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 institutional changes even under the World Trade Organization-ruled regime and complement it with a resource-based view of IB. We use this framework to analyze unintended consequences on multinational enterprises' strategies regarding their scope and structure. Our empirical strategy examines the AD-CVDs implemented by the US on the import of solar panels from China in 2012. Using the Dunn and Bradstreet database of corporate conglomerates and a difference-in-differences design, we document how Chinese MNEs were affected by this shock. Our findings show that targeted MNEs experience a reduction in their returns and an increase in their leverage ratio the year the policy is implemented. They respond by increasing the geographical dispersion of their foreign subsidiaries and restructuring their domestic units. These results show that Chinese conglomerates impacted by US protectionism develop strategic responses that avoid undermining their financial performance and preeminence in the international market.

Keywords: Trade Policy, Anti-Dumping, Firm Strategies, Multinational Enterprises, Solar Panels, United States, China.

1 Introduction

The recent shift in the global economy from openness to trade protectionism challenges international business practice and theory (Luo (2023)). This paradigm change raises questions about the potential impacts on multinational enterprises facing uncertainties in their global operations (Luo and Van Assche (2023), Petricevic and Teece (2019)). Specifically, the strategies they develop and how they affect the organization's structure (Witt (2019)).

Institutional changes impact many aspects of MNEs' activities (Meyer et al. (2023)). Trade policy, in particular, can have unintended consequences that amplify uncertainty in the global economy (Gereffi et al. (2021)). Thus, a comprehensive study of MNEs must include a framework that highlights the importance of unfolding capabilities in a changing environment (Petricevic and Teece (2019)). Especially in key industries, given the increased prevalence of industrial policy in strategic sectors (Luo (2023)).

We develop a framework for studying the unintended consequences of protectionist policies on multinational enterprises. Our focus is on anti-dumping and countervailing duties (AD-CVDs). For firms operating in the global economy, these administered forms of protection represent institutional changes that can potentially harm their activities and their use and development of resources. We apply this framework to the analysis of the AD-CVDs implemented by the US on the import of solar panels from China in 2012. Using the Dunn and Bradstreet database of corporate conglomerates and a difference-in-differences design, we document how targeted Chinese MNEs reacted to this shock.

Building on the proposal by Meyer et al. (2023) for the study of firms facing sanctions, we develop a framework in which MNEs' institutional 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 a resource-based view (Meyer et al. (2009)).

We use this integrated framework to analyze how institutional changes in bilateral trade conditions have unintended consequences on the internal aspects of firms operating in the global economy. In particular, how they adapt and innovate in a changing environment. We focus on the financial effects firms experience due to this negative shock and their strategic and operational responses.

The institutional changes prompted by AD-CVDs can alter international trade and investment patterns several years after implementation (Montti (2024)). Thus, studies from a longer perspective can help us understand the theoretical and practical implications of IB strategies beyond the immediate response.

We examine the short and medium-run impact of these trade barriers on multinational enterprises in the renewable energy sector. Our empirical findings show that targeted MNEs experience a reduction in their returns and an increase in their leverage ratio the year the policy is implemented. They respond by increasing the geographical dispersion of their foreign subsidiaries and restructuring their domestic units, i.e. reducing the number of employees in Chinese subsidiaries. These results show that Chinese conglomerates impacted by US protectionism develop strategic responses that avoid undermining their financial performance and preeminence in the international market.

Our paper contributes to the advance of theoretical frameworks on MNEs' behavior by analyzing the unintended consequences of a negative institutional shock under the WTO regime and complementing it with a resource-based view of IB strategy. MNEs face institutional challenges even in a stable international rule-based system. Thus, maintaining an adaptive managerial approach is key to not losing relevance in the international markets while overcoming negative external shocks.

We make an empirical contribution by providing an identification strategy that allows us to find the causal effects of these policies on MNEs' international business (IB) strategies. We develop a difference-in-differences design exploiting that AD-CVDs target firms in the same industry with different rates. These different AD-CVD rates reflect the differential exposure to the US trade policy, with firms receiving a specific rate being the most exposed (Montti (2024)).

The paper is organized as follows: In section 2, we develop our conceptual framework, in section 3 we explain our methods, while section 4 discusses our results. Finally, in section 5 we conclude and present the implications of our findings for MNEs' managerial decisions.

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' institutional 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)).

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The institution-based view 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 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 Organization).[1] Because both mechanisms aim at specific products and exporters from a particular country they make for an interesting setting to analyze differential effects of institutional changes.

Multinational enterprises have to make critical strategic decisions regarding their operations when faced with a changing institutional context. These include exploiting loopholes in the regime or relocating operations to third countries, which 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

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[1]See more information for AD and CVD.

to explain MNEs' strategies (Dunning (1980)). We expand this resource -based view by focusing on how firms reconfigure their structure and scope across locations when AD-CVDs disrupt the external environment. Using this mechanism to examine institutional transitions allows us to focus on changes that are country and industry-specific.

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 recently discussed as "friend-shoring" (Hsu et al. (2022)). It is also described as a production-switching strategy, which involves moving production to countries not affected by the barriers; or a market-switching strategy, which implies selling products to alternative countries (Gereffi et al. (2021)). Chinese firms, due to the size of their economy, can even move away from foreign markets into their domestic economy to avoid trade barriers.

These responses by MNEs are possible by having context-specific capabilities. Strategic and organizational flexibility allows firms to compete and adapt in volatile environments, especially in emerging economies (Meyer et al. (2009),Meyer et al. (2023)). This adaptive managerial approach is key to firms not losing relevance in the international markets while overcoming negative external shocks.

3   Methods

In this section, we describe our dataset and the construction of the several variables we use for our empirical analysis. We then explain the estimation method we use to evaluate the impact of the AD-CVDs on targeted Chinese MNEs.

3.1   Data & Variables

We use the following data XXX

We depict the summary statistics in Table **??** and the evolution of variables by MNE groups in Figures **??**.

3.1.1 Financial Results

We rely on two financial indicators as dependent variables to analyze the effects of the AD-CVDs on targeted MNEs' financial performance: the return on assets, and the leverage ratio.

The variable ROA (Return On Assets) is constructed as the ratio of net income over assets. This measure of performance compares the profit a company generates with the capital it has invested in assets. Meanwhile, the leverage ratio is defined as total assets over net worth. This indicator reflects how much of a firm's capital comes from debt, assessing the ability of the company to meet its financial obligations.

In some specifications, we include the logarithm of total assets as a control variable as a means to absorb the impact of the size of the firms on the results. In all cases, the variables are defined at the headquarters level.

3.1.2 Geographical Dispersion and Number of Employees

To account for the geographical dispersion of firms, we create a variable that counts the number of subsidiaries by company headquarters per year.

To investigate the domestic restructuring of firms, our variable considers the number of employees in Chinese subsidiaries for conglomerates that operate within the same industry as the targeted firms.

In some of our estimations, we include as a control variable the number of employees at the headquarters level. This aims to consider how the differential size of the companies might impact the estimations.

3.2 Model and Estimation

We develop a difference-in-differences design exploiting that AD-CVDs target 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 that were 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 firm i and year t as follows:

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

Where Y_{it} represents different variables depending on the effect we are assessing: return over total assets, leverage ratio, geographical dispersion, or the number of employees in Chinese subsidiaries. X_{it} are control variables such as financial indicators or the number of employees in the headquarters or the subsidiaries. γ_i are firm fixed effects; λ_t are year fixed effects; and ϵ_{it} is the error term. Robust standard errors are clustered at the firm 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 1. These show that in all cases the estimated coefficients have no statistically significant effects in the pre-policy period. For the number of employees in Chinese subsidiaries, the results are for the financial subsample and they are significant at the 10% level.

4 Results: MNE Reconfiguration

4.1 Financial Effects

4.2 Geographical Dispersion

4.3 Domestic Restructure
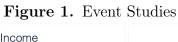
5 Conclusion: Implications for MNEs

Multinational firms that faced a changing environment adapted by making new business decisions.

5.1 Limitations and Future Research

References

Cunningham, Scott, *Causal Inference: The Mixtape*, Yale University Press, 2021.

Dunning, John, "Toward an eclectic theory of international production: some empirical tests," *Journal of International Business Studies*, 1980, pp. 9–31.

Gereffi, Gary, Hyun-Chin Lim, and Joonkoo Lee, "Trade policies, firm strategies, and adaptive reconfigurations of global value chains," *Journal of International Business Policy*, December 2021, *4* (4), 506–522.

Hsu, Jonathan, Zhi Li, and Jing Wu, "Supply Chain Nearshoring in Response to Regional Value Content Requirements," October 2022.

Luo, Yadong, "Paradigm shift and theoretical implications for the era of global disorder," *Journal of International Business Studies*, December 2023.

_ **and Ari Van Assche**, "The rise of techno-geopolitical uncertainty: Implications of the United States CHIPS and Science Act," *Journal of International Business Studies*, October 2023, *54* (8), 1423–1440.

Meyer, Klaus E., Saul Estrin, Sumon Kumar Bhaumik, and Mike W. Peng, "Institutions, resources and entry strategies in emerging economies," *Strategic Management Journal*, 2009, pp. 61–80.

_ **, Tony Fang, Andrei Y. Panibratov, Mike W. Peng, and Ajai Gaur**, "International business under sanctions," *Journal of World Business*, February 2023, *58* (2), 101426.

Montti, A. Oriana, "Effects of Trade Barriers on Foreign Direct Investment: Evidence from Chinese Solar Panels," 2024.

Peng, Mike W, Denis Y L Wang, and Yi Jiang, "An institution-based view of international business strategy: a focus on emerging economies," *Journal of International Business Studies*, July 2008, *39* (5), 920–936.

Petricevic, Olga and David J. Teece, "The structural reshaping of globalization: Implications for strategic sectors, profiting from innovation, and the multinational enterprise," *Journal of International Business Studies*, December 2019, *50* (9), 1487–1512.

Witt, Michael A., "De-globalization: Theories, predictions, and opportunities for international business research," *Journal of International Business Studies*, September 2019, *50* (7), 1053–1077.
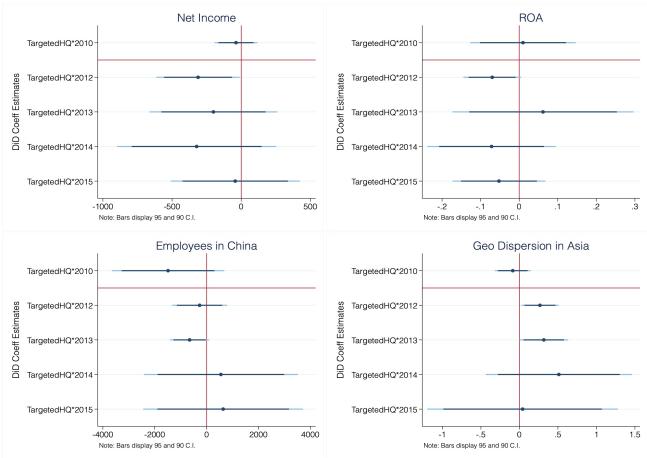
Figure 1. Event Studies

Note: Bars display 95 and 90 C.I.

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Table 1. Financial Results

	(1) Net Income	(2) ROA
TargetedHQ*2010	-37.98	0.009
	(70.50)	(0.062)
TargetedHQ*2012	-311.90**	-0.070*
	(136.90)	(0.034)
TargetedHQ*2013	-201.10	0.062
	(209.60)	(0.11)
TargetedHQ*2014	-322.20	-0.072
	(261.30)	(0.076)
TargetedHQ*2015	-43.69	-0.053
	(212.0)	(0.055)
Fixed Effects		
Firm	✓	✓
Year	✓	✓
Mean	40.56	0.003
Std_Dev	379.70	0.12
Firms	12	12
Observations	71	71
R^2	0.219	0.383

Standard errors in parentheses

* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Table 2. Financial Results (<100000 employees)

	(1) Net Income	(2) ROA
TargetedHQ*2010	-44.140	0.004
	(74.91)	(0.064)
TargetedHQ*2012	-359.10**	-0.088**
	(143.90)	(0.030)
TargetedHQ*2013	-219.30	0.046
	(231.00)	(0.108)
TargetedHQ*2014	-353.80	-0.090
	(297.40)	(0.083)
TargetedHQ*2015	-57.67	-0.068
	(232.50)	(0.059)
Fixed Effects		
Firm	✓	✓
Year	✓	✓
Mean	29.33	0.002
Std_Dev	394.50	0.123
Firms	11	11
Observations	65	65
R^2	0.232	0.409

Standard errors in parentheses

* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Table 3. Financial Results (Refinitiv Data)

	(1) Revenue	(2) EBITDA/Assets
Targeted*2010	133.6	0.113
	(175.7)	(0.0842)
Targeted*2012	-290.5**	0.0237
	(138.7)	(0.0371)
Targeted*2013	-263.9	0.0684**
	(233.9)	(0.0313)
Targeted*2014	-101.6	0.116***
	(277.9)	(0.0304)
Targeted*2015	149.2	0.0684
	(361.7)	(0.0413)
Fixed Effects		
Firm	✓	✓
Year	✓	✓
Mean	1248.7	0.0424
Std_Dev	2506.7	0.113
Firms	35	24
Observations	162	124
R^2	0.139	0.159

Standard errors in parentheses
* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Table 4. Domestic Restructure - Heterogeneous Effects

	(1) Employees China	(2) Employees China	(3) Employees China
TargetedHQ*2010	-1487.0	-1546.2	-1702.3
	(1027.1)	(1203.1)	(1219.8)
TargetedHQ*2012	-271.5	-384.5	-274.6
	(502.5)	(555.3)	(668.8)
TargetedHQ*2013	-656.6*	-828.5**	-798.5*
	(358.6)	(382.7)	(449.2)
TargetedHQ*2014	548.9	-822.4	708.4
	(1402.7)	(502.6)	(1799.6)
TargetedHQ*2015	636.8	-721.1	828.0
	(1458.6)	(677.2)	(1876.1)
Fixed Effects			
Firm	✓	✓	✓
Year	✓	✓	✓
Mean	34137.8	30556.2	14080.6
Std_Dev	92582.0	97003.2	26156.9
Sample	Full	Financials	< 100000 emp.
Firms	18	16	14
Observations	102	90	81
R^2	0.140	0.165	0.169

Standard errors in parentheses
* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Table 5. Geographical Dispersion in Asia - Heterogeneous Effects

	(1) Asia	(2) Asia	(3) Asia
TargetedHQ*2010	-0.235	-0.333	-0.143
	(0.164)	(0.230)	(0.147)
TargetedHQ*2012	0.176*	0.250*	0.214*
	(0.0971)	(0.134)	(0.117)
TargetedHQ*2013	0.235**	0.333**	0.286**
	(0.108)	(0.145)	(0.129)
TargetedHQ*2014	0.406	0.611	0.571
	(0.437)	(0.607)	(0.530)
TargetedHQ*2015	-0.294	0.194	-0.143
	(0.692)	(0.609)	(0.958)
Fixed Effects			
Firm	✓	✓	✓
Year	✓	✓	✓
Mean	1.512	1.611	1.563
Std_Dev	1.427	1.528	1.582
Sample	Full	Financials	<100000 emp.
Firms	28	21	21
Observations	168	126	126
R^2	0.161	0.169	0.151

Standard errors in parentheses

* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Table 6. Regional Dispersion - Heterogeneous Effects

	(1) Asia w/o China	(2) Asia w/o China	(3) Asia w/o China
TargetedHQ*2010	-0.0588	-0.0833	
	(0.0599)	(0.0852)	
TargetedHQ*2012	0.118	0.167	0.143
	(0.0821)	(0.115)	(0.0999)
TargetedHQ*2013	0.176*	0.250*	0.214*
	(0.0971)	(0.134)	(0.117)
TargetedHQ*2014	0.439	0.639	0.500
	(0.430)	(0.603)	(0.532)
TargetedHQ*2015	-0.262	0.222	-0.214
	(0.699)	(0.612)	(0.960)
Fixed Effects			
Firm	✓	✓	✓
Year	✓	✓	✓
Mean	0.387	0.444	0.452
Std_Dev	1.153	1.190	1.288
Sample	Full	Financials	<100000 emp.
Firms	28	21	21
Observations	168	126	126
R^2	0.140	0.130	0.143

Standard errors in parentheses
* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$