

---

THE GEORGE  
WASHINGTON  
UNIVERSITY

---

WASHINGTON, DC



Competition &  
Innovation Lab

# Navigating the Skies of Regulation and Innovation: The Case of Civil Drones

Aurelien Portuese

*Research Professor and Founding Director of  
the GW Competition & Innovation Lab at  
The George Washington University*

OECD Workshop -- October 2, 2024  
2 Rue Andre Pascal, 75016 Paris

# The GW Competition & Innovation Lab

GW  
Competition &  
Innovation Lab  
FIRESIDE CHAT



ADAM CELLA

Chief Counsel, U.S. House of Representatives  
Committee on the Judiciary



WILLIAM KOVACIC

Senior Professor of Law  
Georgetown Law School, Former FTC

- Launched in 2024
- Co-directors Aurelien Portuese, Bill Kovacic, Frederic Jenny
- Interdisciplinary center on innovation and antitrust
- Global center with local teams created via regional initiatives
- Visit and engage:  
<https://competitionlab.gwu.edu/>





# Navigating the Skies of Regulation and Innovation: The Case of Civil Drones

- Published at the Journal of Law, Market & Innovation, Vol.3 Issue 2/2024, pp.120-140
- Outside digital markets, what innovation-driven markets portray rooms for enhanced innovation and competition, but also potential antitrust concerns?
- Civil drones are critically important for consumers. And yet, antitrust authorities have overlooked this market.



# Some background



Unmanned Aerial Vehicles (UAVs) = civil drones



Emergence of AI-embedded drones



Malicious use of civil drones. E.g., US Department of Justice, Drones: A Report on the Use of Drones by Public Safety Agencies –and a Wake-up Call about the Threat of Malicious Drone Attacks, COPS, Police Executive Research Forum, (2020)

- “Drone invasion is unavoidable”: purposes include recreational purposes (i.e. photography), shopping delivery purposes, or agricultural purposes.
- Consumers increasingly perceive the usefulness of drone delivery for their shopping experience, and decreasingly perceive privacy risks related with drone delivery (see Amazon Prime Air)

# Market Shares Analysis

- Supremacy of DJI is unparalleled, with a global market leadership that put its competitors to shame.
- Dominance further reinforced by the fact that DJI is the only drone company in the world, together with MMC another Chinese drone manufacturer, of *“fully designing and producing major industrial chains, including aircraft, power supply, flight control, video transmission and ground control.*

Rank	Manufacturer <sup>1</sup>	HQ Location	Founding Date	US Market Share <sup>2</sup>
1		Shenzhen, China	2006	76,1%
2		Santa Clara, USA	1968	4,1% (+0,4%)
3		Hong Kong, China	1999	2,6% (-0,5%)
4	Parrot	Paris, France	1994	2,5% (+0,3%)
5		Berkeley, USA	2009	0,6% (-0,8%)
6		Bothell, USA	2014	0,6% (-0,2%)
7		Redwood City, USA	2014	0,3% (+0,1%)
8		Lausanne, Switzerland	2009	0,2% (-0,1%)
9		Menlo Park, USA	2013	0,1% (-0,2%)
10		Simi Valley, USA	1971	0,1% (-)

# DJI's Super-Dominance

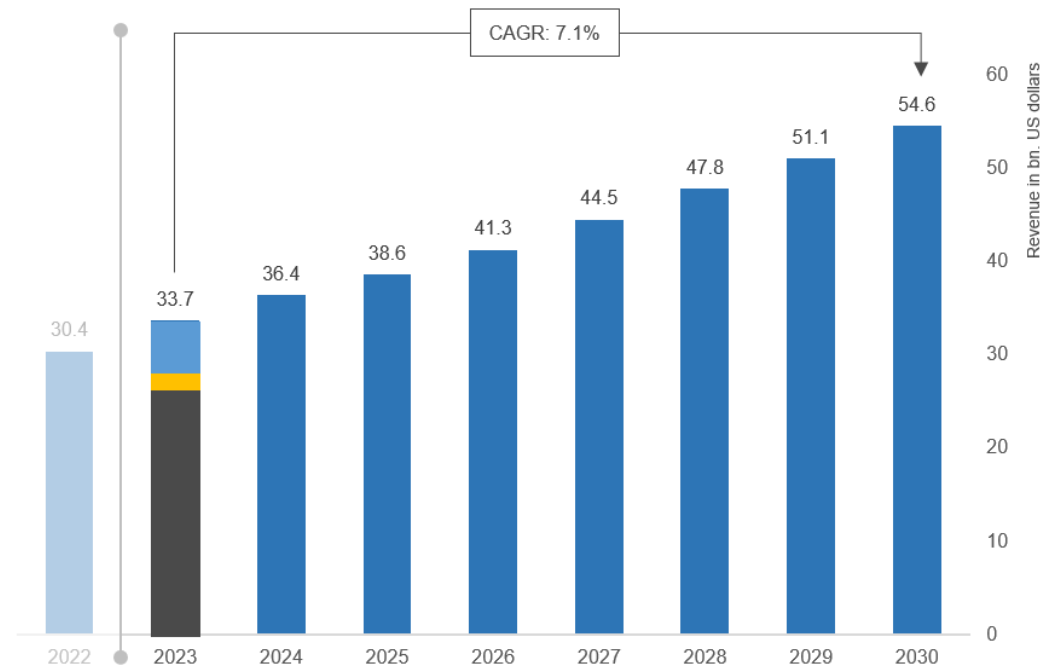
- *DJI had a dominant position due to its market share of 76.8%. The value of its relative market share is more than 20 times higher than the closest competitor, Intel Corporation.*
- *DJI's leadership is clearly visible and the remaining 5 included competitors are at the very tail, reaching values not exceeding 0.05"*
- In the US, DJI has 90% of the US's consumer drone market, 70% of the industrial drone market, and 92% of the first responder market.



# Market Growth and Antitrust Concerns

- Mass produced in Asia, the civil drone market is imbalanced toward one market actor – DJI – but more structurally toward one region for production – China.
- Dual dependency generates both antitrust concerns and national security concerns
- Reliance is further intensified by the fact that the United States market leads the world in drone sales, accounting for 30% of civil drone purchases, significantly surpassing China
- **National security concerns tied up with antitrust concerns**

GLOBAL MARKET SIZE AND GROWTH





# US Regulation and Innovation on UAVs

- US experienced years of an ex-ante ban on civil drones that stifled innovation
- FAA Modernization and Reform Act of 2012 (FMRA) enabled UAVs into the national airspace system
- In 2018, the adoption of Part 107 of the relevant regulations laid down the principles for ex-ante permissions subject to ex-post enforcement (Small Unmanned Aircraft Systems, 14 C.F.R. pt. 107 (2018)).
- The US approach to drone regulation via the FAA –beside a traditional antitrust enforcement that has its limits as discussed above –remains focused on safety over privacy concerns
- Antitrust enforcement:
  - DJI-Autel case whereby the super-dominant Chinese company was challenged for allegedly having compete unfairly by using predatory pricing
  - DJI and Autel considered by many as “threats to US security.”



# The DJI-Autel Case

1. DJI initially filed a patent infringement lawsuit against Autel in 2016 related to drone technology and operation
2. Autel responded with antitrust counterclaims, alleging that DJI engaged in monopolization and predatory pricing practices
3. In 2018, Autel requested the International Trade Commission (ITC) to investigate DJI for alleged patent infringement
4. The investigation involved three patents related to intelligent drone operations, rotor blades, and battery attachment
5. In March 2020, an Administrative Law Judge issued an initial determination largely favorable to DJI, finding many of Autel's patent claims invalid or not infringed
6. Concurrently, DJI successfully challenged Autel's patents at the Patent Trial and Appeal Board (PTAB), resulting in several claims being declared unpatentable
7. On August 20, 2020, the ITC issued its final determination, finding that certain DJI products infringed some claims of one of Autel's patents
8. However, the enforcement of exclusion and cease-and-desist orders was suspended pending the Federal Circuit's ruling on the PTAB decisions

*SZ DJI Tech. Co. v. Autel Robotics*, U.S. District Court for the District of Delaware, December 16, 2019, p.3: unsuccessful predatory pricing claim:

- *“DJI has repeatedly engaged in predatory pricing to blunt the advance of new competitors and ultimately drive them out of the prosumer drone market entirely or, at a minimum, to its fringes.” “[N]early a dozen companies have attempted to bring new and better ‘prosumer’ drones to American consumers . . . [b]ut each time DJI has perceived a new threat, DJI has used its dominant market share to maintain and extend its monopoly by predatorily cutting its prices, below cost, to undercut the advent of the competitor drone.” “[There is] a continuing pattern of DJI’s anti-competitive conduct,” whereby DJI tactically lowers its price below cost to drive out each new competitor that enters.”*



# Antitrust Takeaways from DJI-Autel Case

The *SZ DJI Technology Co. Ltd. v. Autel Robotics USA LLC* case shows antitrust laws' limits: the judicial rationale highlights several reasons why antitrust mechanisms were inadequate in this case:

1. The court's insistence on exact and detailed evidence of pricing below the cost shows that plaintiffs in antitrust cases have a high burden of proof, making it difficult for competitors to challenge dominant firms' bold or unfair pricing strategies.
2. Autel's claims failed to prove that DJI's pricing strategy intentionally damaged competition and that DJI could recover its losses, the court ruled. Creating predatory pricing and using antitrust laws to limit market dominance are difficult.
3. In addition to the primary limitations of antitrust, which include the requirement that anticompetitive behavior be supported by evidence, antitrust is unable to effectively sanction predatory pricing and is unable to effectively incorporate concerns regarding national security. The case of DJI exemplifies both limitations in a particularly severe and compelling manner.

## Naivety of Antitrust:

- Not only DJI's dominance threaten US's national security but it also undermines leadership in aviation sector: *"The U.S. must recognize that, in addition to national security concerns, China's subsidized drone market is harming the U.S. workforce, and ultimately our standing as the global leader in aviation."* (AUVSI White Paper)
- Disconnect with growing reality:
  - The absence of actions for the drone consumer market is striking due to the fact that, in October 2022, the Department of Defense identified DJI as a "Chinese military company" operating in the US
  - In 2023, President Biden signed the National Defense Authorization Act of 2024 which contained restrictive provisions originally proposed in the American Security Drone Act (ASDA) of 2023 which restricts government agencies from the use of drones manufactured in China

# The EU Approach to Regulation of Civil Drones

- Ex-ante Regulation of Civil Drones: A Precautionary Approach:
  - Commission Implementing Regulation (EU) 2021/664 of 22 April 2021 on a regulatory framework for the U-space : safety, data use and sharing provisions. The providers of common information service of each U-space ought comply “with the necessary data quality, latency and protection requirements
  - Drone Strategy 2.0” from November 2022
  - Strategy outlines 19 specific operational, technical, and financial measures to create a favorable legal and commercial environment for drone operations

## The Privacy Emphasis:

- One crucial element of GDPR compliance for drone operations is the necessity of conducting Data Protection Impact Assessments (DPIAs) in cases where there is a significant threat to individual privacy.
- Drone operations have the potential to collect substantial amounts of unauthorized personal data through video recordings and other surveillance activities



# Conclusion: Comparative Analysis

US focused on national security concerns and ex-post antitrust enforcement

EU focused on Single Market, ex-ante regulation, and primary focus on privacy and data quality

Both approach fail to account for the imbalanced market structure, antitrust concerns, national security concerns in law enforcement, and to foster innovation by manufacturing civil drones in either Europe or US.



**GW** Competition &  
Innovation Lab

---

**THE GEORGE  
WASHINGTON  
UNIVERSITY**

---

WASHINGTON, DC