

Autocracy and AI Innovation

Martin Beraja, Andrew Kao, David Y. Yang, and Noam Yuchtman (2021). **AI-tocracy**. NBER.

This is the second of two SCCEI China Briefs on China's AI technology innovation. The **first brief** analyzed how access to government data helped boost innovation in China's AI firms. This second brief focuses on how AI innovation can be sustained when it advances the authoritarian goal of stifling unrest.

Autocratic institutions have long been considered incompatible with frontier innovation. China's emergence as a leader in AI technology, however, has challenged this orthodoxy. Research underlying this brief argues that innovation can thrive under autocracies when mutually reinforcing conditions exist -- namely, novel technology bolsters the autocrat's political power; and the autocrat's demand for such technology stimulates further innovation. As evidence for this argument, researchers point to the facial recognition AI sector in China. They show that China's application of this AI technology enhances the government's ability to exert political control, thereby spurring demand from the public security apparatus. Such government demand stimulates technology innovation, which, in turn, can further entrench the autocratic regime.

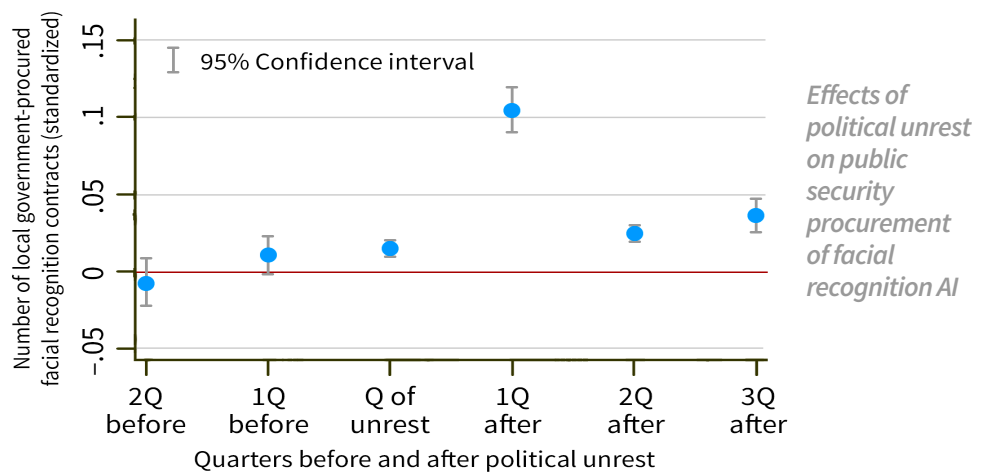
The data. Researchers first tested whether China's government procures facial recognition AI for purposes of political control and whether facial recognition AI is, indeed, effective in suppressing political unrest in China.

To do so, researchers gathered data on 9,267 episodes of local political unrest between 2014 and 2020 in China from the Global Database of Events, Language, and Tone Project. The research team also gathered comprehensive information from Tianyancha and Pitchbook databases on all active facial recognition AI firms in China, then identified 1,095 firms that had received at least one public security AI contract between 2013 and 2019 by going through China's Ministry of Finance's Government Procurement Database. Data on contracts awarded by non-public security units of the government, like public banks, hospitals, and schools, were also included for comparison.

INSIGHTS

- Autocracy and innovation can be mutually reinforcing when new technology bolsters autocratic power, and autocratic demand for technology stimulates innovation across sectors.
- In response to episodes of political unrest, public security agencies in China increased their procurement of facial recognition AI. This, in turn, suppressed unrest in their locality.
- Politically-motivated procurement of facial recognition AI stimulated both government innovation and commercial innovation.

Researchers next analyzed the extent to which commercial facial recognition AI innovations (an indicator of frontier innovation beyond government uses) were associated with politically-motivated public security procurement. To do so, they searched software registration records from China's Ministry of Industry and Information Technology and used machine learning to classify each major software innovation produced by the 1,095 AI firms according to its intended customers and uses (i.e., commercial or government market).



Local unrest leads to greater government procurement of facial recognition AI. Controlling for political and socioeconomic factors, researchers found that public security agencies at locations experiencing political unrest in one quarter significantly increased their procurement of facial recognition technology in the following quarter. These same locations, however, had not increased their procurement of facial recognition AI prior to the unrest, suggesting that these protest events had, in fact, prompted the AI procurement.

In the quarter following unrest, local public security units (i.e., police forces) also significantly increased their purchase of high-resolution surveillance cameras. One year after procuring facial recognition technology, they also reduced the number of police and shifted more new hires to desk positions rather than street patrols.

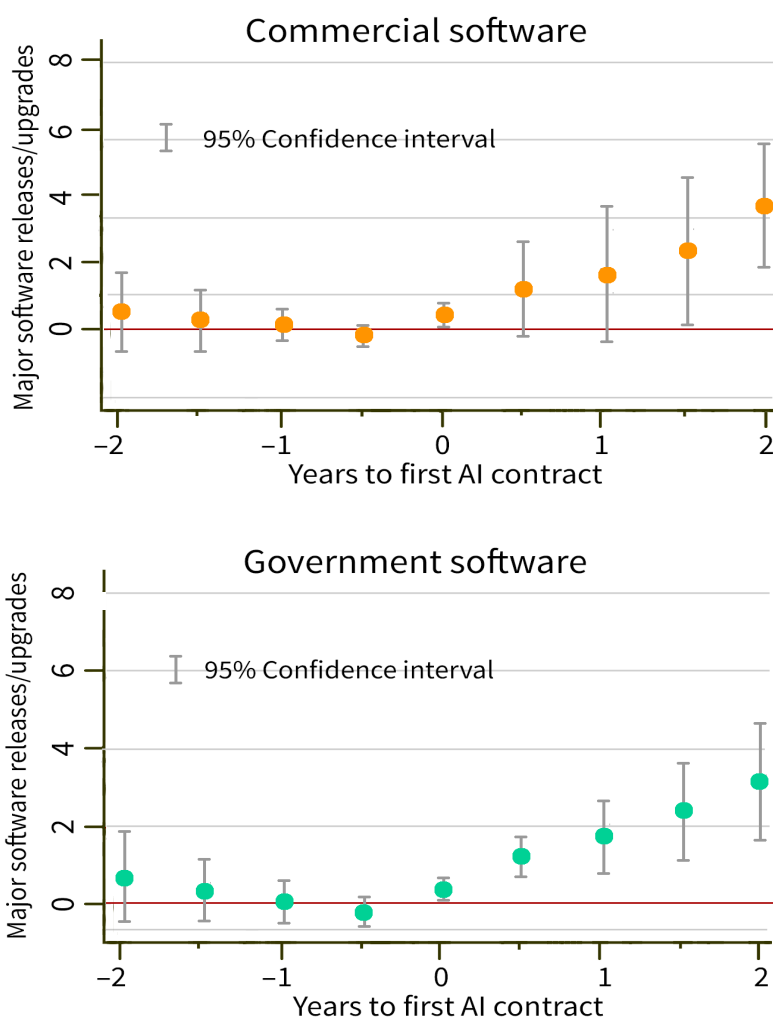
Increased AI procurement suppresses subsequent unrest. Researchers next quantified the stock of public security facial recognition technology procured by a locality and analyzed if such investments reduced the number of political protests in subsequent quarters. Using an analytical strategy to isolate whether increases in facial recognition AI itself (and not, for instance, socioeconomic conditions or past unrest) was causing declines in subsequent protests, researchers analyzed whether local increases in public security AI significantly weakened the likelihood of unrest occurrences. Researchers found that conditions conducive to protests (e.g., good weather) had smaller effects on political unrest in localities that had previously invested in public security AI. AI procurement for non-public security purposes, however, did not have such an effect. Public security AI technology, in other words, buffered the regime against potential political unrest, effectively enhancing the regime’s political control in China.

Procurement of AI to stifle unrest benefits AI innovation in China. Lastly, researchers tested whether increased local public security demand for AI promoted innovations in facial recognition technology. They focused on politically-motivated AI procurement contracts: i.e., those issued by public security agencies in localities that experienced above median levels of political unrest in the quarter prior to the contracts’ issuance.

Firms that received such a politically-motivated procurement contract developed approximately 3 additional government software products over the subsequent 2 years compared to those that received no government contract. AI innovation also spilled over into the commercial sector. In the span of 2 years, firms receiving such a politically-motivated procurement contract were able to develop around 4 additional commercial software products compared to those receiving no public contracts.

In short, contracts induced by political unrest prompted firms to produce not only significantly more government software but also more commercial software.

Facial recognition AI software resulting from a politically-motivated procurement contract



Innovation and autocracy mutually reinforcing. This research shows that local unrest leads to increased state procurement of facial recognition AI, which in turn suppresses subsequent unrest. This generates government demand for facial recognition AI, which nurtures technological innovation by stimulating contracted firms to achieve software breakthroughs in both government and commercial markets. In short, AI innovation strengthens China’s autocratic regime, and the regime’s investment in AI for political control stimulates further frontier innovation even in the commercial realm. This mutuality of advantage, authors suggest, may even generate long-term, sustained AI innovation in China, creating what they call an “AI-tocracy.”