Industrial Policy in a Globalized Economy: Firm Foreignness and US Subsidy Allocation

Prepared for IPES 2024

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The Renaissance of Industrial Policy

The United States Takes a New Look at Industrial Subsidies

Photo: Bill Pugliano/Getty Images

Made in China 2025 plan thrives with subsidies for tech and EV makers

Handouts continue but local government cash crunch adds extra dimension

Made in China 2025 is aimed at transforming the country into a higher-tech manufacturing powerhouse by 2049, the centennial anniversary of the people's republic © FT Montage/Getty/Bloomberg

Industrial Policy in a Globalized Economy

U.S. Gov Subsidizes Domestic Chip Production With $6.6B Incentives for TSMC and Samsung Under CHIPS Act

The United States government is dispensing billions of dollars in incentives and loans as part of the CHIPS and Science Act passed by Congress in August 2022. TSMC and Samsung have emerged as the third and fourth beneficiaries of billions of dollars available under the U.S. CHIPS and Science Act after GlobalFoundries and Intel.

Where mega battery, EV projects stand after $1 billion in Michigan subsidies

How do governments allocate the benefits of industrial policy among firms, given that industrial policy in a globalized economy often supports foreign-national companies?

How do governments allocate the benefits of industrial policy among firms, given that industrial policy in a globalized economy often supports foreign-national companies?

- What are the motivations of industrial policy?
- Would the government support domestic companies over foreign ones?
- If not, why would they subsidize foreign companies?

Political Motivations of Industrial Policy

- "Nothing speaks louder about a government's priorities than how it spends its money." (Rickard, 2018; McGillivray, 2004)
- Incumbents fund subsidies for business to win election. (Dewartripont and Seabright 2006; Buts et al, 2012)
- In globalized context, domestic companies and voters are more crucial targets of industrial policy than foreign counterparts.

Domestic explanations

- Political institutions
- Interstate competition
- Capture theory

International factors

- Global competition in trade
- Geopolitical considerations
- Nationalism

Strategic Distribution of Industrial Subsidy

To maximize the political backing from businesses and voters, **domestically-focused firms** *will receive greater industrial support from the governments.*

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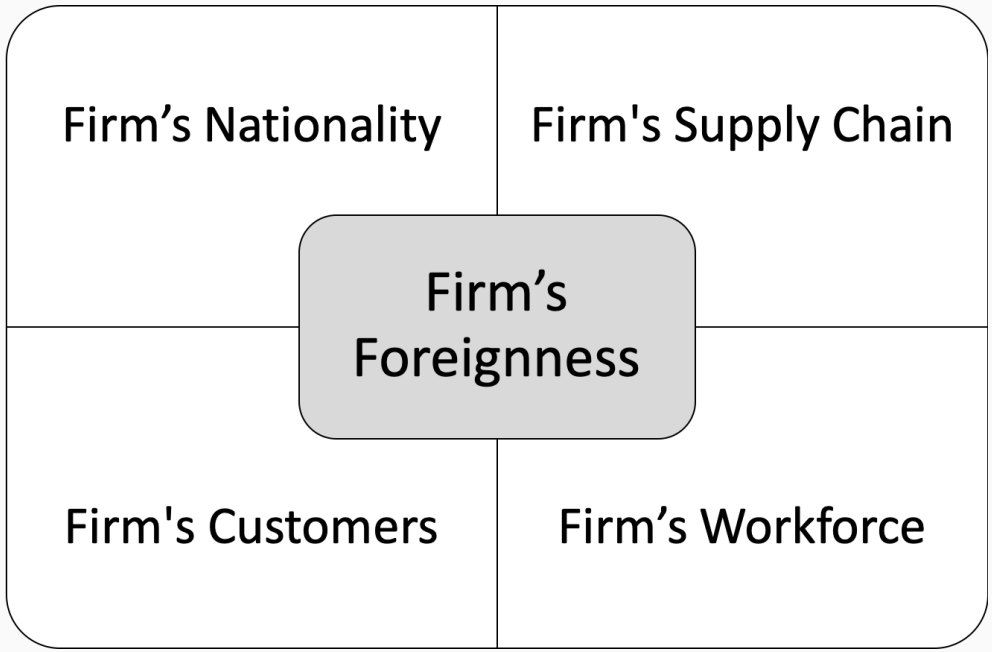
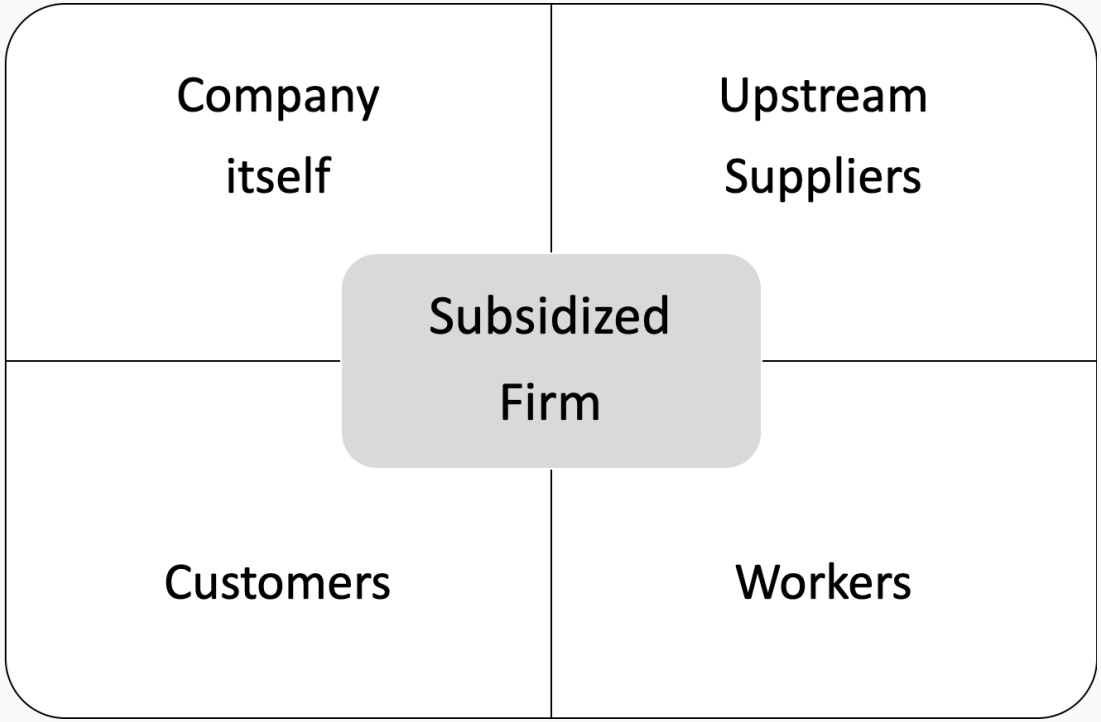
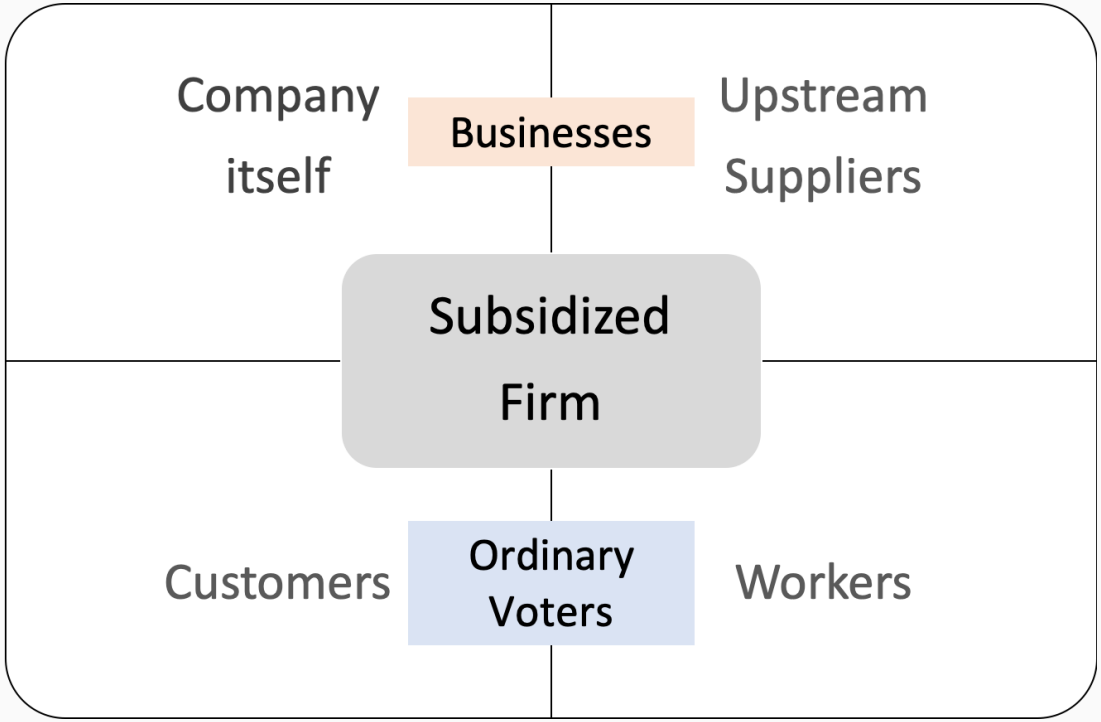
What does 'domestically-focused' mean?



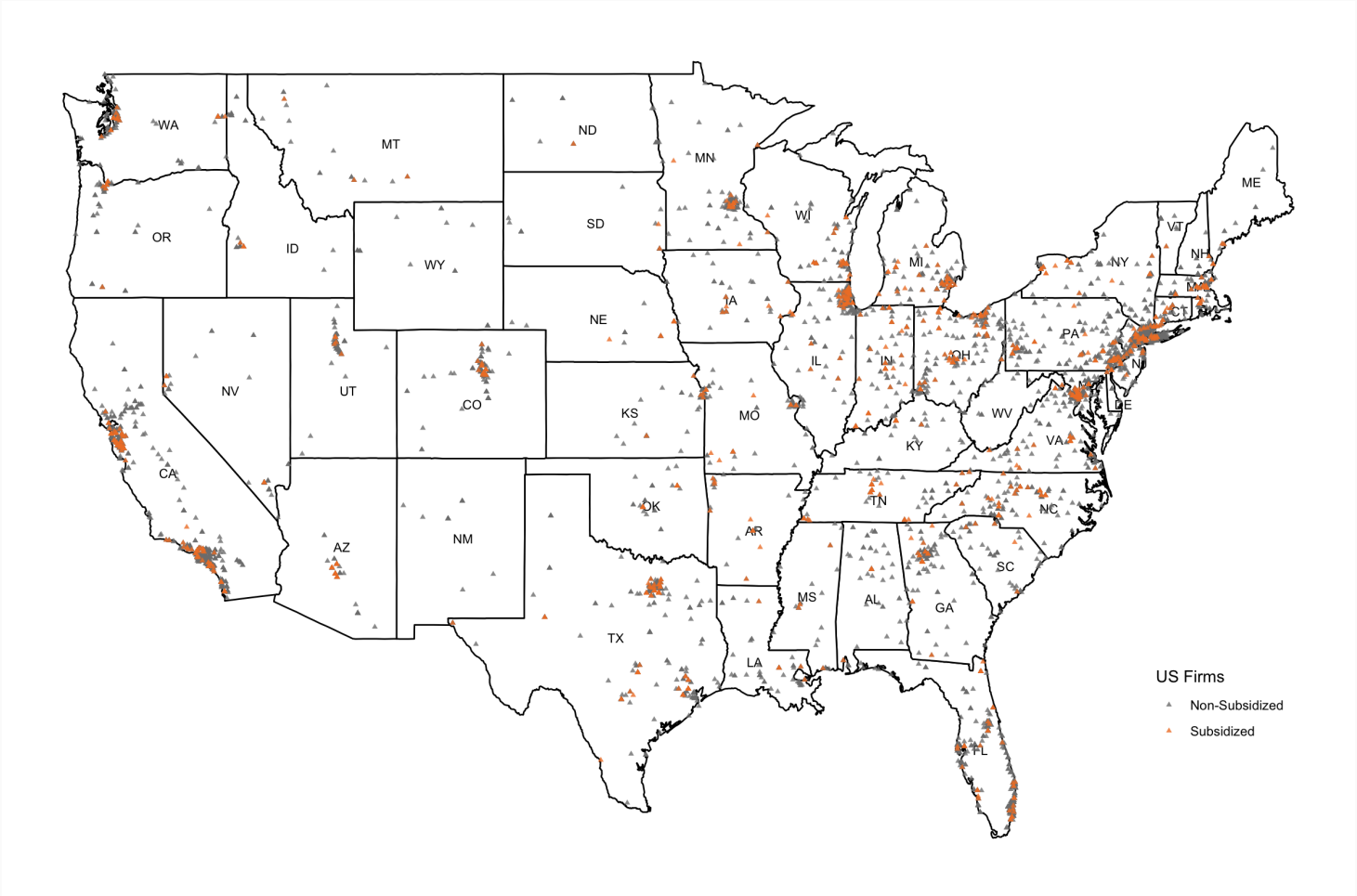
Who is affected by the industrial subsidies provided to a firm?



Who is affected by the industrial support provided to a firm?

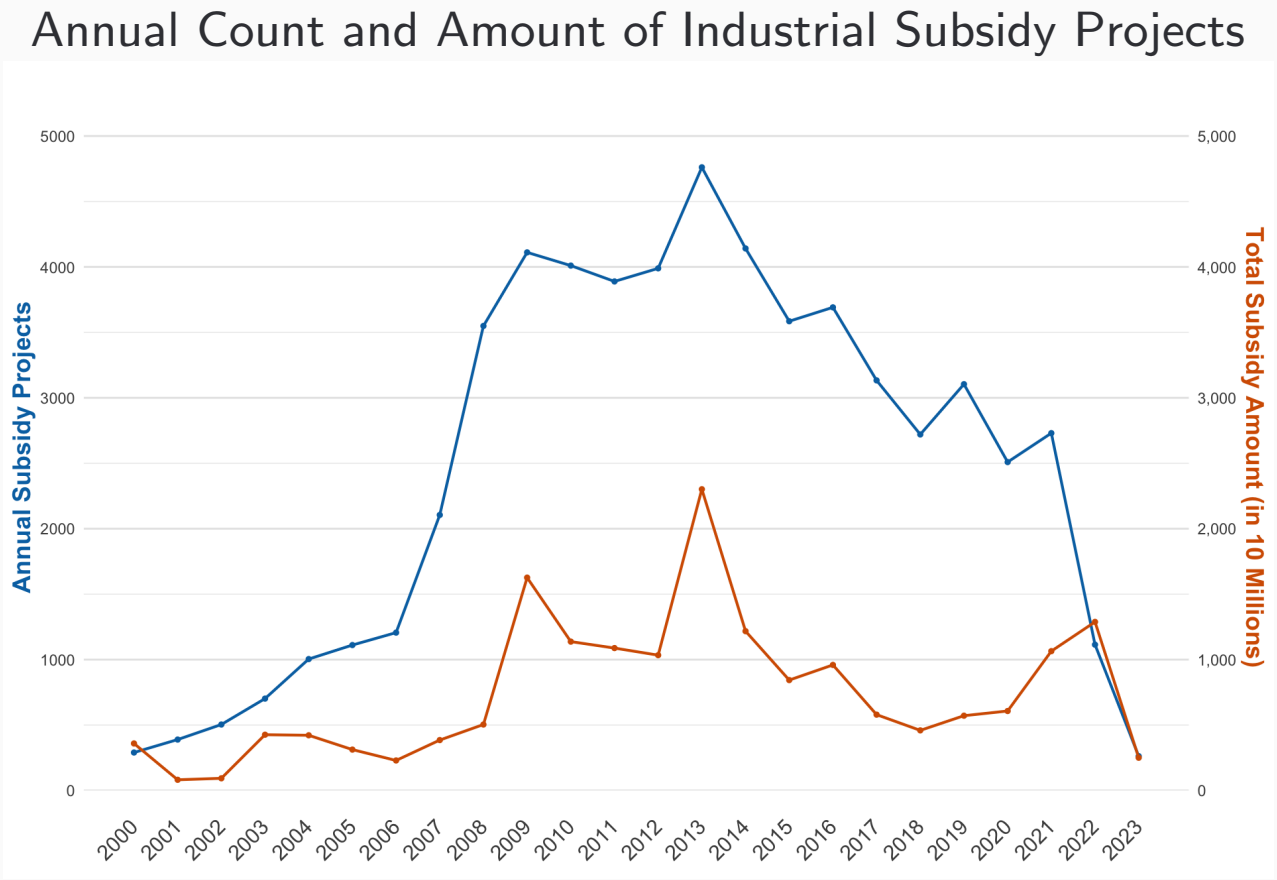


Sample: U.S. publicly traded firms from 2000 to 2023



Dependent Variable

DV: Industrial Subsidy in count_{ij} and amount_{ij}



Explanatory Variables

- Firm Nationality based on the location of their headquarters.

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- Worker Foreignness: Two proxies

  - Foreign Subsidiary: Proportion of subsidiaries located in foreign countries.
  - H-1B Visa Application: Firms' application for nonimmigrant visa that allows US employers to temporarily hire foreign workers for specialty occupations.

Simple models with fixed effects

$$\ln \text{Subsidy Count}_{it} = \beta_0 + \beta_1 X_{it} + \beta_2 \text{Firm Size}_{it} + \alpha_i^{\text{4d NAICS}} + \alpha_t^{\text{Year}} + \alpha_i^{\text{State}} + \varepsilon_{it}$$

$$\ln \text{Subsidy Amount}_{it} = \beta_0 + \beta_1 X_{it} + \beta_2 \text{Firm Size}_{it} + \alpha_i^{\text{4d NAICS}} + \alpha_t^{\text{Year}} + \alpha_i^{\text{State}} + \varepsilon_{it}$$

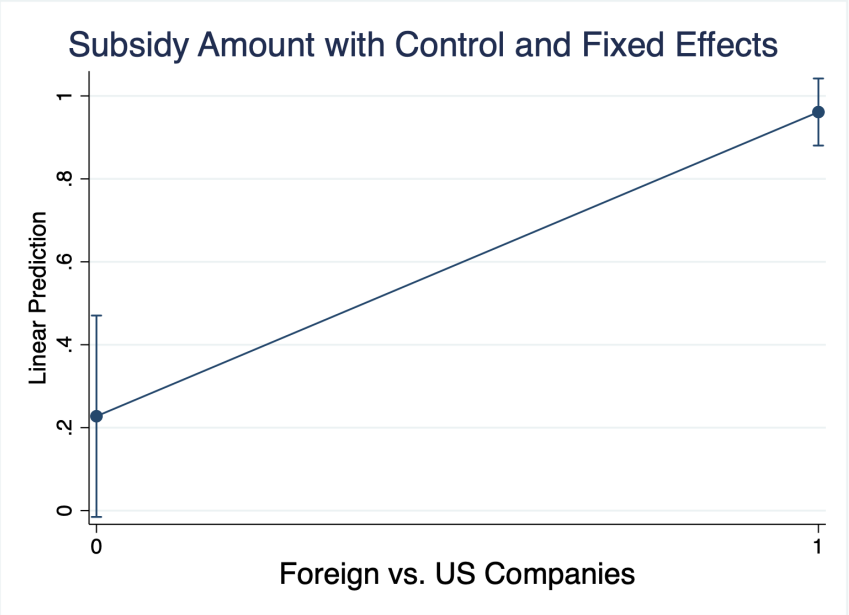
$\mathbf{X_{it}}$	Expected Sign of Coefficient
US Companies	$+$
US Suppliers	$+$
American Customers	$+$
Foreign Subsidiaries	$-$
H1B Applications	$-$

Firm Nationality

US-based companies receive more industrial policy benefits than foreign ones.

	ln *Count*
US Companies	**0.038****
	(0.011)
	ln *Amount*
US Companies	**0.499****
	(0.143)
Firm Size Control	Yes
Year & State FE	Yes
Industry FE	Yes

** $p < 0.01$



American Suppliers and Customers

Firms with American suppliers receive more industrial subsidies, whereas companies serving American customers receive less or insignificant support.

	ln *Count*
US Suppliers$_{t-1}$	**0.011****
	(0.001)
	ln *Amount*
US Suppliers$_{t-1}$	**0.126****
	(0.017)
Firm Size Control	Yes
Year & State FE	Yes
Industry FE	Yes

** $p < 0.01$

American Suppliers and Customers

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	ln *Count*
US Suppliers$_{t-1}$	**0.011****
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	ln *Amount*
US Suppliers$_{t-1}$	**0.126****
	(0.017)
Firm Size Control	Yes
Year & State FE	Yes
Industry FE	Yes

** $p < 0.01$

	ln *Count*
US Customers$_{t-1}$	-**0.002***
	(0.001)
	ln *Amount*
US Customers$_{t-1}$	-0.012
	(0.008)
Firm Size Control	Yes
Year & State FE	Yes
Industry FE	Yes

+ $p < 0.1$, * $p < 0.05$

Foreign Subsidiaries and H-1B Visa Applications

Firms with more foreign subsidiaries and higher H1B applications are getting more industrial subsidies.

	ln *Count*
Foreign Subsidiaries	**0.045****
	(0.002)
	ln *Amount*
Foreign Subsidiaries	**0.493****
	(0.028)
Firm Size Control	Yes
Year & State FE	Yes
Industry FE	Yes

** $p < 0.01$

Foreign Subsidiaries and H-1B Visa Applications

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	ln *Count*
Foreign Subsidiaries	**0.045****
	(0.002)
	ln *Amount*
Foreign Subsidiaries	**0.493****
	(0.028)
Firm Size Control	Yes
Year & State FE	Yes
Industry FE	Yes

** $p < 0.01$

	ln *Count*
H1B workers$_{t-1}$	0.002
	(0.002)
	ln *Amount*
H1B workers$_{t-1}$	**0.087****
	(0.025)
	Yes
	Yes
	Yes

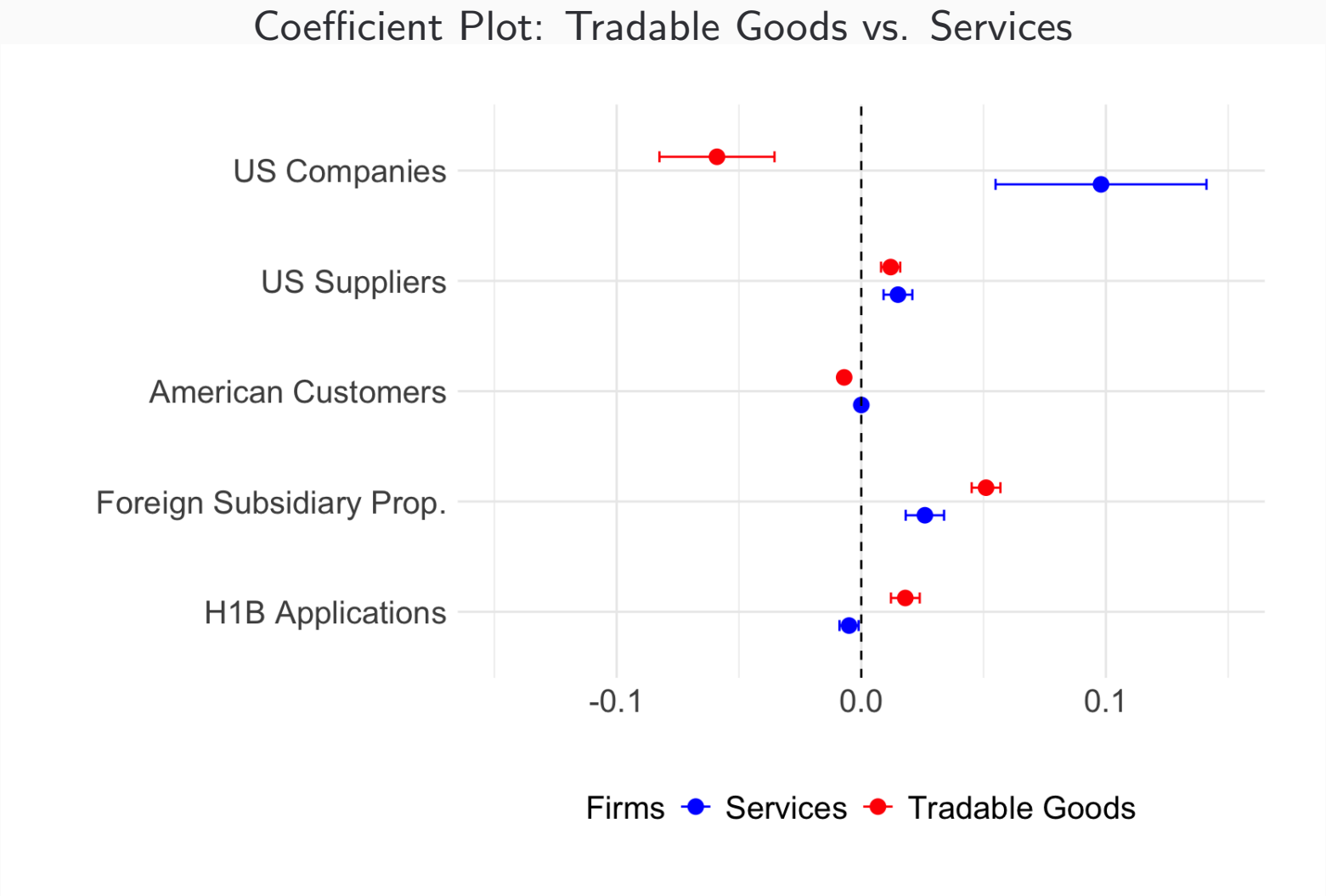
** $p < 0.01$

Full models with fixed effects

Firm Foreignness Factors and Industrial Subsidies

	ln *Count*	ln *Amount*
US Companies	0.488**	6.799**
	(0.103)	(1.616)
US Suppliers$_{t-1}$	0.005**	0.105**
	(0.002)	(0.025)
American Customers$_{t-1}$	-0.000	-0.003
	(0.002)	(0.027)
Foreign Subsidiaries	0.106**	1.251**
	(0.020)	(0.242)
H1B Applications$_{t-1}$	-0.010**	-0.057
	(0.003)	(0.046)
Firm Size Control	Yes	Yes
Year FE	Yes	Yes
State FE	Yes	Yes
Industry FE	Yes	Yes

Subset Analysis: Sector-level



Conclusion

Key findings:

- US-based firms and those working with local suppliers receive more industrial support.
- Firms serving American customers and employing local workers do not necessarily benefit from industrial policy.
- Foreign companies receive subsidies in manufacturing sectors; however, they are integrated into the domestic supply chain.

Conclusion

Key findings:

- US-based firms and those working with local suppliers receive more industrial support.
- Firms serving American customers and employing local workers do not necessarily benefit from industrial policy.
- Foreign companies receive subsidies in manufacturing sectors; however, they are integrated into the domestic supply chain.

Broader implications:

- Industrial policies are politically motivated and unequally distributed.
- Industrial policy might overly represent business interests rather than increasing public welfare.
- Understanding these dynamics is crucial for designing industrial policies that benefit the public and promote sustainable growth.

Paper and contact

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Scan this QR code to access the full paper.

Appendix

Summary Statistics

Industries (NAICS 2-digit level)

Exporting and Importing Industries

Analysis by Industry

Republican Governors and Presidents

Global Competition (DiD)

Government levels - Local, State, and Federal

Firm size matters

Summary Statistics

	Count	Mean	SD	Min	Max
Subsidy Count	243649	0.09	0.89	0.00	196.00
Log of Subsidy Count	243649	0.05	0.21	0.00	5.28
Subsidy Amount	243649	0.00	0.00	0.00	0.00
Log of Subsidy Amount	243649	0.56	2.58	0.00	22.90
US Firms	243649	0.73	0.44	0.00	1.00
American Customers (t-1)	93418	0.44	0.31	0.00	1.00
US Suppliers (t-1)	33039	0.86	0.25	0.00	1.00
Foreign Subsidiary	241665	0.74	0.41	0.00	1.00
H1B Applications	243649	1.06	17.82	0.00	1817.00
Log Number of H1B Applications (t-1)	204702	0.10	0.49	0.00	7.51

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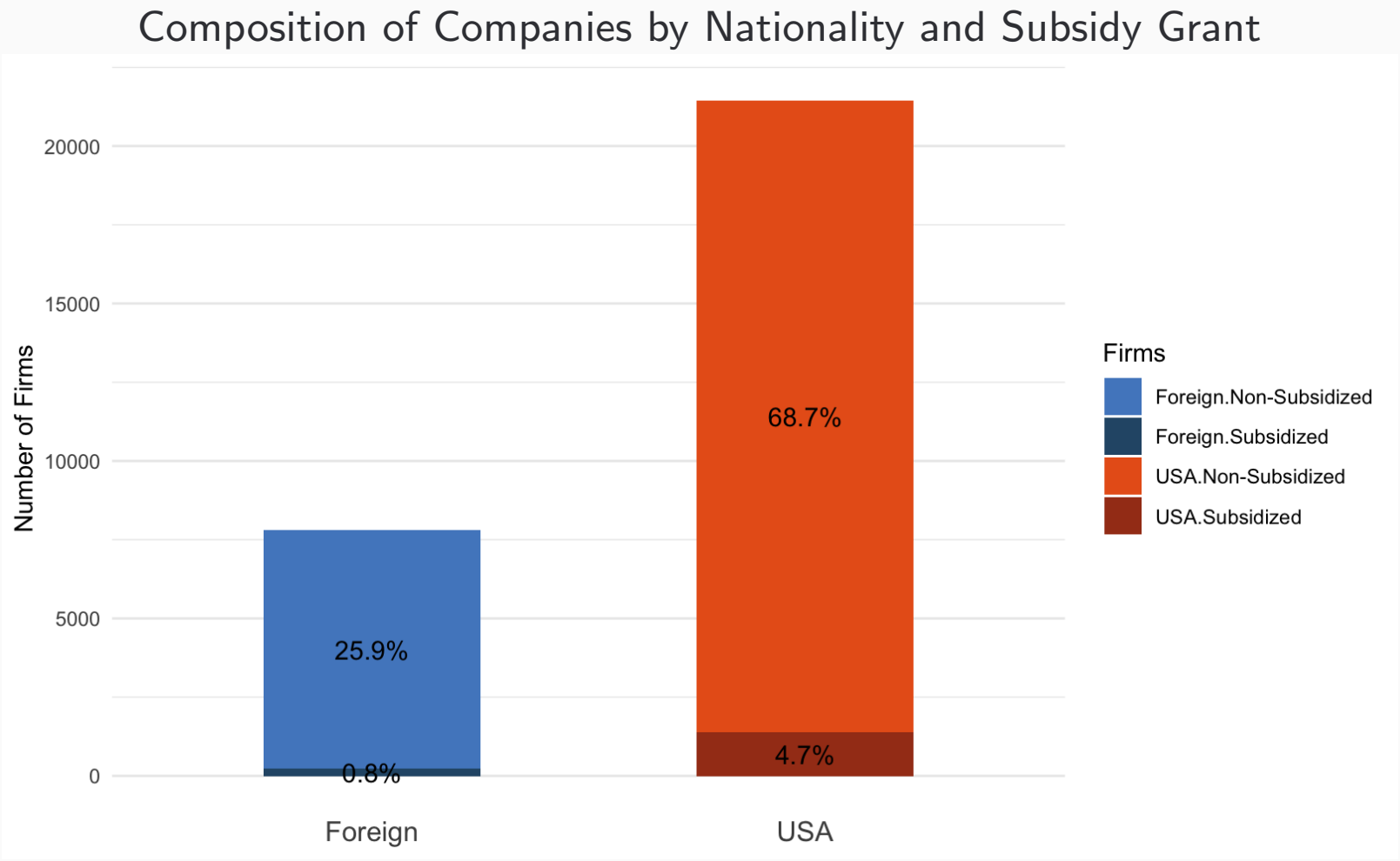
Descriptive Plot - Count



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Descriptive Plot - Amount

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Industrial Subsidy Counts by Industry (NAICS 2-digit)

NAICS Code	Count	Amount (Billion)	Industry Description
33	15765	63.74	Manufacturing (Metal, Machinery, Electronic, etc.)
32	7871	21.02	Manufacturing (Wood, Paper, Petroleum, Chemical, etc.)
52	5053	8.36	Finance and Insurance
51	4613	13.10	Information
31	3984	4.43	Manufacturing (Food, Textile, Apparel, etc.)
45	2605	5.19	Retail Trade
22	1975	25.24	Utilities
48	1971	4.95	Transportation and Warehousing
44	1894	0.97	Retail Trade
99	1838	0.38	Nonclassifiable
42	1408	0.55	Wholesale Trade
21	1223	4.34	Mining, Quarrying, and Oil and Gas Extraction
49	1095	0.53	Transportation and Warehousing
54	903	1.66	Professional, Scientific, and Technical Services
53	831	2.18	Real Estate and Rental and Leasing
72	800	0.66	Accommodation and Food Services
62	604	0.61	Health Care and Social Assistance
56	449	0.13	Administrative, Support, Waste Management and Remediation Services
71	242	0.36	Arts, Entertainment, and Recreation
23	160	0.08	Construction
61	97	0.11	Educational Services
81	47	0.01	Other Services (except Public Administration)
11	31	0.04	Agriculture, Forestry, Fishing and Hunting
92	0	0	Public Administration

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Industrial Subsidy for Exporting/Importing Industries

	Log Count of Industrial Subsidy				Log Amount
Exporting	0.0153**	0.0255*	0.0240*	0.0240*	0.1436*
	(0.005)	(0.011)	(0.011)	(0.011)	(0.067)
Importing	-0.0175**	-0.0375**	-0.0337**	-0.0337**	-0.1891**
	(0.005)	(0.011)	(0.010)	(0.010)	(0.066)
US Customers		0.5518**	0.4652**	0.4652**	1.7531**
		(0.071)	(0.073)	(0.073)	(0.481)
US Suppliers		0.0453	-0.0338	-0.0338	-0.1402
		(0.059)	(0.057)	(0.057)	(0.412)
Domestic Subsidiaries			0.5300**	0.5300**	2.8968**
			(0.060)	(0.060)	(0.416)
H1B Applications			0.0515**	0.0515**	0.1094*
			(0.008)	(0.008)	(0.049)
Firm size	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes
NAICS 2-digit FE	Yes	Yes	Yes	Yes	Yes
Observations	5979	3171	3170	3170	3170

◂ return

Industrial Subsidy Distribution for Each Industry

	Agri	Infra	Trade	Info	F&I	Service.1	Service.2
US Binary	0.084**	0.307**	0.927**	0.491**	0.710**	0.238**	0.021
	(0.032)	(0.083)	(0.189)	(0.102)	(0.189)	(0.087)	(0.119)
US Suppliers (t-1)		0.002	0.001	0.017**	-0.003		
		(0.005)	(0.006)	(0.006)	(0.009)		
American Customers (t-1)		-0.006	0.017*	0.011**	0.010		
		(0.007)	(0.007)	(0.004)	(0.008)		
Foreign Subsidiary Prop.	0.054*	0.151*	0.148+	0.392**	0.698**	0.062*	0.038*
	(0.024)	(0.059)	(0.086)	(0.059)	(0.172)	(0.025)	(0.016)
H1B Applications (t-1)		-0.011	-0.051**	-0.038**	0.014	-0.002	-0.017*
		(0.020)	(0.013)	(0.007)	(0.015)	(0.005)	(0.008)
Firm Size Control	Yes	Yes	Yes	Yes	Yes	Yes	Yes
State FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Industry FE	No	Yes	Yes	Yes	Yes	Yes	Yes
Observations	536	1859	1808	1267	646	3841	1619

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

Note: The models correspond to various industries based on NAICS 2-digit codes: Agri (11: Agriculture), Infra (21, 22, 23: Mining, Utilities, Construction), Trade (42, 44-45, 48-49: Trade, Transportation, Warehouses), Info (51: Information), F&I (52: Finance, Insurance), Service.1 (54-56: Professional, Scientific, Technical, Management, Administrative Services), and Service.2 (61, 62: Educational, Health Care, Social Assistance). Some models exclude specific variables or fixed effects due to the unique characteristics of these sectors.

◂ return

Industrial support by Administrations

US companies and customers consistently benefited from subsidies, while US suppliers saw little to no gains, especially under Biden and Trump.

	Biden		Trump		Obama		Bush	
US Binary	0.0614**	0.2356**	0.0939**	0.2982**	0.0909**	0.2707**	0.0408**	0.1993**
	(0.004)	(0.030)	(0.003)	(0.026)	(0.002)	(0.021)	(0.002)	(0.018)
US Suppliers (t-1)		-0.0387		0.0006		0.0706**		0.0435**
		(0.040)		(0.031)		(0.017)		(0.011)
American Customers (t-1)		0.1037**		0.0821**		0.0594**		0.0206*
		(0.026)		(0.021)		(0.014)		(0.009)
Foreign Subsidiary Prop.		0.0590		0.0977**		0.1810**		0.1579**
		(0.039)		(0.033)		(0.026)		(0.022)
H1B Applications (t-1)		-0.0145**		-0.0075		0.0035		0.0000
		(0.005)		(0.005)		(0.004)		(.)
Firm Size Control	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Industry FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

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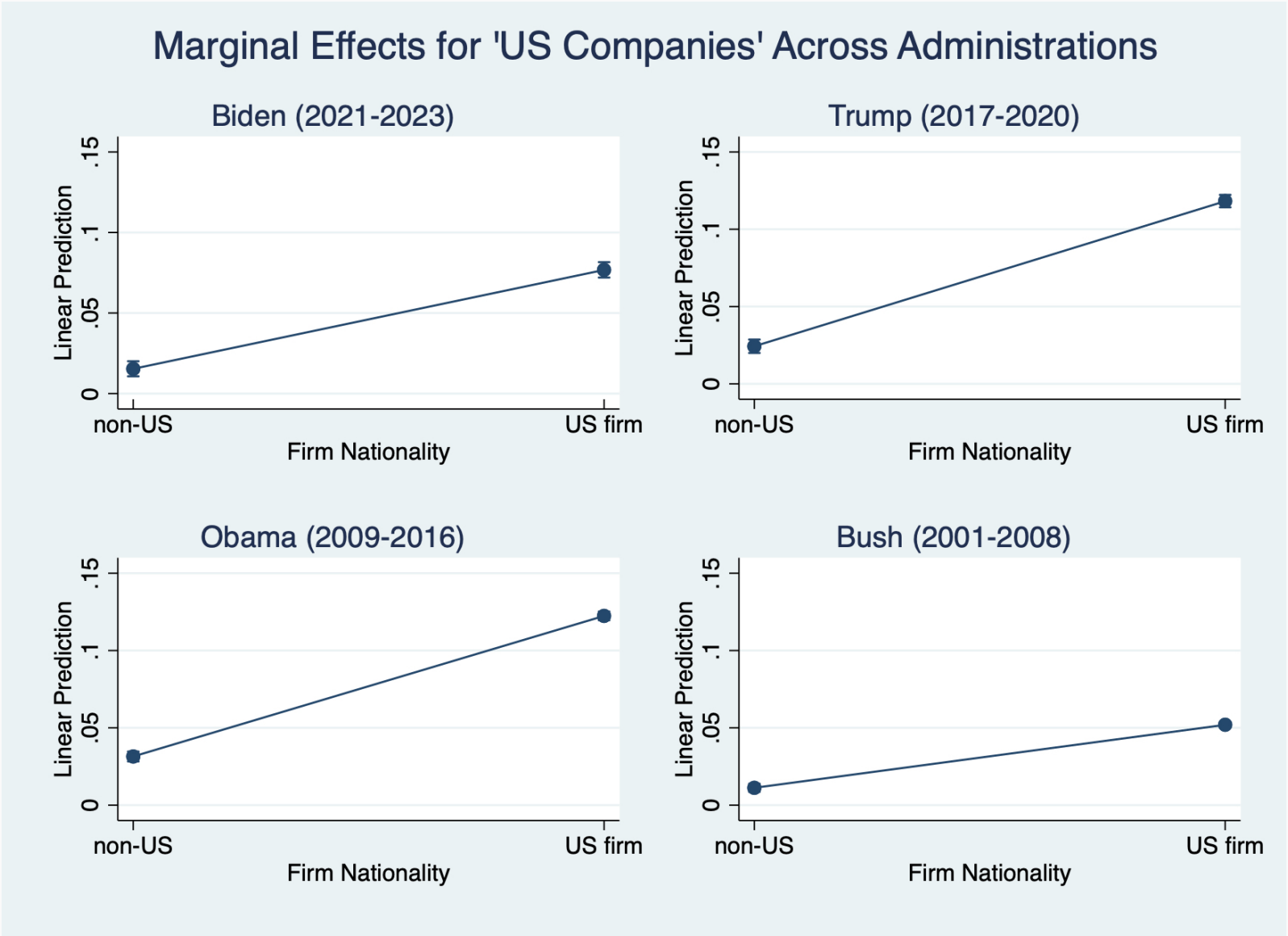
◂ return

Industrial support by Administrations



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Republican governors allocate more industrial subsidies to foreign firms, with no significant increase for domestic-oriented companies.

	Log Amount of Industrial Subsidy									
Republican Governor	0.0467*	0.853*	0.094	0.1796	0.11**	0.068	0.052**	0.057**	0.069**	0.077**
	(0.012)	(0.426)	(0.067)	(0.204)	(0.027)	(0.043)	(0.019)	(0.018)	(0.020)	(0.020)
US Companies	1.488**	1.893**								
	(0.218)	(0.363)								
US Firms X Rep. Governor		-0.807+								
		(0.426)								
US Suppliers (t-1)			0.68**	0.732**						
			(0.112)	(0.165)						
US Suppliers X Rep. Governor				-0.098						
				(0.221)						
American Customers (t-1)					-0.018	-0.068				
					(0.034)	(0.052)				
US Customers X Rep. Governor						0.090				
						(0.067)				
Foreign Subsidiary Prop.							0.685**	0.74**		
							(0.057)	(0.081)		
For. Subsidiary X Rep. Governor								-0.115		
								(0.116)		
H1B Applications (t-1)									0.076**	0.092**
									(0.023)	(0.028)
H1B X Rep. Governor										-0.046
										(0.040)
Industry FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
State FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Firm Size Control	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

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

◂ return

Republican Presidents

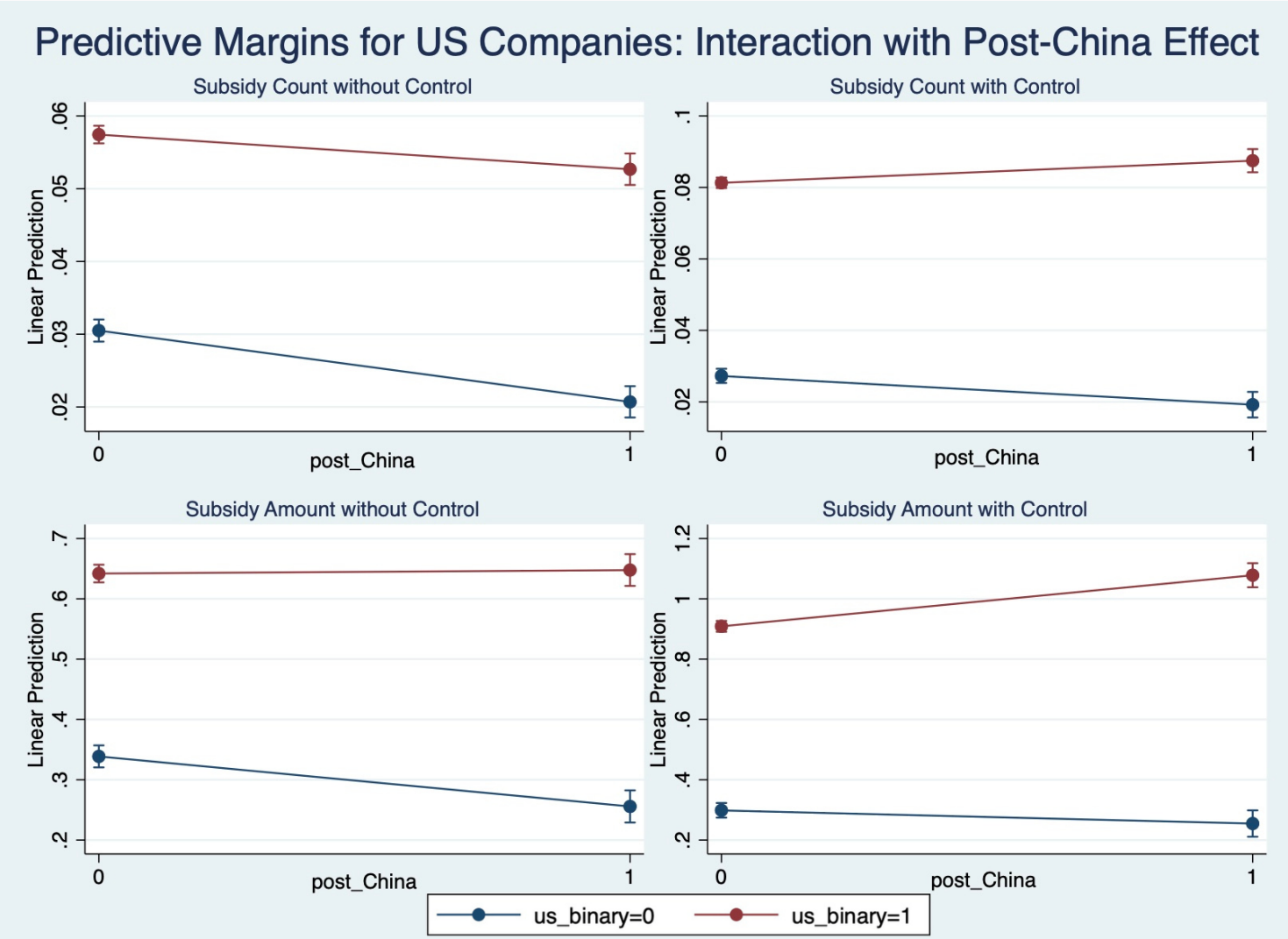
Republican presidents are more inclined to provide industrial subsidies to foreign firms, yet they support firms serving American customers.

	Log Amount of Industrial Subsidy									
Republican President	0.04**	0.054**	0.098	0.205	0.031	-0.005	0.037**	0.039**	0.025	0.028
	(0.012)	(0.015)	(0.090)	(0.128)	(0.038)	(0.040)	(0.012)	(0.012)	(0.026)	(0.026)
US Companies	0.085**	0.095**								
	(0.021)	(0.022)								
US Firms X Rep. President		-0.018+								
		(0.011)								
US Suppliers (t-1)			-0.049	0.027						
			(0.045)	(0.078)						
US Suppliers X Rep. President				-0.133						
				(0.091)						
American Customers (t-1)					0.018+	-0.036+				
					(0.010)	(0.020)				
US Customers X Rep. President						0.089**				
						(0.022)				
Foreign Subsidiary Prop.							0.061**	0.067**		
							(0.012)	(0.014)		
For. Subsidiary X Rep. President								-0.012		
								(0.012)		
H1B Applications (t-1)									0.011	0.014
									(0.010)	(0.012)
H1B X Rep. President										-0.009
										(0.016)
Industry FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
State FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Firm Size Control	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

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

◂ return

Industrial Subsidy and US Companies After Global Trade Competition



After controlling for firm size, larger US firms received significantly more subsidies post-2018 compared to foreign firms. This suggests a targeted policy shift favoring bigger domestic companies during this period.

Industries Backed by the Chinese Government under Made in China 2025

	Log Count of Industrial Subsidy					
	1	2	3	4	5	6
US Companies	-0.025					-0.121
	(0.020)					(0.087)
US Suppliers (t-1)		0.018**				0.009*
		(0.003)				(0.004)
American Customers (t-1)			-0.005**			0.018**
			(0.002)			(0.005)
Foreign Subsidiary Prop.				0.037**		0.076*
				(0.005)		(0.031)
H1B Applications (t-1)					-0.005	-0.006
					(0.004)	(0.006)
Firm Size Control	Yes	Yes	Yes	Yes	Yes	Yes
State FE	Yes	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes	Yes
Industry FE	Yes	Yes	Yes	Yes	Yes	Yes
Observations	31409	4811	17747	31204	16245	2934

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

◂ return

Subsidy Allocation by Government Levels in the US

	All Subsidized		Local		State		Federal	
US Companies	0.0206*	0.0853**	-0.0307+	-0.0239	0.0382**	0.0880**	0.0719	0.3104*
	(0.009)	(0.019)	(0.016)	(0.033)	(0.010)	(0.021)	(0.048)	(0.137)
US Suppliers		-0.0656*		0.0349		0.0235		-0.7909**
		(0.028)		(0.037)		(0.019)		(0.199)
American Customers		0.0357*		0.0574*		0.0527**		-0.1133
		(0.014)		(0.026)		(0.017)		(0.090)
Foreign Subsidiary		0.0871**		0.0373		0.0927**		0.1879
		(0.024)		(0.040)		(0.026)		(0.179)
H1B Applications		-0.0092**		-0.0070		-0.0049		-0.0541**
		(0.003)		(0.009)		(0.004)		(0.019)
Firm Size Control	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Industry FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	13989	7238	2744	1394	9898	5294	1297	514

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

◂ return

Effects of Firm Size (Number of Employee)

Models including Interaction terms with logged Number of Employee

	Log Amount of Industrial Subsidy				
ln Employment	0.6472**	0.8899**	1.1529**	1.1721**	1.0496**
	(0.015)	(0.057)	(0.020)	(0.013)	(0.011)
US Companies	-0.0359				
	(0.161)				
US Companies X Emp. Size	0.5969**				
	(0.019)				
US Suppliers (t-1)		-0.5575**			
		(0.124)			
US Suppliers X Emp. Size		0.5898**			
		(0.063)			
American Customers (t-1)			-0.0396		
			(0.032)		
American Customers X Emp. Size			0.1066**		
			(0.041)		
Foreign Subsidiary Prop.				0.6834**	
				(0.029)	
Foreign Subsidiaries X Emp. Size				-0.3814**	
				(0.023)	
H1B Applications (t-1)					-0.2798**
					(0.032)
H1B Applications X Emp. Size					0.2068**
					(0.018)
State FE	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes
Industry FE	Yes	Yes	Yes	Yes	Yes

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

Effects of Firm Size (Revenue)

Models including Interaction terms with logged Revenue

	Log Amount of Industrial Subsidy				
ln Revenue	0.2116**	0.5500**	0.5184**	0.3803**	0.3534**
	(0.005)	(0.034)	(0.008)	(0.004)	(0.004)
US Companies	-0.5970**				
	(0.135)				
US Companies X Rev. Size	0.2090**				
	(0.006)				
US Suppliers (t-1)		-1.2283**			
		(0.248)			
US Suppliers X Rev. Size		0.2818**			
		(0.037)			
American Customers (t-1)			0.1427*		
			(0.060)		
American Customers X Rev. Size			-0.0505**		
			(0.015)		
Foreign Subsidiary Prop.				1.1229**	
				(0.029)	
Foreign Subsidiaries X Rev. Size				-0.0981**	
				(0.007)	
ln Number of H1B Applications (t-1)					-1.5561**
					(0.072)
H1B Applications X Rev. Size					0.2305**
					(0.011)
State FE	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes
Industry FE	Yes	Yes	Yes	Yes	Yes

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