## Exporting Autocracy via Trade in Al

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Prior work has shown that the Chinese regime's demand of facial recognition AI for the purpose of political repression has contributed to frontier innovation in this technology (Beraja et al. 2022a, 2022b).<sup>1</sup> To the extent that such autocracy-enhancing technology can be exported, what are the international ramifications of China's emergent leadership in AI?

We formulate two hypotheses. First, on China's comparative advantage: we hypothesize that the government's demand for facial recognition AI could enhance Chinese firms' global competitiveness in AI technology. Second, on the political bias of China's exports: we hypothesize that due to the effectiveness of AI technology in suppressing political unrest, China's exports of AI technology may be biased toward autocracies and weak democracies that share similar political motivation.

To test these hypotheses, we collect global data on AI trade, compiled from AI companies' announcements of overseas AI deals, either with state or non-state actors. 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.

We estimate cross-country regressions examining: (1) whether China is more likely to export its facial recognition AI technology relative to other countries, and relative to other frontier technologies; and (2), whether China's AI technology is imported more by autocracies and weak democracies. Differencing out trade in other frontier technologies allows us to account for other unobserved factors associated with whether country-pairs could trade more in frontier technologies generally. Finally, (3), we explore the timing of such AI imports and examine whether they increase following domestic political unrest.

We find three primary results. First, China indeed exports substantially more AI technologies than other countries, and particularly so as compared to other frontier technologies (see Table 1). Second, China's AI technology is imported more by autocracies and weak democracies, and this is not the case for the imports of China's other frontier technologies (see Table 2). Third, countries – in particular autocracies and weak democracies – are differentially more likely to import China's AI technology following episodes of political unrest at home (see Table 3). Importantly, there is no evidence of differential pre-trends of AI imports leading up to domestic political unrest. Again, these patterns are only observed in AI technology, but not other frontier technologies.

To the extent that Chinese facial recognition AI technologies will effectively help governments abroad to suppress political unrest, our findings suggest that China's autocratic regime may beget more autocracies via trade in AI. Therefore, it is important for policymakers to frame the potential regulation of AI trade around regulations on weapons and dual-use technologies more broadly. It is also vital to develop international standards in developing and trading AI technologies.

<sup>&</sup>lt;sup>1</sup> Beraja, Martin, David Y. Yang, Noam Yuchtman (2022a), "Data-intensive Innovation and the State: Evidence from AI Firms in China," Review of Economic Studies. Beraja, Martin, Andrew Kao, David Y. Yang, Noam Yuchtman (2022b), "AI-tocracy," working paper.

	Linear probability of trade				
	(1)	(2)	(3)	(4)	
Origin China	-0.005	-0.005	0.005	-0.005	
	(0.004)	(0.004)	(0.007)	(0.004)	
AI	$-2.948^{***}$	$-2.913^{***}$	-3.053***	-2.849***	
	(0.308)	(0.289)	(0.319)	(0.357)	
Origin China X AI	0.220***	$0.229^{***}$	0.262***	0.220***	
	(0.045)	(0.045)	(0.061)	(0.045)	
Ν	5364	5364	5364	5364	

**Table 1:** Chinese vs. US exports of Al vs. frontier technologyUS vs. China, AI vs. frontier technologies

*Notes:* Regressions are at the product-import-export country dyad level. Outcome is dummy for trade. Omitted: US X not AI. Errors clustered at origin countries. 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.

Fable 2: AI and from	ontier trade b	y importer/ex	porter polity
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	Linear probability of trade					
	(1)	(2)	(3)	(4)		
Destination authoritarian	-0.043**	-0.043**	-0.046***	-0.041**		
	(0.017)	(0.017)	(0.016)	(0.017)		
Origin authoritarian	-0.107***	-0.107***	-0.110***	-0.105***		
	(0.026)	(0.026)	(0.025)	(0.025)		
Origin China	-0.058***	-0.059***	-0.048**	-0.054**		
	(0.021)	(0.021)	(0.021)	(0.021)		
AI	$2.658^{***}$	$2.657^{***}$	$2.666^{***}$	$2.668^{***}$		
	(0.207)	(0.209)	(0.213)	(0.212)		
Destination authoritarian X AI	$0.046^{***}$	$0.046^{***}$	$0.049^{***}$	$0.044^{***}$		
	(0.017)	(0.017)	(0.016)	(0.017)		
Origin authoritarian X AI	$0.104^{***}$	$0.104^{***}$	$0.107^{***}$	$0.102^{***}$		
	(0.026)	(0.026)	(0.025)	(0.026)		
Origin China X AI	$0.545^{***}$	$0.547^{***}$	$0.536^{***}$	$0.542^{***}$		
	(0.030)	(0.033)	(0.031)	(0.031)		
N	320796	320796	320796	320796		

AI vs. frontier technologies by polity type

*Notes:* Regression at the product-import-export country dyad level. Outcome is dummy for trade. Omitted: origin/destination democracy X not AI. Errors two-way clustered at origin and destination countries. 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.

		Sta	undardized t	trade deals		
		Α	I		Frontier tech	
	A	All		Smart city		
	(1)	(2)	(3)	(4)	(5)	(6)
Panel A: all countries						
AI 2 years before unrest	0.288	0.437	0.584	0.850	0.015	0.004
, , , , , , , , , , , , , , , , , , ,	(0.476)	(0.639)	(0.557)	(0.720)	(0.115)	(0.115)
AI 1 year before unrest	-0.018	-0.019	-0.055	-0.056	-0.076	-0.074
Ū	(0.077)	(0.078)	(0.119)	(0.119)	(0.067)	(0.066)
AI same year as unrest	0.206***	0.204***	0.279***	0.275**	-0.075	-0.067
5	(0.064)	(0.064)	(0.106)	(0.106)	(0.097)	(0.094)
AI 1 year after unrest	-0.036	-0.037	-0.037	-0.038	-0.007	-0.006
, , , , , , , , , , , , , , , , , , ,	(0.043)	(0.043)	(0.051)	(0.051)	(0.015)	(0.016)
AI 2 years after unrest	0.013	0.014	0.022	0.021	-0.005	-0.001
·	(0.090)	(0.090)	(0.113)	(0.113)	(0.027)	(0.027)
Panel B: import countries	s that are a	utocracies (	and weak de	emcoracies	3	
	0 501	1.010	0.901	0.051	0.002	0.000
Al 2 years before unrest	-0.521	-1.010	-0.381	-0.651	-0.093	-0.099
	(0.620)	(0.886)	(0.539)	(0.784)	(0.116)	(0.114)
Al 1 year before unrest	0.018	0.019	-0.032	-0.030	-0.069	-0.069
	(0.059)	(0.060)	(0.077)	(0.079)	(0.074)	(0.073)
Al same year as unrest	0.307**	0.312**	0.199**	0.203**	-0.144	-0.140
	(0.134)	(0.135)	(0.092)	(0.092)	(0.156)	(0.154)
AI 1 year after unrest	-0.064	-0.064	-0.084	-0.083	-0.024*	-0.023*
	(0.055)	(0.056)	(0.065)	(0.066)	(0.012)	(0.012)
AI 2 years after unrest	0.094	0.096	0.076	0.075	0.037	0.039
	(0.082)	(0.085)	(0.076)	(0.078)	(0.054)	(0.056)
Panel C: import countries	s that are n	nature dem	ocracies			
AI 2 years before unrest	1.528	1.551	1.314	1.306	-0.044	-0.008
	(1.406)	(1.460)	(1.297)	(1.376)	(0.320)	(0.290)
AI 1 year before unrest	-0.049	-0.047	-0.069	-0.067	-0.033	-0.034
	(0.117)	(0.117)	(0.176)	(0.176)	(0.049)	(0.047)
AI same year as unrest	-0.097	-0.096	-0.043	-0.042	0.063	0.067
	(0.101)	(0.101)	(0.183)	(0.183)	(0.100)	(0.103)
AI 1 year after unrest	0.059	0.061	-0.005	-0.003	0.012	0.013
	(0.098)	(0.098)	(0.097)	(0.097)	(0.049)	(0.049)
AI 2 years after unrest	-0.121	-0.123	-0.112	-0 115	-0.049	-0.046
	(0.119)	(0.119)	(0.175)	(0.175)	(0.067)	(0.065)
log import GDP	No	Yes	No	Yes	No	Yes
country time trend	Yes	Yes	Yes	Yes	Yes	Yes

Table 3: Imported Chinese AI following local unrest

Notes: Regressions are at the country-year level, stacked so that the independent variable (unrest) vary within an observation. Unrest measured in millions of events. Panel B keeps import countries with polity score < 7 while Panel C keeps import countries with polity  $\geq$  7. A polity score of 7 is often used as a cutoff to distinguish strong and weak democracies (see for instance Max Roser and Bastian Herre (2013)) Residualized number of trade deals relative to year = 0. All columns have fixed effects for import country, and year. Standard errors are clustered at the import country level.