Trade Wars and Solar Flares: The Unintended Consequences of Ray-dical Protectionist Policies

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Abstract

The recent shift in the global economy from openness to trade protectionism challenges international business (IB) practice and theory. We develop a framework in which multinational enterprises face international changes under the World Trade Organization rules and complement it with a resource-based view of IB. We use this framework to analyze unintended consequences on targeted multinational enterprises. We examine the anti-dumping and countervailing duties implemented by the United States on the import of solar panels from China in 2012. Using the Directory of Corporate Affiliations database and a difference-in-differences design, we document how this shock affects Chinese MNEs and how they react. Our findings show that targeted MNEs experience a reduction in their net income and return on assets the year the policy is implemented. They respond by restructuring their domestic units, increasing the regional dispersion of their foreign subsidiaries, and diversifying their industrial activities. We find large heterogeneity in these groups that condition their strategic responses and how they adapt to the changing environment. Our results show US protectionism harms Chinese conglomerates in the short term and that they respond with several strategies to regain financial strength and market preeminence.

Keywords: Trade Policy, Anti-Dumping, Multinational Conglomerates, Solar Panels, United States, China.

1 Introduction

The recent shift in the global economy from openness to trade protectionism challenges international business (IB) practice and theory. The increased prevalence of industrial policy generates concerns among researchers and practitioners about the potential impacts on the international economy and firms (Luo (2023)). These protectionist policies require in-depth analysis to grasp their intended and unintended consequences.

This paradigm change raises questions about the effects on multinational enterprises (MNE) facing uncertainties in their global operations (Luo and Van Assche (2023), Buckley (2020)). On one hand, about the strategies they develop and how they modify the organization's structure to adapt to a changing environment (Witt (2019)). Furthermore, on their managerial approaches and the capabilities they need to overcome these challenges and not lose relevance in the international markets (Petricevic and Teece (2019)).

This paper examines these questions with a quasi-experimental empirical design and detailed data on MNE conglomerates in China. Building on the proposal by Meyer et al. (2023) for the study of firms facing sanctions, we develop a framework in which multinational enterprises face changes in international conditions from the World Trade Organization-supported anti-dumping and countervailing duties. We complement this institutional-based view of IB theory with a resource-based view, as in Meyer et al. (2009), emphasizing the use of existing resources and the development of new ones.

The current discussion on changes in IB institutional conditions emphasizes protectionism as moving away from the rules of the World Trade Organization (WTO). It focuses on cases such as the US and China trade war or the protectionist measures that industrialized countries have implemented after the COVID-19 pandemic and that base their motivation on supply chain or national security concerns.

However, MNEs may face institutional challenges even in a stable international rule-based system. This is the case with anti-dumping and countervailing duties (AD-CVDs) which can be a one-sided change to bilateral trade conditions. Changes in trade policy affect many aspects of MNEs' activities and have unintended consequences that amplify uncertainty in the global economy (Meyer et al. (2023), Gereffi et al. (2021)). For firms operating globally, these protectionist policies have the potential to harm their operations,

use, and development of resources.

We apply our framework to study the unintended consequences in targeted MNEs of the AD-CVDs implemented by the US on the import of solar panels from China in 2012. We analyze how they adapt to this changing environment. We focus on the financial effects due to the negative shock, the strategic responses regarding the use of existing resources such as labor and industrial capacity, and the establishment of new subsidiaries.

The AD-CVDs imposed by the US mostly target Chinese firms that are part of conglomerates. In this paper, rather than focusing on the response of the targeted firms as if they were stand-alones, we how the business group reacts to an earnings shock in one of their firms (Bertrand et al. (2002), Siegel and Choudhury (2012)). Our data will allow us to test the effect of an industry-specific shock on diversified conglomerates and will permit us to examine the strategic responses of the conglomerate as a whole.

We develop a difference-in-differences design leveraging specific characteristics of this policy, which targets companies in the same industry with two different rates. The US anti-dumping law defines China as a non-market economy. This legal framework assumes that all Chinese firms are under government control unless they prove otherwise. Those that show government independence receive a specific anti-dumping duty rate, while all others in the same industry are granted a general rate, greater than the specific. These differential rates reflect differential exposure to the US trade policy, with firms receiving a specific - lower - rate being the most exposed (Montti (2024)).

Using this variation given by the policy's discriminatory nature, we compare the changes in several outcomes of interest before and after the policy by the targeted MNEs, granted a specific rate, relative to the non-targeted, assigned the general rate.

We rely on the Directory of Corporate Affiliations (DCA) database and identify multinational enterprises that, within their conglomerate, have companies targeted by the 2012 US AD-CVDs. Our descriptive data analysis and statistical results show this is a heterogeneous group. To address the internal sources of variation, we estimate the effects on the whole sample and different subsamples defined by conglomerate characteristics like availability of financial data and number of employees.

Our empirical findings show that targeted MNE conglomerates experience a reduction in

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net income and return on assets the year the policy is implemented. Following this negative shock, they develop several strategic responses. They restructure their domestic units by reducing the number of employees in Chinese subsidiaries. They increase the regional dispersion, having more subsidiaries in Asia, especially in other Chinese administrative regions. Finally, they diversify their industrial activities, increasing the number of industry activities developed by the companies in the conglomerate. Our analysis of heterogeneous effects shows that smaller companies (in terms of employees) are more affected by this external shock and that firms in the financial subsample are more capable of implementing an industry diversification strategy.

Our results provide three insights into the IB literature of international business groups facing tensions such as a trade war. First, US protectionism hurts Chinese conglomerates but only in the short run. Our findings of negative financial results disappear after the first year with policy effects. Second, we contribute to the analysis of managerial decisions in an unstable international context that hinders globalization by showing that these are dynamic conglomerates that adapt rapidly. The changes in their structure and scope happen one or two years after the policy is in place, reflecting a quick response. Third, these groups have significant heterogeneity as some Chinese conglomerates develop a large set of different activities. This contributes to great variation and outliers in the data and thus requires careful data management for the empirical analysis.

Our empirical contribution provides an identification strategy that allows us to find the causal effects of these policies on MNEs' finances, structure, and geographical and industrial scope. Further, we detail a case study for the renewable energy sector, contributing to a better understanding of how Chinese multinational enterprises in a key industry operate in the global economy and react to US unilateral changes in trade policy.

The paper is organized as follows: In section 2 we develop our conceptual framework, in section 3 we describe our dataset and the variables we use in our estimations. In section 4 we explain our model and estimation method, and in section 5 our findings. In section 6 we discuss implications for MNEs' managerial decisions. Finally, in section 7 we conclude and present our study's limitations and lines for future research.

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2 MNE Reconfiguration as a Response to AD-CVDs

Building on the proposal by Meyer et al. (2023) for the study of firms facing sanctions, we develop a framework in which MNEs' international rule changes come from the World Trade Organization-supported AD-CVDs, as suggested in Peng et al. (2008). We complement this institutional-based view of IB theory with the resource-based view (Meyer et al. (2009)). We use this integrated framework to analyze how changes in bilateral trade conditions have unintended consequences on the internal aspects of conglomerates operating in the global economy and in their industry and geographic scope. We focus on how they adapt to a changing environment and recover from a negative financial shock.

The institution-based view of international business asks how institutions impact firm strategy and performance (Peng et al. (2008)). Recent developments in the global economy, such as the rise of protectionism and geopolitical tensions, have prompted IB theorists to suggest that the institutional view needs to adapt to be able to explain this new reality (Luo (2023), Luo and Van Assche (2023), Meyer et al. (2023)). However, tensions and uncertainties also arise under the global institutions governed by the World Trade Organization's rules, such as anti-dumping and countervailing duties.

The current discussion on changes in IB institutional conditions emphasizes protectionism as moving away from international trade and investment rules. The argument focuses on cases such as the US and China trade war or different protectionist measures that industrialized countries have implemented after the COVID-19 pandemic and that base their motivation on supply chain or national security concerns. However, we highlight that MNEs may face institutional disruptions even in a stable international rule-based system. That is the case of anti-dumping and countervailing duties that are a one-sided change to bilateral trade conditions with the potential to harm targeted MNEs.

The Anti-Dumping Agreement (Agreement on Implementation of Article VI of the GATT 1994) defines dumping as "the introduction of a product into the commerce of another country at less than its normal value" (World Trade Organization). The Agreement on Subsidies and Countervailing Measures allows countries to charge a countervailing duty when they find that subsidized imports are hurting domestic producers (World Trade Or-

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ganization).[1] Because both mechanisms aim at specific products and exporters from a particular country they make for an interesting setting to analyze the differential effects of international rule changes.

When faced with a changing institutional context, multinational enterprises must make critical strategic decisions regarding their resources and operations. These include exploiting loopholes in the regime or relocating operations to third countries and have short and long-term intended and unintended consequences for the organization (Meyer et al. (2023)). Many IB theories focus on the ownership, exploitation, and acquisition of resources to explain MNEs' internationalization strategies (Dunning (1980)). We build on this resource-based view by focusing on how firms reconfigure their structure and geographic scope across locations when AD-CVDs disrupt the external environment. Using this policy change to examine institutional transitions allows us to have a country and industry-specific focus.

Motivated by the challenges posed by a negative shift in bilateral trade policy, MNEs can move away from the targeted country into trade-neutral zones, increasing the geographic scope of their organizational units. This behavior has been described as "friend-shoring" in the current context of deglobalization of international trade policies (Hsu et al. (2022)). Previous work has shown that even in a context of growing globalization, the largest MNEs tend to have a home region orientation (Rugman and Verbeke (2004), Banalieva and Dhanaraj (2013)). A widely accepted explanation for this phenomenon is that distance, be it cultural, administrative, geographic, or economic, increases costs and thus refrains multinationals from engaging in international trade, investment, and business with countries far away from their home market (Ghemawat (2001), Hofstede (1994)).

Some common strategies for alleviating negative impacts induced by trade restrictions are described by Gereffi et al. (2021). These involve production-switching, which implies moving production to countries unaffected by the barriers, or market-switching, which entails selling products to alternative countries. Due to the size of their economy, Chinese companies can even move away from foreign markets into their domestic economy to avoid trade barriers. Firms can also leverage their resources and diversify their industrial activities to avoid dependence on the harmed industry. An upgrading strategy involves improving processes or products or moving into higher value-added market segments.

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[1]See more information for AD and CVD.

Changes in external conditions directly affect MNEs' operations and require specific strategies. Wenzel et al. (2021) find four strategies firms implement when responding to a crisis. Retrenchment, which implies reducing costs, assets, and product lines, among others, and has the potential of narrowing the scope of the firm's business activity. In contrast, a persevering strategy aims to maintain the firm's activity after a crisis. Another approach is innovating, which they define as realizing strategic renewal in response to a crisis. Strategic renewal, as defined by Agarwa and Helfat (2009), can involve continuing incremental changes and discontinuous transformations and may include widening the scope of the business. Finally, an exit strategy is discontinuing a firm's business activities after a crisis.

MNE responses depend on managerial decisions and are possible by having context-specific capabilities (Meyer et al. (2009)). Strategic and organizational flexibility allows firms to compete and adapt in volatile environments, especially in emerging economies (Meyer et al. (2023)). This adaptive managerial approach is key to firms overcoming negative external shocks and not losing relevance in the international markets, even within a seemingly stable WTO-ruled system.

AD-CVDs target specific firms in a particular industry, many of which are not stand-alone firms but part of a larger group. Hence, we can study business groups' reactions to changes in international trade policy. From a resource-based view, foreign trade and investment policies impact the diversification and organization of business groups in emerging economies. Diversification facilitates access and a combination of domestic and foreign resources such as inputs, processes, and market access (Guillén (2000)).

These policies can thus generate trickle-down effects for other firms part of the conglomerate with a targeted firm in it. Due to the AD-CVDs' discriminatory nature, we can asses how an earnings shock in one firm affects the business group. As in Bertrand et al. (2002), we find that group firms are sensitive to industry shocks that impact other firms in the group. This might differ for stand-alone firms in the same industry since group affiliates tend to have different business activities than their counterparts that are not part of a group. Group members are usually more engaged in the recombination of economic inputs, while stand-alones are more prone to reselling finished goods (Siegel and Choudhury (2012)).

3 Data & Variables

In this section, we describe our dataset and the construction of the several variables we use in our empirical analysis.

3.1 Dataset

Our data comes from the LexisNexis' Directory of Corporate Affiliates (DCA) and consists of Chinese MNEs through the years 2010 to 2015. This period allows us to have two years before the AD-CVDs are in place, and observe possible mid-term effects after their implementation.

The DCA provides corporate affiliations on global parent companies, affiliates, subsidiaries, and divisions. It traces corporate families to the eighth linkage level. This allows us to capture the full chain of ownership affiliations, defining the headquarters as the ultimate parent. For non-US-based companies to be included in this dataset, they have to demonstrate revenues above $10 million.

The dataset includes information on corporate identity, such as company name. We use this to identify the companies targeted by the 2012 AD-CDVs on solar panels imposed by the US. The list of Chinese company names comes from the determination for the anti-dumping duty order (United States Department of Commerce (2012)). We refer to these as "solar firms" to differentiate them from the whole conglomerate of which they are part. We define the variable "treated headquarters" as the ultimate parent of an MNE that has within their conglomerate a company in the targeted list by the USDOC. This is our main unit of analysis.

The control group for our difference-in-differences design comes from identifying firms that operate in the same economic activities as the targeted group and make foreign direct investment announcements during the period of analysis. We search for these companies in the Financial Times' fDi markets dataset and classify them according to the cluster, industry, sub-sector, and industry activity classification listed in their FDI announcement. This yields a control group with companies that the Federal Register does not list but is as similar as possible to the targeted ones regarding industry and FDI activity. We call this

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group non-targeted MNEs.

From the descriptive data provided by the DCA, we use the number of employees at the headquarters and subsidiary level, and primary industries indicated by Standard Industry Codes (SIC). We also take advantage of the financial and location information as described in section 3.

We end up with a balanced panel of 28 Chinese conglomerates, 17 targeted and 11 non-targeted, for the six years.

3.2   Descriptive Analysis

A key feature of this dataset is the heterogeneity in the value of the observations. Since we analyze the effects that AD-CVDs on solar firms have on the whole conglomerate there is variation in our main variables of interest, defined at the headquarters level.

We address this by performing our empirical analysis for the full headquarters sample and two subsamples. One is restricted to firms with financial information available in our dataset for the whole period. The rationale behind this choice is twofold. First, MNEs that provide information for their financial indicators are mostly publicly traded and share this data due to regulation requirements. Thus, these firms have specific characteristics that differentiate them from those without this information. Second, the availability of this data in our sample fluctuates over time, we choose to have a balanced panel to reduce variation in estimations' standard errors attributed to changes in the sample size.

The second subsample is defined by the number of employees at the headquarters level. It is comprised of firms that before the policy, during 2010 and 2011, had less than 100,000 employees. This number represents approximately the mean plus one standard deviation of employees.

Table 1 depicts the summary statistics of our relevant variables. In Panel A we show the values for the full sample at the headquarters level. In Panel B we restrict the observations to those who are part of the financial subsample, while in Panel C we summarize it for the sample restricted to MNEs with less than 100,000 employees. In Table A4 in the Appendix, we show the summary statistics for the full sample by year, reflecting the evolution of these

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variables through time.

To further describe our data, in Figure 1 we present the scatter plots by year for all the variables, differentiating by targeted and non-targeted MNE. This visualization provides more evidence of the intrinsic heterogeneity of the sample and the variation in the mean values of our variables of interest.

The heterogeneous characteristic of our study object, Chinese MNEs with solar firms within their conglomerate, impacts our analysis and estimations. Our empirical approach explained in detail in section 4, captures outliers and other specific characteristics with MNE fixed effects. The intrinsic variation in our dataset, especially toward the end of our analysis period, impacts the standard errors of our estimations, though not the point estimates.

3.3   Variables

In this subsection, we describe the construction of the several dependent variables we use to evaluate the impact of AD-CVDs in Chinese conglomerates. In all cases, the independent variables are the interaction of the treatment and the year.

3.3.1   Dependent Variables

First, we use a set of dependent variables to analyze the effects of the AD-CVDs on targeted MNEs' financial performance. For this, we rely on two financial indicators: net income (in million dollars) and return on assets. These variables are measured at the headquarters level. The net income variable is provided in our dataset. It reflects a company's revenues minus its expenses, as it is a useful measure for assessing its profitability. We construct the variable ROA (Return On Assets) as the ratio of net income over assets. This performance measure compares a company's profit with the capital invested in assets.

We investigate the effects on the structure of targeted conglomerates by focusing on their level of employment. We rely on the number of employees at the headquarters level provided by our dataset. Then, we focus on their domestic units and create the variable "Number of Employees in Chinese Subsidiaries". This is defined as the sum of the employees

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in units located in mainland China for targeted or non-targeted conglomerates.

To account for the regional dispersion of firms, we create a variable that counts the yearly number of foreign subsidiaries in Asia. This leaves out mainland China but includes Hong Kong, Macau, and the rest of the Asian countries in the sample.[2]

We consider an alternative measure for Chinese foreign subsidiaries in Asia. We create a variable that counts all Asian subsidiaries except the People's Republic of China's administrative divisions. We call this variable "Asia not PRC" and it excludes mainland China, Hong Kong, and Macau.

Finally, we focus on the firms' industrial scope. The dataset provides Standard Industrial Classification (SIC) codes at the 4-digit level of each unit in the conglomerate by year. It includes up to nine SIC codes for the same company level. This means a subsidiary can have activities in nine different industries in one year. We construct the variable "Number of SIC Codes" at the headquarters level by counting all the different SIC codes by all the companies in the conglomerate.

3.3.2 Control Variables

To isolate the effect of the policy we rely on two-way fixed effects: unit and time. Conglomerate-level fixed effects capture time-invariant characteristics of our units of analysis. The year-fixed effects control for time-specific variations common to all units (Angrist and Pischke (2008)).

Our main explanatory variables come from the interaction of targeted headquarters and year. This accounts for the differential effects before and after the policy for our group of interest with respect to our control group.

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[2]All Asian countries in the sample are China, China (Hong Kong), Japan, Singapore, India, Taiwan, China (Macau), Philippines, United Arab Emirates, Malaysia, Pakistan, Saudi Arabia, Indonesia, Jordan, Thailand, Uzbekistan, Vietnam.

4   Model and Estimation Method

To evaluate the impact of the AD-CVDs on targeted Chinese MNEs, we develop a difference-in-differences design exploiting the fact that the policy targets firms in the same industry with different rates. The treatment is given by the AD-CVD rate imposed in 2012 by the US on the imports of Chinese solar cells and modules.

This design has specific characteristics given by the US anti-dumping law defining China as a non-market economy (Section 771(18) of the Tariff Act of 1930). The US Department of Commerce assumes that all Chinese firms are under government control unless they prove otherwise, in which case they are granted a specific anti-dumping duty rate. All other Chinese firms in the industry are assigned a general - larger - rate (PRC-wide). Firms granted a specific rate in the 2012 solar panel case are larger exporters than those granted the PRC-wide rate. Thus, the different AD-CVD rates reflect the differential exposure to the US trade policy, with firms receiving the specific rate being the most exposed (Montti (2024)).

Our model is expressed at the level of MNE i and year t as follows:

$$Y_{it} = \sum_{s=2009}^{2015} \delta_t (D_{it} \times 1[t=s]) + \gamma_i + \lambda_t + \epsilon_{it}. \tag{1}$$

Where Y_{it} represents our dependent variables of interest depending on the effect we are assessing, as described in section 3.3; D is a binary indicator for targeted MNE; γ_i are conglomerate fixed effects; λ_t are year fixed effects, and ϵ_{it} is the error term. Robust standard errors are clustered at the MNE level. We use OLS to estimate our main coefficient of interest δ_t.

The key assumption in a difference-in-differences design is the existence of parallel trends, which implies that the pre-treatment trajectories for treated and control groups are parallel (Cunningham (2021)). We present support for this assumption in the event study plots in Figures A1. We show the results for the subsample of MNEs with less than 100,000 employees since it captures statistically significant effects after the policy for all

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our variables of interest. The bars in the chart display the estimated coefficients at 90 and 95 % confidence intervals. As expected for the validity of the design, the event study plots show that the estimated coefficients have no statistically significant effects in the pre-policy period for all our variables.

5   Findings: MNE Shock and Reconfiguration

In this section, we show and discuss how the 2012 US AD-CVDs on solar panels resulted in a negative shock and a reconfiguration by Chinese multinational enterprises with solar firms within their conglomerate.

Our main explanatory variables are the interaction of year and targeted MNE. We use 2011 as the baseline as it is the last year without the effects of the policy. As expected for a valid difference-in-differences design, we do not obtain statistically significant effects in the pre-policy period (before 2012). All our estimations include conglomerate and year-fixed effects. At the bottom of each result table, we display the mean and standard deviation of the respective dependent variable.

Despite some of our results being statistically significant at the 10% level, we still support these findings as statistically meaningful since many are close to a p-value of 0.050 and the point estimates are robust throughout our specifications. The main reason behind this lower statistical significance is the variation and magnitude of the standard errors due to the heterogeneity in our sample that we address throughout our analysis.

5.1   Financial Results

In Table 2, we present the estimation results for the financial variables net income and return on assets (ROA). In the first two columns, we use the financial subsample, in columns three and four, the subsample of MNEs with less than 100,000 employees.

In column 1, we present the results for the net income variable expressed in million dollars. The coefficients of the interaction between treated headquarters and year only show statistically significant effects in 2012. The point estimate indicates that targeted

MNEs decrease their net income by 301.2 million dollars (p-value is 0.067) compared to the non-targeted group. In this specification, the mean net income is about 39 with a standard deviation of 394 million dollars. This reflects the economic significance of the effect we find as well as the large heterogeneity of the observations.

In column 2, the estimations for ROA, which is the net income normalized by assets and is measured as a percentage, have no statistically significant results.

Column 3 shows the estimated effects on net income for MNEs with less than 100,000 employees. In this case, we also find that the interaction coefficients between treated headquarters and year show statistically significant effects in 2012. The coefficient of -348.4 million dollars (p-value is 0.050) reflects that the loss for the targeted conglomerates in this subsample is larger than for those in the financial one. Furthermore, this subsample has a smaller mean of the dependent variable, 26.67 million dollars, and a larger standard deviation, 410.7, than firms in the previous subgroup. Thus, even though these companies are more similar in terms of their number of employees, they are more heterogeneous in their financial performance.

Meanwhile, in column 4, the impact on the return on assets is negative and significant in 2012. The point estimate of -0.089 (p-value is 0.037) indicates that targeted conglomerates experience a decrease in the return on assets of nearly 0.09 percentage points compared to the non-targeted group. This is larger than the mean of -0.006.

Overall, we see that the anti-dumping and countervailing duties implemented by the US harm the net income and return on assets of targeted Chinese MNE conglomerates the year the policy is implemented. Smaller conglomerates, in terms of their number of employees, experience larger negative shocks compared to those in the financial subsample and have a greater dispersion in the observed variables. There are no effects in the rest of the period, showing that this is a short-term negative shock.

5.2 Domestic Restructure

We continue our analysis by focusing on the effects on the number of employees. In Table A3 in the Appendix we show that the AD-CVDs do not have statistically significant effects on

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employment at the headquarters level. We shift our analysis to the domestic units and find negative effects.

Table 3 displays the results for the number of employees in Chinese subsidiaries. In the first column, the estimations are performed in the whole sample with information for this variable, in the second, for the subsample of conglomerates with available financial data, and in the last one for those with less than 100,000 employees.

In column 1, there is a negative and statistically significant coefficient of the interaction of treated headquarters and the year 2013. The point estimate of -823.3 (p-value is 0.050) shows a reduction in the number of employees for targeted conglomerates with respect to non-targeted. The average number of employees in Chinese subsidiaries in this specification is approximately 41,500 with a standard deviation of more than 100,000. Therefore, our point estimates do not represent a large loss in employment for the whole sample.

In column 2, the statistically significant coefficient for the financial subsample reflects that in 2013 targeted MNEs had a loss of 1042.2 employees (p-value is 0.073) compared to non-targeted. This is a smaller and more homogeneous subsample than that reflected in column 1. The average number of employees is approximately 6,500 and the standard deviation is 97,000. Hence, the point estimate indicates that this group experiences a more severe impact than the previous one.

In column 3 the estimation results for MNEs with less than 100,000 employees show a statistically significant negative coefficient for the interaction of treated headquarters and 2013. The point estimate reflects a loss by the targeted group of about 1067 employees (p-value is 0.046) with respect to the non-targeted. This subsample has an average of 8,190 employees with a 9,898 standard deviation. Thus, on average, these MNEs employ more workers than those in the financial subsample, with a similar dispersion.

These results show that after the negative financial shock experienced in 2012, as the AD-CVDs were implemented, affected MNEs did not reduce the number of employees at the headquarters level. Instead, they resorted to their domestic units to recompose their financial performance. This is the case across our different specifications, with smaller conglomerates suffering larger employment losses.

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5.3   Regional Dispersion

Our next analysis looks at the internationalization strategy of the affected conglomerates. As we discuss in section 2, MNEs facing an international changing environment may seek to expand their operations into new countries to take advantage of the available resources. In the case we are analyzing, where China is a direct target of a US trade policy, finding new locations for subsidiaries implies a strategy of moving into a trade-neutral zone.

However, not all new locations present the same desirable characteristics. In particular when the conglomerate faces financial losses, as we have shown, and requires a rapid recovery from the negative shock. Following our discussion in section 2, we expect these MNEs to focus on nearby countries, as being geographically and culturally close has been suggested to be a relevant driver of location choice.

In Table 4 we present the results of our regional dispersion analysis. As we describe in section 3.3, the dependent variable counts the yearly number of foreign subsidiaries in Asia. This leaves out mainland China but includes Hong Kong, Macau, and other Asian countries in the sample. For a more comprehensive description of our regional dispersion measurement and a better interpretation of the results, in Table A1 in the Appendix we show the frequency of the different values taken by this variable before and after 2012.

Column 1 shows the estimated coefficients for the full sample, with positive statistically significant results for the interaction of treated headquarters and the years 2012 and 2013. The coefficient for the year the policy is implemented is 0.176 (p-value is 0.080) while the following year is 0.235 (p-value is 0.038). Comparing both point estimates with the sample mean of 0.589 implies a 30% increase in the number of Asian subsidiaries in 2012 and almost 40% in 2013 for targeted conglomerates with respect to non-targeted.

The estimations for the financial subsample in column 2 show a point estimate of 0.375 (p-value 0.084) in the interaction coefficients for 2012, and 0.500 (p-value 0.033) for 2013. The sample mean in this case is 1.015, almost twice the whole sample, indicating these MNEs have, on average, more subsidiaries in Asia. The results show that the difference in the regional dispersion between targeted and non-targeted MNES is 37% the first year of the policy effect and 50% the following year.

Finally column 3, with results for the subsample with less than 100,000 employees, also

has positive and statistically significant coefficients for the interaction of treated headquarters with the years 2012 and 2013. The point estimates of 0.214 (p-value is 0.084) and 0.286 (p-value is 0.040) compared with the mean of 0.592 indicate a rise in regional dispersion variables of 36% and 48% respectively by targeted MNEs with respect to non-targeted.

This illustrates that all conglomerates in our sample develop a regionalization strategy as a response to the negative shock created by unilateral changes in bilateral trade policy. The magnitudes are different, with firms in the financial subsample taking more advantage of this approach. In addition, we find this effect concomitantly with the policy implementation in 2012 but is larger in magnitude and statistical significance the following year.

Our alternative definition for Chinese foreign subsidiaries in Asia excludes Hong Kong and Macau, in addition to mainland China, as they are administrative divisions of the People's Republic of China. The estimation results are presented in Table 5 and reflect smaller effects than our previous specification.

In column 1, the estimations for the whole sample show statistical significance for the interaction coefficient of treated headquarters and the year 2013. The point estimate of 0.176 (p-value is 0.080) compared to the sample mean of 0.387 represents a 45% increase in this variable for targeted MNEs with respect to the non-targeted.

Column 2 presents the estimations for the financial subsample. A statistically significant coefficient of 0.375 (p-value is 0.084) in the interaction coefficient of treated headquarters and 2013 indicates a 52.6% increase in regional dispersion outside of the PRC for the targeted group compared to the non-targeted.

We do not show results for the subsample of MNEs with less than 100,000 employees as there are not enough observations to perform the estimations for the whole period.

This alternative definition of Asian foreign subsidiaries does not have effects in 2012, the year of the policy implementation, as it does in the previous analysis including Hong Kong and Macau. In addition, the results for 2013 have less statistical power than the previous definition.

This reflects that an important part of the regionalization strategy by targeted MNEs includes other Chinese regions. These results can be interpreted within the literature that finds a negative relationship between cultural distance and firms' international diversifica-

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tion as we discuss in section 6.

5.4 Industry Diversification

Lastly, we turn our attention to industrial activities to investigate if targeted conglomerates implement a scope diversification strategy. For constructing the dependent variable, as described in section 3.3, we count all the different SIC codes by all the companies in the conglomerate family.

For a more comprehensive description of our industry diversification measurement and a better interpretation of the results, in Table A2 in the Appendix we show the frequency of the different values taken by this variable before and after 2012.

Column 1 presents the estimations for the full sample, with no statistically significant effects. The average number of SIC codes in this specification is 4.708 with a standard deviation of 5.103.

In column 2 we see the results for the financial subsample. We find a statistically significant and positive coefficient for the interaction of treated headquarters and the year 2012, with a point estimate of 3.000 (p-value is 0.022). Comparing it with the sample average number of SIC codes, which is 5.970, this represents a 50% increase for the targeted group compared to the non-targeted. The following year, the coefficient is 3.375 (p-value is 0.056) and represents an increase by targeted conglomerates of 57% with respect to the non-targeted.

In column 3, we present the estimations for the subsample of MNEs with less than 100,000 employees. We find a positive and statistically significant coefficient in the interaction of treated headquarters and the year 2013. The point estimate of 2.190 (p-value is 0.073) implies that the differential increase in industry diversification by targeted MNEs is 46%.

Our findings show heterogeneous results for the industry diversification strategy. The conglomerates that take more advantage of it are those in the financial subsample, which make public their financial data possibly due to being traded in international financial markets. Thus, their organizational structure and managerial capabilities have characteristics

that make them more suited than other companies to develop this strategy.

6   Discussion: Implications for MNEs

Our results uncover interesting strategic responses. Unfortunately, in some cases, the sample size and heterogeneity yield a statistical significance above the 5% level. However, the consistency of the effects on our dependent variables across the different subsamples signals we are uncovering a pattern in the strategic responses.

We find evidence of retrenchment and innovation in terms of the strategies identified by Wenzel et al. (2021). The first one is cost reduction when we show a decrease in the number of employees in China. However, it is not general to the whole conglomerate but specific to the domestic units. We see innovation as a strategic renewal when firms expand their activities toward other industrial sectors, widening their business scope as a response to the changing institutional environment.

Our findings align with the literature claiming that in the absence of a pro-globalization social environment - skepticism of globalization - multinational enterprises' strategies may counteract regulatory restrictions (Cuervo-Cazurra et al. (2020)). We show that despite facing an increase in trade barriers, Chinese MNEs do not diminish their international presence. Rather, they re-focus on the home region by increasing the number of subsidiaries in Asia. Thus, MNEs can alter their organizational structure to facilitate strategic responses that avoid de-globalization measures.

An interesting finding of the regionalization strategy by these companies is that it focuses on other Chinese regions. These results lie within the literature that shows a negative relationship between cultural distance and international diversification in high-technology industries. Since these firms already face a higher risk than others due to their large technology investments, they minimize the potential risks of cultural differences by expanding into markets with familiar cultures (Tihanyi et al. (2005)).

We provide evidence that business groups can be affected by industry-specific shocks to one of the group-affiliated firms. The shock to one of the members of the corporate family leads to strategic reshuffling inside the group.

These results highlight it is key for MNEs to show capabilities that allow them to be attuned to geopolitical changes, facing critical decisions driven by institution-based and resource-based motivations. Different strategies must be timely implemented for multinational enterprises to successfully navigate the unintended consequences of the changing conditions in international trade policy, investment, and business.

7   Conclusion

Our paper focuses on anti-dumping and countervailing duties to study the unintended consequences of protectionist policies on targeted MNE conglomerates. These administered forms of protection represent international rule changes with the potential to harm MNEs' operations, use, and development of resources.

We analyze the AD-CVDs implemented by the US on the import of solar panels from China in 2012. We use the DCA database and a difference-in-differences design to document how targeted Chinese MNEs are affected by the policy change, and the strategies they develop as a reaction to the negative shock.

The data analysis shows the heterogeneity of the Chinese conglomerates operating in the global economy that have units in the solar energy sector. This leads us to perform our econometric analysis in different subsamples.

Our policy evaluation focuses on several areas of MNEs' operations and strategies: financial results, domestic restructuring, regional dispersion, and industry diversification.

We find that the 2012 US anti-dumping and countervailing duties harm the net income and return on assets of targeted Chinese MNEs the year they are imposed, with smaller conglomerates experiencing larger negative results. After the negative financial shock experienced in 2012, targeted MNEs did not reduce the number of employees at the headquarters level. Instead, they resorted to their domestic units to recompose their financial performance, with smaller conglomerates suffering larger employment losses.

We document that all targeted conglomerates in our sample develop a regionalization strategy as a response to the negative shock created by unilateral changes in bilateral trade

policy. These are differences in magnitudes, with firms in the financial subsample taking more advantage of this approach. In addition, we find this starts in 2012, concomitantly with the policy, but is larger in magnitude and statistical significance the following year.

We consider an alternative definition for foreign Chinese subsidiaries in Asia that excludes Hong Kong and Macau and find smaller effects than in the previous case. We explain these results within the framework of cultural distance's impact on international business strategy and management. In particular for firms in high technology industries, expanding into markets with similar cultural backgrounds minimizes the already high potential risks of international diversification.

Lastly, we shift our focus to industry diversification and find it is a strategy that not all conglomerates implement. The MNEs that take more advantage of this strategy are those in the financial subsample, which share a specific set of organizational structure and managerial capabilities.

Our results document that US protectionism harms Chinese conglomerates in the short run. They quickly respond by developing strategies to avoid being undermined financially and in their international market preeminence. In addition, we show that for MNEs to take full advantage of this set of strategies they require capabilities to adapt to a changing external environment.

7.1 Limitations and Future Research

Our study's limitations suggest future research directions. Firstly, due to data availability and consistency, we focus on a reduced number of Chinese conglomerates. Therefore, our study faces issues in terms of generalizability. It would be interesting to find a complementary source of conglomerate-level information that could provide a wider characterization of the sector.

It would also be interesting to determine if our findings can be applied to MNEs from other home countries. Because the Chinese solar sector experienced a rapid increase in the years before 2012, it might be that there are industry and country-specific skills that allow them to develop this set of reconfiguration strategies.

Our study of AD-CVDs allows us to focus on country and industry-specific effects, future research could focus on how this has different effects on MNEs strategies than a generalized increase in tariffs, such as what happened in the US-China trade war.

Finally, the recent growth in the Chinese industry of Electric Vehicles (EV) presents an interesting parallel with the solar panel case. With China becoming the largest EV exporter in the world, both the US and the European Union have been explicit about the possibility of imposing anti-dumping duties on the import of Chinese EVs. Future research could use the solar panel experience to inform how implementing anti-dumping duties impacts the global provision of resources that promote a green-energy transition.

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Table 1. Summary Statistics

Variable	Obs	Mean	Std. dev.	Min	Max
Full sample					
Net Income (million USD)	89	108	560	-1637	3616
Return Over Assets	89	0.01	0.11	-0.54	0.17
Employees in China	102	34138	92582	0	390254
Subsidiaries in Asia	168	0.59	1.42	0	11
Number of Industries	168	4.71	5.10	1	28
Financial Sample					
Net Income (million USD)	66	39	394	-1637	708
Return Over Assets	66	-0.004	0.12	-0.54	0.17
Employees in China	50	5230	9330	0	30902
Subsidiaries in Asia	66	1	2	0	11
Number of Industries	66	6	7	1	28
<100000 employees					
Net Income (million USD)	74	18	390	-1637	708
Return Over Assets	74	0.004	0.12	-0.54	0.17
Employees in China	75	7207	9655	0	30902
Subsidiaries in Asia	120	1	2	0	11
Number of Industries	120	4.77	5.24	1	28

Figure 1. Variables' Scatter Plots by Year for Targeted and Non-Targeted MNEs

s
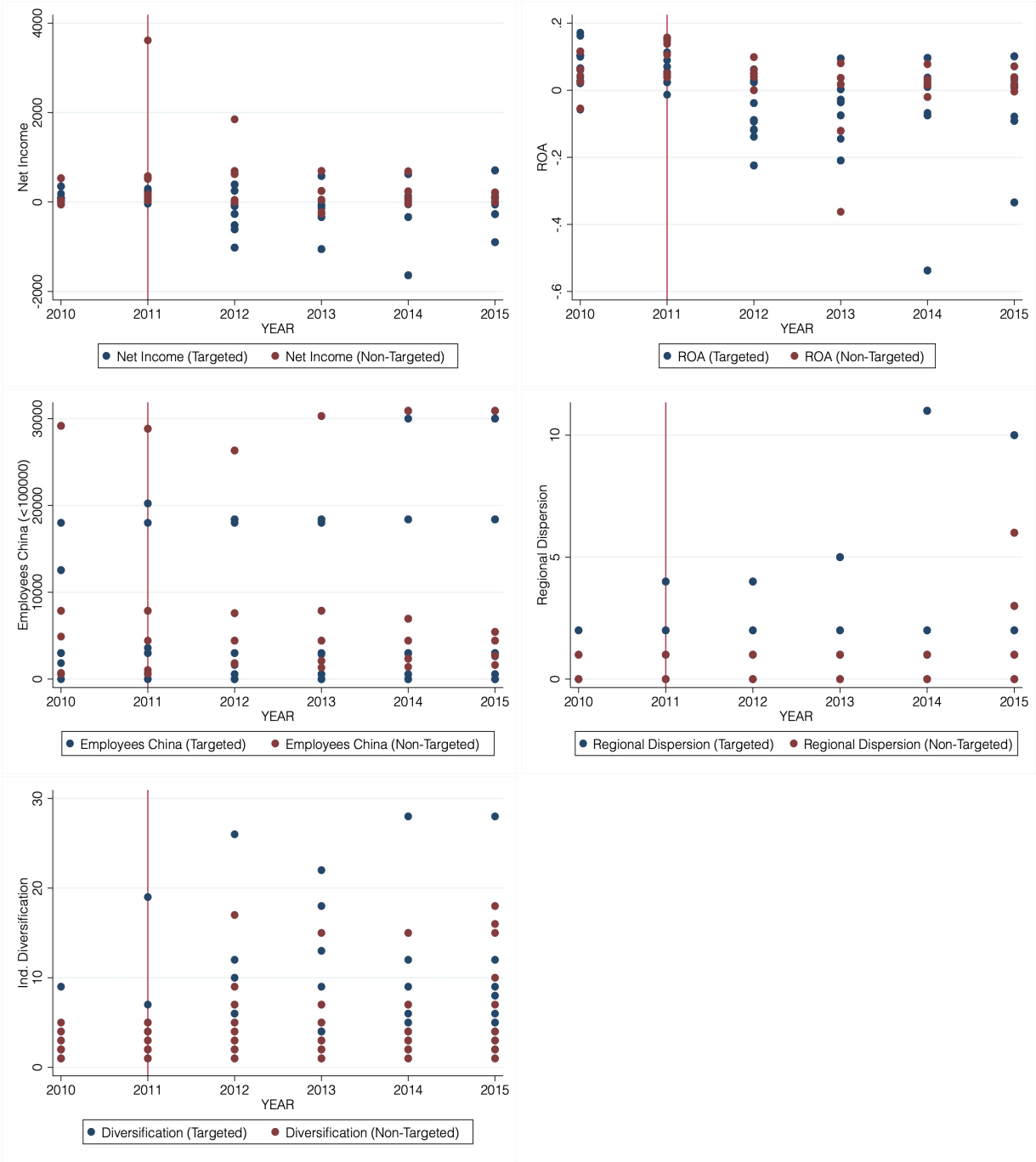
Table 2. Financial Results

	(1) Net Income	(2) ROA	(3) Net Income	(4) ROA
TargetedHQ*2010	-3.552	0.016	-9.706	0.010
	(70.08)	(0.069)	(74.75)	(0.071)
	[0.961]	[0.820]	[0.900]	[0.889]
TargetedHQ*2012	-301.2	-0.070	-348.4	-0.089
	(146.9)	(0.039)	(154.1)	(0.036)
	[0.067]	[0.105]	[0.050]	[0.037]
TargetedHQ*2013	-146.4	0.101	-164.6	0.085
	(228.3)	(0.130)	(249.4)	(0.132)
	[0.536]	[0.458]	[0.526]	[0.538]
TargetedHQ*2014	-298.3	-0.074	-329.9	-0.092
	(268.8)	(0.079)	(305.6)	(0.087)
	[0.293]	[0.376]	[0.308]	[0.317]
TargetedHQ*2015	39.16	-0.058	25.19	-0.073
	(220.5)	(0.059)	(241.4)	(0.063)
	[0.863]	[0.351]	[0.919]	[0.278]
Fixed Effects				
MNE	✓	✓	✓	✓
Year	✓	✓	✓	✓
Mean	38.99	-0.004	26.67	-0.006
Std_Dev	394.0	0.119	410.7	0.125
Sample	Financials		<100000 emp.	
MNEs	11	11	10	10
Observations	66	66	60	60
R^2	0.232	0.405	0.245	0.430

Robust standard errors in parentheses. p values in brackets.

Table 3. Domestic Restructure

	(1) Employees in China	(2) Employees in China	(3) Employees in China
TargetedHQ*2010	-1408.9	-573.2	-1657.9
	(1115.5)	(610.0)	(1314.5)
	[0.229]	[0.384]	[0.236]
TargetedHQ*2012	-418.6	-437.3	-459.0
	(576.3)	(1103.4)	(770.6)
	[0.481]	[0.706]	[0.565]
TargetedHQ*2013	-823.3	-1042.2	-1066.9
	(381.5)	(480.6)	(468.7)
	[0.050]	[0.073]	[0.046]
TargetedHQ*2014	899.3	-1022.1	942.4
	(1880.9)	(765.0)	(2260.5)
	[0.641]	[0.230]	[0.686]
TargetedHQ*2015	990.9	-887.5	1080.9
	(1937.5)	(1184.2)	(2357.7)
	[0.618]	[0.482]	[0.656]
Fixed Effects			
MNE	✓	✓	✓
Year	✓	✓	✓
Mean	41453	6469	8190
Std_Dev	100615	9749	9898
Sample	Full	Financials	< 100000 emp.
MNEs	14	7	11
Observations	84	42	66
R^2	0.168	0.184	0.198

Robust standard errors in parentheses. p values in brackets.

Table 4. Regional Dispersion

	(1) Subsidiaries in Asia	(2) Subsidiaries in Asia	(3) Subsidiaries in Asia
TargetedHQ*2010	-0.176 (0.131) [0.188]	-0.375 (0.281) [0.211]	-0.143 (0.148) [0.345]
TargetedHQ*2012	0.176 (0.0971) [0.080]	0.375 (0.195) [0.084]	0.214 (0.118) [0.084]
TargetedHQ*2013	0.235 (0.108) [0.038]	0.500 (0.202) [0.033]	0.286 (0.129) [0.040]
TargetedHQ*2014	0.406 (0.437) [0.361]	0.917 (0.948) [0.356]	0.548 (0.538) [0.322]
TargetedHQ*2015	-0.294 (0.692) [0.674]	0.792 (0.826) [0.361]	0.690 (0.498) [0.181]
Fixed Effects			
MNE	✓	✓	✓
Year	✓	✓	✓
Mean	0.589	1.015	0.592
Std_Dev	1.424	1.981	1.537
Sample	Full	Financials	< 100000 emp.
MNEs	28	11	20
Observations	168	66	120
R^2	0.156	0.226	0.140

Robust standard errors in parentheses. p values in brackets

Table 5. Regional Dispersion - Asia not PRC

	(1) Subsidiaries in Asia not PRC	(2) Subsidiaries in Asia not PRC
TargetedHQ*2010	-0.059	-0.125
	(0.060)	(0.133)
	[0.335]	[0.371]
TargetedHQ*2012	0.118	0.250
	(0.082)	(0.175)
	[0.163]	[0.183]
TargetedHQ*2013	0.176	0.375
	(0.097)	(0.195)
	[0.080]	[0.084]
TargetedHQ*2014	0.439	0.792
	(0.430)	(0.963)
	[0.317]	[0.430]
TargetedHQ*2015	-0.262	0.667
	(0.699)	(0.840)
	[0.711]	[0.446]
Fixed Effects		
MNE	✓	✓
Year	✓	✓
Mean	0.387	0.712
Std_Dev	1.153	1.537
Sample	Full	Financials
MNEs	28	11
Observations	168	66
R^2	0.140	0.191

Robust standard errors in parentheses. p values in brackets.

Table 6. Industry Diversification

	(1) Number of Industries	(2) Number of Industries	(3) Number of Industries
TargetedHQ*2010	-1.021	-2.500	-1.143
	(0.749)	(1.439)	(0.772)
	[0.184]	[0.113]	[0.155]
TargetedHQ*2012	-0.187	3.000	1.024
	(1.473)	(1.104)	(1.062)
	[0.900]	[0.022]	[0.347]
TargetedHQ*2013	0.711	3.375	2.190
	(1.450)	(1.560)	(1.155)
	[0.628]	[0.056]	[0.073]
TargetedHQ*2014	-0.642	-0.708	0.0238
	(1.502)	(3.293)	(1.767)
	[0.673]	[0.834]	[0.989]
TargetedHQ*2015	-2.107	-1.042	0.286
	(1.791)	(3.587)	(1.915)
	[0.250]	[0.777]	[0.883]
Fixed Effects			
MNE	✓	✓	✓
Year	✓	✓	✓
Mean	4.708	5.970	4.767
Std_Dev	5.103	6.523	5.240
Sample	Full	Financials	< 100000 emp.
MNEs	28	11	20
Observations	168	66	120
R^2	0.309	0.379	0.291

Robust standard errors in parentheses. p values in brackets.

A   Appendix

Figure A1. Event Studies
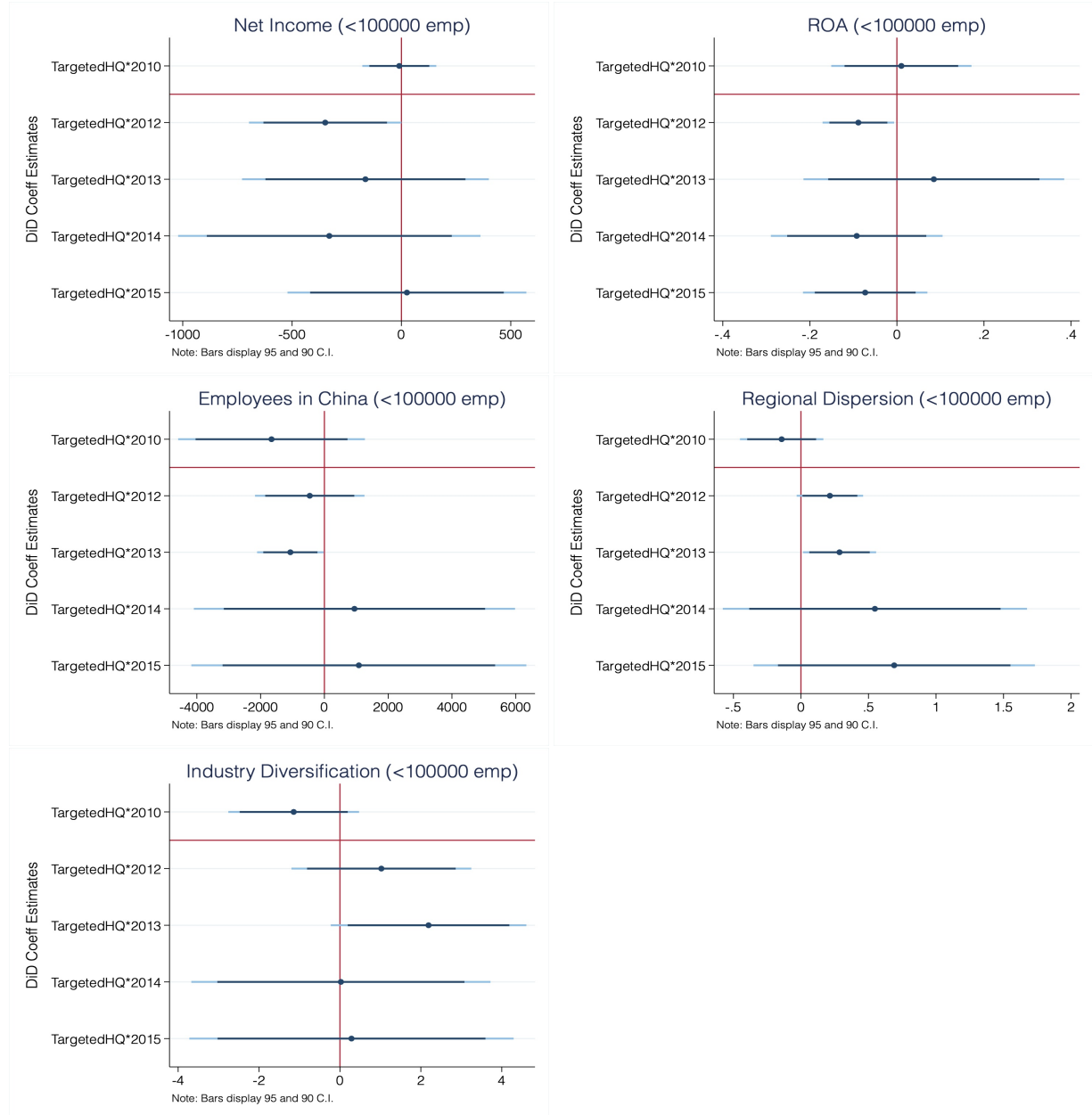
Table A1. Frequency for Number of Subsidiaries in Asia

	PRE-POLICY		POST-POLICY	
Asian Subsidiaries	Non-Targeted	Targeted	Non-Targeted	Targeted
0	16	28	26	43
1	6	3	16	16
2		2		4
3			1	1
4		1		1
5				1
6			1	
10				1
11				1
Total Observations	22	34	44	68

Table A2. Frequency for Number of Industries

Total SIC Codes by Conglomerate	PRE-POLICY		POST-POLICY	
	Non Targeted	Targeted	Non Targeted	Targeted
1	2	14	4	10
2	11	13	6	15
3	4		14	3
4	2	3	3	13
5	3	1	2	8
6				4
7		1	6	1
8				1
9		1	1	3
10			1	1
12				3
13				1
15			4	
16			1	
17			1	
18			1	1
19		1		
22				1
26				1
28				2
Total Observations	22	34	44	68

Table A3. Number of Employees in Headquarters

	(1) Employees in Headquarters	(2) Employees in Headquarters	(3) Employees in Headquarters
TargetedHQ*2010	5856.0	-5683.0	-3723.3
	(9650.9)	(950.2)	(999.0)
	[0.551]	[0.000]	[0.002]
TargetedHQ*2012	46.85	930.0	95.74
	(672.6)	(1425.6)	(778.3)
	[0.945]	[0.530]	[0.903]
TargetedHQ*2013	-1043.0	-1497.9	-1220.4
	(1318.8)	(2627.8)	(1347.0)
	[0.438]	[0.583]	[0.377]
TargetedHQ*2014	63.50	-1075.2	-114.4
	(1721.2)	(2865.9)	(1769.5)
	[0.971]	[0.716]	[0.949]
TargetedHQ*2015	42.79	-876.5	-82.44
	(1726.0)	(2945.0)	(1812.5)
	[0.980]	[0.773]	[0.964]
Fixed Effects			
MNE	✓	✓	✓
Year	✓	✓	✓
Mean	37705	16848	12820
Std_Dev	82557	18868	15431
Sample	Full	Financials	< 100000 emp.
MNEs	22	10	19
Observations	132	60	114
R^2	0.123	0.292	0.190

Robust standard errors in parentheses. p values in brackets

Table A4. Summary Statistics by Year

Variable	Obs	Mean	Std. dev.	Min	Max
year = 2010					
Net Income (million USD)	16	97.22	149.46	-54.91	532.57
Return Over Assets	16	0.06	0.06	-0.06	0.17
Employees in China	14	40678	103984	0.00	390254
Subsidiaries in Asia	28	0.25	0.52	0.00	2.00
Number of Industries	28	2.25	1.67	1.00	9.00
year = 2011					
Net Income (million USD)	17	416.58	844.91	-37.82	3616.05
Return Over Assets	17	0.09	0.05	-0.01	0.16
Employees in China	16	36156	97657	0.00	390254
Subsidiaries in Asia	28	0.36	0.87	0.00	4.00
Number of Industries	28	3.14	3.47	1.00	19.00
year = 2012					
Net Income (million USD)	16	81.29	641.86	-1018.00	1850.13
Return Over Assets	16	-0.03	0.09	-0.22	0.10
Employees in China	18	31878	92500	0.00	390254
Subsidiaries in Asia	28	0.46	0.88	0.00	4.00
Number of Industries	28	5.39	5.50	1.00	26.00
year = 2013					
Net Income (million USD)	13	-38.33	431.60	-1052.06	696.07
Return Over Assets	13	-0.06	0.13	-0.36	0.09
Employees in China	18	32173	92467	0.00	390254
Subsidiaries in Asia	28	0.50	1.04	0.00	5.00
Number of Industries	28	5.39	5.36	1.00	22.00
year = 2014					
Net Income (million USD)	13	-2.28	560.06	-1637.21	687.26
Return Over Assets	13	-0.03	0.16	-0.54	0.10
Employees in China	18	32844	92408	0.00	390254
Subsidiaries in Asia	28	0.79	2.08	0.00	11.00
Number of Industries	28	5.57	5.83	1.00	28.00
year = 2015					
Net Income (million USD)	14	17.22	337.42	-896.51	708.23
Return Over Assets	14	-0.01	0.11	-0.33	0.10
Employees in China	18	32775	92429	0.00	39025
Subsidiaries in Asia	28	1.18	2.18	0.00	10.00
Number of Industries	28	6.50	6.28	1.00	28.00