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 structure and scope. 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 react to this shock. Our findings show that targeted MNEs increase the geographic scope of their subsidiary portfolio and their industrial activities (i.e., the number of four-digit SIC industries in which they operate). Even though their financial performance is negatively affected for several years after the policy, they do not have a significant change in the number of employees. These results show how a US protectionist policy can severely impact Chinese conglomerates without undermining their preeminence in the international market. We argue this is possible due to MNEs' managerial capabilities.

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 2023). Trade policy, in particular, can have unintended consequences that amplify uncertainty in the global economy (Gereffi et al. (2021)). Thus, the theory of the MNE 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 the study of the unintended consequences of protectionist policies on multinational enterprises' strategies. We focus on anti-dumping and countervailing duties (AD-CVDs). For firms operating in the global economy, these administered forms of protection represent institutional changes with the potential to harm their activities, resource development, and use. 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 the 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. Our focus is on firm-level strategic and operational responses, and the financial effect they experience due to this negative shock.

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 firms' strategies promote the geographical and organizational reconfiguration of MNEs. Targeted MNEs increase the geographic scope of their subsidiary portfolio and their industrial activities (i.e., the number of four-digit SIC industries in which they operate). Even though their financial performance is negatively affected for several years after the policy, they do not have a significant change in the number of employees. These results show how a US protectionist policy can severely impact Chinese conglomerates without undermining their 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. 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)).

The paper is organized as follows: In section X, we develop our conceptual framework. In section XX we show the trends in AD-CVDs and explain the 2012 US anti-dumping and countervailing duties against the import of solar cells and modules from China. In section XXX we explain our methods. In section XXXX we discuss our results. Finally, in section XXXXX we 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)).

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. Our focus is on firm-level strategic and operational responses, and the financial effect they experience due to this negative shock.

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 Or-

ganization).[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.

When faced with a changing institutional context, multinational enterprises have to make critical strategic decisions regarding their operations. 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 to explain MNEs' strategies (Dunning 1980). We expand this resource -based view by focusing on how firms reconfigure their structure and scope across locations and units when the external environment is disrupted by AD-CVDs. 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 an abrupt 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)). Gereffi et al. (2021) also describe this 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. In the case of Chinese firms, due to the size of their economy, they can even move away from foreign to domestic markets to avoid trade barriers.

Firms can also leverage their resources to diversify their industrial activities to avoid depending on the harmed industry. The strategy defined as upgrading (Gereffi et al. (2021)), implies improving processes or products or moving into higher value-added market segments.

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.

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[1]See more information for AD and CVD.

3 Methods

3.1 Data

We use the following data XXX

3.2 Variables

3.2.1 Dependent Variables

3.2.2 Control Variables

3.3 Modeling

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).

Thus, our model is as follows:

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

3.4 Results

4 Discussion and Contributions

5 Conclusion: Implications for MNEs

I find it particularly interesting to understand how multinational firms that faced a changing environment adapted by making new business decisions.

5.1 Limitations and Future Research

References

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.

ISO count

Raw data

Note: Bars display 90 C.I.
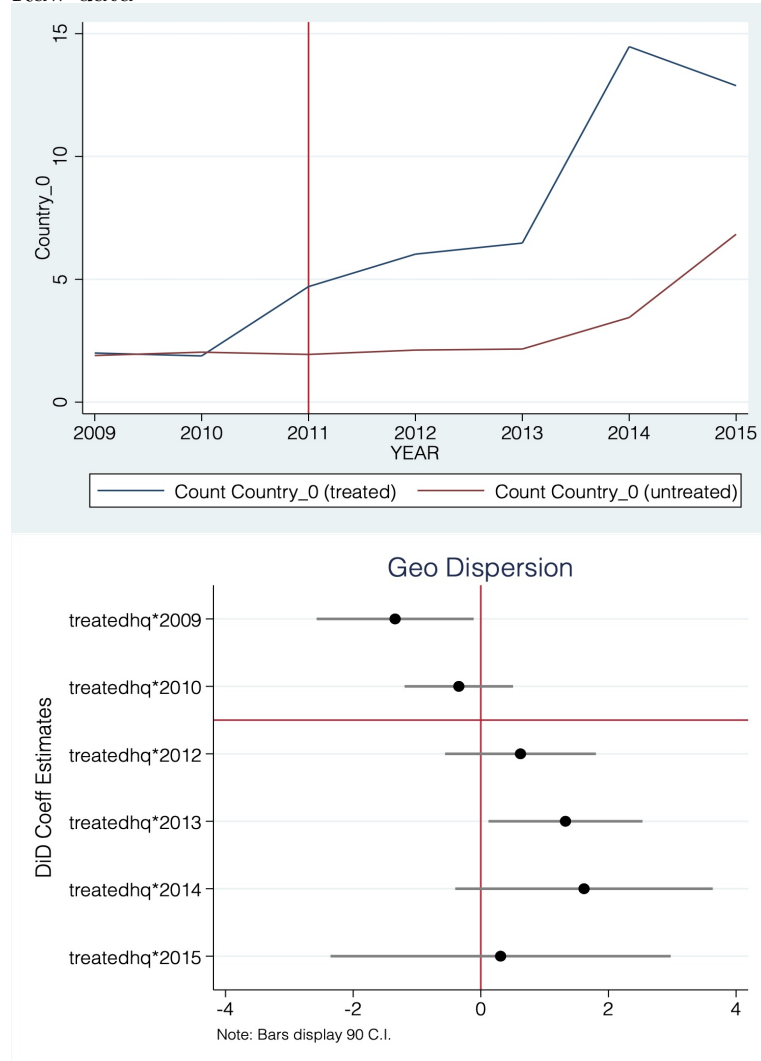
Table 1. Geographical Dispersion of Subsidiaries

	(1) Geo Dispersion	(2) Geo Dispersion	(3) Geo Dispersion	(4) Geo Dispersion
Targeted*2009	-1.342*	0.372	0.529	0.690
	(0.731)	(0.875)	(0.924)	(1.122)
Targeted*2010	-0.344	-0.925	-0.802	-0.645
	(0.505)	(0.734)	(0.822)	(0.943)
Targeted*2012	0.622	1.342	1.415	1.677
	(0.702)	(1.128)	(1.188)	(1.121)
Targeted*2013	1.327*	2.210*	2.314*	2.305*
	(0.717)	(1.199)	(1.230)	(1.287)
Targeted*2014	1.617	3.782	3.829	4.148
	(1.198)	(2.466)	(2.448)	(3.005)
Targeted*2015	0.310	4.096*	4.150*	4.345
	(1.583)	(2.288)	(2.264)	(2.581)
Fixed effects				
Firm	✓	✓	✓	✓
Year	✓	✓	✓	✓
Control Variables				
Log of Assets		✓	✓	✓
Leverage Ratio			✓	✓
Av. Return				✓
Observations	263	128	128	123
R^2	0.259	0.341	0.341	0.346

Standard errors in parentheses

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

Table 2. ISO count per year (different samples)

	(1) count_iso0	(2) count_iso0	(3) count_iso0	(4) count_iso0
treatedhq*2009	-1.476**	-0.952	-0.580**	-1.720*
	(-2.21)	(-1.35)	(-2.57)	(-1.81)
treatedhq*2010	-0.626	-0.845	-0.325	-0.594
	(-1.39)	(-1.19)	(-1.56)	(-1.19)
treatedhq*2012	1.122	1.820	0.222	1.191
	(1.67)	(1.70)	(1.54)	(1.61)
treatedhq*2013	1.637**	2.789**	0.422*	1.695**
	(2.44)	(2.44)	(1.93)	(2.29)
treatedhq*2014	2.650**	5.206**	0.477**	2.873**
	(2.32)	(2.26)	(2.36)	(2.26)
treatedhq*2015	3.237***	4.984**	1.725	3.373**
	(2.78)	(2.27)	(1.50)	(2.64)
Mean	2.795	3.406	2.215	2.982
Std_Dev	3.484	4.221	2.481	3.674
FE: Year & Firm	Y	Y	Y	Y
Sample	full	financials	no financials	ticker
N	263	128	135	219
r2	0.179	0.324	0.0431	0.194

t statistics in parentheses

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

NOTE: This table presents the logit coefficients for the estimations based on equation **??**. The dependent variables are all binary indicators and equal to 1 if the firm makes an FDI investment in the US (columns 1, 2, 3); Europe (columns 4, 5, 6); and Asia (columns 7, 8, 9). Some coefficients are not estimated due to a lack of observations. Standard errors clustered at the firm level are shown in parentheses. Statistical significance levels are given by * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

10

SIC count

Raw data
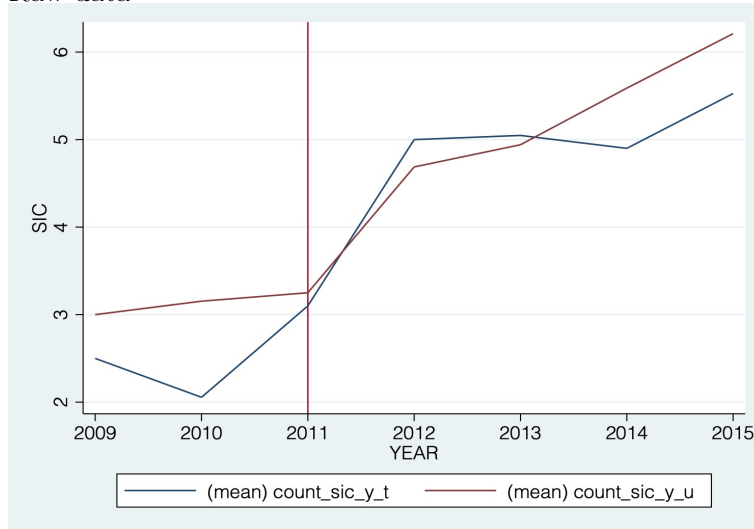
Table 3. SIC count per year

	(1) count_sic	(2) count_sic
treatedhq*2009	-2.341**	-1.856
	(-2.06)	(-1.53)
treatedhq*2010	-1.411**	-1.818*
	(-2.06)	(-1.77)
treatedhq*2012	1.900***	2.636***
	(3.64)	(3.33)
treatedhq*2013	2.068***	3.197**
	(2.77)	(2.38)
treatedhq*2014	1.869***	2.792**
	(3.08)	(2.51)
treatedhq*2015	2.338***	2.792**
	(3.67)	(2.51)
Mean	4.373	5.369
Std_Dev	4.675	5.697
FE: Year & Firm	Y	Y
Sample	full	financials
N	233	111
r2	0.182	0.256

t statistics in parentheses

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

Table 4. SIC count per year (controls)

	(1) count_sic_y	(2) count_sic_y	(3) count_sic_y
treatedhq*2009	-2.177 (-1.70)	-2.175 (-1.69)	-2.395 (-1.69)
treatedhq*2010	-2.039* (-1.92)	-2.033* (-1.90)	-2.006* (-2.02)
treatedhq*2012	2.711*** (3.40)	2.722*** (3.37)	3.052** (2.52)
treatedhq*2013	3.255** (2.46)	3.376** (2.47)	3.641** (2.47)
treatedhq*2014	2.873** (2.51)	2.859** (2.46)	3.152* (1.96)
treatedhq*2015	2.888** (2.51)	2.870** (2.45)	3.119* (1.99)
Controls	assets	assets+rev	assets+rev+ret
FE: Year & Firm	Y	Y	Y
N	111	111	106
r2	0.263	0.266	0.275

t statistics in parentheses

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

Note: Bars display 95 and 90 C.I.

Note: Bars display 99, 95 and 90 C.I.
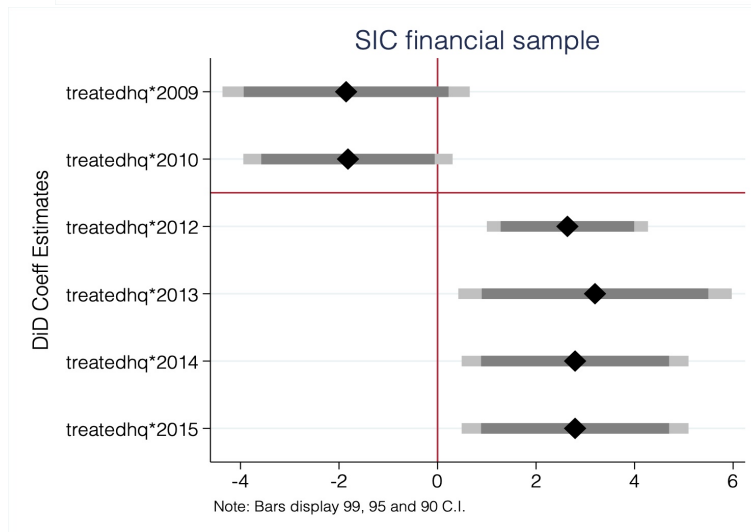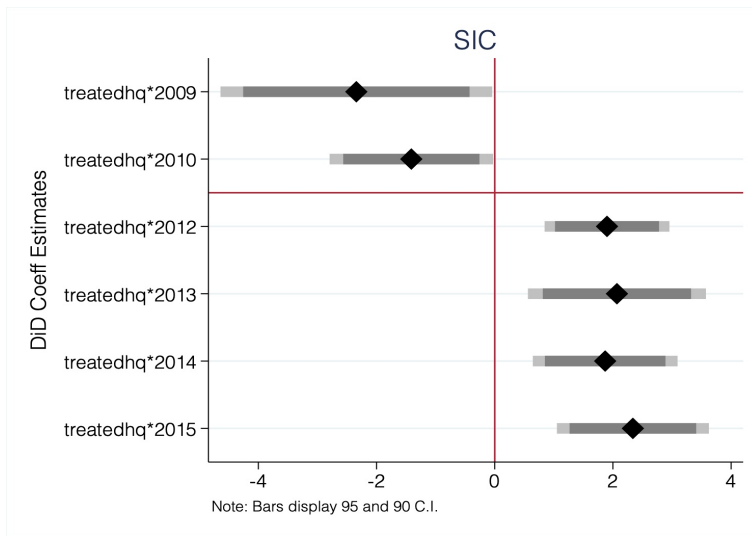
Financials & Employees

Table 5. Financial Results

	(1) log assets	(2) leverage ratio	(3) return assets
treatedhq*2009	-1.018***	-0.541	0.00290
	(0.162)	(0.370)	(0.0233)
treatedhq*2010	-0.698***	-0.235	-0.0300
	(0.142)	(0.183)	(0.0223)
treatedhq*2012	0.237***	1.827***	-0.157***
	(0.0659)	(0.520)	(0.0242)
treatedhq*2013	0.186*	-0.0839	-0.141***
	(0.0909)	(2.542)	(0.0281)
treatedhq*2014	0.258	-1.172	-0.154**
	(0.176)	(3.058)	(0.0658)
treatedhq*2015	0.304	-1.695	-0.132***
	(0.224)	(1.717)	(0.0442)
Mean	21.30	2.764	0.0140
Std_Dev	1.579	3.623	0.109
FE: Year & Firms	Y	Y	Y
N	111	109	106
r2	0.156	0.0645	0.350

Standard errors in parentheses

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

Note: Bars display 95 and 90 C.I.

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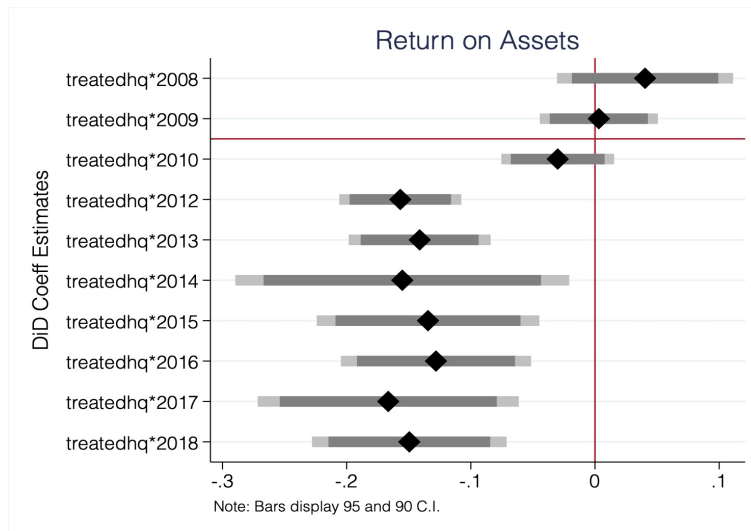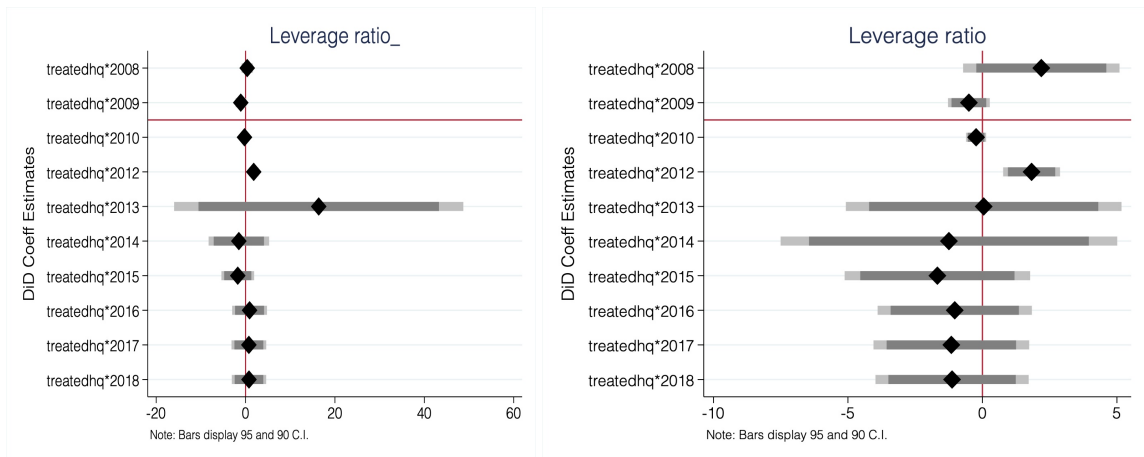
Table 6. Number of Employees

	(1) number_of_employees_5	(2) number_of_employees_0	(3) emp_0_ch	(4) emp_0_ch_solar
treatedhq*2009	-4205.6***	-2011.4	2835.3	-1968.1
	(1296.0)	(2374.9)	(7326.9)	(1873.6)
treatedhq*2010	-3435.8***	-1886.8	4529.4	-1453.2
	(846.0)	(1404.7)	(7242.0)	(962.3)
treatedhq*2012	84.54	-2601.3	9439.9	-318.4
	(523.1)	(2022.4)	(8973.4)	(266.7)
treatedhq*2013	-823.9	-1944.9	8505.0	-205.7
	(1146.8)	(2205.4)	(8853.2)	(209.6)
treatedhq*2014	-293.9	-220.9	9187.4	891.4
	(1649.5)	(3238.5)	(8591.4)	(1172.2)
treatedhq*2015	1681.1	-128.5	10101.1	863.4
	(1972.2)	(3346.1)	(10221.3)	(1176.5)
Mean	37086.6	32477.9	31341.7	24100.0
Std_Dev	75932.3	90031.8	75195.7	77965.7
N	180	106	212	149
r2	0.0254	0.00946	0.0291	0.138

Standard errors in parentheses

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

Table 7. Ratio of Employees

	(1) ratio_empl_05	(2) ratio_empl_05_ch	(3) ratio_empl_05_ch_solar
treatedhq*2009	0.121** (2.09)	0.0719 (1.07)	0.0841 (1.03)
treatedhq*2010	0.0577 (1.63)	0.0680 (1.31)	0.0504 (1.01)
treatedhq*2012	-0.178** (-2.53)	0.129 (1.64)	0.00212 (0.36)
treatedhq*2013	-0.187** (-2.55)	0.113 (1.45)	0.00335 (0.63)
treatedhq*2014	-0.205*** (-2.83)	0.114 (1.34)	0.000586 (0.08)
treatedhq*2015	-0.232*** (-2.99)	0.0685 (1.02)	0.0000459 (0.01)
Mean	0.682	1.025	0.741
Std_Dev	0.337	0.326	0.427
FE: Year & Firm	Y	Y	Y
N	180	169	117
r2	0.276	0.0488	0.157

t statistics in parentheses

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