

# Outward Censorship in An Era of Globalization: Evidence from Government Websites

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# Declining Internet Freedom Worldwide

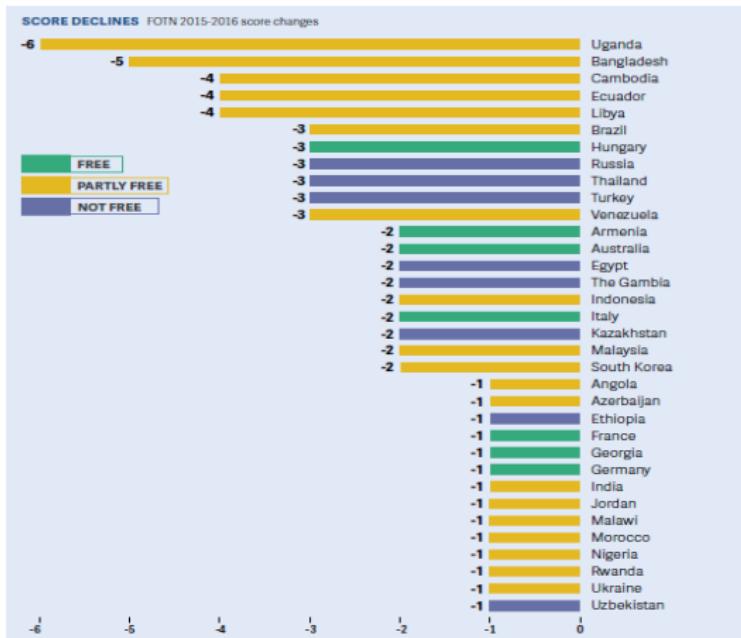


Figure 1: A comparative view of Internet freedom (FOTN, 2016, p. 3)

- ① Social media platform blocked
- ② Websites blocked
- ③ Internet connectivity restricted
- ④ Pro-government commentators
- ⑤ New censorship law passed
- ⑥ New surveillance law passed
- ⑦ Internet users arrested or imprisoned
- ⑧ Internet users physically assaulted
- ⑨ Technical attacks

# Distinguishing Different Forms of Censorship

- ① Content-based censorship: government scrutinizes and deletes content that it deems harmful
  - Social media posts, articles, books, films, music, etc.
- ② Access-based censorship: government uses digital tools to stop people from accessing certain services and platforms
  - The Great Firewall in China; the 2017 blocking of Wikipedia in Turkey
  - Internet and media disruptions during the Egyptian uprising in 2011

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  - The Great Firewall in China; the 2017 blocking of Wikipedia in Turkey
  - Internet and media disruptions during the Egyptian uprising in 2011
- ③ What have we learned about the access-based censorship?
  - The breadth, depth and mechanisms of Internet blocking around the world (Deibert et al. 2008; Clark et al., 2017)
  - Access-based censorship can shape political opinions and behaviors (Hassanpour, 2014; Hobbs and Roberts, 2018; Chen and Yang 2019)

# Censorship toward External Internet Traffic



Try:

- Checking the connection
- [Checking the proxy and the firewall](#)



Figure 2: Some real-world evidence of outward censorship in China

# Why Do Governments Engage in Censorship?

- ① Explanation from the literature on content-based censorship
  - collective action threat (King, Pan and Roberts, 2013)
  - informational benefits (Lorentzen, 2014)
  - or both (Chen and Xu, 2017)
- ② Explanation from the literature on access-based censorship (Deibert et al. 2008)
  - political power
  - social norms
  - economic interests
  - security concerns

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  - political power
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  - economic interests
  - security concerns
    - Among 100,484 instances of website defacements in 2020, only 0.49% of them occurred on government websites.
    - Among 53,171 websites that encountered backdoor attacks in 2020, only 256 were government websites, suggesting an attack rate of 0.48%.

# Three Additional Theses

- ① Economic globalization account (Marquis and Qiao, 2020; Wang, Du and Marquis, 2019)
  - Hypothesis 1: *There may be less outward censorship among governments in regions that are more dependent on the international market*
- ② Economic modernization account (Lipset, 1959; Boix and Stokes, 2003)
  - Hypothesis 2: *There may be less outward censorship among governments in more developed regions*
- ③ International relations account (Flores-Macias and Kreps, 2013; Bastos, 2020)
  - Hypothesis 3: *China might censor fewer requests from countries with which they share a good international relation*

# Defining and Measuring Website Censorship

- ① Definition: outward censorship exists when a government allows its domestic residents to visit a government website but denies foreign visitors the access
- ② Websites under scrutiny: 17,869 government websites across China's central, provincial, city, and county levels
- ③ Data collection method: web scraping based on residential proxy IP addresses, with http response other than 200 coded as evidence of censorship

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- ③ Data collection method: web scraping based on residential proxy IP addresses, with http response other than 200 coded as evidence of censorship
  - Pretest: running the scraping program on a computer located inside China in summer 2021 to exclude 618 government websites which were never accessible in a two-week test period.
  - 17,251 websites remain after the deletion.
- ④ Repeatedly scraping 17,251 websites based on proxy IPs from 135 countries in fall 2021

# Error Codes of Website Censorship

Table 1: The distribution of response codes in a pilot trial

Errors	2021-08-07	2021-08-05	2021-08-03	2021-08-01	2021-07-30	2021-07-28	2021-07-26	2021-07-24
1 200	12286	11983	12023	12151	12323	12375	12311	12302
2 202	1	1	0	0	0	0	0	0
3 400	7	6	5	6	5	6	7	6
4 403	73	74	75	72	71	82	118	120
5 404	8	5	5	7	5	6	8	6
6 405	4	3	4	3	3	4	4	4
7 408	3	2	0	3	1	1	3	0
8 412	189	184	183	189	191	192	191	186
9 416	3	2	2	2	2	2	2	2
10 418	1	0	1	1	1	1	1	1
11 420	94	90	90	91	94	92	94	94
12 422	1	1	1	1	1	0	0	0
13 444	0	0	0	0	0	0	1	0
14 466	1	1	0	1	1	1	1	0
15 493	59	57	59	57	58	59	59	58
16 500	0	1	2	1	1	1	0	0
17 502	129	115	105	105	110	118	130	161
18 503	2635	2517	2542	2555	2584	2537	2558	2618
19 504	11	9	13	18	46	18	13	17
20 521	0	1	11	10	10	10	11	10
21 522	0	2	0	0	0	1	0	2
22 524	0	1	0	0	0	0	0	0
23 Connection failure	33	43	30	24	54	40	35	25
24 Connection reset	0	0	0	1	1	0	2	0
25 Connection timeout	0	460	354	264	0	0	0	37
26 Other error	12	12	10	11	12	13	11	16
27 Proxy error	109	101	106	105	106	116	109	81
28 Read timeout	521	507	559	503	500	505	511	432
29 SSL error	1	3	1	0	1	1	1	3

# Measurement Validity

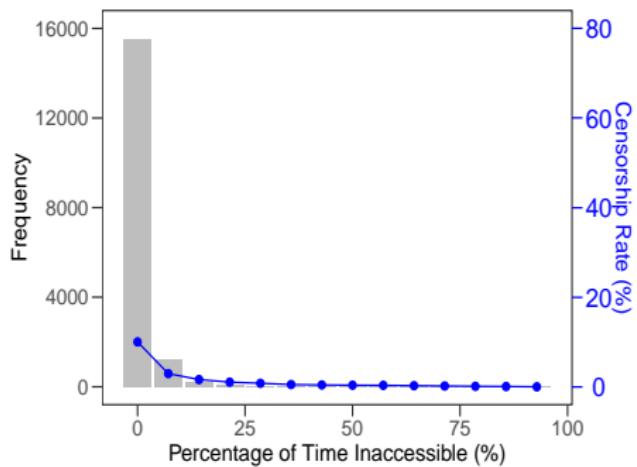


Figure 3: Access to websites from inside China

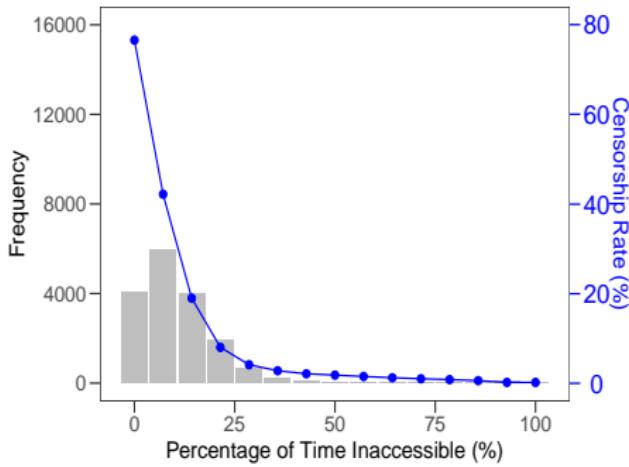


Figure 4: Access to websites from outside China with proxy IPs in China

# Variables for Cross-Country Analysis

- Censorship rate: the percentage of all 17,251 websites that are inaccessible to a country
- International relations: an ordinal measure on a 0–9 scale based on China's official foreign partnerships
- Economic development: GDP per capita in the 135 countries in 2020
- Economic globalization:
  - Trade volume: the sum of export and import in 2020
  - FDI contracts: the number of FDI contracts signed in 2020
- Population
- GDP per capita
- IP availability

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Country	Censor Rate	Export	Controls
USA	6.179%	45,172,903	...
Japan	8.573%	14,261,864	...
India	6.359%	6,671,971	...
Denmark	15.489%	746,427	...
Ghana	18.045%	675,628	...

# Variables for Within-Country Analysis

- Block rate: the percentage of countries blocked by a website
- Trade volume
- FDI contracts
- GDP per capita
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Level	URL	Block Rate
Shanghai	<a href="http://www.jiading.gov.cn">http://www.jiading.gov.cn</a>	54.815%
Shanghai	<a href="http://sthj.sh.gov.cn">http://sthj.sh.gov.cn</a>	2.222%
Suqian	<a href="http://www.suqian.gov.cn">http://www.suqian.gov.cn</a>	99.259%
Yangzhou	<a href="http://gaj.yangzhou.gov.cn">http://gaj.yangzhou.gov.cn</a>	0%
Anhui	<a href="http://www.ah.gov.cn">http://www.ah.gov.cn</a>	97.037%
Wuhan	<a href="http://www.wuhan.gov.cn">http://www.wuhan.gov.cn</a>	0.741%

# Descriptive Results: A Global View of Censorship Rates

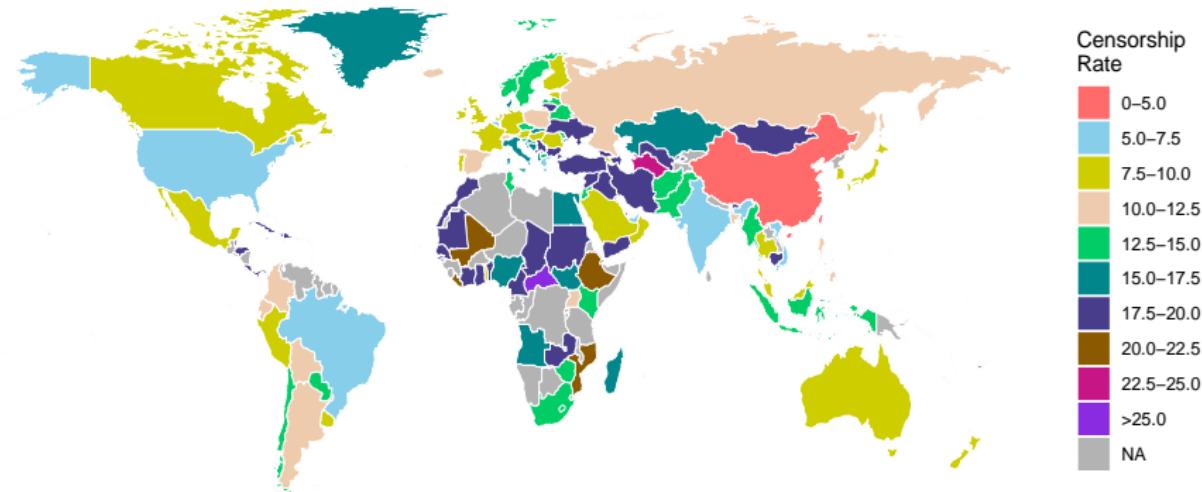


Figure 5: Access to 17,251 Chinese government websites around the globe

# Descriptive Results: A Domestic View of Block Rates

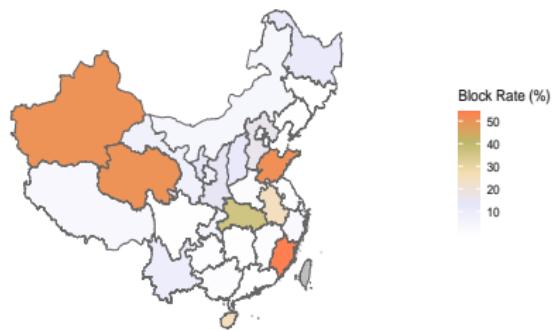


Figure 6: Block rates at provincial level

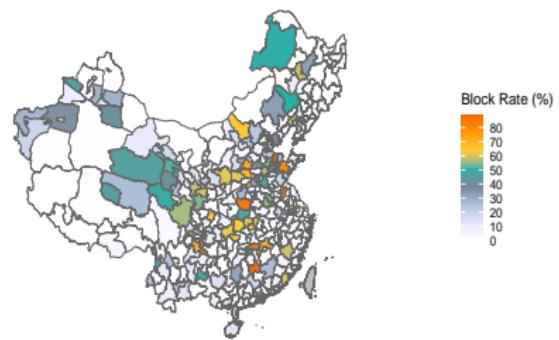


Figure 7: Block rates at city level

# More Heterogeneity in Block Rates

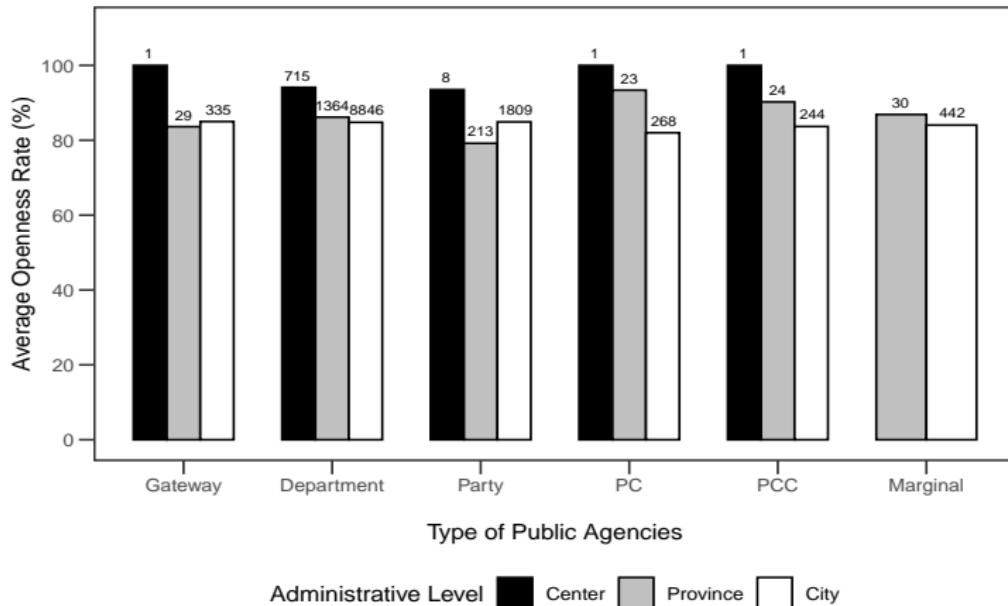


Figure 8: The heterogeneity in block rates within the government

# Empirical Analysis at the Global Level

Table 2: The analysis of censorship at the global level

	Dependent Variable: Censorship Rate					
	(1)	(2)	(3)	(4)	(5)	(6)
Logged Trade	-1.309*** (0.161)	-1.473*** (0.264)	-1.521*** (0.286)	-1.397*** (0.287)	-1.358*** (0.290)	-0.729* (0.421)
Logged FDI		0.024 (0.307)	0.023 (0.308)	0.027 (0.304)	0.060 (0.306)	0.358 (0.345)
International Relations			0.073 (0.161)	-0.017 (0.163)	-0.010 (0.164)	-0.156 (0.176)
GDP per capita				-0.031** (0.014)	-0.033** (0.014)	-0.075*** (0.021)
Population					-0.003 (0.003)	-0.002 (0.003)
IP Pool Size						-0.586** (0.289)
Intercept	25.689*** (1.411)	27.140*** (1.756)	27.350*** (1.822)	27.073*** (1.799)	26.767*** (1.830)	27.069*** (2.786)
Observations	134	125	125	125	125	93
R <sup>2</sup>	0.333	0.346	0.347	0.372	0.376	0.407
Adjusted R <sup>2</sup>	0.328	0.335	0.331	0.351	0.350	0.366

Note:

\*p<0.1; \*\*p<0.05; \*\*\*p<0.01

# Robustness to IP availability

Table 3: Examining the regression robustness to IP availability

	Dependent variable: Censorship Rate					
	IP>0 (1)	IP>10,000 (2)	IP>30,000 (3)	IP>50,000 (4)	IP>70,000 (5)	IP>90,000 (6)
Logged Trade	-0.729* (0.421)	-1.009** (0.435)	-1.265** (0.496)	-1.833*** (0.551)	-2.224*** (0.560)	-1.963*** (0.689)
Logged FDI	0.358 (0.345)	0.599 (0.388)	0.880** (0.436)	1.007** (0.442)	1.048** (0.449)	1.016* (0.504)
IP Pool Size	-0.586** (0.289)	-0.649* (0.353)	-0.816* (0.453)	-0.759 (0.524)	-0.536 (0.540)	-0.442 (0.568)
International Relations	-0.156 (0.176)	-0.265 (0.192)	-0.387* (0.219)	-0.425* (0.232)	-0.307 (0.250)	-0.330 (0.258)
GDP per capita	-0.075*** (0.021)	-0.081*** (0.022)	-0.108*** (0.038)	-0.083** (0.040)	-0.064 (0.039)	-0.070* (0.040)
Population	-0.002 (0.003)	-0.002 (0.003)	-0.002 (0.003)	-0.001 (0.003)	-0.001 (0.003)	-0.002 (0.003)
Intercept	27.069*** (2.786)	30.265*** (3.607)	34.791*** (4.714)	39.150*** (6.040)	39.413*** (6.878)	35.671*** (7.754)
Observations	93	81	57	42	35	32
R <sup>2</sup>	0.407	0.435	0.555	0.599	0.602	0.510
Adjusted R <sup>2</sup>	0.366	0.390	0.501	0.530	0.516	0.392

Note:

\*p<0.1; \*\*p<0.05; \*\*\*p<0.01

# Analysis at China's Provincial and City Levels

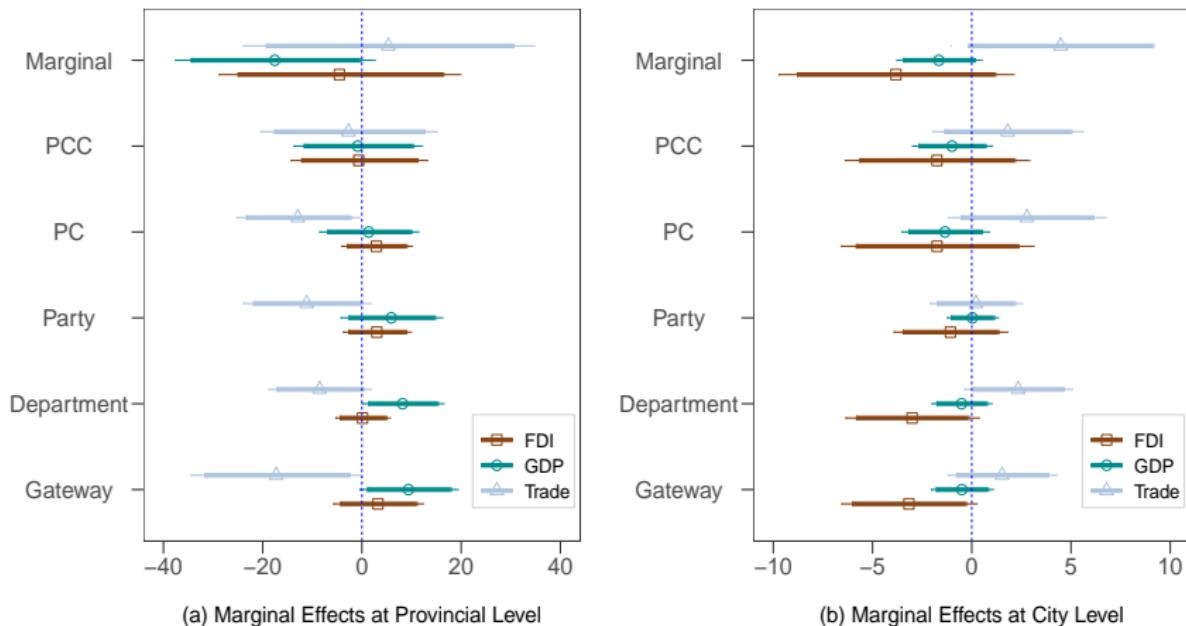


Figure 9: The analysis of block rates at the provincial and city levels

# Conclusion

- ① China's censorship against foreign traffic to its government websites not only varies with countries but also with bureaucratic characteristics (the level of the government, the location of the government, and the type of the agency).
- ② Quantitative analysis reveals an economic logic at both the global and domestic level.
  - China's major trade partners see a lower censorship rate
  - Political allies do not have an advantage
- ③ It seems to be economic interests, rather than political motivations, that drive China's censorship on government websites.

Thank you for listening!

# Descriptive Statistics (Global Level)

Table 4: Descriptive statistics at the global level

Statistic	N	Mean	St. Dev.	Min	Pctl(25)	Pctl(75)	Max
Openness rate	135	85.52	5.01	70.62	81.16	90.06	99.84
Logged trade volume	190	7.67	2.48	0.70	6.30	9.54	13.28
Logged FDI contracts	168	2.83	1.71	0.00	1.55	3.92	7.61
International relations	193	2.51	2.62	0	0	5	9
GDP per capita	174	15.68	26.61	0.27	1.92	15.84	190.51
Population	192	40.14	146.78	0.01	2.05	29.31	1,402.11
Internet infrastructure	168	8.24	3.44	1.10	5.76	11.05	15.91
Logged IP count	103	10.86	1.75	6.52	9.98	11.61	15.89

# Descriptive Statistics (Provincial Level)

Table 5: Descriptive statistics at the provincial level

Statistic	N	Mean	St. Dev.	Min	Pctl(25)	Pctl(75)	Max
Openness rate	29	83.63	32.47	2.96	97.78	100.00	100.00
Logged trade volume	29	3.38	1.88	-1.14	2.37	4.27	6.59
Logged FDI contracts	29	-1.45	2.69	-11.51	-1.98	-0.34	2.66
GDP per capita	29	7.36	3.14	4.42	5.37	8.77	16.49
GDP growth	29	3.02	1.53	0.20	1.70	3.80	7.80
Higher education	29	2.61	0.75	0.81	2.25	2.81	4.52
Fiscal revenue	29	7.20	6.00	2.73	4.12	6.69	28.32
Population	29	43.33	32.26	3.53	21.55	63.98	126.24
Youth-League secretary	29	0.10	0.31	0	0	0	1
Youth-League governor	29	0.14	0.35	0	0	0	1

# Descriptive Statistics (City Level)

Table 6: Descriptive statistics at the city level

Statistic	N	Mean	St. Dev.	Min	Pctl(25)	Pctl(75)	Max
Openness rate	334	84.96	27.78	0.74	95.93	100.00	100.00
Logged trade volume	279	0.14	2.19	-10.29	-1.03	1.40	5.70
Logged FDI contracts	252	-1.56	1.73	-4.60	-2.66	-0.52	4.07
GDP per capita	287	6.27	3.13	1.74	3.92	7.88	18.09
GDP growth	287	0.88	31.61	-530.00	2.02	4.10	12.01
Higher education	275	2.01	1.91	0.18	0.84	2.37	10.99
Fiscal revenue	287	7.29	2.27	2.60	5.57	8.79	15.89
Population	287	4.18	2.97	0.24	2.18	5.36	18.74
Provincial capital	288	0.09	0.28	0	0	0	1
Youth-League secretary	328	0.28	0.45	0	0	1	1
Youth-League governor	328	0.34	0.47	0	0	1	1

# International Relations

Table 7: China's Global Partners as of September 14, 2021

Type of Relations	Countries
9 Comprehensive Strategic Coordinative Partnership	Russia (2011)
8 All-weather Strategic Cooperative Partnership	Pakistan (2015)
7 Comprehensive Strategic Cooperative Partnership	Vietnam (2008), Laos (2009), Cambodia (2010), Myanmar (2011), Thailand (2012), Congo (Brazzaville) (2016), Senegal (2016), Guinea (2016), Sierra Leone (2016), Mozambique (2016), Ethiopia (2017), Kenya (2017), Zimbabwe (2018), Namibia (2018)
6 Strategic Cooperative Partnership	India (2005), South Korea (2008), Turkey (2010), Afghanistan (2012), Sri Lanka (2013), Bangladesh (2016), Brunei (2018), Nepal (2019)
5 Comprehensive Strategic Partnership	France (2004), Italy (2004), Spain (2005), Portugal (2005), Greece (2006), Denmark (2008), South Africa (2010), Brazil (2012), Peru (2013), Indonesia (2013), Malaysia (2013), Mexico (2013), Belarus (2013), Algeria (2014), Mongolia (2014), Egypt (2014), Argentina (2014), Venezuela (2014), Australia (2014), New Zealand (2014), [Global] United Kingdom (2015), Ecuador (2016), Saudi Arabia (2016), Iran (2016), Poland (2016), Serbia (2016), Chile (2016), Uzbekistan (2016), Tajikistan (2017), Hungary (2017), Papua New Guinea (2018), UAE (2018), Kyrgyzstan (2018), Fiji (2018), Cook Islands (2018), Micronesia (2018), Niue (2018), Samoa (2018), Tonga (2018), Vanuatu (2018), [Permanent] Kazakhstan (2019)
4 Strategic Partnership	Canada (2005), Nigeria (2006), Angola (2010), Ukraine (2011), [Reciprocal] Ireland (2012), Turkmenistan (2013), Qatar (2014), [Omnidirectional] Germany (2014), Costa Rica (2015), Sudan (2015), Jordan (2015), Iraq (2015), [Innovative] Switzerland (2016), Czech Republic (2016), Uruguay (2016), Morocco (2016), Djibouti (2017), [Friendly] Austria (2018), Kuwait (2018), Oman (2018), Bolivia (2018), Jamaica (2019), Bulgaria (2019)
3 Omnibus Cooperative Partnership	[Friendly] Belgium (2014), Singapore (2015)
2 Comprehensive Cooperative Partnership	[Friendly] Romania (2004), Croatia (2005), Tanzania (2013), Netherlands (2014), East Timor (2014), [Friendly] Maldives (2014), Liberia (2015), Equatorial Guinea (2015), Gabon (2016), Madagascar (2017), Sao Tome and Principe (2017), Uganda (2019), Trinidad and Tobago (2019)
1 Partnership	[Innovative and Comprehensive] Israel (2017), [New Cooperative] Finland (2017)

# IV Estimation

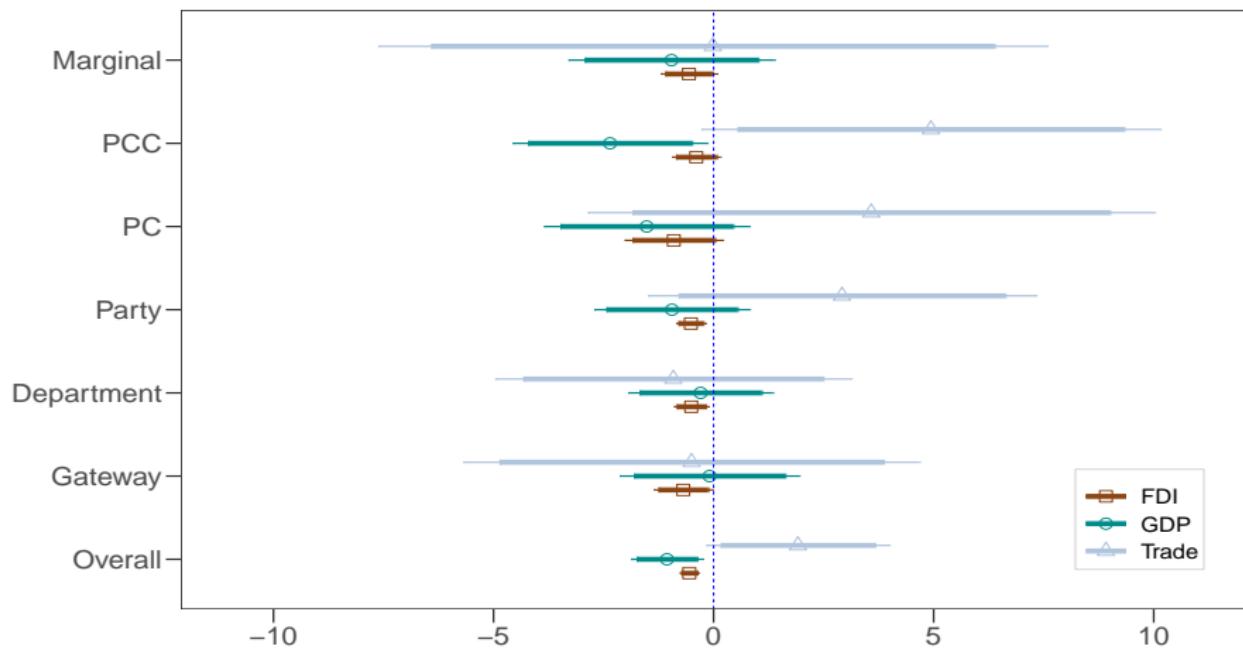


Figure 10: Marginal effects on block rate based on IV estimation