Exporting the Surveillance State via Trade in AI

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We collect comprehensive data on global trade in surveillance AI technology, and document three facts about its diffusion. First, China has a comparative advantage in this technology, exporting substantially more surveillance AI than other countries, particularly compared to other frontier technologies. Second, autocracies and weak democracies are more likely to import surveillance AI, and more likely to do so from China. Third, autocracies and weak democracies are especially likely to import China's surveillance AI following domestic unrest. Such imports coincide with broader declines in domestic institutional quality, suggesting that China may be exporting its surveillance state via trade in AI.
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Artificial intelligence (AI) technology has been hailed as the basis for a "fourth industrial revolution" (Schwab, 2017) that will drive economic growth in the years to come (Aghion et al., 2018, Brynjolfsson et al., 2021). However, AI also raises a range of social and political concerns: the empowerment of "surveillance capitalists" (Zuboff, 2019), the enhancement of autocrats' aims of social control (Guriev and Treisman, 2019, Tirole, 2021, Beraja et al., 2023a), and the weakening of democratic institutions more generally (Acemoglu, 2021).

Up to now, we know little about patterns of international trade in this potentially transformative technology. Of particular concern is that China's emergence as a frontier producer of facial recognition AI (Beraja et al., 2023b) may be the basis for a comparative advantage that allows importing countries to apply this technology for purposes of political repression.[1]

We evaluate this possibility, studying global trade in facial recognition AI technology, which can be applied to enhance surveillance. We collect novel data on global trade of surveillance AI and document three facts:

1) **China's comparative advantage in surveillance AI:** China has a comparative advantage in surveillance AI. It is more likely to export this surveillance technology than other countries, and especially so as compared to other frontier technologies.

2) **Differential demand depending on importer political institutions:** Autocracies and weak democracies are more likely to import surveillance AI, relative to mature democracies and relative to their imports of other frontier technologies. Autocracies and weak democracies are more likely to import surveillance AI from China than from other exporters, relative to

[1] This possibility has been suggested in the case of Myanmar (as reported by Reuters, source: https://www.reuters.com/world/china/fears-digital-dictatorship-myanmar-deploys-ai-2021-03-18/), Uganda and Zambia (as reported by the Wall Street Journal, source: https://www.wsj.com/articles/huawei-technicians-helped-african-governments-spy-on-political-opponents-11565793017?ns=prod/accounts-wsj), as well as in policy reports (Greitens, 2020).

their imports of other frontier technologies. China's exports of surveillance AI are systematically biased toward weak democracies and autocracies.

3) **Imports of surveillance AI at times of domestic political unrest:** Autocracies and weak democracies are differentially more likely to import surveillance AI from China in years when they experience domestic political unrest. These imports coincide with the erosion of domestic political institutional quality more broadly.

To document our facts, we collect global data on surveillance AI trade spanning 2008-2021 based on the Carnegie Endowment for International Peace's report *The Global Expansion of AI Surveillance* (Feldstein, 2019).[2] The report compiles information from AI companies' announcements of overseas AI deals, either with state or non-state actors.[3] We complement this set of deals with our own search of AI trade deals from all surveillance AI firms identified in the Capital IQ database. We refer to these deals as "surveillance AI trade" going forward. These data are aggregated to the exporter-importer-year level. For comparison, we construct analogous data of trade in other frontier technologies, such as robotic and genomic products, from the UN Comtrade database.

We begin our empirical analysis by studying patterns of comparative advantage as seen in surveillance AI exports (fact 1). We first observe that China has more surveillance AI trade links as exporter than any other country: we find 250 Chinese export deals (the US is second with 215 deals). We then predict the likelihood of a trade link between country pairs for surveillance AI and for other frontier technologies. Differencing out trade in other frontier technologies allows us to account for other unobserved factors associated with country-pairs trading more in frontier technologies generally. We find that China is economically and statistically significantly more likely to export surveillance AI than other countries, and particularly so as compared to other frontier technologies.

We next examine whether importers of surveillance AI exhibit institutional features suggesting the potential use of AI for purposes of repression (fact 2). We propose that weak democracies and autocracies are regimes most likely to apply surveillance AI for such purposes (rather than, for example, applying it to enhance public safety), coding these regimes based on Polity Scores from the Polity IV Project.[4] We then predict the likelihood of a trade link between country pairs for surveillance AI and for other frontier technologies, but now examining whether the set of weak democracies and autocracies are differentially likely to import AI technology, relative to their imports of other frontier technologies. Indeed, we find that weak democracies and autocracies import differentially more surveillance AI technology. Suggesting a specific link between China's comparative advantage in surveillance AI and weak democracies and autocracies' imports of the technology, we find that China's exports are substantially (and significantly) more likely to be imported by autocracies and weak democracies. Such political bias is not seen in exports of other frontier technologies from China, nor is it seen in exports of surveillance AI from most other countries (e.g., the second largest exporter of surveillance AI, the US, exhibits a political "bias" indistinguishable from 0).

Finally, we investigate the role of the domestic political context in shaping surveillance AI imports from China (fact 3). We find that autocracies and weak democracies are differentially more likely to import China's surveillance AI technology in years of greater political unrest. Importantly, there is no evidence of differential pre-trends of AI imports leading up to domestic political

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[2]Large-scale facial recognition trade deals typically involve a component of public surveillance. As an alternative, narrower definition of surveillance AI trade deals we consider only those deals that are labeled as "smart city" AI deals (a subset of our baseline set). Results are very similar whether examining the broad set of surveillance AI trade deals or the "smart city" deals alone.

[3]Both the state and non-state actors could contribute to the building of a surveillance state. Non-state sectors often act as local intermediaries from which the government procures imported products.

[4]Specifically, following Marshall et al. (2016), we classify regimes as autocracies and weak democracies (those with a Polity Score below 6), in contrast with mature democracies (those with a score greater than or equal to 7).

unrest, suggesting a causal effect of domestic unrest on AI imports. Greater imports from China in years of domestic political unrest are only observed in surveillance AI technology, but not other frontier technologies; and these patterns are not observed among mature democracies. These results suggest the particular value of China's surveillance AI technology for repressive purposes, demanded under specific political regime types and particular political circumstances.

We also find that imports of Chinese surveillance AI technology during episodes of domestic unrest occur alongside other measures associated with the erosion of democratic institutions, and the entrenchment of non-democratic regimes. This finding suggests that as part of autocracies and weak democracies' concerted efforts to consolidate political control, they turn to China's surveillance AI technology which was developed there to achieve similar goals.[5]

These facts indicate that China's surveillance AI technology indeed is diffusing to autocracies and weak democracies that may use it for purposes of political repression, implying that the rise of China as a technological leader may enhance and beget more autocracies abroad. More generally, they challenge the conventional view that economic integration is associated with the diffusion of liberal, democratic institutions (López-Córdova and Meissner, 2005; Tabellini and Magistretti, 2023).[6] Our results corroborate work that is more skeptical regarding the political consequences of globalization (Rodrik, 2011).

Our finding of China's comparative advantage in surveillance AI suggests a novel dimension to the "home-market effect" (Linder, 1961; Krugman, 1980; Costinot et al., 2019). In particular, it appears that the Chinese *government's* demand for surveillance and political control indeed translates into more exports of AI. That this demand is (at least in part) fueled by an autocratic government's objective of surveillance for political control suggests an institutional basis for China's comparative advantage in surveillance AI.[7] This contributes to a broad literature on the impact of institutions on international trade (see Nunn and Trefler, 2014 for a review). Much work in this literature has focused on how institutions shape patterns of trade through property rights protection, contract enforcement, or the rule of law more broadly (see Berkowitz et al., 2006, Levchenko, 2007, and Nunn, 2007, Shapiro, 2023). Our work, in contrast, points to a source of comparative advantage arising in autocracies — data extraction and civilian monitoring that are valuable advantages in data-intensive AI innovation.[8]

The political bias of AI imports from China suggests a novel mechanism through which domestic autocratic institutions may diffuse abroad. Traditional views emphasize how ideology and correlated shocks shape political transition in waves — a so-called *domino* effect in the spread of democracy (Huntington, 1993) and of autocracy (Ninkovich et al., 1994). Recent work highlights that the spread of (democratic) ideology through trade integration with other democracies could account for domestic democratization (Tabellini and Magistretti, 2023). Our results suggest an autocratic analog to the international institutional spillover through trade. Moreover, we demonstrate a distinct mechanism — a technology used for domestic surveillance can affect institutions abroad via its export, potentially enhancing autocracies elsewhere and triggering weak democracies to move towards autocracies.[9] As such, our paper also relates to the literature on the impact

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[5]However, we do not find any erosion in domestic electoral institutional quality when China's surveillance AI is imported by mature democracies. As such, the global diffusion of surveillance AI technology might contribute to divergent institutional paths between mature democracies *vis-a-vis* autocracies and weak democracies.

[6]In a speech to Democratic Party leaders in 1999, then-Treasury Secretary Lawrence H. Summers summarized this view: "Examples such as Korea, Taiwan and Argentina illustrate that economic development tends to bring democratization in its wake. And there is no better way to spur this process than by integrating them into the global marketplace." Remarks to the Democratic Leadership Annual Conference, October 14, 1999. Available online at `https://home.treasury.gov/news/press-releases/ls154`, accessed January 29, 2025.

[7]Beyond government demand for surveillance technology, Chinese facial recognition technology is also supported by a range of other industrial and innovation policies (Liu, 2019; Beraja et al., 2024).

[8]Our finding that autocrats and would-be autocrats abroad demand surveillance technology from China suggest that political factors may affect the direction of AI innovation (Habakkuk, 1962; Acemoglu, 2007).

[9]Other technologies with political implications include the printing press (Dittmar, 2011), radio (e.g., Olken, 2009; DellaVigna et

of trade with China (Autor et al., 2016), especially on domestic politics (Autor et al., 2020), and to the literature on how governments should respond to automation technologies like AI (Costinot and Werning, 2022; Korinek and Stiglitz, 2020; Beraja and Zorzi, 2022).

The rest of the paper proceeds as follows. Section 1 introduces the data sources we use, in particular, our construction of a global surveillance AI trade database. Sections 2–4 present each of our three facts. Finally, in Section 5 we offer a concluding discussion.

I. Data sources

Trade in surveillance AI technology. We begin constructing our database of AI trade deals with the bibliography of the Carnegie Endowment for International Peace's report *The Global Expansion of AI Surveillance* (Feldstein, 2019). This bibliography focuses on international procurement of AI surveillance technology by governments, containing 1,300 citations spanning 75 importing countries.[10]

For each item in the bibliography, we develop a web scraper to collect the source text.[11] We then use Stanza (Qi et al., 2020), a Python NLP (Natural Language Processing) and NER (Named Entity Recognition) package developed by the Stanford NLP Group, to identify key variables from each source: the exporting country, importing country, year of the deal, exporting company, and whether the deal concerns smart city technology. At least one research assistant then validated whether each source contains an actual AI trade deal, as well as each of the deal characteristics described above.[12] Out of the 1,300 citations, we confirm that 313 of them reference AI trade deals.

Since the Carnegie report was only intended to provide an overview of the industry and is not a comprehensive record of all AI trade deals, we use these trade deals as a starting point to explore the universe of potential trade deals.[13] To do so, we search through the website of every firm that appears in the report, as well as references to them in the news/media, and collect any references to potential AI trade. There are 15,351 such sources. We collect deal-level information from each source following the procedure outlined above: a web-scraper collects the text, Stanza's NER identifies whether this is an AI trade deal and documents important deal characteristics, and then a human verifies each entry and cleans the output as needed. This ensures that we do not flag any trade deals as false positives. We use Google as a test company to ensure that our procedure misses relatively few AI trade deals: we manually check all 206 sources flagged as non-AI trade deals and find only 2 false negatives.[14] At this point, we find 1,377 AI trade deals from 36 exporting countries to 132 importing countries.

Given the focus of the report on raising awareness of "surveillance states", one may be concerned that the Carnegie report contains a biased sample of companies. To address this concern, we collect a list of all surveillance AI companies from Capital IQ, which is the S&P's financial database covering global public and private firms. There are 2,878 companies in this list. For each new company in this list, we follow the process outlined above and collect data on whether these companies export their technology to other countries. By combining these sets of trade deals, we create a comprehensive database of trade in surveillance AI.

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al., 2014; Yanagizawa-Drott, 2014), and information and communications technologies such as mobile phones (Manacorda and Tesei, 2020) and 3G internet (Guriev et al., 2021).

[10]The original bibliography is accessible at `https://www.zotero.org/groups/2347403/global_ai_surveillance/library`.

[11]Some sources pointed to images and others contained references in non-English languages. For the former, we used Google's Tesseract-OCR engine to obtain the source text, and for the latter, Google Translate.

[12]We follow the guidelines in The OECD Handbook on Measuring Digital Trade (González and Jouanjean, 2017) to resolve potentially ambiguous instances of trade in AI.

[13]As the report notes: "Given limited resources and staffing constraints (one full-time researcher plus volunteer research assistance), the index is only able to offer a snapshot of AI surveillance levels in a given country." All of our results are robust to using only the trade deals identified in the Carnegie report sources. See Appendix Tables S.2 to S.4.

[14]This procedure extends our dataset from the business-to-government deals identified in the Carnegie report to also include business-to-business (B2B) trade deals. For our analysis, we use the total number of deals between two countries, since many B2B sales are government sub-contracts or could reasonably be associated with government procurement due to local regulations.

In all, we find 1,636 AI trade deals from 36 exporting countries to 136 importing countries. China is the largest exporter of AI with 250 trade deals, while the United States is the second largest exporter with 215 deals. When restricting analysis to smart city trade deals, China remains the largest exporter with 158 trade deals, while Germany is the second largest exporter with 124 deals. For the remainder of our analysis, we restrict our sample of exporters and importers to the top 100 countries by GDP, given the sparsity of trade in AI outside of this sample. In this sample, we find 1,488 AI trade deals from 33 exporting countries to 92 importing countries. China remains the largest exporter of AI with 238 trade deals, while the United States is the second largest exporter with 211 deals. Examples from our dataset include trade deals titled "Safe City Service Brings the Future to Laos: Huawei case studies" (China exporting to Laos in 2015), "Bosch equips Hong Kong-Zhuhai-Macao Bridge with customized security solutions" (Germany exporting to China in 2018), and "Digital Intelligence is Helping Brazil's Federal Police Seize Millions in Assets to Bring Down Drug-Smuggling Kingpins (Israel exporting to Brazil in 2020). Table 1 shows summary statistics of surveillance AI purchases at the importing country level. We plot the number of AI trade deals over time in Appendix Figure A.2. Bar charts of the top exporters and importers in AI trade are displayed in Appendix Figures A.3 - A.4.

It is important to note that firms issue press releases even when selling to regimes that may be perceived as problematic. In Appendix Figure A.1 we provide press releases from US and Chinese companies announcing deals with Kuwait and Saudi Arabia, respectively. One may still be concerned that US exports to autocracies and weak democracies may be under-reported as a result of self-censorship among the American firms. While many of our analyses consider patterns within Chinese exports and are thus unaffected by the potential reporting bias, this could however distort comparisons between China and "rest of the world" where US exports contribute a significant share. To address this concern, as a robustness check, we conduct such comparisons between China and the "rest of the world" excluding US, and find very similar results as our baseline estimates (see Appendix Figures S.1, S.2 and Appendix Tables S.8-S.10).

Frontier trade and country characteristics. We collect data on trade in frontier technologies from the UN Comtrade database. Our fields of frontier technology are the 10 technologies identified in the OECD Science, Technology, and Innovation Outlook (OECD, 2018): artificial intelligence, the internet of things, virtual reality/augmented reality, drones, robotics, autonomous vehicles, space, genomics, neuroscience, and blockchain technology. We then find 16 SITC codes that are most closely associated with these frontier technologies, and collect information on the volume of trade at the country dyad level from the years 2000-2020.[15] Notably, there is no SITC code associated with artificial intelligence.[16]

We also collect data on country dyad characteristics (distance between countries, whether they share a common border, free trade agreement, colonial history, legal system, language, or religion), sourced from Helpman et al. (2008). Data on country level GDP come from the World Bank, data on AI investment by country from NetBase Quid, and data on regime type from the Polity IV Project. Aid data on China comes from Custer et al. (2021) and aid data on the rest of the world comes from the OECD. Finally, we collect data on Chinese foreign investment and construction from the American Enterprise Institute's China Global Investment Tracker and data on the global arms trade from the SIPRI Arms Transfers Database.

Political unrest. We collect data on political unrest from the Global Database of Events, Language, and Tone (GDELT) Project. The GDELT project records instances of events based on articles

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[15]In particular, these SITC codes are: 525, 541, 712, 716, 718, 728, 731, 772, 774, 776, 781, 792, 872, 874, 884, and 899. These 10 technologies are commonly associated with frontier technology. For instance, the UNs 2018 report "Frontier technologies for sustainable development" (ESCAP, 2018) identifies and analyzes the same 10 technologies.

[16]One may be concerned about the comparability of data between trade in AI and other frontier trade. We therefore focus our analysis on the extensive margin of trade (whether two countries engage in trade in a sector of frontier trade), which should be more comparable between the data, instead of the intensive margin (number of trade deals). However, our main results all replicate using the number of trade deals as the outcome. See Appendix Tables S.5 to S.7.

Table 1—Summary statistics

	All	Strong democracies	Weak democracies/ autocracies
	(1)	(2)	(3)
Panel A: AI trade			
Total AI import deals	13.2	18.2	8.5
	(23.6)	(32.3)	(8.5)
AI import deals from China	1.9	1.6	2.2
	(2.5)	(2.7)	(2.2)
AI import deals from USA	1.6	2.4	0.8
	(2.7)	(3.4)	(1.4)
Total smart city import deals	10.4	14.7	6.4
	(20.1)	(27.6)	(7.1)
Smart city import deals from China	1.2	1.0	1.4
	(1.6)	(1.7)	(1.5)
Smart city import deals from USA	1.1	1.8	0.4
	(2.1)	(2.8)	(0.9)
N	100	48	52
Panel B: Institutions and political events			
Institutional quality index	-0.1	0.3	-0.4
	(0.7)	(0.5)	(0.6)
Total unrest events	5951.4	6668.9	5289.1
	(16893.6)	(23487.6)	(6683.2)
N	100	48	52
Panel C: Economic conditions			
Log(GDP)	25.3	25.9	24.8
	(1.6)	(1.7)	(1.2)
Log(total trade)	22.0	22.3	21.8
	(1.4)	(1.5)	(1.3)
Log(frontier trade)	17.0	17.2	16.7
	(1.6)	(1.7)	(1.4)
N	100	48	52

Notes: This table presents sample means and standard deviations of key variables, aggregated at the import country level. Column 1 contains statistics for the top 100 countries by GDP, column 2 restricts the sample to strong democracies, and column 3 restricts the sample to weak democracies and autocracies. A Polity score of 7 is used as the cutoff for a 'full democracy' by the Polity IV project (Marshall et al., 2016), which we use to distinguish mature and weak democracies.

from a global, comprehensive set of news feeds.[17] In sum, we find 18,449,402 events across the world indicating political unrest.[18] Sample headlines indicating unrest include "Laos: Police arrests 8 activists planning to stage protests to condemn land grabs and dam projects, later releases 6 of them," "Two more monks arrested in Ngaba county for calling freedom in Tibet," and "Brazil's President Rousseff Rocked by Anti-Government Protests." Combining the GDELT data with the data above, we obtain panel data at the country-year level on the amount of AI trade, non-AI frontier trade, and political unrest in a country.

[17]Text analysis and machine learning methods are applied to the contents of these articles to identify salient characteristics, such as event location, date of the event, and the nature of these events. When multiple news sources cover the same event, GDELT records only one event. See https://www.gdeltproject.org for a detailed description of the GDELT Project and its methodology.

[18]Each event is classified under the Conflict and Mediation Events Observations (CAMEO) event and actor codebook. Twelve of the twenty top-level "verbs" that an event can be classified under indicate political unrest: protests, sanctions, violence, investigations, demands, disapproval, rejections, threats, coercion, assault, fights, and unconventional mass violence.

Institutional type and quality. We categorize broad institutional types using Polity Scores from the Polity IV Project. Specifically, following Marshall et al. (2016), we classify regimes as autocracies and weak democracies (those with a Polity Score below 6), in contrast with mature democracies (those with a score greater than or equal to 7). Among the countries in our dataset, 63.3% are classified as autocracies and weak democracies and 36.7% are mature democracies.

We also measure political institutional quality using indices from the National Elections Across Democracy and Autocracy Dataset 6.0 (NELDA), constructed by Hyde and Marinov (2012). These indices measure four broad categories of electoral-based institutional quality where regimes not holding any elections receive the lowest score: *(i)* fair elections (the opposition is allowed to run, the opposition is not harassed); *(ii)* no media bias; *(iii)* peaceful elections; and *(iv)* election monitors. We present the full list of disaggregated measures and the index categories to which they belong in Appendix Table S.1. In addition to these disaggregated indices, we pool all variables and construct an overall index for institutional quality (inverse covariance weighted across all disaggregated indices). The Polity Scores and the NELDA index are highly correlated cross-sectionally (correlation coefficient = 0.348). However, the NELDA index captures distinct over-time variation while the Polity Scores are relatively stable: conditional on country fixed effects, the correlation coefficient drops to 0.178. Finally, we collect data on regime changes from V-Dem's Episodes of Regime Transformation (ERT) dataset (Edgell et al., 2023).

II. China's comparative advantage in surveillance AI

A first indication of China's comparative advantage in surveillance AI can be seen in the number of countries to which China exports the technology. In Figure 1, we map the export deals from the two largest producers and exporters: China in Panel A and the US in Panel B. Between 2008 and 2021, we observe that China exports to roughly twice as many countries as the US (83 versus 57 links) and has about 10% more trade deals (238 versus 211).
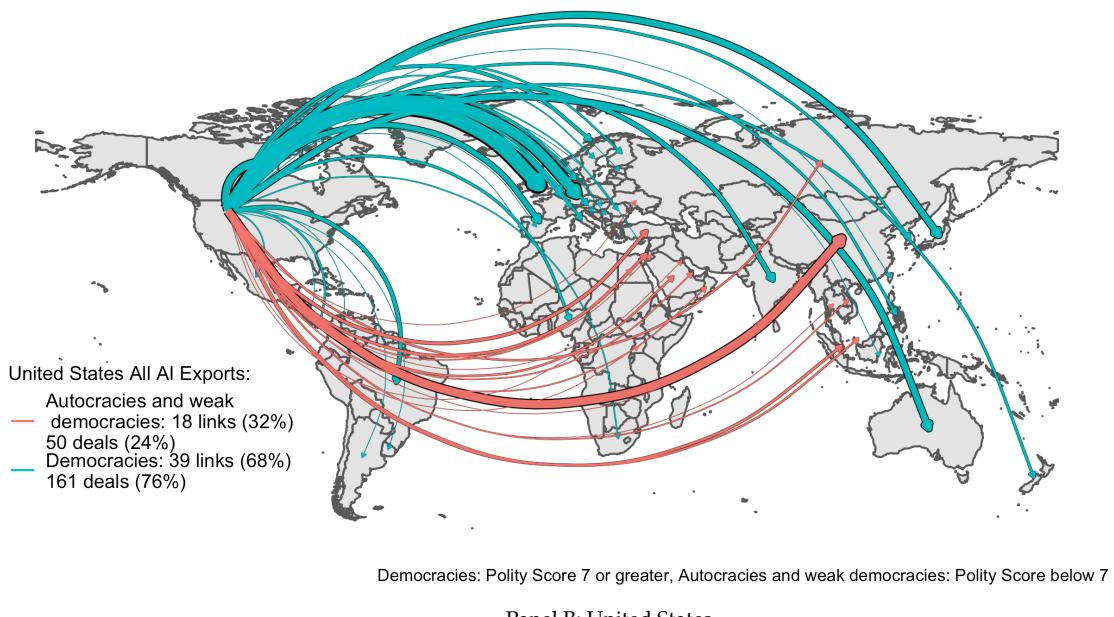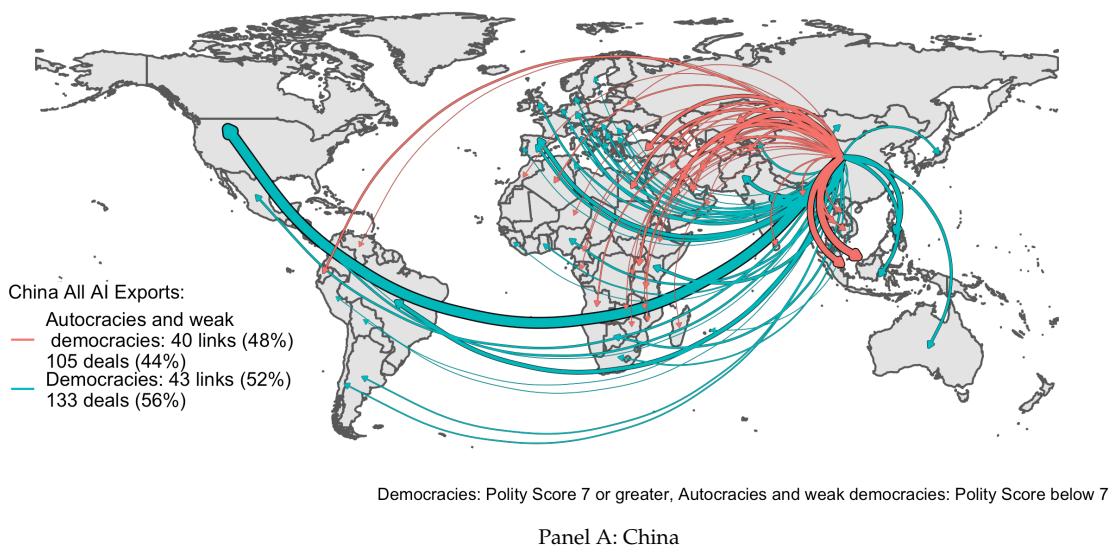
To examine China's comparative advantage more rigorously, we compare exports of surveillance AI from China against those exports by the rest of the world, relative to exports of other frontier technologies. Specifically, we estimate the following equation:

$$(1) \qquad trade_{ijs} = \beta_0 + \beta_1 \mathbf{1}_{i=\text{China}} + \beta_2 \mathbf{1}_{s=\text{AI}} + \beta_3 \mathbf{1}_{i=\text{China},s=\text{AI}} + X_{ij} + u_{ijs},$$

where $trade_{ijs}$ denotes a trade link in technology sector (s) between exporting country (i) and importing country (j), and X_{ij} are a vector of controls at the country-pair level. The coefficient β_1 indicates the difference in exports of non-AI frontier technologies between China and the rest of the world (which is the omitted category). The coefficient β_2 indicates the difference between the exports from the rest of the world in AI and its exports of other frontier technologies. Finally, the coefficient β_3 indicates the differential export of China's AI, relative to other frontier technologies and the rest of the world. We cluster standard errors at the exporting country level.

We present the results in Table 2. China's exports of non-AI frontier technology are very similar to that of the rest of the world — β_1 is approximately zero — once we account for countries' GDP and distance. However, China is more likely to export AI than other frontier technologies relative to the rest of the world — β_3 is significantly greater than zero. The magnitude of the coefficient implies that the propensity for Chinese AI exports is 47.4 percentage points greater (at the country-pair level) than Chinese exports of other frontier technologies.[19] These results hold for specifications that control for a range of other country-pair characteristics that influence trade; including having trade agreements or a common border, as well as institutional characteristics such as having a common language, legal system, or religion. We observe similar patterns focusing

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[19]In making these comparisons, it is worth noting that the trade deals are similar in dollar values: the median contract size for Chinese AI export deals is US$22.5 million, and the median for non-China deals is US$ 21.5 million. We acknowledge the caveat that we only observe such values for around 5% of the deals and we do not observe "units" or other attributes of the deals.

Democracies: Polity Score 7 or greater, Autocracies and weak democracies: Polity Score below 7

Panel A: China

Democracies: Polity Score 7 or greater, Autocracies and weak democracies: Polity Score below 7

Panel B: United States

Figure 1. Surveillance AI exports from China and the US

Note: These figures display trade links and number of export deals in AI from China (Panel A) and the United States (Panel B) to the rest of the world. A thicker arrow represents more deals. Exports to autocracies and weak democracies (polity score under 7) are displayed in red. Exports to mature democracies (polity score greater than or equal to 7) are in blue.
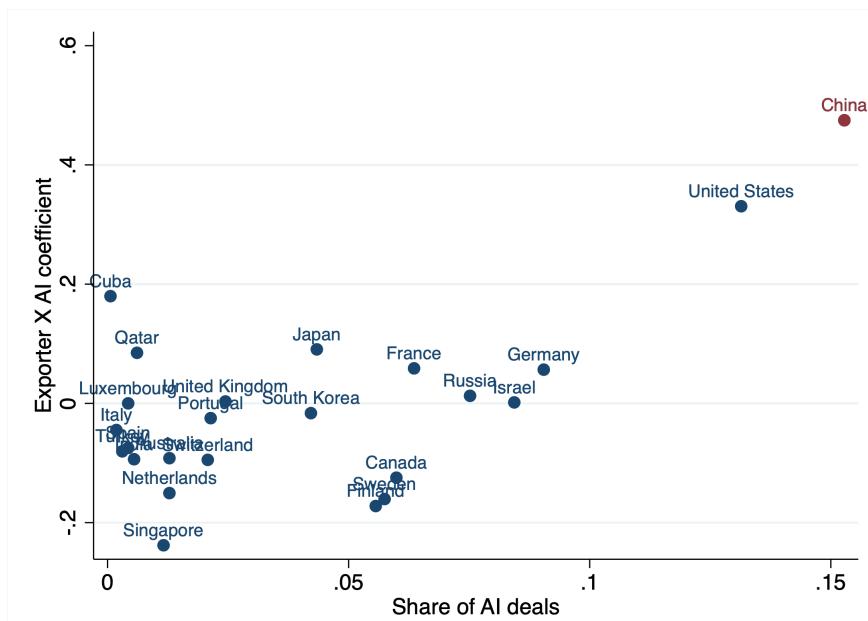
only on imports of smart city AI technology, the flagship urban surveillance tools (see Appendix Table A.1).

To put China's comparative advantage in surveillance AI in perspective, we repeat the analysis in Table 2, column 1, but now replacing China with each exporting country in our sample. We plot along the y-axis of Figure 2 China's interaction coefficient —indicating the differential likelihood of a trade link specifically when the exporter is China and the technology is AI — along with

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Table 2—China vs. rest of world, AI vs. frontier technologies

	Engage in trade			
	(1)	(2)	(3)	(4)
Origin China	-0.026	-0.026	-0.012	-0.026
	(0.024)	(0.024)	(0.025)	(0.024)
AI	-0.356	-0.357	-0.355	-0.355
	(0.010)	(0.010)	(0.010)	(0.010)
Origin China X AI	0.474	0.475	0.461	0.475
	(0.030)	(0.030)	(0.030)	(0.030)
N	402300	402300	402300	402300
Log importer/exporter GDP	Yes	Yes	Yes	Yes
Log distance	Yes	Yes	Yes	Yes
Border/trade characteristics	No	Yes	No	No
Institutional characteristics	No	No	Yes	No
Geographical characteristics	No	No	No	Yes

Notes: Regressions are at the product-import-export country dyad level. Outcome is dummy for trade. Omitted: not China X not AI. All columns control for importer/exporter GDP and log distance. Column (2) adds controls for common border, free trade agreements, and shared colonial background. Column (3) adds controls for common language, legal system, and religion. Column (4) adds controls for landlocked and island characteristics. Standard errors are clustered by origin country.

Figure 2. AI export advantage by country

Note: The figure plots coefficients from the specification in Table 2, column 1 on the y-axis (Origin China X AI) and the share of AI exports on the x-axis for each AI exporting country.

the interaction coefficient for all other exporters. One can see that China's estimated comparative advantage in surveillance AI, captured by the interaction coefficient, substantially exceeds the
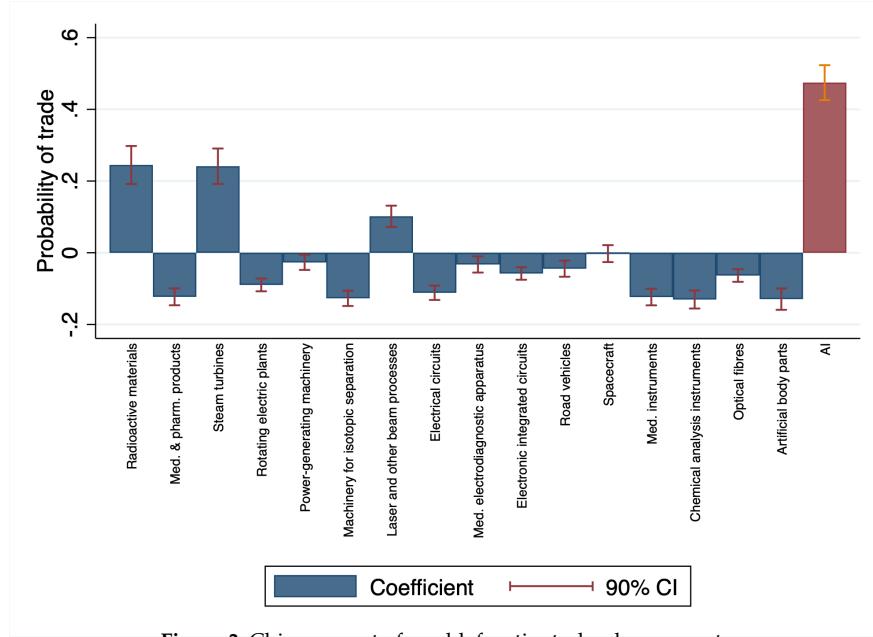
Figure 3. China vs. rest of world, frontier technology exports

Note: The figure follows the specification in Table 2 and presents the coefficient and 90% confidence interval for the interaction term (Origin China X frontier technology) for each of the different frontier technologies.

coefficient estimated for any other country. Even the second largest exporter, the United States, exhibits an interaction coefficient more than 10 percentage points smaller than China's.

To provide another illustration of China's comparative advantage in surveillance AI technology, we repeat the baseline analysis in Table 2, column 1, but now estimate China's differential exports in technology sector s, one frontier technology sector at a time. We plot the interaction coefficients for each frontier technology sector s in Figure 3. One observes that China also exhibits moderate comparative advantage in the production of radioactive and associated materials, steam turbines, and laser and other beam processes. However, China's comparative advantage in surveillance AI technology stands out.

What contributes to China's comparative advantage? Many factors may have contributed to the Chinese comparative advantage in the surveillance AI industry that we document. We highlight two salient factors below.

The Chinese regime has explicitly stated that becoming a world leader in AI is one of their key development and strategic goals.[20] In practice, this has meant that AI firms receive generous government subsidies and are recipients of a variety of AI-related industrial and innovation policies.[21] A range of government incentives to train and recruit AI talent are in place as well.

Moreover, the surveillance AI industry in particular has also directly benefited from government demand for surveillance technology and firms' access to large-scale government datasets. In Beraja et al. (2023a,b) we have shown that AI procurement by public security agencies (e.g., municipal police departments) stimulates firm innovation and development of a variety of new products. In part, such procurement has been motivated by the local agencies' desire to suppress

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[20]Examples of landmark policies in AI set by China include the "'Internet +' Three-Year Implementation Plan" in 2016, the "New Generation Artificial Intelligence Development Plan' in 2017, and the "National New Generation of AI Standardization Guidance" in 2020.

[21]For a list of tax incentives, see for instance: `https://www.china-briefing.com/news/tax-incentives-china-to-encourage-technology-innovation-updated/`. See also Beraja et al. (2025) on government venture capital funds' investments in the AI sector.

political unrest, and the stimulus has come from firms gaining access to valuable government data to train AI algorithms (e.g., surveillance video from street cameras). Indeed, we found that the firms winning such public security contracts became more likely to export.

III. Differential demand depending on importer political institutions

Having established China's comparative advantage in surveillance AI technology, we next explore the characteristics of the importers of such technology.

A. Domestic political institutions

We begin by considering the possibility that autocracies and weak democracies are more likely to import surveillance AI, relative to mature democracies, and relative to other frontier technologies. To explore this possibility, compare imports of surveillance AI by autocracies and weak democracies against those imports by mature democracies, relative to imports of other frontier technologies. Specifically, we estimate the following equation:

$$(2) \qquad trade_{ijs} = \beta_0 + \beta_1 \mathbf{1}_{j=\text{low Polity Score}} + \beta_2 \mathbf{1}_{s=\text{AI}} + \beta_3 \mathbf{1}_{j=\text{low Polity Score},s=\text{AI}} + X_{ij} + u_{ijs},$$

where $trade_{ijs}$ again denotes a trade link in technology sector (s) between exporting country (i) and importing country (j), and X_{ij} are a vector of controls at the country-pair level — this vector of controls is particularly important because autocracies and weak democracies tend to be poorer than mature democracies. The coefficient β_1 indicates the difference in imports of non-AI frontier technologies between autocracies and weak democracies on the one hand and mature democracies (the omitted category) on the other hand. The coefficient β_2 indicates the difference between mature democracies' imports of surveillance AI and their imports of other frontier technologies. Finally, the coefficient β_3 indicates the differential import of surveillance AI by autocracies and weak democracies, relative to other frontier technologies and to mature democracies. Again, standard errors are clustered at the exporting country level.

We present the results in Table 3. One can see that autocracies and weak democracies generally important less frontier technology (excluding surveillance AI) compared with mature democracies — β_1 is negative and significant across specifications. As above, we generally see fewer trade deals in surveillance AI compared to other frontier technologies (β_2 is negative and significant). Consistent with speculation that surveillance AI technology may be differentially demanded by autocracies and weak democracies, we find that β_3 is positive and significant, even controlling for importing country GDP and importer and exporter country characteristics.[22]

B. From where do autocrats purchase surveillance AI?

One naturally wonders, do autocracies and weak democracies import their surveillance AI differentially from China, rather than other leading exporters of the technology? To investigate this formally, we examine whether autocracies and weak democracies differentially import China's AI technology (relative to other exporters, and other frontier technologies). We estimate the following regression model:

$$(3) \quad trade_{i,j=\text{low Polity Score},s} = \beta_0 + \beta_1 \mathbf{1}_{i=\text{China}} + \beta_2 \mathbf{1}_{s=\text{AI}} + \beta_3 \mathbf{1}_{i=\text{China},s=\text{AI}} + X_{i,j=\text{low Polity Score},s} + u_{ijs},$$

where we replicate our baseline comparative advantage model (with results shown in Table 2), but restricting the set of importing countries to those with Polity scores less than 7. One can see in Table 4 that weak democracies and autocracies are more likely to import surveillance AI from China compared to other frontier technologies, and to other exporters — β_3 is significantly greater

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[22]In Table A.5, we replicate this analysis focusing on smart city AI exports only and find very similar results.

Table 3—Autocracies and weak democracies vs. strong democracies as importers, AI vs. frontier technology

	Engage in trade			
	(1)	(2)	(3)	(4)
Dest. autocracy/weak democracy	-0.038	-0.036	-0.037	-0.026
	(0.006)	(0.005)	(0.005)	(0.006)
AI	-0.375	-0.375	-0.373	-0.369
	(0.009)	(0.009)	(0.009)	(0.010)
Dest. autocracy/weak democracy X AI	0.033	0.031	0.031	0.024
	(0.007)	(0.006)	(0.006)	(0.007)
N	402300	402300	402300	402300
Importer/exporter GDP	Yes	Yes	Yes	Yes
Log distance	Yes	Yes	Yes	Yes
Border/trade characteristics	No	Yes	No	No
Institutional characteristics	No	No	Yes	No
Geographical characteristics	No	No	No	Yes

Notes: Regressions are at the product-import-export country dyad level. Outcome is dummy for trade. Omitted: mature democracy X not AI. All columns control for importer/exporter GDP and log distance. Column (2) adds controls for common border, free trade agreements, and shared colonial background. Column (3) adds controls for common language, legal system, and religion. Column (4) adds controls for landlocked and island characteristics. Standard errors are clustered by origin country.

than zero. The magnitude of the coefficient implies that the propensity for Chinese surveillance AI imports is more than 50 percentage points greater (at the country-pair level) than imports of other frontier technologies from China. In Online Appendix Figure A.5 one can see analogous estimates for every other exporting country, with China's coefficient far larger than all of the others.

C. China's exports to autocracies and weak democracies

Having observed that weak democracies and autocracies differentially import surveillance AI from China, we next consider whether China's exports are biased toward these regimes. A first indicator of such a bias can be seen in Figure 1. The AI exports of the US (in terms of both country links and number of trade deals) are concentrated in mature democracies, perhaps reflecting the fact that these countries are in general richer. In contrast, China's AI exports country links and trade deals are nearly equally split between mature democracies or autocracies and weak democracies.

To investigate this more formally, we examine whether China differentially exports surveillance AI technology to autocracies and weak democracies (relative to China's exports of other frontier technologies). We estimate the following regression model:

$$trade_{i=\text{China},js} = \beta_0 + \beta_1 \mathbf{1}_{j=\text{low Polity Score}}$$
$$(4) \qquad\qquad + \beta_2 \mathbf{1}_{s=\text{AI}} + \beta_3 \mathbf{1}_{j=\text{low Polity Score},s=\text{AI}} + X_{i=\text{China},j} + u_{js},$$

where the unit of analysis is the technology (s) by the importing country (j), and X_{ij} are a vector of controls at the country-pair level. Of particular interest is the coefficient on the interaction β_3, which indicates the differential exports of surveillance AI from China to autocracies and weak democracies, compared to mature democracies and relative to China's exports of other frontier technologies. We cluster errors by importer in this table, given that that there is only a single exporter.

We present our findings in Table 5, Panel A. One can see in column 1 that China exports to

Table 4—China vs. rest of world, AI vs. frontier technologies—autocracy and weak democracy importers

	Engage in trade			
	(1)	(2)	(3)	(4)
Origin China	-0.012	-0.017	-0.007	-0.013
	(0.027)	(0.027)	(0.027)	(0.027)
AI	-0.350	-0.350	-0.350	-0.349
	(0.010)	(0.010)	(0.010)	(0.010)
Origin China X AI	0.522	0.529	0.518	0.523
	(0.030)	(0.031)	(0.030)	(0.030)
N	236016	236016	236016	236016
Log importer/exporter GDP	Yes	Yes	Yes	Yes
Log distance	Yes	Yes	Yes	Yes
Border/trade characteristics	No	Yes	No	No
Institutional characteristics	No	No	Yes	No
Geographical characteristics	No	No	No	Yes

Notes: Regressions are at the product-import-export country dyad level. Outcome is dummy for trade. Omitted: not China X not AI. All columns control for importer/exporter GDP and log distance. Column (2) adds controls for common border, free trade agreements, and shared colonial background. Column (3) adds controls for common language, legal system, and religion. Column (4) adds controls for landlocked and island characteristics. Standard errors are clustered by origin country.

mature democracies and autocracies quite similarly for most frontier technologies (β_1 is close to zero). China exports AI to mature democracies less frequently than it exports other frontier technologies (β_2 is negative), but exports of surveillance AI to autocracies and weak democracies are substantially more likely, relative to mature democracies and other technologies (β_3 is positive). The estimated β_3 implies a 22% increase in the probability that China exports AI to autocracies and weak democracies, relative to its exports of other frontier technologies. One can see in columns 2–4 that these results hold controlling for a variety of importing countries' geographic, economic, and political characteristics.

To put China's surveillance AI export bias toward autocracies and weak democracies in perspective, we repeat the analysis in Table 5, Panel A, column 1, but now replacing China with each exporting country in our sample. We plot along the y-axis of Figure 4 China's interaction coefficient —indicating the differential likelihood of a trade link specifically when the importer is an autocracy or weak democracy and the technology is surveillance AI, considering all frontier technologies and holding the exporter fixed as China. We also plot the analogous interaction coefficient for all other exporters. One can see that China's estimated autocratic bias in its exports of surveillance AI, captured by the interaction coefficient, exceeds the coefficient estimated for any other country. China's pattern of surveillance AI exports is particularly striking in that Figure 4 indicates *both* a strong comparative advantage *and* a strong autocratic bias; in contrast, the US has the second-largest estimated comparative advantage, but almost no autocratic bias in its surveillance AI exports.

As an alternative approach to benchmarking China's autocratic bias in its exports of surveillance AI, we repeat the analysis in Table 5, Panel A, column 1, but now estimate the differential exports from China to autocracies and weak democracies one frontier technology sector *s* at a time. We plot the β_3 coefficients for each technology in Figure 5. One observes a striking pattern: AI is the *only* frontier technology that China differentially exports to autocracies and weak democracies.

An important question about China's pattern of exports is whether the appearance of a bias toward autocracies and weak democracies may reflect the effects of differential receipt of Chinese

**Table 5—**Leading exporters trade in AI by importers Polity score
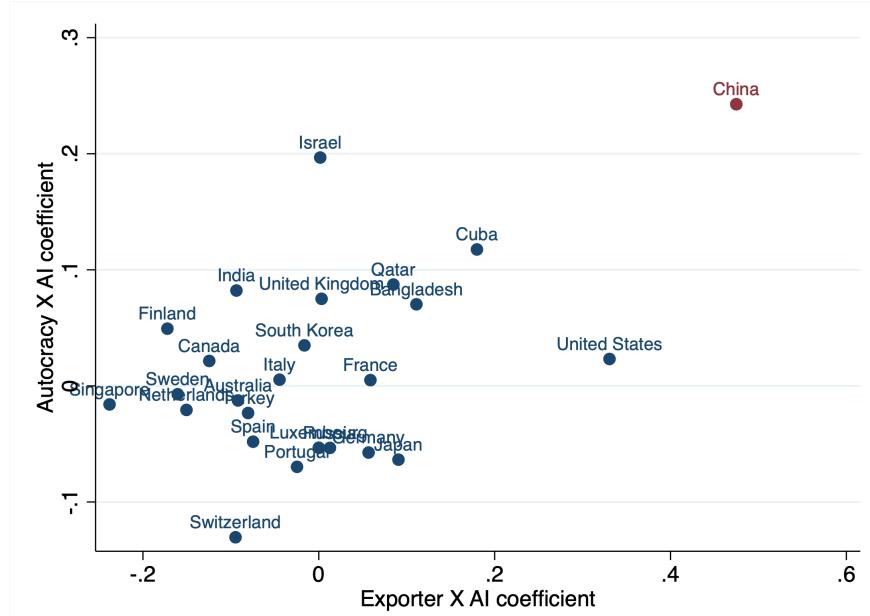
	China exports				US exports			
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Panel A: effect by regime type								
Autocracy and weak democracy	-0.004	-0.003	-0.003	0.000	-0.003	-0.002	0.002	-0.002
	(0.003)	(0.003)	(0.005)	(0.003)	(0.004)	(0.005)	(0.005)	(0.004)
AI	-0.600	-0.597	-0.560	-0.601	-0.727	-0.726	-0.734	-0.732
	(0.097)	(0.101)	(0.794)	(0.096)	(0.062)	(0.062)	(0.065)	(0.060)
Autocracy and weak democracy X AI	0.222	0.266	0.223	0.231	-0.015	-0.032	0.001	-0.031
	(0.103)	(0.102)	(0.121)	(0.108)	(0.077)	(0.077)	(0.081)	(0.080)
N	2394	2394	2394	2394	2394	2394	2394	2394
Panel B: horserace regime type and aid relationship								
Autocracy and weak democracy	-0.005	-0.004	-0.004	-0.001	-0.005	-0.004	-0.001	-0.005
	(0.003)	(0.003)	(0.005)	(0.003)	(0.004)	(0.005)	(0.005)	(0.005)
AI	-0.598	-0.580	-0.545	-0.598	-0.738	-0.737	-0.744	-0.741
	(0.100)	(0.102)	(0.804)	(0.099)	(0.063)	(0.063)	(0.066)	(0.061)
Autocracy and weak democracy X AI	0.218	0.246	0.218	0.226	0.007	-0.011	0.021	-0.014
	(0.106)	(0.106)	(0.122)	(0.110)	(0.079)	(0.078)	(0.083)	(0.082)
Aid from exporter to importer	0.001	0.001	0.000	0.001	0.003	0.003	0.003	0.003
	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)
AI X aid	0.004	0.020	0.004	0.005	-0.029	-0.029	-0.029	-0.023
	(0.049)	(0.038)	(0.049)	(0.050)	(0.025)	(0.025)	(0.025)	(0.027)
N	2394	2394	2394	2394	2394	2394	2394	2394
Log importer GDP	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Log distance	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Border/trade characteristics	No	Yes	No	No	No	Yes	No	No
Institutional characteristics	No	No	Yes	No	No	No	Yes	No
Geographical characteristics	No	No	No	Yes	No	No	No	Yes

Notes: Regression at the product-import country level. Outcome is dummy for trade. Omitted: destination mature democracy X not AI. All columns control for importer GDP and log distance. Panel B additionally interacts AI by the standardized amount of total aid given to the importer. Columns (2) and (6) add controls for common border and shared colonial background. Columns (3) and (7) add controls for legal system and religion. Columns (4) and (8) add controls for landlocked and island characteristics. Standard errors are clustered by export country.

foreign aid. If autocracies and weak democracies differentially receive foreign aid from China, they may also be disproportionately more likely to procure its surveillance AI technology, plausibly because of the compatibility with the infrastructure and other facilities that China supports. In Table 5, Panel B, we test whether recipients of Chinese aid are more likely to be importers of its AI technology.[23] We do not find evidence that this is the case. Receiving aid is not associated with differential AI imports, and allowing for AI imports to depend on receipt of Chinese aid does not affect the pattern of differential AI exports across political regimes.
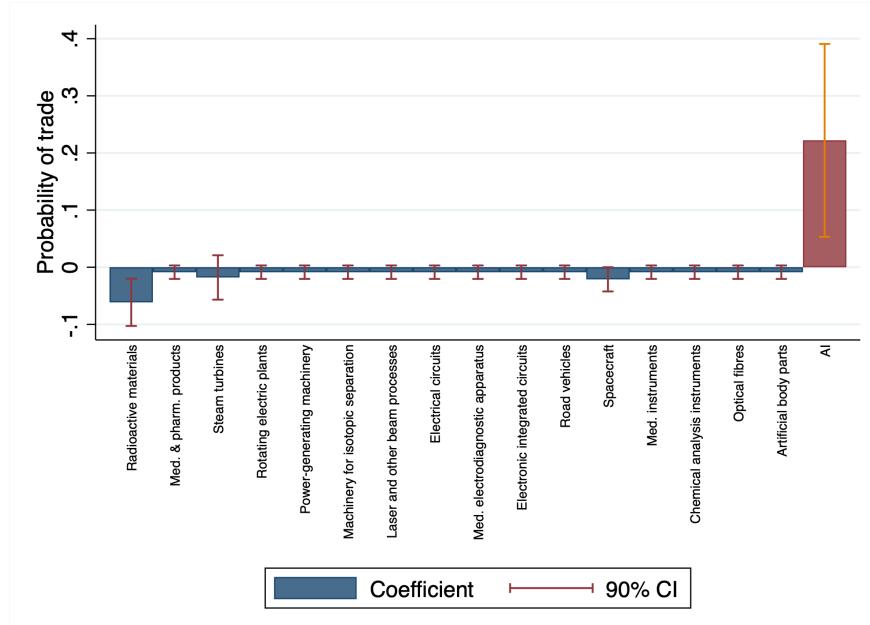
How prominent are importing country political institutions in explaining differential exports of China's surveillance AI, relative to other importer characteristics? To benchmark the role of importing country institutions in shaping the pattern of China's surveillance AI trade, we compare our interaction coefficient (importer autocratic or weak democracy interacted with the technology being AI) to estimates of analogous models, but now examining a set of 167 distinct economic, political, and social characteristics included in the World Bank's World Development Indicators (WDI) dataset and Databank International's Cross-National Time-Series Data (CNTS). Specifically,

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[23]In Appendix Table A.7, we replicate this exercise using subcategories of aid, including official development assistance (ODA), other official flows (OOF), and direct financing. Results are similar.

Figure 4. AI export advantage and AI export political bias by country

Note: The figure plots coefficients from the specification in Table 2, column 1 on the x-axis (Origin China X AI) and coefficients from the specification in Table 5, Panel A, column 1 on the y-axis (Autocracy and weak democracy X AI) for each AI exporting country.
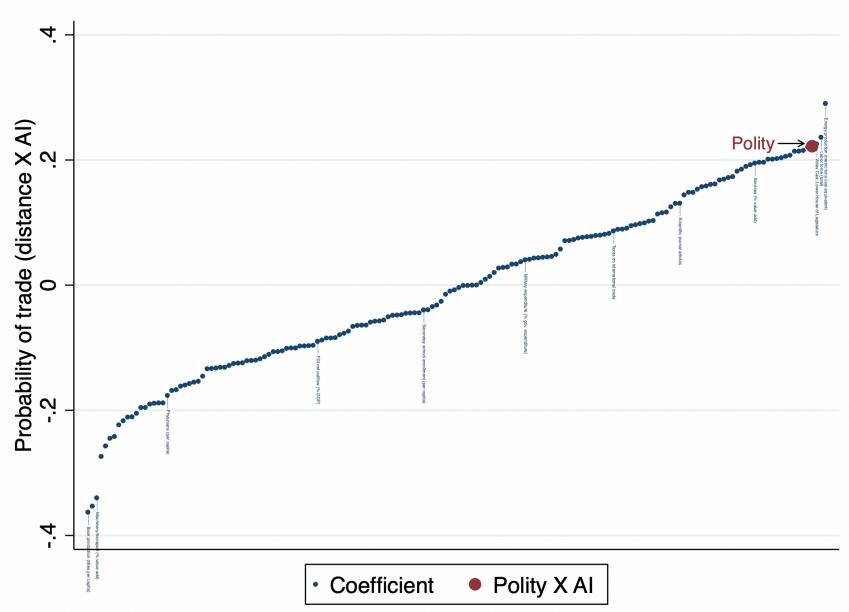
Figure 5. Political bias in frontier technology imports from China

Note: The figure follows the specification in Table 5 and presents the coefficient and 90% confidence interval for the interaction term (Destination low Polity score X frontier technology) for each of the different frontier technologies.

we estimate the model in Table 5, Panel A, column 1, but now replacing $\mathbf{1}_{j=\text{low Polity Score}}$ (the importer autocratic or weak democracy dummy) in the interaction and the lower-order term, with a dummy variable indicating that the importer is above the median on each of the 168 variables

(examined one at a time).

In Figure 6, we plot the estimated interaction coefficient from Table 5, Panel A, column 1 (where the variable of interest is importing country autocratic or a weak democracy) alongside the estimated coefficients for all other 168 interactions. As one would expect, we find that some other importer characteristics (e.g., above median size of the labor force and above median energy production) are associated with substantially different imports of China's surveillance AI.[24] It is striking that importing countries' *political institutions* are associated with among the largest differential increases in imports of China's surveillance AI technology.

Figure 6. Bias in AI imports from China by various importer characteristics

Note: The figure follows the specification in Table 5 and presents coefficients for the interaction term between 168 different importer characteristics with AI. Characteristics include 167 economic, political, and social characteristics from the World Bank and Databank International, alongside the importer's polity score.

What contributes to China's differential exports to autocracies and weak democracies? One might naturally wonder why autocracies and weak democracies turn specifically to China for their surveillance AI and why China's firms differentially export to these countries. While a comprehensive analysis of the mechanisms underlying the trade patterns we document is beyond the scope of this paper, several plausible mechanisms may be at work. On the supply side, Chinese firms may produce particularly effective AI technology for social and political control. The Chinese government may also implicitly subsidize AI exports to autocracies and weak democracies as part of its foreign policy. Our data do not allow us to directly test for this. It is also possible that major competitors, such as US firms, self-impose bans on their AI exports to countries with autocratic regimes. Indeed, among the 23 US companies in our dataset, 3 have released a policy banning such exports (IBM, Microsoft, and Google).[25] The first of these bans was in 2018 (Microsoft), when this issue started becoming politically salient. With this in mind, Appendix Table A.4 repeats our analysis using AI deals before 2018. We lose over half of our deals in the

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[24]In Table S.13, we provide variable descriptions and coefficients for all 167 variables. A thorough investigation of these variables' roles in shaping trade in surveillance AI is beyond the scope of this paper.

[25]IBM has banned by regime type, Microsoft has banned sales to police departments, and Google has banned all sales to governments.

sample, but we find that the results for China look similar to our baseline when using the entire sample (although the magnitude of β_3 is smaller) and that, if anything, AI exports from the US were *more* biased towards mature democracies before the self-imposed bans. This suggests that restrictions on US exports do not drive the patterns we observe.

On the demand side, autocracies and weak democracies may view Chinese surveillance AI as a particularly "appropriate technology" (Basu and Weil, 1998) in terms of price or specific features that they value. One such feature is the capacity of surveillance AI to suppress political unrest, a use to which such technology has been put in the Chinese context (Beraja et al., 2023a). This suggests that autocracies and weak democracies may specifically import China's surveillance AI technology when needing to exert political control. We empirically examine this possibility next.

IV. Domestic political context and imports of China's surveillance AI

In this section, we explore importing countries' domestic political environment as a potential demand side factor.[26] China's surveillance AI technology may be particularly valuable to regimes that have recently experienced political unrest because many of these AI products were demanded and developed precisely in response to occurrence of political unrest within China (Beraja et al., 2023a). This is particularly true in autocracies and weak democracies where, like in China, freedom of speech and freedom of assembly are limited and state repression is regularly deployed.

To empirically test this, we examine how a country's yearly imports of China's surveillance AI technology vary in response to the occurrence of domestic political unrest, as well as leads and lags of unrest. Specifically, we estimate the following model of the imports of China's surveillance AI technology by weak democracies and autocracies:

$$(5) \qquad trade_{i=\text{China},s=\text{AI},jt} = \beta_0 + \sum_{h=t-2}^{t+2} \beta_{1h} unrest_{jh} + \alpha_t + \gamma_j + u_{jt},$$

where h is a set of two leads of domestic unrest in importing country j, contemporaneous unrest at t when AI trade deals are observed, as well as two lags of domestic unrest. The one year lag is the omitted category. We control for calendar time fixed effects (α_t) as well as importing country fixed effects (γ_j).

Table 6 presents the results. One can see in column 1 that greater political unrest in weak democracies and autocracies in a given year is associated with a significantly higher likelihood of importing China's surveillance AI technology in the corresponding year. There were no differential trends in AI imports prior to episodes of unrest, suggesting that the regimes do not preemptively import surveillance AI anticipating future unrest. Moreover, we find that surveillance AI imports are not statistically significantly different during one or two years after episodes of unrest.

We next explore the robustness of these patterns. One may be concerned that changes in local unrest and surveillance AI imports may reflect broad changes in the domestic country's economic conditions and trade activities. We find that our baseline results remain quantitatively similar when we control for country-specific time trend, total trade volume, and/or the importer GDP (columns 1-4). Moreover, a similar pattern is observed among countries' imports of China's smart city surveillance AI technology where the importing countries' governments are the explicit purchasers (columns 5-8). In order to visualize our estimates, we plot the β_{1h} coefficients in Figure 7, Panel A.

Importantly, what we find for Chinese surveillance AI technology does not simply reflect a

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[26]It is important to emphasize that we do not expect this factor to fully account for the observed trade patterns. In addition to supply side factors noted above, there exist other demand side factors beyond domestic politics that we do not explore in depth. For example, we find that the absence of domestic investment in AI is associated with differentially greater imports of surveillance AI technology from China (see Appendix Table A.8).

Table 6—Local unrest on AI trade to autocracies and weak democracies

	AI import deals (all)				AI import deals (smart city)			
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
AI 2 years before unrest	-0.025	-0.020	-0.020	-0.020	-0.008	-0.005	-0.005	-0.005
	(0.021)	(0.021)	(0.021)	(0.022)	(0.018)	(0.020)	(0.020)	(0.020)
AI same year as unrest	0.073	0.094	0.096	0.097	0.040	0.053	0.055	0.056
	(0.041)	(0.047)	(0.048)	(0.048)	(0.023)	(0.026)	(0.027)	(0.027)
AI 1 year after unrest	-0.024	-0.016	-0.016	-0.016	-0.015	-0.010	-0.010	-0.010
	(0.013)	(0.013)	(0.013)	(0.013)	(0.010)	(0.011)	(0.011)	(0.011)
AI 2 years after unrest	0.007	0.021	0.022	0.024	0.001	0.009	0.010	0.010
	(0.013)	(0.015)	(0.015)	(0.016)	(0.009)	(0.010)	(0.010)	(0.010)
N	1226	1226	1226	1200	1226	1226	1226	1200
Country time trend	No	Yes	Yes	Yes	No	Yes	Yes	Yes
Total trade	No	No	Yes	Yes	No	No	Yes	Yes
Log importer GDP	No	No	No	Yes	No	No	No	Yes

Notes: Regressions are at the country-year level, stacked so that the independent variable (unrest) vary within an observation. Unrest is standardized. Trade deals is a dummy for any export from China. A Polity score of 7 is used as the cutoff for a 'full democracy' by the Polity IV project (Marshall et al., 2016), which we use to distinguish mature and weak democracies. Residualized number of trade deals relative to year = 0 and controlling for AI 1 year before unrest X year. All columns have fixed effects for import country and year. Standard errors are clustered at the import country level.

generic increase in imports of China's other frontier technologies or an in increase in imports of AI from any other country. We observe no relationship between imports and the occurrence of political unrest when we pool non-AI frontier technologies (see Appendix Table A.9). Neither do we observe any other frontier technology exhibiting the same pattern as AI technology (Figure 8). In addition, we find that it is *Chinese* surveillance AI that is particularly demanded by countries experiencing unrest: when we examine AI imports from the US, we do not observe differential imports from countries experiencing unrest (see Appendix Table A.10).[27] These results suggest that Chinese surveillance AI technology is imported to specifically satisfy domestic state surveillance demand.

One may wonder whether we observe similar efforts to enhance surveillance and political control using China's AI technology even in mature democracies. We replicate the above exercise, but now focusing on mature democracies as importing countries. The results are presented in Appendix Table A.11, and Figure 7, Panel B, plots the β_{1h} coefficients for mature democracies. We do *not* find evidence of mature democracies' importing China's AI technology in response to domestic political unrest. This suggests that governments' motives for importing and deploying China's surveillance AI technology differ across institutional types. Autocracies and weak democracies — which may benefit from a stronger surveillance capacity — import surveillance AI technology precisely when the demand for state repression is high. Mature democracies, on the other hand, do not appear to differentially import surveillance technology at such times.
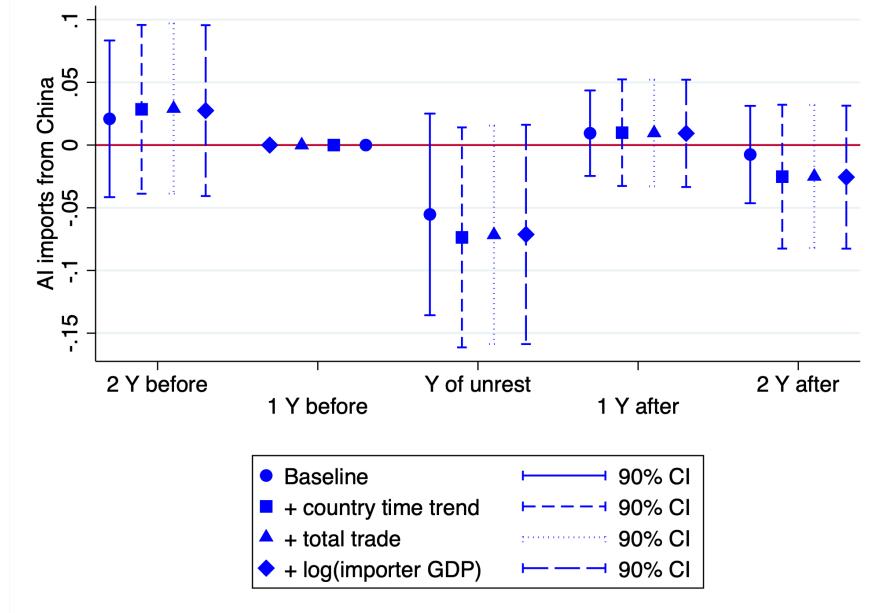
V. Technology of political control and the entrenchment of non-democratic regimes

We next explore whether the import of surveillance AI technology occurs alongside other measures associated with political control and repression, and the entrenchment of non-democratic regimes.

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[27]We are underpowered to conduct this panel data exercise with other exporting countries, hence our comparison of the two major exporters, China and the US.

Panel A: autocracies and weak democracies

Panel B: mature democracies

Figure 7. Local unrest on AI trade

Note: This figure follows the specification in Tables 6 (Panel A) and A.11 (Panel B), Columns 1-4, and presents the coefficients and 90% confidence intervals for trade in AI to weak democracies and autocracies (in red) and strong democracies (in blue).

Erosion of electoral institutional quality. We begin by examining whether imports of surveillance AI technology in a context of domestic unrest are concomitant with broad changes in domestic institutional quality. Specifically, we estimate a long-difference (cross-sectional) model in which changes in political institutional quality in importing country i are predicted by the total amount of surveillance AI technology imports from China specifically in years with above median levels of domestic political unrest. We measure domestic institutional quality, particularly those
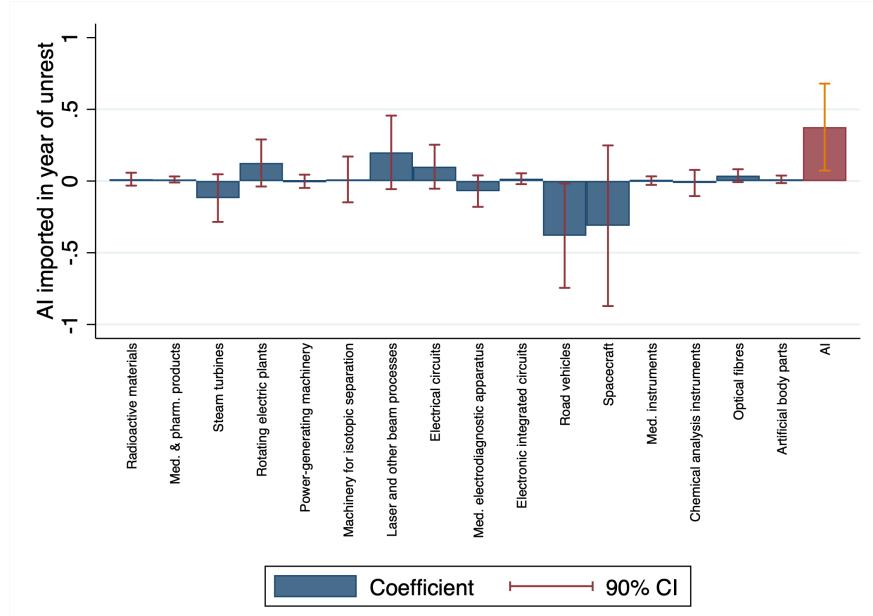
Figure 8. Local unrest on AI and frontier trade to autocracies and weak democracies

Note: This figure follows the specification in Table 6 and presents the coefficient and 90% confidence interval for trade links in a given frontier technology *s* in the same year as unrest for each of the different frontier technologies.

related to the functioning of free and fair elections, using the overall NELDA index, as described in Section I. A country's change in institutional quality is measured as the difference between the average level at the end of the sampling period (2019-2021) and the beginning (2005-2007).[28] The model is as follows:

$$(6) \qquad \Delta Institution_j = \beta_0 + \beta_1 \sum_t trade_{i=\text{China},s=\text{AI},jt} \mathbb{I}_{unrest_{jt}>\text{median}_j} + u_j,$$

where $\sum_t trade_{i=\text{China},s=\text{AI},jt} \mathbb{I}_{unrest_{jt}>\text{median}_j}$ indicates the sum total of surveillance AI imports from China by country *j* during years *t* with above-median domestic unrest.

Table 7, Panel A, presents the estimated relationships among importing countries that are weak democracies and autocracies. Surveillance AI imports from China during episodes of domestic unrest are associated with a broad decline in institutional quality. This is true in a specification without any controls (column 1), and the negative relationship remains when we control for total AI imports throughout the period, total domestic unrest episodes, and total trade (columns 2-5). Rather than reflecting a causal effect of surveillance AI imports on domestic institutional quality, these findings suggest that surveillance AI imports from China and the erosion of domestic institutions may be joint outcomes of regimes' move towards greater political control.

We next explore the robustness of the baseline results using several alternative specifications. First, in Appendix Table S.11, we consider as outcomes each of the disaggregated NELDA indices, and we find qualitatively similar results. Second, in Appendix Table A.12, we focus instead on the smart city AI imports from China following episodes of domestic unrest, and we find similar (though quantitatively smaller) results. Third, we estimate a panel specification where we examine the relationship between AI imports from China in years with above median levels of domestic political unrest and the change in institutional quality during the subsequent two years.

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[28]We study the average institutional quality measures over three years to account for the differential timing of elections across countries.

Table 7—Local unrest and AI imports on electoral outcomes

	Political institutional quality				
	(1)	(2)	(3)	(4)	(5)
Panel A: imports by autocracies and weak democracies					
AI imports during high unrest	-0.556	-0.688	-0.687	-0.704	-0.526
	(0.209)	(0.224)	(0.217)	(0.210)	(0.209)
N	46	46	46	46	46
Panel B: imports by mature democracies					
AI imports during high unrest	0.091	-0.094	-0.157	0.060	0.289
	(0.026)	(0.097)	(0.240)	(0.196)	(0.255)
N	45	45	45	45	45
Panel C: exports by the US to autocracies and weak democracies					
AI imports during high unrest	-0.671	-0.675	-0.676	-0.680	-0.540
	(0.360)	(0.519)	(0.580)	(0.576)	(0.335)
N	46	46	46	46	46
Total AI	No	Yes	Yes	Yes	Yes
Total unrest	No	No	Yes	Yes	Yes
Total trade	No	No	No	Yes	Yes
Log importer GDP	No	No	No	No	Yes

Notes: Regressions are at the country level. AI imports during high unrest is the standardized number of AI imports from China when unrest is over one standard deviation above the mean. Outcomes are the change in an inverse covariance weighted index of electoral outcomes from NELDA between the period before AI exports begin (2005-2007) and the last years for which NELDA data are available (2018-2020), where positive changes reflect improving institutional quality. The specific variables that enter the index are described in footnote S.1. Total AI is the total number of AI exports from China. A Polity score of 7 is used as the cutoff for a 'full democracy' by the Polity IV project (Marshall et al., 2016), which we use to distinguish mature and weak democracies. Standard errors are robust.

This specification, presented in Appendix Table S.12, again shows a negative association between the imports of surveillance AI from China and broad institutional erosion among autocracies and weak democracies.

The context of technology imports matters. We then examine the relationship between surveillance AI imports and domestic institutional quality in two other contexts. We begin by estimating specifications analogous to Table 7, Panel A, but instead focusing on mature democracies as importers (results are presented in Panel B). One does *not* observe erosion in domestic institutional quality when China's AI technology is imported by mature democracies, indicating that the same technology may have context-specific effects. In particular, China's surveillance AI technology may reinforce the initial differences in domestic institutions between mature democracies *vis-a-vis* autocracies and weak democracies.

We then focus on autocracies and weak democracies' imports of surveillance AI technology from the US in order to examine whether its surveillance AI technology is also purchased by these regimes as their institutional quality declines. We again estimate specifications analogous to Table 7, Panel A. The results are presented in Panel C. One indeed observes a decline (albeit noisier) in domestic institutional quality when autocracies and weak democracies import AI technology from the US following political unrest, suggesting that (geo-)political and technological constraints do not preclude imports in such contexts. Taken together, our results suggest that while technology can serve different purposes, regimes that seek to strengthen political control

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can import surveillance AI technology from different exporting countries, though doing so predominantly from China (as shown in Section IV).

Imports of arms. To the extent that surveillance AI imports reflect weak democracies and autocracies seeking to enhance their political control, one may expect changes in other key purchases of potentially repressive technologies. Specifically, we investigate arms imports from China in the context of domestic political unrest. In Appendix Figure S.3, we replicate Figure 7, using imports of Chinese arms instead of Chinese AI. We observe a similar pattern between trade in arms and AI, suggesting that imports of surveillance technology and the erosion of political institutions are part of a concerted effort to enhance the power of coercive regimes.

One may wonder if the increased imports of arms and surveillance AI from China during political unrest are simply a result of greater Chinese attention due to investments made in particular countries. We thus explore whether the broad Chinese foreign investment patterns (of infrastructure and construction projects, in particular) coincide with imports of technology facilitating political control. In Appendix Figure S.4, we replicate Figure 7, using Chinese investment in infrastructure and construction instead of Chinese AI imports.[29] We do *not* find changes in Chinese foreign investment associated with destination countries' political unrest. Imports of repressive technologies like surveillance AI and arms appear to follow a pattern distinct from broad patterns of China's oversea economic activities.

The entrenchment of non-democracy. As the surveillance AI and other technologies for political control are deployed by autocracies and weak democracies during domestic political unrest, political stability may be enhanced and non-democratic institutions may be entrenched. In Appendix Figure A.6, we plot the probability that an autocracy or weak democracy experiences a regime change to become a consolidated democracy, based on whether they have received an above or below median level of AI imports from China during periods of high unrest. For countries importing an above median amount of AI during periods of high unrest, the probability of a regime change to consolidated democracy is 4.7% (1 in 21), while for countries importing a below median amount of AI, the probability of such a change is 21.7% (5 in 23). Though based on a small sample, these results suggest that a broad set of tactics adopted by autocracies during times of unrest — imports of surveillance AI, the erosion of electoral institutions, and imports of military technology — may indeed entrench non-democratic regimes.

VI.   Conclusion

In this paper, we show that China has a comparative advantage in surveillance AI, and that autocracies and weak democracies are more likely to import this technology from China, especially when experiencing political unrest. This suggests the possibility that China's exports of a technology used for state surveillance may strengthen autocrats (and would-be autocrats) around the globe.

Since World War II, global economic integration has been considered instrumental to a liberal democratic world order.[30] This belief may have arisen from several factors: leading innovators have been mature democracies, leading exporters of frontier technology have been mature democracies, and frontier technologies have not been particularly conducive to supporting autocratic regimes. These factors may no longer be true in some contexts in the 21st century, as exemplified

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[29]The investment data used in Appendix Figure S.4 is distinct from the aid data used in Table 5. According to each source, the former is "the only comprehensive public data set covering China's global investment and construction," while the latter dataset "is unique in that it captures the full range of projects that align with the OECDs definitions of Official Development Assistance (ODA) and Other Official Flows (OOF)." Table 5 is robust to controlling for investment and construction.

[30]President Bill Clinton, in a speech given in 2000 arguing for China's joining the WTO, stated, "Membership in the WTO, of course, will not create a free society in China overnight …But over time, I believe it will move China faster and further in the right direction, and certainly will do that more than rejection would." Source: `https://nyti.ms/3peSuXP`. Bombardini et al. (2023) explore policymakers' expectations regarding the economic impact of China's integration into the world economy, accounting for ideological concerns such as the impact of normalizing trade relations on human rights.

in the case of China and its surveillance AI technology. To the extent that trade integration could facilitate the trade of technologies of different political nature, it could challenge the long-held expectation that trade integration fosters democratization around the world and strengthens liberal regimes. Our results suggest that the effects of trade integration could be ambiguous, depending on who has the comparative advantage to produce frontier technology and to export to other countries, and who (and under what circumstances) is importing such technology.

The possibility of negative global externalities (i.e., lost civil liberties and political rights) arising from trade in surveillance AI should inform policy discussions on international standards for AI development and trade. Regulation of trade in surveillance AI can be modeled on existing regulations on trade in products with global externalities. Products sharing similar features include dual-use (military-civilian) technologies, which can contribute to global conflict; goods produced using inputs that are unethically sourced, such as child labor; or, goods that generate negative production or consumption externalities, such as pollution. Autocratically biased AI technology can involve externalities that are both upstream (e.g., data collected for the purpose of domestic political repression) and downstream (e.g., technology used for political repression in importing countries). These features suggest that trade regulations need to be carefully devised in order to achieve the desired goal, and to ensure countries' ability to credibly commit to enforcing such regulations.

Furthermore, our work joins an emerging literature calling on economists to devote greater attention to geopolitics (Clayton et al., 2023; see also Mohr and Trebesch, 2024, for a recent review of the literature). In our setting, geopolitics shapes technological change and the diffusion of technology across countries. Geopolitics also shapes the patterns of trade we observe and will surely shape trade regulation, both of surveillance AI, and more generally. We view this intersection of geopolitics, technology, and international economics as a particularly exciting avenue for further work.

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Appendix for:
Exporting the Surveillance State via Trade in AI

This appendix contains additional figures and tables for the article "Exporting the Surveillance State via Trade in AI."

Panel A: from China to Saudi Arabia
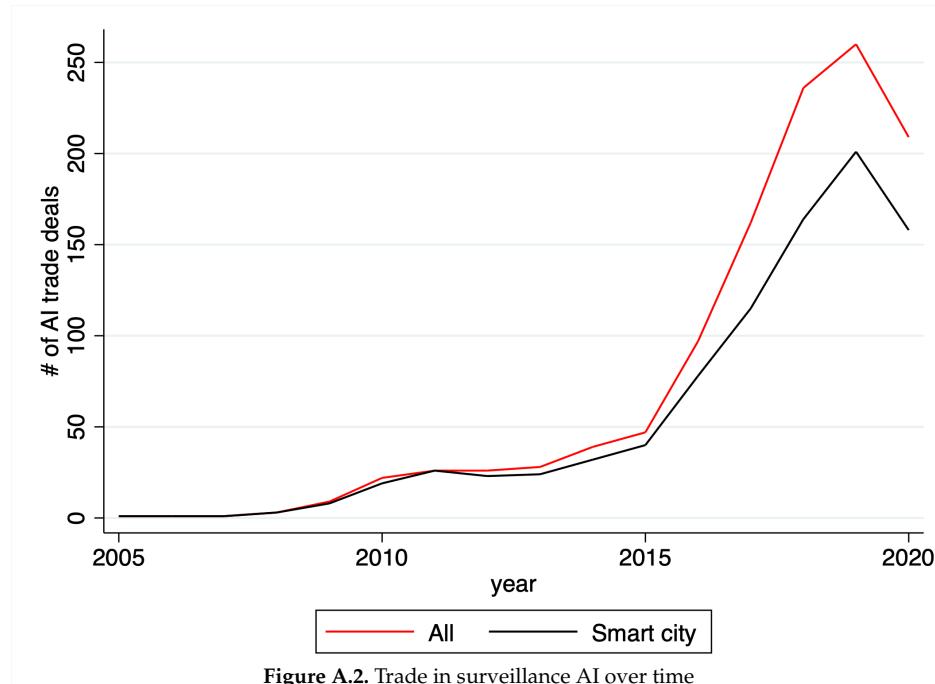
Panel B: from the United States to Kuwait

Figure A.1. AI export case studies

Figure A.2. Trade in surveillance AI over time

Note: Number of surveillance AI trade deals by year.
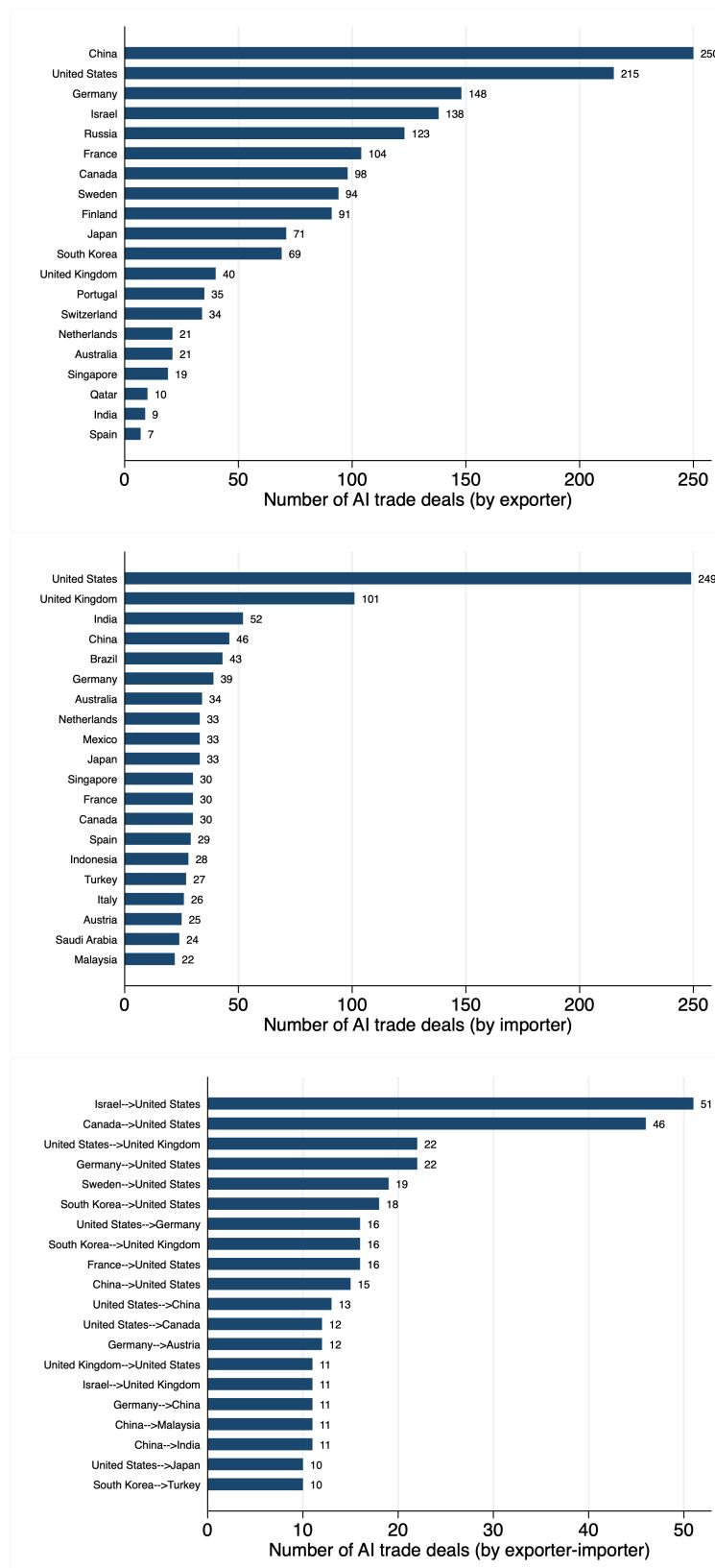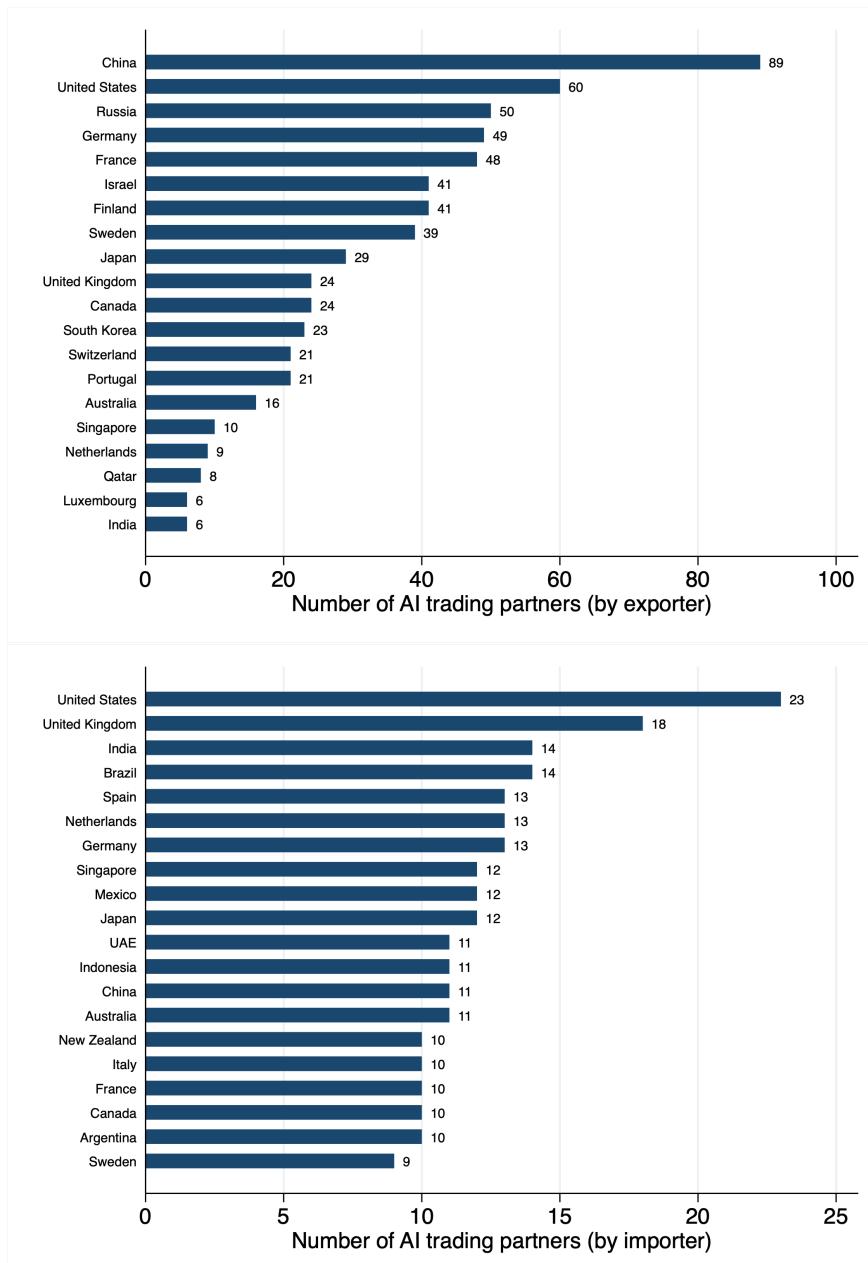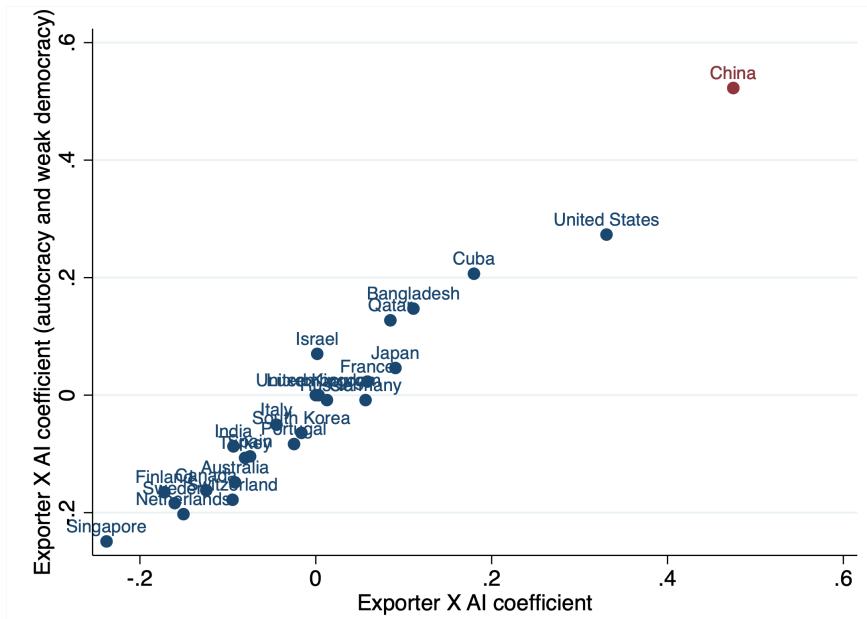
Figure A.3. Top surveillance AI importers and exporters (by # of trade deals)

Note: Number of surveillance AI trade deals by exporter (top), importer (middle), and exporter-importer pairs (bottom).

A.3
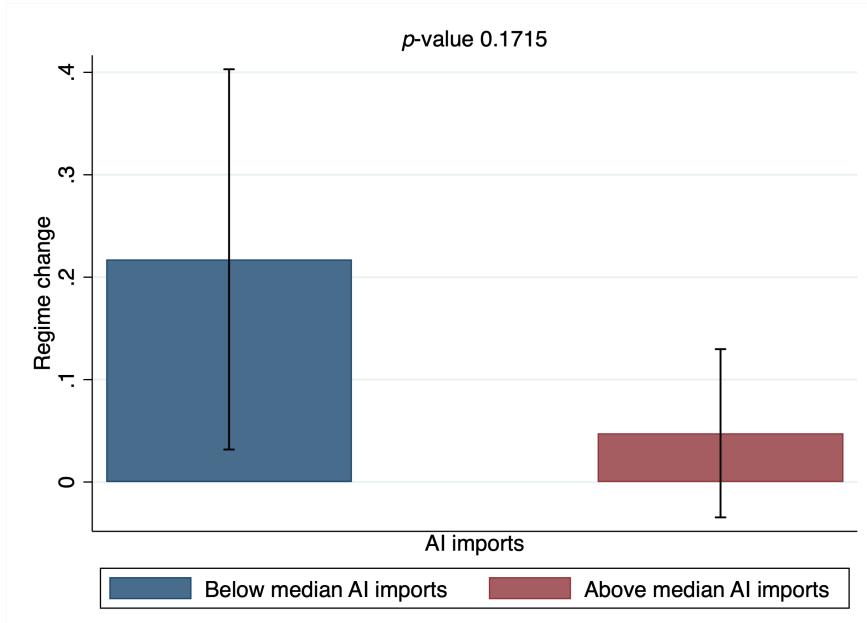
Figure A.4. Top surveillance AI importers and exporters (by # of trade partners)

Note: Number of surveillance AI trading partners by exporter (top) and importer (bottom).

Figure A.5. AI export advantage and AI export advantage to autocracy and weak democracies

Note: The figure plots coefficients from the specification in Table 2, column 1 on the x-axis (Origin China X AI) and coefficients from the specification in Table 4, column 1 on the y-axis (Origin China X AI) for each AI exporting country.

Figure A.6. AI imports during high unrest on regime change

Note: This figure plots the probability of regime change among autocracies and weak democracies, split by whether they received above or below median levels of AI imports from China during periods of high (above median) unrest.

Table A.1—China vs. rest of world, smart city AI vs. frontier technologies

	Engage in trade			
	(1)	(2)	(3)	(4)
Origin China	-0.026	-0.026	-0.012	-0.026
	(0.024)	(0.024)	(0.025)	(0.024)
AI	-0.357	-0.358	-0.356	-0.355
	(0.010)	(0.010)	(0.010)	(0.010)
Origin China X AI	0.383	0.381	0.368	0.383
	(0.029)	(0.029)	(0.029)	(0.029)
N	402300	402300	402300	402300
Log importer/exporter GDP	Yes	Yes	Yes	Yes
Log distance	Yes	Yes	Yes	Yes
Border/trade characteristics	No	Yes	No	No
Institutional characteristics	No	No	Yes	No
Geographical characteristics	No	No	No	Yes

Notes: Regressions are at the product-import-export country dyad level. Outcome is dummy for trade. Omitted: not China X not smart city AI. All columns control for import/export GDP and log distance. Column (2) adds controls for common border, free trade agreements, and shared colonial background. Column (3) adds controls for common language, legal system, and religion. Column (4) adds controls for landlocked and island characteristics. Standard errors are clustered by origin country.

Table A.2—US vs. China, AI vs. frontier technologies

	Engage in trade			
	(1)	(2)	(3)	(4)
Origin China	-0.005	-0.005	0.005	-0.005
	(0.004)	(0.004)	(0.007)	(0.004)
AI	-3.361	-3.331	-3.514	-3.333
	(0.253)	(0.242)	(0.277)	(0.275)
Origin China X AI	0.172	0.179	0.241	0.172
	(0.043)	(0.042)	(0.060)	(0.043)
N	5364	5364	5364	5364
Log importer/exporter GDP	Yes	Yes	Yes	Yes
Log distance	Yes	Yes	Yes	Yes
Border/trade characteristics	No	Yes	No	No
Institutional characteristics	No	No	Yes	No
Geographical characteristics	No	No	No	Yes

Notes: Regressions are at the product-import-export country dyad level. Outcome is dummy for trade. Omitted: US X not AI. All columns control for import/export GDP and log distance. Column (2) adds controls for common border, free trade agreements, and shared colonial background. Column (3) adds controls for common language, legal system, and religion. Column (4) adds controls for landlocked and island characteristics. Standard errors are clustered by origin country.

Table A.3—Leading exporters trade in AI by importers Polity score — pooled regression

	Linear probability of trade			
	(1)	(2)	(3)	(4)
Autocracy and weak democracy	-0.007	-0.007	-0.002	-0.006
	(0.004)	(0.004)	(0.005)	(0.004)
Origin China	-0.000	-0.000	0.011	-0.000
	(0.001)	(0.001)	(0.006)	(0.001)
AI	-0.669	-0.671	-0.685	-0.661
	(0.061)	(0.061)	(0.073)	(0.061)
Autocracy and weak democracy X AI	-0.022	-0.013	-0.035	-0.016
	(0.072)	(0.074)	(0.078)	(0.075)
Origin China X AI	-0.027	-0.024	0.013	-0.026
	(0.081)	(0.079)	(0.099)	(0.081)
Autocracy and weak democracy X origin China	0.006	0.006	0.002	0.006
	(0.005)	(0.005)	(0.006)	(0.005)
Autocracy and weak democracy X origin China X AI	0.324	0.333	0.343	0.323
	(0.103)	(0.100)	(0.105)	(0.103)
N	4788	4788	4788	4788
Log importer/exporter GDP	Yes	Yes	Yes	Yes
Log distance	Yes	Yes	Yes	Yes
Border/trade characteristics	No	Yes	No	No
Institutional characteristics	No	No	Yes	No
Geographical characteristics	No	No	No	Yes

Notes: Regression at the product-import-export country dyad level. Outcome is dummy for trade. Omitted: origin US X mature democracy X not AI. All columns control for import/export GDP and log distance. Column (2) adds controls for common border, free trade agreements, and shared colonial background. Column (3) adds controls for common language, legal system, and religion. Column (4) adds controls for landlocked and island characteristics. Standard errors are clustered by destination country.

Table A.4—Leading exporters trade in AI by importers Polity score, before 2017

	China exports				US exports			
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Autocracy and weak democracy	-0.004	-0.003	-0.002	-0.001	-0.003	-0.002	0.002	-0.003
	(0.003)	(0.003)	(0.005)	(0.003)	(0.005)	(0.005)	(0.006)	(0.005)
AI	-0.352	-0.371	0.096	-0.351	-0.216	-0.214	-0.199	-0.202
	(0.083)	(0.094)	(0.750)	(0.082)	(0.088)	(0.087)	(0.090)	(0.085)
Autocracy and weak democracy X AI	0.166	0.186	0.118	0.153	-0.230	-0.246	-0.245	-0.218
	(0.099)	(0.106)	(0.109)	(0.103)	(0.104)	(0.108)	(0.108)	(0.109)
N	2261	2261	2261	2261	2261	2261	2261	2261
Log importer GDP	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Log distance	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Border/trade characteristics	No	Yes	No	No	No	Yes	No	No
Institutional characteristics	No	No	Yes	No	No	No	Yes	No
Geographical characteristics	No	No	No	Yes	No	No	No	Yes

Notes: Regression at the product-import country level. Outcome is dummy for trade. Omitted: destination mature democracy X not AI. All trade deals are from the year 2017 or earlier. All columns control for importer GDP and log distance. Columns (2) and (6) add controls for common border and shared colonial background. Columns (3) and (7) add controls for legal system and religion. Columns (4) and (8) add controls for landlocked and island characteristics. Standard errors are clustered by export country.

Table A.5—Autocracies and weak democracies vs. strong democracies as importers, AI vs. frontier technology, smart city

	Engage in trade			
	(1)	(2)	(3)	(4)
Dest. autocracy/weak democracy	-0.038	-0.036	-0.037	-0.026
	(0.006)	(0.005)	(0.005)	(0.006)
AI	-0.379	-0.379	-0.377	-0.371
	(0.010)	(0.009)	(0.009)	(0.010)
Dest. autocracy/weak democracy X AI	0.038	0.035	0.036	0.027
	(0.006)	(0.006)	(0.006)	(0.007)
N	402300	402300	402300	402300
Importer/exporter GDP	Yes	Yes	Yes	Yes
Log distance	Yes	Yes	Yes	Yes
Border/trade characteristics	No	Yes	No	No
Institutional characteristics	No	No	Yes	No
Geographical characteristics	No	No	No	Yes

Notes: Regressions are at the product-import-export country dyad level. Outcome is dummy for trade. Omitted: mature democracy X not AI. All columns control for importer/exporter GDP and log distance. Column (2) adds controls for common border, free trade agreements, and shared colonial background. Column (3) adds controls for common language, legal system, and religion. Column (4) adds controls for landlocked and island characteristics. Standard errors are clustered by origin country.

Table A.6—Leading exporters trade in smart city AI by importers Polity score

	China exports				US exports			
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Panel A: effect by regime type								
Autocracy and weak democracy	-0.004	-0.003	-0.003	0.000	-0.003	-0.002	0.002	-0.002
	(0.003)	(0.003)	(0.005)	(0.003)	(0.004)	(0.005)	(0.005)	(0.004)
AI	-0.635	-0.644	-0.240	-0.631	-0.819	-0.819	-0.822	-0.827
	(0.100)	(0.102)	(0.835)	(0.100)	(0.065)	(0.065)	(0.065)	(0.063)
Autocracy and weak democracy X AI	0.243	0.292	0.233	0.250	0.023	0.021	0.035	0.001
	(0.106)	(0.104)	(0.124)	(0.111)	(0.081)	(0.081)	(0.082)	(0.084)
N	2394	2394	2394	2394	2394	2394	2394	2394
Panel B: horserace regime type and aid relationship								
Autocracy and weak democracy	-0.005	-0.004	-0.004	-0.001	-0.005	-0.004	-0.001	-0.005
	(0.003)	(0.003)	(0.005)	(0.003)	(0.004)	(0.005)	(0.005)	(0.005)
AI	-0.624	-0.619	-0.170	-0.620	-0.830	-0.829	-0.831	-0.835
	(0.103)	(0.103)	(0.851)	(0.103)	(0.065)	(0.065)	(0.066)	(0.063)
Autocracy and weak democracy X AI	0.227	0.263	0.212	0.235	0.043	0.041	0.053	0.016
	(0.110)	(0.108)	(0.127)	(0.114)	(0.081)	(0.082)	(0.083)	(0.084)
Aid from exporter to importer	0.001	0.001	0.000	0.001	0.003	0.003	0.003	0.003
	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)
AI X aid	0.017	0.029	0.017	0.017	-0.027	-0.026	-0.026	-0.020
	(0.050)	(0.039)	(0.050)	(0.050)	(0.023)	(0.023)	(0.023)	(0.025)
N	2394	2394	2394	2394	2394	2394	2394	2394
Log importer GDP	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Log distance	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Border/trade characteristics	No	Yes	No	No	No	Yes	No	No
Institutional characteristics	No	No	Yes	No	No	No	Yes	No
Geographical characteristics	No	No	No	Yes	No	No	No	Yes

Notes: Regression at the product-import country level. Outcome is dummy for trade in smart city AI. Omitted: destination mature democracy X not AI. All columns control for importer GDP and log distance. Panel B additionally interacts AI by the standardized amount of total aid given to the importer. Columns (2) and (6) add controls for common border and shared colonial background. Columns (3) and (7) add controls for legal system and religion. Columns (4) and (8) add controls for landlocked and island characteristics. Standard errors are clustered by export country.

Table A.7—Leading exporters trade in AI by importers Polity score and aid relationship — alternative definitions for aid

	China exports			
	(1)	(2)	(3)	(4)
Panel A: official development assistance (ODA)				
Autocracy and weak democracy	-0.005	-0.004	-0.003	-0.000
	(0.003)	(0.003)	(0.005)	(0.003)
AI	-0.589	-0.586	-0.510	-0.590
	(0.097)	(0.100)	(0.802)	(0.095)
Autocracy and weak democracy X AI	0.197	0.242	0.196	0.204
	(0.105)	(0.103)	(0.123)	(0.111)
Aid from exporter to importer	0.001	0.001	0.001	0.000
	(0.003)	(0.003)	(0.003)	(0.003)
AI X aid	0.047	0.044	0.047	0.046
	(0.045)	(0.044)	(0.045)	(0.044)
N	2394	2394	2394	2394
Panel B: finance				
Autocracy and weak democracy	-0.005	-0.004	-0.004	-0.001
	(0.003)	(0.003)	(0.005)	(0.003)
AI	-0.582	-0.582	-0.555	-0.582
	(0.098)	(0.102)	(0.795)	(0.097)
Autocracy and weak democracy X AI	0.197	0.244	0.199	0.207
	(0.106)	(0.105)	(0.123)	(0.110)
Aid from exporter to importer	0.001	0.001	0.001	0.001
	(0.001)	(0.001)	(0.001)	(0.001)
AI X aid	0.036	0.030	0.036	0.037
	(0.021)	(0.021)	(0.020)	(0.021)
N	2394	2394	2394	2394
Panel C: other official flows (OOF)				
Autocracy and weak democracy	-0.004	-0.004	-0.003	-0.000
	(0.003)	(0.003)	(0.005)	(0.003)
AI	-0.607	-0.592	-0.620	-0.607
	(0.100)	(0.102)	(0.811)	(0.099)
Autocracy and weak democracy X AI	0.231	0.261	0.237	0.239
	(0.104)	(0.105)	(0.122)	(0.109)
Aid from exporter to importer	0.000	0.001	0.000	0.001
	(0.001)	(0.001)	(0.001)	(0.001)
AI X aid	-0.012	0.006	-0.013	-0.011
	(0.050)	(0.039)	(0.051)	(0.050)
N	2394	2394	2394	2394
Log importer GDP	Yes	Yes	Yes	Yes
Log distance	Yes	Yes	Yes	Yes
Border/trade characteristics	No	Yes	No	No
Institutional characteristics	No	No	Yes	No
Geographical characteristics	No	No	No	Yes

Notes: Outcome is dummy for trade. Omitted: destination mature democracy X not AI. All columns control for importer GDP and log distance. Instead of using the standardized amount of total aid China gives to the importer, as in Table 5, Panel A uses standardized official development assistance (ODA), Panel B uses financial funding, and Panel C uses other official flows (OOF). Column (2) adds controls for common border and shared colonial background. Column (3) adds controls for legal system and religion. Columns (4) adds controls for landlocked and island characteristics. Standard errors are clustered by export country.

Table A.8—China exports to countries by importers' AI investment

	AI import deals (all)				AI import deals (smart city)			
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Destination — autocracies and weak democracies								
Origin China	0.035	0.035	0.035	0.035	0.032	0.032	0.032	0.032
	(0.003)	(0.003)	(0.003)	(0.003)	(0.002)	(0.002)	(0.002)	(0.002)
Destination total AI investment	-0.012	-0.013	-0.012	-0.013	-0.011	-0.011	-0.011	-0.011
	(0.006)	(0.006)	(0.006)	(0.006)	(0.006)	(0.006)	(0.006)	(0.006)
Origin China X destination AI invest	-0.159	-0.159	-0.159	-0.159	-0.133	-0.133	-0.133	-0.133
	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)
N	4335	4335	4335	4335	4335	4335	4335	4335
Log importer GDP	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Log distance	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Border/trade characteristics	No	Yes	No	No	No	Yes	No	No
Institutional characteristics	No	No	Yes	No	No	No	Yes	No
Geographical characteristics	No	No	No	Yes	No	No	No	Yes

Notes: Regressions are at the import country-export country level, only keeping import countries with Polity score below 7. Outcomes are dummy for trade. Origin China and Destination AI investment are standardized. All columns control for importer GDP and log distance. Columns (2) and (6) add controls for common border and shared colonial background. Columns (3) and (7) add controls for legal system and religion. Columns (4) and (8) add controls for landlocked and island characteristics. Standard errors are clustered by destination country.

Table A.9—Local unrest on frontier trade to autocracies and weak democracies

	Import deals in frontier tech			
	(1)	(2)	(3)	(4)
AI 2 years before unrest	0.079	0.052	0.053	0.053
	(0.050)	(0.034)	(0.034)	(0.032)
AI same year as unrest	0.023	0.056	0.038	0.039
	(0.061)	(0.071)	(0.065)	(0.065)
AI 1 year after unrest	-0.017	-0.008	-0.007	-0.007
	(0.017)	(0.018)	(0.018)	(0.017)
AI 2 years after unrest	-0.016	-0.016	-0.028	-0.029
	(0.019)	(0.023)	(0.025)	(0.027)
N	1226	1226	1226	1200
Country time trend	No	Yes	Yes	Yes
Total trade	No	No	Yes	Yes
Log importer GDP	No	No	No	Yes

Notes: Regressions are at the country-year level, stacked so that the independent variable (unrest) vary within an observation. Unrest is standardized. Trade deals is a dummy for above average frontier technology exports from China. A Polity score of 7 is used as the cutoff for a 'full democracy' by the Polity IV project (Marshall et al., 2016), which we use to distinguish mature and weak democracies. Residualized number of trade deals relative to year = 0 and controlling for AI 1 year before unrest X year. All columns have fixed effects for import country and year. Standard errors are clustered at the import country level.

Table A.10—Local unrest on AI and frontier trade to autocracies and weak democracies — exports from the US

	AI import deals (all)				AI import deals (smart city)			
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
AI 2 years before unrest	0.071	0.056	0.051	0.053	0.058	0.073	0.072	0.076
	(0.055)	(0.080)	(0.081)	(0.083)	(0.057)	(0.073)	(0.074)	(0.074)
AI same year as unrest	0.110	0.236	0.229	0.236	0.048	0.146	0.145	0.155
	(0.152)	(0.142)	(0.139)	(0.139)	(0.123)	(0.126)	(0.126)	(0.127)
AI 1 year after unrest	-0.165	-0.129	-0.129	-0.132	-0.073	-0.062	-0.062	-0.066
	(0.096)	(0.086)	(0.085)	(0.086)	(0.047)	(0.059)	(0.059)	(0.059)
AI 2 years after unrest	0.175	0.075	0.069	0.074	0.039	0.043	0.042	0.047
	(0.139)	(0.068)	(0.071)	(0.072)	(0.056)	(0.080)	(0.081)	(0.082)
N	1226	1226	1226	1200	1226	1226	1226	1200
Country time trend	No	Yes	Yes	Yes	No	Yes	Yes	Yes
Total trade	No	No	Yes	Yes	No	No	Yes	Yes
Log importer GDP	No	No	No	Yes	No	No	No	Yes

Notes: Regressions are at the country-year level, stacked so that the independent variable (unrest) vary within an observation. Unrest is standardized. Trade deals are exports from the US. A Polity score of 7 is used as the cutoff for a 'full democracy' by the Polity IV project (Marshall et al., 2016), which we use to distinguish mature and weak democracies. We restrict the analysis to import countries with a polity score below 7. Residualized number of trade deals relative to year = 0 and controlling for AI 1 year before unrest X year. All columns have fixed effects for import country and year. Standard errors are clustered at the import country level.

Table A.11—Local unrest on AI and frontier trade to mature democracies

	AI import deals (all)				AI import deals (smart city)			
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
AI 2 years before unrest	0.021	0.028	0.029	0.027	0.023	0.031	0.032	0.031
	(0.038)	(0.041)	(0.041)	(0.042)	(0.041)	(0.045)	(0.046)	(0.046)
AI same year as unrest	-0.055	-0.074	-0.072	-0.071	-0.047	-0.059	-0.057	-0.057
	(0.049)	(0.053)	(0.053)	(0.053)	(0.053)	(0.054)	(0.053)	(0.053)
AI 1 year after unrest	0.009	0.010	0.010	0.009	-0.008	-0.007	-0.007	-0.008
	(0.021)	(0.026)	(0.026)	(0.026)	(0.010)	(0.015)	(0.015)	(0.015)
AI 2 years after unrest	-0.008	-0.025	-0.025	-0.026	-0.000	-0.019	-0.019	-0.020
	(0.024)	(0.035)	(0.035)	(0.035)	(0.020)	(0.035)	(0.035)	(0.035)
N	1474	1474	1474	1448	1474	1474	1474	1448
Country time trend	No	Yes	Yes	Yes	No	Yes	Yes	Yes
Total trade	No	No	Yes	Yes	No	No	Yes	Yes
Log importer GDP	No	No	No	Yes	No	No	No	Yes

Notes: Regressions are at the country-year level, stacked so that the independent variable (unrest) vary within an observation. Unrest is standardized. Trade deals is a dummy for any export from China. A Polity score of 7 is used as the cutoff for a 'full democracy' by the Polity IV project (Marshall et al., 2016), which we use to distinguish mature and weak democracies. Residualized number of trade deals relative to year = 0 and controlling for AI 1 year before unrest X year. All columns have fixed effects for import country and year. Standard errors are clustered at the import country level.

Table A.12—Local unrest and smart city AI imports on electoral outcomes

	Political institutional quality				
	(1)	(2)	(3)	(4)	(5)
Panel A: imports by autocracies and weak democracies					
AI imports during high unrest	-0.206	-0.205	-0.204	-0.202	-0.192
	(0.240)	(0.287)	(0.283)	(0.284)	(0.217)
N	46	46	46	46	46
Panel B: imports by mature democracies					
AI imports during high unrest	0.044	0.001	0.115	0.113	0.062
	(0.123)	(0.151)	(0.101)	(0.094)	(0.036)
N	45	45	45	45	45
Total AI	No	Yes	Yes	Yes	Yes
Total unrest	No	No	Yes	Yes	Yes
Total trade	No	No	No	Yes	Yes
Log importer GDP	No	No	No	No	Yes

Notes: Regressions are at the country level. AI imports during high unrest is the standardized number of smart city AI imports from China when unrest is over one standard deviation above the mean. Outcomes are the change in an inverse covariance weighted index of electoral outcomes from NELDA between the period before AI exports begin (2005-2007) and the last years for which NELDA data are available (2018-2020), where positive changes reflect improving institutional quality. The specific variables that enter the index are described in footnote S.1. Total AI is the total number of AI exports from China. A Polity score of 7 is used as the cutoff for a 'full democracy' by the Polity IV project (Marshall et al., 2016), which we use to distinguish mature and weak democracies. Standard errors are robust.

Supplemental Appendix for:
Exporting the Surveillance State via Trade in AI

This appendix contains supplemental figures and tables for the article "Exporting the Surveillance State via Trade in AI."
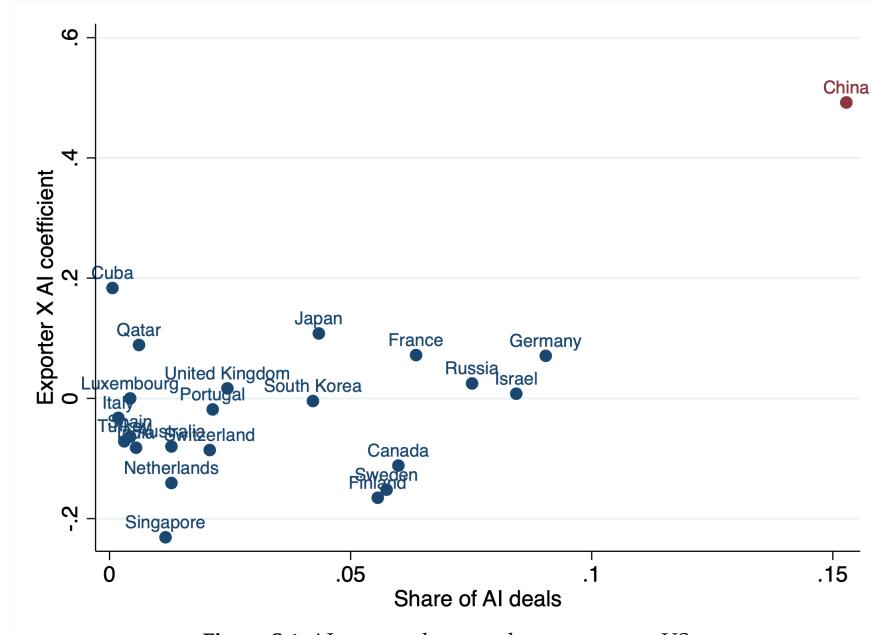
Figure S.1. AI export advantage by country—no US

Note: The figure plots coefficients from the specification in Table S.8, column 1 on the y-axis (Origin China X AI) and the share of AI exports on the x-axis for each AI exporting country.
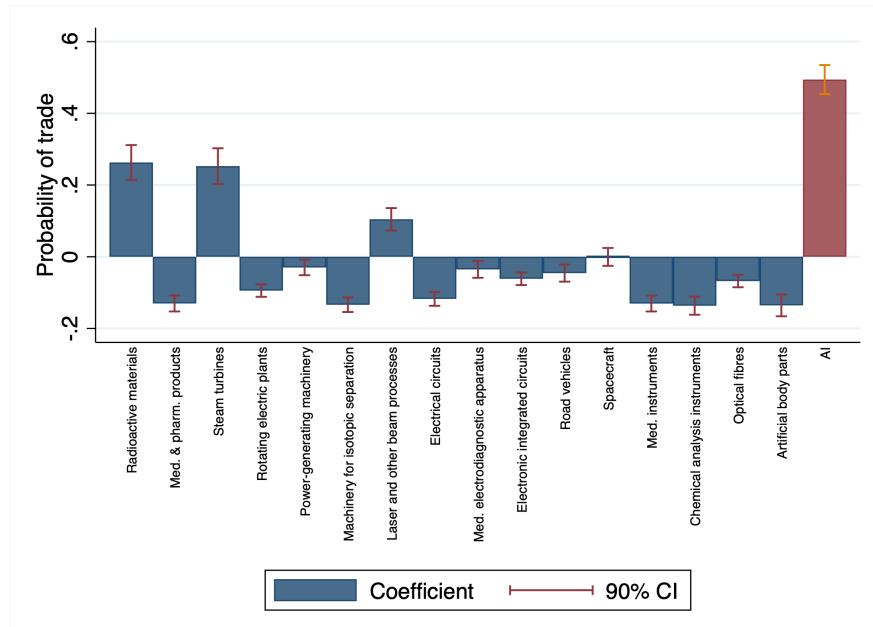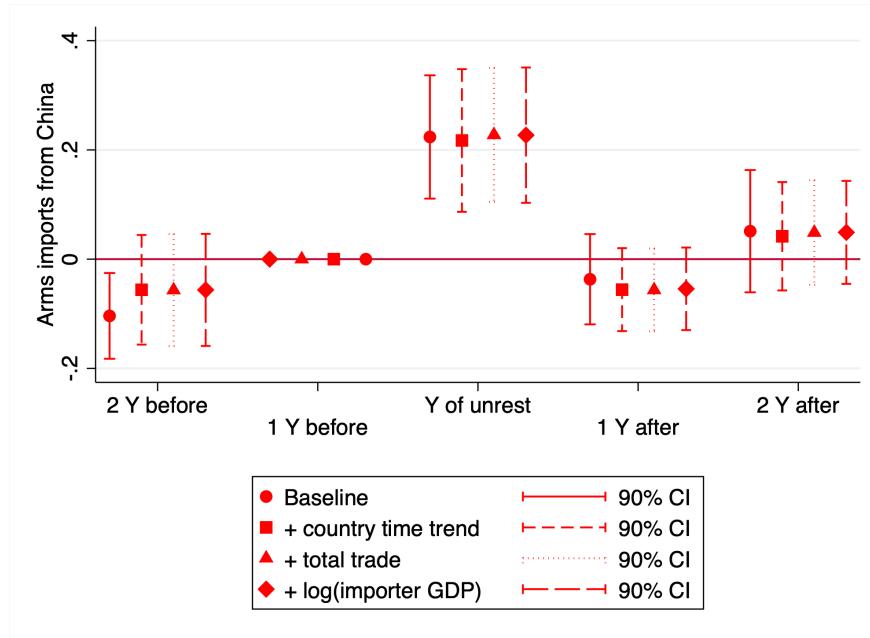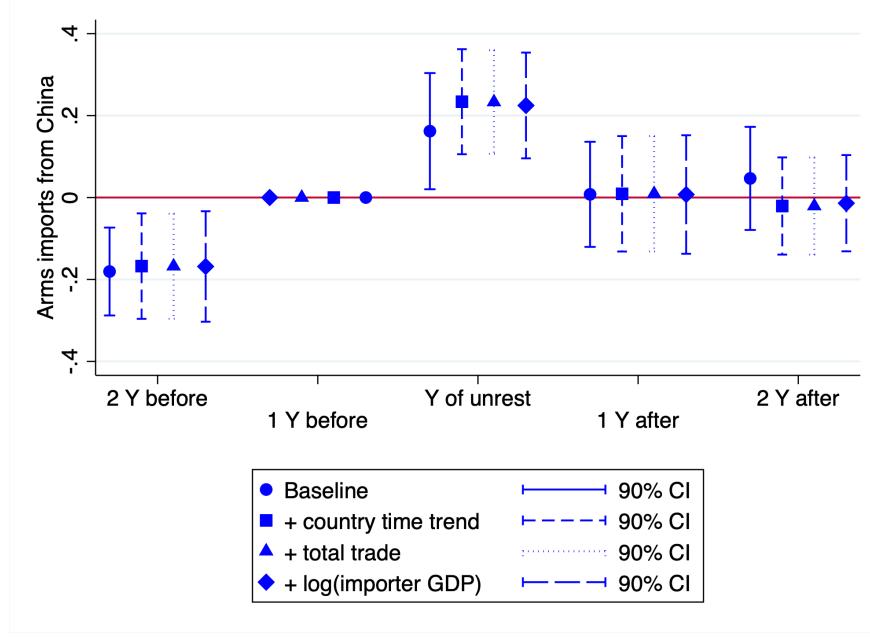
Figure S.2. China vs. rest of world, frontier technology exports—no US

Note: The figure follows the specification in Table S.8 and presents the coefficient and 90% confidence interval for the interaction term (Origin China X frontier technology) for each of the different frontier technologies.
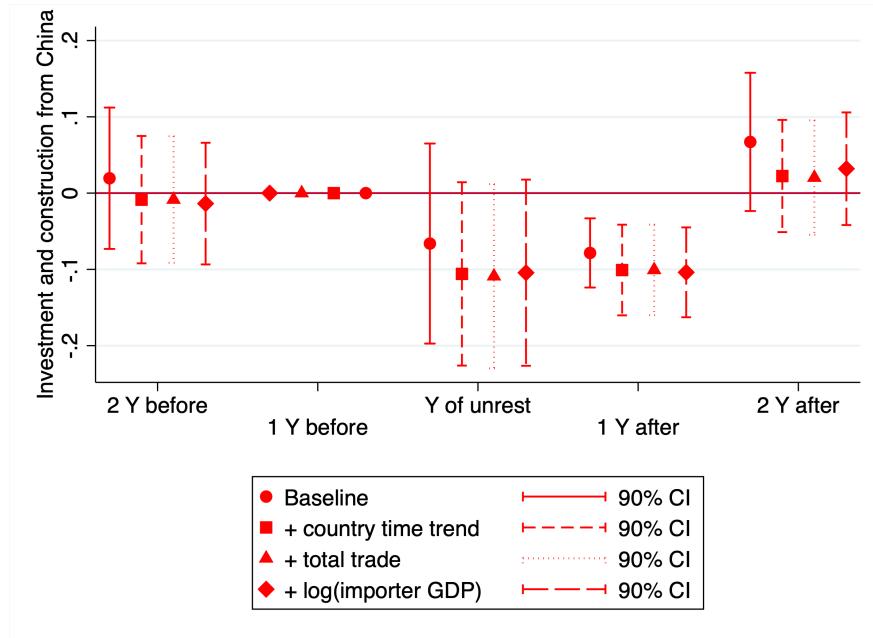
Panel A: autocracies and weak democracies
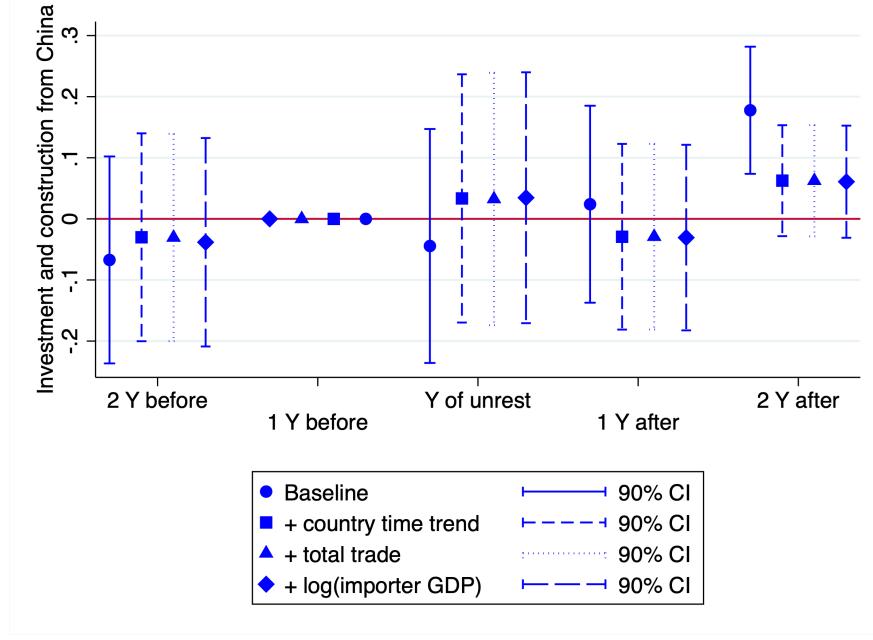
Panel B: mature democracies

Figure S.3. Local unrest on Chinese arms

Note: This figure follows the specification in Tables 6 (Panel A) and A.11 (Panel B), Columns 1-4, using Chinese arms imports of AI imports as the outcome, and presents the coefficients and 90% confidence intervals for trade in AI to weak democracies and autocracies (in red) and strong democracies (in blue).

Panel A: autocracies and weak democracies

Panel B: mature democracies

Figure S.4. Local unrest on Chinese investment and construction

Note: This figure follows the specification in Tables 6 (Panel A) and A.11 (Panel B), Columns 1-4, using Chinese investment and construction instead of AI imports as the outcome, and presents the coefficients and 90% confidence intervals for trade in AI to weak democracies and autocracies (in red) and strong democracies (in blue).

Table S.1—NELDA variables used to construct institutional quality measures

NELDA #	Question text	In overall index	Sub-index
(1)	(2)	(3)	(4)
1*	Were regular elections suspended before this election?	Yes	1. Fair elections
3	Was opposition allowed?	Yes	1. Fair elections
4	Was more than one party legal?	Yes	1. Fair elections
5	Was there a choice of candidates on the ballot?	Yes	1. Fair elections
6*	If regular, were these elections early or late relative to the date they were supposed to be held per established procedure?	Yes	1. Fair elections
7	Before elections, were there clear indications that the incumbent had made a prior decision to give up power?	Yes	1. Fair elections
9*	Had the incumbent extended his or her term in office or eligibility to run in elections at any point in the past?	Yes	1. Fair elections
11*	Before elections, are there significant concerns that elections will not be free and fair?	Yes	1. Fair elections
13*	Were opposition leaders prevented from running?	Yes	1. Fair elections
14*	Did some opposition leaders boycott the election?	Yes	1. Fair elections
15*	Is there evidence that the government harassed the opposition?	Yes	1. Fair elections
16*	In the run-up to the election, were there allegations of media bias in favor of the incumbent?	Yes	2. Media bias
28*	Is there evidence that reports critical of the governments handling of the election reached large numbers of people?	Yes	2. Media bias
29*	Were there riots and protests after the election?	Yes	3. Peaceful elections
30*	If yes (NELDA-29): did they involve allegations of vote fraud?	Yes	3. Peaceful elections
31*	If yes (NELDA-29): did the government use violence against demonstrators?	Yes	3. Peaceful elections
32*	Were results that did not favor the incumbent canceled?	Yes	1. Fair elections
33*	Was there significant violence involving civilian deaths immediately before, during, or after the election?	Yes	3. Peaceful elections
34*	Were results that were favorable to the incumbent canceled?	Yes	1. Fair elections
35*	If yes (NELDA-34): was this in part a result of wide-spread protests?	Yes	3. Peaceful elections
36*	If yes (NELDA-34): was this in part a result of outside pressure?	Yes	3. Peaceful elections
45	Were international monitors present?	Yes	4. Election monitors
46	If yes (NELDA-45), were Western monitors present?	Yes	4. Election monitors
47*	If yes (NELDA-46), were there allegations by Western monitors of significant vote-fraud?	Yes	4. Election monitors
48*	Were some monitors denied the opportunity to be present by the government holding elections?	Yes	4. Election monitors
49*	Did any monitors refuse to go to an election because they believed that it would not be free and fair?	Yes	4. Election monitors
57*	Is aid cut-off, or threatened to be cut-off, by an outside actor at any point before or after the election?	Yes	4. Election monitors

Notes: This table presents which National Elections Across Democracy and Autocracy Dataset 6.0 (NELDA) questions are included in the measure of institutional quality. Variables are indicators for the answer being "Yes", except for questions marked with a ∗, which are coded as indicators for an answer "No" (because they reflect worse institutional quality). We exclude some questions as they are not directly relevant to institutional quality. For instance, NELDA-17, 'Is economic growth in the country said to be good?', NELDA-21 'Did the incumbent run?', or NELDA-50, 'Is country said to be in good relations with the US before the elections?'

Table S.2—China vs. rest of world, AI vs. frontier technologies — Carnegie sample

	Engage in trade			
	(1)	(2)	(3)	(4)
Origin China	-0.026	-0.026	-0.012	-0.026
	(0.024)	(0.024)	(0.025)	(0.024)
AI	-0.354	-0.355	-0.353	-0.352
	(0.010)	(0.010)	(0.010)	(0.010)
Origin China X AI	0.444	0.443	0.427	0.444
	(0.033)	(0.033)	(0.033)	(0.033)
N	402300	402300	402300	402300
Log importer/exporter GDP	Yes	Yes	Yes	Yes
Log distance	Yes	Yes	Yes	Yes
Border/trade characteristics	No	Yes	No	No
Institutional characteristics	No	No	Yes	No
Geographical characteristics	No	No	No	Yes

Notes: Regressions are at the product-import-export country dyad level. Outcome is dummy for trade. Omitted: not China X not AI. This table only uses trade deals identified in Feldstein (2019). All columns control for importer/exporter GDP and log distance. Column (2) adds controls for common border, free trade agreements, and shared colonial background. Column (3) adds controls for common language, legal system, and religion. Column (4) adds controls for landlocked and island characteristics. Standard errors are clustered by origin country.

Table S.3—Leading exporters trade in AI by importers Polity score — Carnegie sample

	China exports				*US exports*			
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Autocracy and weak democracy	-0.004	-0.003	-0.002	-0.001	-0.003	-0.002	0.002	-0.003
	(0.003)	(0.003)	(0.005)	(0.003)	(0.005)	(0.005)	(0.006)	(0.005)
AI	-0.352	-0.371	0.096	-0.351	-0.229	-0.227	-0.221	-0.218
	(0.083)	(0.094)	(0.750)	(0.082)	(0.087)	(0.086)	(0.092)	(0.087)
Autocracy and weak democracy X AI	0.166	0.186	0.118	0.153	-0.198	-0.211	-0.213	-0.188
	(0.099)	(0.106)	(0.109)	(0.103)	(0.105)	(0.108)	(0.110)	(0.109)
N	2261	2261	2261	2261	2261	2261	2261	2261
Log importer GDP	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Log distance	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Border/trade characteristics	No	Yes	No	No	No	Yes	No	No
Institutional characteristics	No	No	Yes	No	No	No	Yes	No
Geographical characteristics	No	No	No	Yes	No	No	No	Yes

Notes: Regression at the product-import country level. Outcome is dummy for trade. Omitted: destination democracy with Polity score over 7 X not AI. This table only uses trade deals identified in Feldstein (2019). All columns control for importer GDP and log distance. Columns (2) and (6) add controls for common border and shared colonial background. Columns (3) and (7) add controls for legal system and religion. Columns (4) and (8) add controls for landlocked and island characteristics. Standard errors are clustered by export country.

Table S.4—Local unrest on AI and frontier trade to autocracies and weak democracies — Carnegie sample

	AI import deals (all)				AI import deals (smart city)			
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
AI 2 years before unrest	-0.026	-0.022	-0.022	-0.022	-0.008	-0.007	-0.007	-0.006
	(0.021)	(0.022)	(0.021)	(0.022)	(0.018)	(0.020)	(0.020)	(0.020)
AI same year as unrest	0.074	0.093	0.094	0.095	0.041	0.051	0.053	0.054
	(0.040)	(0.047)	(0.047)	(0.048)	(0.023)	(0.026)	(0.027)	(0.027)
AI 1 year after unrest	-0.023	-0.015	-0.015	-0.015	-0.014	-0.009	-0.009	-0.009
	(0.013)	(0.013)	(0.013)	(0.013)	(0.010)	(0.011)	(0.011)	(0.011)
AI 2 years after unrest	0.006	0.020	0.020	0.021	0.001	0.007	0.008	0.008
	(0.013)	(0.016)	(0.015)	(0.016)	(0.008)	(0.010)	(0.010)	(0.010)
N	1226	1200	1226	1200	1226	1226	1226	1200
Country time trend	No	Yes	Yes	Yes	No	Yes	Yes	Yes
Total trade	No	No	Yes	Yes	No	No	Yes	Yes
Log importer GDP	No	No	No	Yes	No	No	No	Yes

Notes: Regressions are at the country-year level, stacked so that the independent variable (unrest) vary within an observation. Unrest is standardized. Trade deals are only the exports from China identified in Feldstein (2019). A Polity score of 7 is used as the cutoff for a 'full democracy' by the Polity IV project (Marshall et al., 2016), which we use to distinguish mature and weak democracies. Residualized number of trade deals relative to year = 0 and controlling for AI 2 years before unrest X year. All columns have fixed effects for import country and year. Standard errors are clustered at the import country level.

Table S.5—China vs. rest of world, AI vs. frontier technologies (standardized outcome)

	Standardized trade			
	(1)	(2)	(3)	(4)
Origin China	0.384	0.383	0.411	0.383
	(0.078)	(0.077)	(0.080)	(0.076)
AI	-0.671	-0.673	-0.669	-0.663
	(0.027)	(0.026)	(0.027)	(0.026)
Origin China X AI	1.103	1.104	1.077	1.103
	(0.079)	(0.078)	(0.081)	(0.079)
N	402300	402300	402300	402300
Log importer/exporter GDP	Yes	Yes	Yes	Yes
Log distance	Yes	Yes	Yes	Yes
Border/trade characteristics	No	Yes	No	No
Institutional characteristics	No	No	Yes	No
Geographical characteristics	No	No	No	Yes

Notes: Regressions are at the product-import-export country dyad level. Outcome is the log(trade+1), standardized. Omitted: not China X not AI. All columns control for importer/exporter GDP and log distance. Column (2) adds controls for common border, free trade agreements, and shared colonial background. Column (3) adds controls for common language, legal system, and religion. Column (4) adds controls for landlocked and island characteristics. Standard errors are clustered by origin country.

Table S.6—Leading exporters trade in AI by importers Polity score (standardized outcome)

	China exports				US exports			
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Autocracy and weak democracy	0.028	0.042	0.049	0.030	-0.098	-0.102	-0.078	-0.105
	(0.025)	(0.024)	(0.031)	(0.025)	(0.044)	(0.048)	(0.037)	(0.059)
AI	-1.696	-1.732	0.338	-1.701	-2.391	-2.390	-2.395	-2.407
	(0.326)	(0.340)	(2.721)	(0.325)	(0.191)	(0.191)	(0.193)	(0.185)
Autocracy and weak democracy X AI	0.805	0.963	0.732	0.801	0.148	0.143	0.171	0.094
	(0.343)	(0.338)	(0.398)	(0.358)	(0.237)	(0.240)	(0.242)	(0.246)
N	2394	2394	2394	2394	2394	2394	2394	2394
Log importer GDP	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Log distance	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Border/trade characteristics	No	Yes	No	No	No	Yes	No	No
Institutional characteristics	No	No	Yes	No	No	No	Yes	No
Geographical characteristics	No	No	No	Yes	No	No	No	Yes

Notes: Regression at the product-import country level. Outcome is the log(trade+1), standardized. Omitted: destination democracy with Polity score over 7 X not AI. All columns control for importer GDP and log distance. Columns (2) and (6) add controls for common border and shared colonial background. Columns (3) and (7) add controls for legal system and religion. Columns (4) and (8) add controls for landlocked and island characteristics. Standard errors are clustered by export country.

Table S.7—Local unrest on AI and frontier trade to autocracies and weak democracies (standardized outcome)

	AI import deals (all)				AI import deals (smart city)			
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
AI 2 years before unrest	-0.101	-0.081	-0.017	-0.017	-0.044	-0.028	0.042	0.043
	(0.081)	(0.085)	(0.063)	(0.063)	(0.106)	(0.118)	(0.112)	(0.112)
AI same year as unrest	0.290	0.368	0.224	0.231	0.233	0.310	0.208	0.187
	(0.158)	(0.183)	(0.086)	(0.088)	(0.135)	(0.154)	(0.080)	(0.077)
AI 1 year after unrest	-0.092	-0.059	-0.059	-0.058	-0.088	-0.060	-0.058	-0.062
	(0.050)	(0.051)	(0.055)	(0.055)	(0.059)	(0.063)	(0.072)	(0.075)
AI 2 years after unrest	0.026	0.083	0.039	0.042	0.008	0.050	0.031	0.019
	(0.050)	(0.059)	(0.036)	(0.043)	(0.050)	(0.058)	(0.052)	(0.059)
N	1226	1226	876	872	1226	1226	876	872
Country time trend	No	Yes	Yes	Yes	No	Yes	Yes	Yes
Total trade	No	No	Yes	Yes	No	No	Yes	Yes
Log importer GDP	No	No	No	Yes	No	No	No	Yes

Notes: Regressions are at the country-year level, stacked so that the independent variable (unrest) vary within an observation. Unrest is standardized. Trade deals are exports from China. A Polity score of 7 is used as the cutoff for a 'full democracy' by the Polity IV project (Marshall et al., 2016), which we use to distinguish mature and weak democracies. Residualized number of trade deals relative to year = 0 and controlling for AI 1 year before unrest X year. All columns have fixed effects for import country and year. Standard errors are clustered at the import country level.

Table S.8—China vs. rest of world, AI vs. frontier technologies—no US

	Engage in trade			
	(1)	(2)	(3)	(4)
Origin China	-0.032	-0.031	-0.018	-0.032
	(0.025)	(0.025)	(0.025)	(0.025)
AI	-0.353***	-0.354***	-0.352***	-0.352***
	(0.010)	(0.010)	(0.010)	(0.010)
Origin China X AI	0.494***	0.495***	0.480***	0.494***
	(0.025)	(0.025)	(0.025)	(0.025)
N	399618	399618	399618	399618
Log importer/exporter GDP	Yes	Yes	Yes	Yes
Log distance	Yes	Yes	Yes	Yes
Border/trade characteristics	No	Yes	No	No
Institutional characteristics	No	No	Yes	No
Geographical characteristics	No	No	No	Yes

Notes: Regressions are at the product-import-export country dyad level, dropping all US exports. Outcome is dummy for trade. Omitted: not China X not AI. All columns control for importer/exporter GDP and log distance. Column (2) adds controls for common border, free trade agreements, and shared colonial background. Column (3) adds controls for common language, legal system, and religion. Column (4) adds controls for landlocked and island characteristics. Standard errors are clustered by origin country.

Table S.9—Autocracies and weak democracies vs. strong democracies as importers, AI vs. frontier technology—no US

	Engage in trade			
	(1)	(2)	(3)	(4)
Dest. autocracy/weak democracy	-0.039***	-0.036***	-0.037***	-0.026***
	(0.006)	(0.005)	(0.005)	(0.006)
AI	-0.373***	-0.372***	-0.370***	-0.366***
	(0.010)	(0.009)	(0.009)	(0.010)
Dest. autocracy/weak democracy X AI	0.033***	0.032***	0.031***	0.024***
	(0.007)	(0.006)	(0.006)	(0.007)
N	399618	399618	399618	399618
Importer/exporter GDP	Yes	Yes	Yes	Yes
Log distance	Yes	Yes	Yes	Yes
Border/trade characteristics	No	Yes	No	No
Institutional characteristics	No	No	Yes	No
Geographical characteristics	No	No	No	Yes

Notes: Regressions are at the product-import-export country dyad level, dropping all US exports. Outcome is dummy for trade. Omitted: mature democracy X not AI. All columns control for importer/exporter GDP and log distance. Column (2) adds controls for common border, free trade agreements, and shared colonial background. Column (3) adds controls for common language, legal system, and religion. Column (4) adds controls for landlocked and island characteristics. Standard errors are clustered by origin country.

Table S.10—China vs. rest of world, AI vs. frontier technologies—autocracy and weak democracy importers, no US

	Engage in trade			
	(1)	(2)	(3)	(4)
Origin China	-0.016	-0.022	-0.012	-0.017
	(0.028)	(0.029)	(0.028)	(0.028)
AI	-0.348***	-0.348***	-0.347***	-0.346***
	(0.011)	(0.010)	(0.010)	(0.010)
Origin China X AI	0.537***	0.545***	0.532***	0.538***
	(0.028)	(0.028)	(0.028)	(0.028)
N	234432	234432	234432	234432
Log importer/exporter GDP	Yes	Yes	Yes	Yes
Log distance	Yes	Yes	Yes	Yes
Border/trade characteristics	No	Yes	No	No
Institutional characteristics	No	No	Yes	No
Geographical characteristics	No	No	No	Yes

Notes: Regressions are at the product-import-export country dyad level, dropping all US exports. Outcome is dummy for trade. Omitted: not China X not AI. All columns control for importer/exporter GDP and log distance. Column (2) adds controls for common border, free trade agreements, and shared colonial background. Column (3) adds controls for common language, legal system, and religion. Column (4) adds controls for landlocked and island characteristics. Standard errors are clustered by origin country.

Table S.11—Local unrest and AI imports on electoral outcomes—sub-indices

	Political institutional quality				
	(1)	(2)	(3)	(4)	(5)

Panel A.1: index for fair elections, imports by autocracies and weak democracies

AI imports during high unrest	0.091	-0.241	-0.241	-0.323	0.105
	(0.340)	(0.289)	(0.285)	(0.262)	(0.297)
N	46	46	46	46	46

Panel A.2: index for fair elections, imports by mature democracies

AI imports during high unrest	0.024	-0.243	0.023	0.211	0.480
	(0.028)	(0.096)	(0.197)	(0.190)	(0.208)
N	45	45	45	45	45

Panel B.1: index for no media bias, imports by autocracies and weak democracies

AI imports during high unrest	-0.357	-0.389	-0.395	-0.373	-0.340
	(0.213)	(0.210)	(0.237)	(0.241)	(0.247)
N	46	46	46	46	46

Panel B.2: index for no media bias, imports by mature democracies

AI imports during high unrest	-0.053	-0.006	-0.388	-0.470	-0.464
	(0.041)	(0.097)	(0.277)	(0.242)	(0.300)
N	45	45	45	45	45

Panel C.1: index for peaceful elections, imports by autocracies and weak democracies

AI imports during high unrest	-0.774	-0.662	-0.662	-0.671	-0.806
	(0.197)	(0.215)	(0.216)	(0.209)	(0.226)
N	46	46	46	46	46

Panel C.2: index for peaceful elections, imports by mature democracies

AI imports during high unrest	-0.014	-0.109	-0.482	-0.431	-0.315
	(0.013)	(0.053)	(0.180)	(0.160)	(0.123)
N	45	45	45	45	45

Panel D.1: index for election montiors, imports by autocracies and weak democracies

AI imports during high unrest	-0.473	-0.372	-0.370	-0.350	-0.425
	(0.107)	(0.142)	(0.148)	(0.143)	(0.116)
N	46	46	46	46	46

Panel D.2: index for election montiors, imports by mature democracies

AI imports during high unrest	0.121	0.112	-0.020	0.144	0.216
	(0.022)	(0.104)	(0.259)	(0.221)	(0.222)
N	45	45	45	45	45

Total AI	No	Yes	Yes	Yes	Yes
Total unrest	No	No	Yes	Yes	Yes
Total trade	No	No	No	Yes	Yes
Log importer GDP	No	No	No	No	Yes

Notes: Regressions are at the country level. AI imports during high unrest is the standardized number of AI imports from China when unrest is over one standard deviation above the mean. Outcomes are the change in an inverse covariance weighted index of electoral outcomes from NELDA between the period before AI exports begin (2005-2007) and the last years for which NELDA data are available (2018-2020), where positive changes reflect improving institutional quality. The specific variables that enter the index are described in footnote S.1. Total AI is the total number of AI exports from China. A Polity score of 7 is used as the cutoff for a 'full democracy' by the Polity IV project (Marshall et al., 2016), which we use to distinguish mature and weak democracies. Standard errors are robust.

Table S.12—Local unrest and AI imports on electoral outcomes, Chinese AI in autocracies and weak democracies

	Political institutional quality					
	AI import deals (all)			AI import deals (smart city)		
	(1)	(2)	(3)	(4)	(5)	(6)
Panel A: overall index						
AI imports	0.028	0.028	0.027	0.029	0.029	0.028
	(0.019)	(0.019)	(0.019)	(0.019)	(0.019)	(0.019)
Unrest	0.009	0.069	0.089	0.007	0.067	0.087
	(0.152)	(0.172)	(0.172)	(0.152)	(0.172)	(0.173)
AI X unrest	-0.106	-0.114	-0.115	-0.121	-0.120	-0.121
	(0.032)	(0.031)	(0.032)	(0.032)	(0.030)	(0.030)
N	1052	1032	1032	1052	1032	1032
Panel B: index for fair elections						
AI imports	0.021	0.021	0.021	0.023	0.023	0.022
	(0.020)	(0.020)	(0.020)	(0.020)	(0.020)	(0.020)
Unrest	0.019	0.074	0.090	0.015	0.070	0.087
	(0.114)	(0.139)	(0.140)	(0.114)	(0.139)	(0.140)
AI X unrest	-0.107	-0.116	-0.117	-0.143	-0.141	-0.142
	(0.031)	(0.027)	(0.027)	(0.028)	(0.026)	(0.027)
N	1052	1032	1032	1052	1032	1032
Panel C: index for no media bias						
AI imports	0.012	0.012	0.010	0.013	0.013	0.011
	(0.026)	(0.026)	(0.026)	(0.026)	(0.026)	(0.026)
Unrest	0.182	0.170	0.227	0.178	0.165	0.222
	(0.188)	(0.194)	(0.175)	(0.188)	(0.194)	(0.175)
AI X unrest	-0.068	-0.066	-0.070	-0.112	-0.113	-0.116
	(0.046)	(0.047)	(0.049)	(0.046)	(0.048)	(0.051)
N	1052	1032	1032	1052	1032	1032
Panel D: index for peaceful elections						
AI imports	0.027	0.026	0.026	0.028	0.027	0.027
	(0.024)	(0.025)	(0.025)	(0.024)	(0.025)	(0.025)
Unrest	-0.166	-0.177	-0.188	-0.166	-0.178	-0.190
	(0.176)	(0.209)	(0.205)	(0.175)	(0.209)	(0.205)
AI X unrest	-0.128	-0.129	-0.128	-0.128	-0.130	-0.129
	(0.039)	(0.039)	(0.039)	(0.067)	(0.068)	(0.068)
N	1052	1032	1032	1052	1032	1032
Panel E: index for election monitors						
AI imports	0.006	0.007	0.004	0.006	0.007	0.005
	(0.021)	(0.021)	(0.020)	(0.021)	(0.021)	(0.020)
Unrest	0.053	0.074	0.145	0.050	0.071	0.142
	(0.267)	(0.286)	(0.267)	(0.268)	(0.287)	(0.268)
AI X unrest	-0.013	-0.014	-0.018	-0.046	-0.045	-0.049
	(0.038)	(0.038)	(0.037)	(0.050)	(0.050)	(0.047)
N	1052	1032	1032	1052	1032	1032
Country time trend	Yes	Yes	Yes	Yes	Yes	Yes
Total trade	Yes	Yes	Yes	Yes	Yes	Yes
Log importer GDP	No	Yes	Yes	No	Yes	Yes
Gov. revenue	No	No	Yes	No	No	Yes

Notes: Regressions are at the country-year level. Unrest and AI imports are standardized. Outcomes are an inverse covariance weighted index of electoral outcomes from NELDA (positive is better) averaged over the 3 years following the unrest/AI imports. The specific variables that enter the index are described in footnote S.1. A Polity score of 7 is used as the cutoff for a 'full democracy' by the Polity IV project (Marshall et al., 2016), which we use to distinguish mature and weak democracies. Index is inverse covariance weighted. All columns have fixed effects for import country and year. Standard errors are clustered at the import country level.

Table S.13—Descriptions and coefficients for WDS and CNTS variables

Variable description (1)	Coefficient (2)
Book Production by Titles Per Capita .000001	-0.363
Book Production by Titles	-0.353
Machinery and transport equipment (% of value added in manufacturing)	-0.340
Cement Production (metric tons) Per Capita .0001	-0.274
Registered Voters/Population .001	-0.257
Foreign direct investment, net (BoP, USD)	-0.245
National Income Per Capitaş	-0.242
Technicians in R&D (per million people)	-0.223
Televisions Per Capita .00001	-0.217
Percent Work Force in Other Activity .1	-0.211
Telephones, excluding Cellular Per Capita .00001	-0.210
Commercial Vehicles Per Capita .00001	-0.205
Medium and high-tech exports (% manufactured exports)	-0.196
All Highway Vehicles Per Capita .00001	-0.195
Gross Domestic Product Per Capita (Factor Cost)ş	-0.190
Televisions 10	-0.189
Electric Power Production, Metric Tons Coal Equiv. Per C.	-0.188
Passenger Cars Per Capita .00001	-0.188
Physicians Per Capita .000001	-0.176
Gross National Product Per Capita (Market Prices)ş	-0.168
Energy Consumption in Kilograms Coal Equivalent Per Capita	-0.167
Percent Literate .1	-0.161
Radios Per Capita .0001	-0.160
Services, value added (% of GDP)	-0.157
All Telephones, including Cellular, Per Capita .00001	-0.155
Changes in Effective Executive	-0.154
Number of Legislative Elections	-0.145
Percent Work in Industry .1	-0.134
Imports Per Capitaş .01	-0.133
Estimated Personal Computers Per Capita .0001	-0.132
National Defense Expenditure Per Capitaş .01	-0.131
Effective Executive (Type)	-0.131
Internet Hosts Per Capita .000001	-0.128
Internet Users Per Capita .000001	-0.125
Daily Newspaper Circulation Per Capita .0001	-0.125
Current education expenditure, total (% of total expenditure in public institutions)	-0.124
Degree of Parliamentary Responsibility	-0.121
Legislative Effectiveness	-0.120
High-technology exports (% of manufactured exports)	-0.120
University Enrollment 1000	-0.118
University Enrollment Per Capita .0001	-0.114
Taxes on goods and services (% value added of industry and services)	-0.111
Votes Cast, Lower House of Legislature/Population .001	-0.106
Domestic z-score	-0.106
Effectiveness of Legislature	-0.105
Nat'l Gov't Revenueş 1000	-0.101
Nat'l Gov't Expenditure Per Capitaş .01	-0.100
Nat'l Gov't Revenue & Expenditure Per Capitaş .01	-0.100
Telephones, excluding Cellular 100	-0.097
Seven-Year Total, Item 125	-0.097
Human capital index (HCI) (scale 0-1)	-0.097
Nat'l Gov't Revenue Per Capitaş .01	-0.096
Foreign direct investment, net outflows (% of GDP)	-0.090

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Mobile Cellular Telephones Per Capita .00001	-0.088
Seven-Year Average, Item 124	-0.084
Labor force with advanced education (% of total working-age population with advanced education)	-0.084
Educational attainment, at least Bachelor's or equivalent, population 25+, total (%) (cumulative)	-0.084
Unemployment, total (% of total labor force) (national estimate)	-0.079
Size of Legislature/Number of Seats, Largest Party .01	-0.077
All School Enrollment Per Capita .0001	-0.073
Manufacturing, value added (% of GDP)	-0.066
All Highway Vehicles 1000	-0.064
Energy Production in Kilograms Coal Equivalent Per Capita	-0.064
General Strikes	-0.064
Military expenditure (% of GDP)	-0.059
Trade in services (% of GDP)	-0.058
Foreign direct investment, net outflows (BoP, USD)	-0.057
Composite Index, Items 120-123	-0.056
All Letter-Post Mail Per Capita .001	-0.051
Government Crises	-0.048
Number of Coups d'Etat	-0.048
Party Fractionalization Index .0001	-0.047
Proportion of World Trade .00001	-0.045
Population Density .1	-0.044
Nat'l Gov't Expenditureş 1000	-0.044
Nat'l Gov't Revenue & Expenditureş 1000	-0.044
Secondary School Enrollment Per Capita .0001	-0.040
Exports Per Capitaş .01	-0.039
Military z-score	-0.034
Medium and high-tech manufacturing value added (% manufacturing value added)	-0.032
Party Legitimacy	-0.026
Agriculture, forestry, and fishing, value added (USD)	-0.014
Passenger Cars 1000	-0.009
Trade (% of GDP)	-0.008
Industry (including construction), value added (USD)	-0.004
Food, beverages and tobacco (% of value added in manufacturing)	-0.001
Number of Major Cabinet Changes	-0.000
Legislative Selection	0.000
Population, Cities of 100,000 & Over Per Capita .001	0.000
Estimated Personal Computers 1000	0.004
Chemicals (% of value added in manufacturing)	0.010
Commercial Vehicles 1000	0.014
Foreign direct investment, net inflows (% of GDP)	0.020
High-technology exports (USD)	0.027
Competitiveness of Nominating Process	0.028
Revolutions	0.029
Anti-Government Demonstrations	0.034
Net official flows from UN agencies, UNAIDS (USD)	0.034
Effective Executive (Selection)	0.038
Military expenditure (% of general government expenditure)	0.041
Percent GDP Originating in Industrial Activity	0.041
Head of State	0.043
International z-score	0.044
Premier	0.045
Percent Voter Turnout, Legislature .1	0.045
Industry (including construction), value added (% of GDP)	0.046
Type of Regime	0.049
Armed forces personnel (% of total labor force)	0.058
Number of Major Constitutional Changes	0.071
National Defense Expenditureş 10000	0.071
Assassinations	0.073
Terrorism/Guerrilla Warfare	0.075

Primary + Secondary School Enrollment Per Capita .0001	0.077
Foreign direct investment, net inflows (BoP, USD)	0.077
Internet Hosts	0.078
Inhabitants Per Physician 10	0.079
Electric Power Production, Metric Tons Coal Equiv. 1000	0.080
Importsş 10000	0.081
Energy Consumption, Metric Tons Coal Equivalent 1000	0.083
Taxes on international trade (% of revenue)	0.087
Nat'l Defense Expenditure/Nat'l Gov't Expenditure .001	0.089
Net official development assistance and official aid received (USD)	0.090
Political z-score	0.091
Mineral rents (% of GDP)	0.095
Official/Princial Exchange Rate, Local Currency/ .01	0.096
Military expenditure (current USD)	0.098
Per Capita GDP Originating in Industrial Activityş	0.100
Manufacturing, value added (USD)	0.102
Exportsş 10000	0.103
Internet Users 100	0.114
Air transport, passengers carried	0.116
Weighted Conflict Index	0.117
Unemployment with advanced education (% of total labor force with advanced education)	0.125
Cement Production (metric tons) 1000	0.131
Scientific and technical journal articles	0.131
Purges	0.144
Area in Square Kilometers	0.148
Area in Square Miles	0.148
Primary/Primary + Secondary School Enrollment .01	0.153
Size of Cabinet	0.157
Radios 1000	0.159
Size of Legislature (Lower House)	0.161
Party Coalitions	0.162
Agriculture, forestry, and fishing, value added (% of GDP)	0.168
Armed forces personnel, total	0.169
All Letter-Post Mail 1000	0.172
Primary + Secondary School Enrollment 1000	0.173
Number of Seats, Largest Party in Legislature	0.182
Primary School Enrollment Per Capita .0001	0.185
Textiles and clothing (% of value added in manufacturing)	0.190
Primary School Enrollment 1000	0.193
Services, value added (USD)	0.195
Technical cooperation grants (BoP, USD)	0.196
All Telephones, including Cellular 100	0.196
Mobile Cellular Telephones 100	0.201
All School Enrollment 1000	0.201
Arms imports (SIPRI trend indicator values)	0.202
Present value of external debt (USD)	0.204
Secondary School Enrollment 1000	0.206
Percent Work Force in Agriculture .1	0.208
Riots	0.214
Registered Voters 1000	0.214
Population 1000	0.215
Population, Cities of 100,000 & Over 1000	0.221
Votes Cast, Lower House of Legislature 1000	0.226
Labor force, total	0.237
Energy Production, Metric Tons Coal Equivalent 1000	0.290