, s_j = 1, d_j = 1, \eta_t = 1, \tau_k^h = \kappa\} + \alpha PTA_{ijt} + \mathbf{FE} \right\} + v_{ijkt} \quad (2)$$

The estimation results are presented in Table 1 with Columns 1-2 corresponding to Equation 1 and Hypothesis 1-2 and results in Column 3 to Equation 2 and Hypothesis 3.

Table 1: Differential Effects of the New U.S. Tariffs across Countries and Sectors

	(1)	(2)	(3)
$\mathbb{1}\{\Omega_{ij} = 1, s_j = 1, \eta_t = 1\}$	0.136***		
	(0.046)		
$\mathbb{1}\{\Omega_{ij} = 1, s_j = 1, d_j = 1, \eta_t = 1\}$		0.115**	
		(0.047)	
$\mathbb{1}\{\Omega_{ij} = 1, s_j = 1, d_j = 1, \eta_t = 1, \tau_k^h = 1\}$			0.131***
			(0.044)
$\mathbb{1}\{\Omega_{ij} = 1, s_j = 1, d_j = 1, \eta_t = 1, \tau_k^h = 0\}$			0.078
			(0.074)
Fixed Effects:			
Country-Pair-Sector	✓	✓	✓
Host-Country-Sector-Year	✓	✓	✓
Home-Country-Sector-Year	✓	✓	✓
Country-Pair Time Trend	✓	✓	✓
Country-Pair Controls	✓	✓	✓
Observations	188,291	188,291	188,291

Note: Ω_{ijt} identifies country pairs where the home of the multinational firms is China and the host country is a third country other than China and the United States. s_j identifies host countries that are substitutes to China, and d_j identifies countries that are substitutes to China and face a downward-sloping supply curve according to the classification by Fajgelbaum et al. (2024). See Table A1.1 in the Annex for the full list. $\tau_k^h = 1$ identifies sectors with high exposure to increases in tariffs (above the median) and $\tau_k^h = 0$ those with low exposure (below the median). Standard errors clustered by country-pair are reported in parentheses. *** p<0.01, ** p<0.05, * p<0.1

First, we find evidence in line with Hypotheses 1-2: Countries that are substitutes to China (Column 1) and those that, additionally, face a downward-sloping

supply curve (Column 2) experienced a statistically significant increase in the number of affiliates of Chinese multinational firms relative to other countries in response to the U.S. tariffs. Second, Chinese multinational firms expanded their activity especially in sectors with high U.S. tariff exposure in those countries compared to other countries, providing supporting evidence for Hypothesis 3.[22] Overall, estimates suggest that third countries that can serve as China's substitutes and operate along downward-sloping supplies attracted an average of 14.0% more affiliates from Chinese MNEs in the sectors highly exposed to the new U.S. tariffs relative to other countries after these tariffs were introduced.[23]

We now turn to explore the role of other country characteristics that could affect differential patterns in the creation of affiliates of Chinese firms following the rise in U.S. tariffs, and specifically the role of trade agreements.

5. Did Trade Agreements Affect the Adjustment of Multinational Activity?

By allowing duty-free access to the U.S. market for products that otherwise would have to pay increased tariffs, preferential trade agreements (PTA) can magnify the effects of countries' structural characteristics and incentivize stronger expansion of Chinese multinationals wishing to reduce their trading costs.[24] We accordingly formulate additional hypotheses to guide our analysis of the potential role of trade agreements:

Hypothesis 4a: *Conditional on being a substitute for China and operating along a downward-slopping supply curve, countries with a PTA with the United States experienced a larger expansion of Chinese multinational firms than those without a PTA.*

Hypothesis 4b: *Conditional on having a PTA with the United States, countries that are substitutes for China and operate along a downward-slopping supply curve*

[22] In additional estimations whose results are available from the authors upon request, we show that these results hold and particularly apply to sectors with high economic exposure to the U.S. in terms of the U.S. share in Chinese sectoral exports.

[23] The percent change is calculated as $[(exp(\beta) - 1)100]\%$, where β represents the estimated coefficient.

[24] PTA can act as a form of insurance to tariff hike threats, making some export destinations more attractive and thus potentially attracting multinational investment (Carballo et al. (2022)).

experienced a larger expansion of Chinese multinational firms than those without such characteristics.

Hypothesis 5: *The effect on the expansion of multinational firms in countries with favoring structural factors (i.e., being a substitute for China and operating along a downward-slopping supply curve) and a PTA with the US has been stronger in sectors with higher exposure to tariff increases.*

To test these hypotheses, we adopt the following general specification:

$$N_{ijkt} = \exp\left\{ \sum_{\kappa=0}^{1} \sum_{\ell=0}^{1} \beta_{\kappa,\ell} \mathbb{1}\left\{\Omega_{ij}=1, \Psi_{ij}=1, \eta_t=1, \tau_k=\kappa, PTA_{jt}^{US}=\ell\right\} + \right.$$
$$\left. + \alpha PTA_{ijt} + \mathbf{FE} \right\} + \upsilon_{ijkt} \quad (3)$$

where Ω_{ij} is defined as above (see Equation 1) and Ψij is a binary indicator that takes a value of 1 when the host country is China's substitute *and* faces a downward-sloping supply curve (i.e., $\Psi j = \mathbb{1}\{s_j = 1, d_j = 1\}$). We also add an additional condition ($PTA_{jt}^{US} = \ell$) and allow the coefficient β to vary depending on whether the host country has a trade agreement with the United States or not (where ℓ identifies the presence of an agreement). The rest of the terms and controls are the same as in Equation 2.

Results are presented in Table 2 with the top panel corresponding to Hypothesis 4a-b and the bottom panel to Hypothesis 5. Comparing the coefficients in the first and second row in Column 1 reveals that, conditional on country structural characteristics, trade agreements with the U.S. appear to have a small and non-significant additional effect on the expansion of Chinese multinationals after the new U.S. tariffs were imposed (p=0.11). The same holds within the set of highly tariff-exposed sectors, as shown in Column 2 (p=0.115). As such, we do not find strong evidence for Hypothesis 4a. Meanwhile, comparing the coefficients in the first and third row provides clearer support for Hypothesis 4b: conditional on the presence of a trade agreement with the United States, host countries that are China's substitutes and face downward-sloping supply

Table 2: Differential Effects of the New U.S. Tariffs by Trade Agreement Status

	(1)	(2)
Country Characteristics		
$\mathbb{1}\{\Omega_{ij}=1, \Psi_j=1, PTA_{jt}^{US}=1\}$	0.160***	
	(0.053)	
$\mathbb{1}\{\Omega_{ij}=1, \Psi_j=1, PTA_{jt}^{US}=0\}$	0.110**	
	(0.054)	
$\mathbb{1}\{(\Omega_{ij}=1, \Psi_j=0, PTA_{jt}^{US}=1\}$	-0.011	
	(0.054)	
Country Characteristics and Sector Exposure		
$\mathbb{1}\{\Omega_{ij}=1, \Psi_j=1, \tau_k^h=1, PTA_{jt}^{US}=1\}$		0.184***
		(0.057)
$\mathbb{1}\{\Omega_{ij}=1, \Psi_j=1, \tau_k^h=1, PTA_{jt}^{US}=0\}$		0.113**
		(0.051)
$\mathbb{1}\{(\Omega_{ij}=1, \Psi_j=0, \tau_k^h=1, PTA_{jt}^{US}=1\}$		-0.078
		(0.073)
$\mathbb{1}\{\Omega_{ij}=1, \Psi_j=1, \tau_k^h=0, PTA_{jt}^{US}=1\}$		0.128*
		(0.075)
$\mathbb{1}\{\Omega_{ij}=1, \Psi_j=1, \tau_k^h=0, PTA_{jt}^{US}=0\}$		0.098
		(0.080)
$\mathbb{1}\{\Omega_{ij}=1, \Psi_j=0, \tau_k^h=0, PTA_{jt}^{US}=1\}$		0.095
		(0.068)
Fixed Effects:		
Country-Pair-Sector	✓	✓
Host-Country-Sector-Year	✓	✓
Home-Country-Sector-Year	✓	✓
Country-Pair Time Trend	✓	✓
Country-Pair Controls	✓	✓
Observations	188,291	188,291

Note: Ω_{ijt} identifies country pairs where the home of the multinational firms is China and the host country is a third country other than China and the United States, Ψ_j identifies if the host country is China's substitute *and* faces a downward-sloping supply curve according to the classification by Fajgelbaum et al. (2024). See Table A1.1 in the Annex for the full list. $\tau_k^h = 1$ identifies sectors with high exposure to increases in tariffs (above the median) and $\tau_k^h = 0$ those with low exposure (below the median). PTA_{jt}^{US} takes a value of 1 when a country is covered by a preferential trade agreement with the United States in the given year, or zero otherwise. Standard errors clustered by country-pair are reported in parentheses. *** p<0.01, ** p<0.05, * p<0.1

curve experienced statistically significantly stronger expansion of Chinese multinational firms' than the countries with such trade agreements but without the structural conditions (p=0.0002).

In turn, countries covered by a PTA with the United States but lacking auspicious structural conditions did not experience a statistically significant rise in multinational activity. This is shown in the third row in column 1 and in rows 3 and 6 in column 2 by tariff exposure.

6. Have There Been Anticipation Effects?

The implementation of the new tariffs has represented a break from the previous long-term U.S. policy and represented a shock to firms.[25] Yet, some firms may have anticipated changes to the U.S. trade policy prior to the introduction of tariffs in 2018. This is because trade-related announcements – including tariff increases – featured prominently in the program of the winning presidential candidate during the electoral campaign in 2016 and several visible actions were taken shortly after assuming the office in 2017 as discussed in Handley and Limão (2017a).[26] This is reflected in the U.S. news-based Trade Policy Uncertainty (TPU) Index by Caldara et al. (2020), which first started increasing after the proposal of a 45% tariff on China was made in January 2016, and shot up further after the introduction of the first tariffs in January 2018 (see Figure 2(a)).[27]

The left graph correlates the average trade war US tariff with the Column 2-MFN tariff margin in 2000, whereas the right graph correlates the share of products with the trade war US tariff with the share of products with positive Column 2-MFN margin.

In addition, besides the general possibility of a rise in tariffs on imports from China, firms also had a possible indication regarding the products that could be

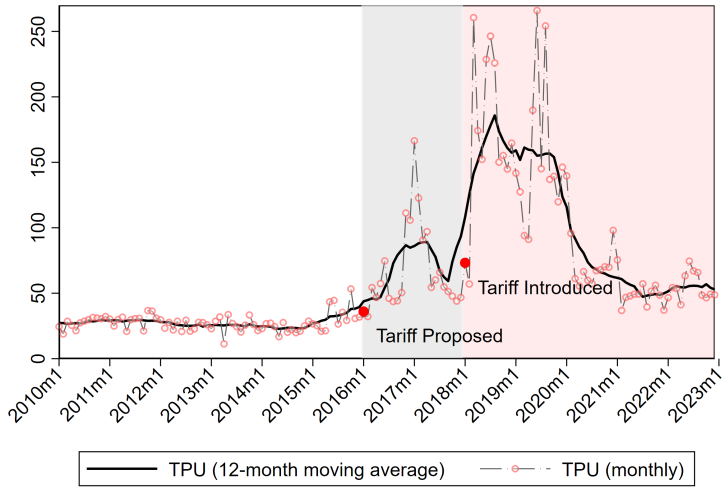
[25] Prior to 2018, tariffs were imposed only 74 times under the mechanism used by the U.S. administration to introduce such tariffs and in one-quarter of those cases the President was given the authority and applied tariffs (Bown (2018)). As highlighted by Grossman et al. (2024): "*After a long period of stable trade policies, the tariff hikes came as a shock to firms that had forged relationships with suppliers in China.*"

[26] These actions included, for instance, withdrawal from the Trans-Pacific Partnership.

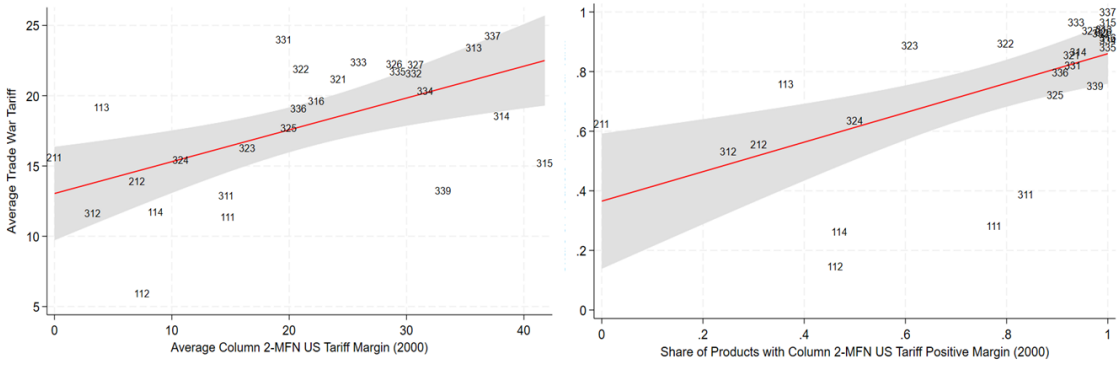
[27] The index tracks the fraction of newspaper articles on trade policy that also refer to TPU.

Figure 2: A Possible Anticipation of U.S. Tariffs on China

(a): Trade Policy Uncertainty in the U.S. over Time



(b): New U.S. Tariffs vs. Pre-WTO Accession U.S. Tariffs



Source: Panel 2(a) shows the evolution of the monthly news-based U.S. trade policy uncertainty index (TPU) based on the data from Caldara et al. (2020) along with information tariff events from Handley and Limão (2017a) and Bown (2018). *Tariff Proposed* refers to the announcement of a tariff to be imposed on China by the eventually winning presidential candidate in January 2016 and *Tariff Introduced* refers to the first tariff hike applied to products on China in January 2018. Panel 2(b) shows the sectoral (3-digit NAICS) correlation between the average trade war US tariff and the Column 2-MFN tariff margin in 2000 (left graph) and the share of products with a positive trade war US tariff and the share of products with positive Column 2-MFN margin (right graph).

exposed to the tariff increases. This is because prior to China's WTO entry, the United States was not limited by the WTO's MFN discipline, having thus the possibility of imposing China tariffs higher than the MFN tariff bounds. More specifically, before the WTO accession, Chinese exports risked facing increased tariffs if an annual review by the US Congress did not extend the MFN status (Handley and Limão (2017b, 2022)). The respective product lines and (higher) tariffs were listed in the U.S. schedule called "Column 2".

In Figure 2(b), we show that the margin between Column 2 and MFN tariffs may have provided early information about the sectors that would be targeted later in 2018-2019, when US tariffs on Chinese goods were effectively raised. The left graph correlates the average trade war US tariff with the Column 2-MFN tariff margin in 2000, whereas the right graph correlates the share of products with the trade war US tariff with the share of products with positive Column 2-MFN margin. In both cases, the correlation is positive and significant.

Taking these two facts together –i.e., that at least some firms could have anticipated an eventual increase in U.S. tariffs on imports from China and the products and thus sector likely to be affected–, we formulate an additional hypothesis:

To test empirically this hypothesis, we estimate the following equation:

$$N_{ijkt} = \exp\left\{ \sum_{\kappa=0}^{1}\sum_{\ell=0}^{1} \beta_{\kappa,\ell}^{\eta,\tau} \mathbb{1}\left\{\Omega_{ij}=1, \Psi_j=1, \eta_t=1, T_k^h=\kappa, PTA_{jt}^{US}=\ell\right\} + \right.$$
$$+ \sum_{\kappa=0}^{1}\sum_{\ell=0}^{1} \beta_{\kappa,\ell}^{\tilde{\eta},\tau} \mathbb{1}\left\{\Omega_{ij}=1, \Psi_j=1, \tilde{\eta}_t=1, T_k^h=\kappa, PTA_{jt}^{US}=\ell\right\}$$
$$\left. + \alpha PTA_{ijt} + \mathbf{FE} \right\} + v_{ijkt} \quad (4)$$

where $\tilde{\eta}_t = 1$ corresponds to the anticipation period, i.e., the two years immediately before the new U.S. tariffs became in place (i.e., $t = \{2016, 2017\}$, and T^h is the sectoral high tariff exposure defined by using alternatively (i) the new US tariffs on China (τ_k^h) and (ii) the Column 2-MFN tariff margin in 2000 ($\tilde{\tau}_k^h$).[28]

[28] Specifcally, T_k^h is an indicator that takes the value of 1 if the sector has above the median share of

Table 3 presents the estimation results. We first report results differentiating the effect depending on the countries' structural characteristics and sector exposure only (Panel A). Second, we additionally allow the impact to vary depending on whether the country is covered by a trade agreement with the U.S. or not (Panel B).

Table 3: Differential Effects of the New U.S. Tariffs with Anticipation

Panel A. The Role of Country Characteristics and Sector Exposure		
	(1)	(2)
	$T_k^h = \tau_k^h$	$T_k^h = \tilde{\tau}_k^h$
New Trade Policy Period (2018-2022)		
$\mathbb{1}\{\Omega_{ij} = 1, \Psi_j = 1, \eta_t = 1, T_k^h = 1\}$	0.170***	0.164***
	(0.051)	(0.051)
$\mathbb{1}\{\Omega_{ij} = 1, \Psi_j = 1, \eta_t = 1, T_k^h = 0\}$	0.110	0.115
	(0.087)	(0.087)
Anticipation (2016-2017)		
$\mathbb{1}\{\Omega_{ij} = 1, \Psi_j = 1, \tilde{\eta}_t = 1, T_k^h = 1\}$	0.055***	0.055***
	(0.020)	(0.020)
$\mathbb{1}\{\Omega_{ij} = 1, \Psi_j = 1, \tilde{\eta}_t = 1, T_k^h = 0\}$	0.028	0.024
	(0.043)	(0.046)
Fixed Effects:		
Country-Pair-Sector	✓	✓
Host-Country-Sector-Year	✓	✓
Home-Country-Sector-Year	✓	✓
Country-Pair Time Trend	✓	✓
Country-Pair Controls	✓	✓
Observations	188,291	188,291

products affected by the increase in US tariffs on China (τ_k^h) and the Column 2-MFN positive margin ($\tilde{\tau}_k^h$), respectively.

Table 3: Differential Effects of the New U.S. Tariffs with Anticipation (*ctd.*)

Panel B. The Additional Role of Trade Agreements

	(1)	(2)
	$T_k^h = \tau_k^h$	$T_k^h = \tilde{\tau}_k^h$
New Trade Policy Period (2018-2022)		
$\mathbb{1}\{\Omega_{ij}=1, \Psi_j=1, \eta_t=1, T_k^h=1, PTA_{jt}^{US}=1\}$	0.301***	0.338***
	(0.064)	(0.066)
$\mathbb{1}\{\Omega_{ij}=1, \Psi_j=1, \eta_t=1, T_k^h=1, PTA_{jt}^{US}=0\}$	0.140**	0.138**
	(0.058)	(0.059)
$\mathbb{1}\{\Omega_{ij}=1, \Psi_j=0, \eta_t=1, T_k^h=1, PTA_{jt}^{US}=1\}$	-0.104	-0.070
	(0.099)	(0.077)
$\mathbb{1}\{\Omega_{ij}=1, \Psi_j=1, \eta_t=1, T_k^h=0, PTA_{jt}^{US}=1\}$	0.210**	0.165*
	(0.089)	(0.087)
$\mathbb{1}\{\Omega_{ij}=1, \Psi_j=1, \eta_t=1, T_k^h=0, PTA_{jt}^{US}=0\}$	0.131	0.136
	(0.094)	(0.092)
$\mathbb{1}\{\Omega_{ij}=1, \Psi_j=0, \eta_t=1, T_k^h=0, PTA_{jt}^{US}=1\}$	0.107	0.093
	(0.068)	(0.074)
Anticipation (2016-2017)		
$\mathbb{1}\{\Omega_{ij}=1, \Psi_j=1, \tilde{\eta}_t=1, T_k^h=1, PTA_{jt}^{US}=1\}$	0.210***	0.223***
	(0.040)	(0.031)
$\mathbb{1}\{\Omega_{ij}=1, \Psi_j=1, \tilde{\eta}_t=1, T_k^h=1, PTA_{jt}^{US}=0\}$	0.030	0.030
	(0.018)	(0.019)
$\mathbb{1}\{\Omega_{ij}=1, \Psi_j=0, \tilde{\eta}_t=1, T_k^h=1, PTA_{jt}^{US}=1\}$	-0.078	-0.070**
	(0.052)	(0.035)
$\mathbb{1}\{\Omega_{ij}=1, \Psi_j=1, \tilde{\eta}_t=1, T_k^h=0, PTA_{jt}^{US}=1\}$	0.044	0.026
	(0.055)	(0.049)
$\mathbb{1}\{\Omega_{ij}=1, \Psi_j=1, \tilde{\eta}_t=1, T_k^h=0, PTA_{jt}^{US}=0\}$	0.051	0.055
	(0.042)	(0.043)
$\mathbb{1}\{\Omega_{ij}=1, \Psi_j=0, \tilde{\eta}_t=1, T_k^h=0, PTA_{jt}^{US}=1\}$	0.090***	0.119***
	(0.024)	(0.039)
Fixed Effects:		
Country-Pair-Sector	✓	✓
Host-Country-Sector-Year	✓	✓
Home-Country-Sector-Year	✓	✓
Country-Pair Time Trend	✓	✓
Country-Pair Controls	✓	✓
Observations	188,291	188,291

Note: Ω_{ijt} identifies country pairs where the home of the multinational firms is China and the host country is a third country other than China and the United States, Ψ_j identifies if the host country is China's substitute *and* faces a downward-sloping supply curve according to the classification by Fajgelbaum et al. (2024). See Table A1.1 in the Annex for the full list. $T_k^h = 1$ identifies sectors with high exposure to increases in tariffs (above the median) and $T_k^h = 0$ those with low exposure (below the median). Column 1 uses the US trade war tariff (τ_k^h) and Column 2 uses the column 2-MFN tariff margin in 2000 ($\tilde{\tau}_k^h$) to construct T_k^h. Standard errors clustered by country-pair are reported in parentheses. *** p<0.01, ** p<0.05, * p<0.1

We find evidence of a positive and statistically significant anticipation effect in years 2016-2017 during which Chinese multinationals already started expanding their affiliates in countries with favorable underlying supply conditions, albeit weaker than the effect observed once the tariffs were actually introduced. The difference between the two coefficients is statistically significant (p=0.015). When we use instead the exposure criteria based on the Column 2-MFN 2000 tariff margin ($\tilde{\tau}_k$) the result remains virtually identical, as shown in Column 2. As such, we find supportive evidence for Hypothesis 6.

We also observe that the effect of U.S. trade policy on the reallocation of activities of Chinese multinational firms in the sectors highly exposed to tariffs is significantly stronger after the new U.S. tariffs were imposed relative to the anticipation period in the case of countries with structural predisposition regardless of their coverage by a PTA with the United States (p=0.069 and p=0.032 for countries with and without PTAs with the US, respectively).

Interestingly, it also appears to be the case that, compared to before 2016 and conditional on having favorable structural factors, countries with a PTA with the U.S. already experienced a stronger expansion of Chinese multinational firms in the most exposed sectors than countries with similar structural characteristics but without a trade agreement with the U.S. in the period directly preceding the imposition of the new U.S. tariffs (p= 0.006 for τ_k and p= 0.0004 for $\tilde{\tau}_k$). This could suggest an order of market entry: during increased uncertainty firms may have started entering first countries with appropriate structural conditions and the option value of having duty-free access to the U.S. market. Once the tariffs were introduced, expansion took place both in the countries covered by PTAs and those not covered (i.e., *PTA+* markets), potentially as supply had to be ramped up quickly to substitute for China.

Finally, even after controlling for the anticipation effects, there was no statistically significant increase in the number of Chinese multinational firms' affiliates in the countries covered by agreements but lacking favorable structural conditions (regardless of the sectoral tariff exposure).

7. Concluding Remarks

This paper examines whether and how the shift in U.S. trade policy marked by the imposition of new tariffs on China in 2018-2019 contributed to shaping the patterns of multinational firms' activity in third countries. Specifically, we examine whether affected multinational firms adapted the networks of their affiliates in response to the tariff changes and in which economies have they expanded most. To do so, we use the framework proposed by Fajgelbaum et al. (2024) as a starting point and accordingly consider the role of structural factors, i.e., countries' degree of structural substitutability with China and the nature of their supply capabilities. In addition, we investigate whether trade agreements with the U.S. have a magnifying effect and there were anticipatory effects from tariff hike threats before tariffs were effectively enacted..

We find that Chinese multinational firms did expand relatively more into countries with fundamentals that allowed them to serve as China's substitutes and operate under a downward-sloping curve, especially in sectors more exposed to the new U.S. tariffs. In addition, we find that, conditional on the existence of those structural factors, countries covered by trade agreements experienced a stronger expansion of Chinese multinational firms than countries without such agreements in the most tariff-exposed sectors once anticipation effects are accounted for in the analysis. This may suggest that when Chinese multinational firms faced the possibility of a tariff increase, they expanded more in those countries first. The sheer presence of an agreement without the underlying structural conditions, however, is not found to be associated with a stronger expansion of Chinese multinational firms.

These initial findings are consistent with the insights from the broader literature on U.S.-China tensions and are suggestive that multinational firms have adapted their corporate structures to adapt to the new global business reality.

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Appendix

Table A1.1: China's Substitutes and Complements and Nature of Supply Curve

China Substitutes - DSS	China Substitutes - USS	China Complements - DSS	China Complements - USS
Belgium	Argentina	Australia*	Brazil
Bulgaria	Austria	Colombia*	Egypt
Czech Republic	Bangladesh	Ireland	Greece
Finland	Canada*		Hong Kong
France	Chile*		Indonesia
Germany	Denmark		Israel*
Hungary	Slovakia		Japan
India	Spain		New Zealand
Italy	Switzerland		Peru*
Malaysia			Philippines
Mexico*			Romania
Netherlands			Singapore*
Poland			South Africa
Portugal			Slovenia
South Korea*			Turkey
Taiwan			Ukraine
Thailand			
United Kingdom			
Vietnam			

Note: DSS=downward-sloping supply curve. USS=upward-sloping supply curve. Country classification based on Fajgelbaum et al. (2024). Countries are listed in an alphabetical order. *Denotes countries that have a Preferential Trade Agreement in place with the United States.

Table A1.2: Sectors with High Exposure to New Trade Policy

NAICS Code	Description
314	Textile Product Mills
315	Apparel Manufacturing
316	Leather and Allied Product Manufacturing
321	Wood Product Manufacturing
323	Printing and Related Support Activities
326	Plastics and Rubber Products Manufacturing
327	Nonmetallic Mineral Product Manufacturing
332	Fabricated Metal Product Manufacturing
334	Computer and Electronic Product Manufacturing
335	Electrical Equipment, Appliance, and Component Manufacturing
337	Furniture and Related Product Manufacturing

Note: Table lists 3-digit level NAICS sectors that score above the median in terms of the pre-policy exposure of Chinese exports to the U.S. market and change in tariffs imposed on Chinese products.