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COMPETITION POLICY, INDUSTRIAL POLICY AND PUBLIC PROCUREMENT: THE FORMATION OF THE UNITED LAUNCH ALLIANCE AND THE EMERGENCE OF SPACEX

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Introduction

In May 2005, the Boeing Company (“Boeing”) and Lockheed Martin Corporation (“Lockheed Martin”) announced plans to form the United Launch Alliance (“ULA”), a joint venture which combined the only two suppliers of medium-to-heavy (“MTH”) national security-related launch services to the United States government.¹ The Federal Trade Commission (“FTC”) conducted a review of the antitrust implications of the transaction and, in consultation with the Department of Defense (“DOD”), approved the deal—subject to restrictions governing ULA’s relationship with other satellite manufacturers and providers of launch services—in May 2007.²

The transaction confronted the DOD and the FTC with difficult questions concerning the future of the US national security industrial base and the application of competition policy in the aerospace and defense (“A&D”) sector. The DOD recommended that the FTC approve the transaction,³ mainly on the ground that the joint venture would increase launch reliability by concentrating production and launch services in a single team rather than subdividing launch vehicle production and launch preparation activities between two separate organizations.⁴ The DOD’s recommendation was decisive factor in the FTC’s review.⁵ By a vote of 5–0, the FTC cleared the

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¹ See Press Release, ULA, Boeing, Lockheed Martin to Form Launch Services Joint Venture (May 2, 2005), <https://perma.cc/LF6T-ZW7K>.

² See Lockheed Martin Corp., F.T.C. Dkt. No. C-4188 (May 1, 2007) (final decision and order).

³ The Boeing Company, Lockheed Martin Corporation and United Launch Alliance; Analysis of Agreement Containing Consent Orders to Aid Public Comment, 71 Fed. Reg. 60,148, 60,150 (F.T.C. Oct. 12, 2006).

⁴ See Letter from Kenneth J. Krieg, Undersecretary of Def., U.S. Dep’t of Def., to Deborah Platt Majoras, Chairman, FTC (Aug. 15, 2006), <https://perma.cc/WY5T-T7BK>.

⁵ See Lockheed Martin Corp., F.T.C. File No. 051-0165 (May 8, 2007) (Statement of Commissioner William E. Kovacic, with whom Chairman Deborah Platt Majoras and Commissioner J. Thomas Rosch Join) [hereinafter Kovacic Statement], <https://perma.cc/S6SZ-TJY3>.

transaction,⁶ though it did so reluctantly.⁷ The Commission observed: “In the U.S. government MTH launch services market, Boeing and Lockheed are the only competitors, and their consolidation will result in a monopoly.”⁸ The agency concluded that “significant anticompetitive effects, including the loss of non-price competition and the loss of future price competition, are likely if the proposed transaction is consummated.”⁹

A key consideration in the FTC’s clearance decision was the prospect of future competitor entry in the market for MTH launch services for US government customers.¹⁰ In 2002, entrepreneur Elon Musk created a new company—Space Exploration Technologies (“SpaceX”)—to build launch vehicles that could deliver payloads into space at dramatically lower costs than Boeing or Lockheed Martin.¹¹ When the FTC reviewed the proposed ULA venture, SpaceX had yet to carry out a successful launch of its rocket, the Falcon. The Commission offered no view about the ultimate prospects of success for SpaceX, but it recited the formidable barriers that the company would face in gaining acceptance from, and contracts with, government purchasers.¹² Emphasizing that “the U.S. government only procures MTH launch services and space vehicles from firms with an established track record for success,” the Commission concluded “new entry is unlikely to reverse the anticompetitive effects of the Proposed Joint Venture.”¹³

Notwithstanding this gloomy forecast, the FTC attempted to elicit commitments from government buyers to take steps that would qualify SpaceX as a one of their suppliers. Before approving the transaction, the FTC received spoken assurances from the DOD and the National Aeronautics and Space Administration (“NASA”) that these government customers would

⁶ Press Release, FTC, FTC Intervenes in Formation of ULA Joint Venture by Boeing and Lockheed Martin (Oct. 3, 2006), <https://perma.cc/MZ3S-HVNW> (reporting 5–0 vote to accept consent agreement).

⁷ See, e.g., Lockheed Martin Corp., F.T.C. File No. 051-0165 (Oct. 3, 2006) (Concurring Statement of Commissioner Pamela Jones Harbour), <https://perma.cc/WC4F-938R> (“I reluctantly agree that the Commission must give DoD the benefit of the doubt. I therefore vote to accept the proposed consent agreement.”).

⁸ The Boeing Company, Lockheed Martin Corporation and United Launch Alliance; Analysis of Agreement Containing Consent Orders to Aid Public Comment, 71 Fed. Reg. at 60,149.

⁹ *Id.* at 60,150.

¹⁰ See *id.*

¹¹ See Jeffrey Kluger, *SpaceX: 10 Things to Know*, TIME, <https://perma.cc/B64A-3PL5>. In 1995 Musk founded Zip2, which Compaq purchased for \$307 million in 1999. Musk invested most of the \$22 million he made from the sale of Zip2 into a start-up that became PayPal, which eBay acquired in 2002 for \$1.5 billion. Musk took \$100 million of his share of the PayPal proceeds and used it to begin SpaceX in 2002 and then spent \$70 million to create Tesla in 2003. ASHLEE VANCE, ELON MUSK: TESLA, SPACEX, AND THE QUEST FOR A FANTASTIC FUTURE 14 (2015) (examining Musk’s business career extensively).

¹² The Boeing Company, Lockheed Martin Corporation and United Launch Alliance; Analysis of Agreement Containing Consent Orders to Aid Public Comment, 71 Fed. Reg. at 60,149–150.

¹³ *Id.* at 60,150.

use best efforts to facilitate new market entries—most notably, by SpaceX—to compete to supply the US government with launch services.¹⁴ These assurances were not included in the terms of the consent agreement between the FTC and ULA, nor did the correspondence between the FTC and the government buyers set out specific commitments. The DOD’s written statements to the FTC contained only vague aspirations for new entry,¹⁶ yet the Commissioners perceived that the government purchasers would make good faith efforts to encourage entry by other firms to motivate ULA.

Although the transaction’s full impact will not become evident for years to come, two developments since 2007 stand out. First, ULA thus far has met the reliability expectations that guided the DOD and the FTC. Through January 2022, ULA has made 148 launches with no failures.¹⁸

Second, the new suppliers of launch services (SpaceX and others) have become credible alternatives for NASA, the US national security agencies, and commercial buyers. Ashlee Vance—author of the leading biography of Elon Musk—observes that “SpaceX has become the free radical trying to upend everything about this industry.”¹⁹ Journalist Christian Davenport added, “SpaceX went from a rich man’s folly that no one took seriously to a disrupter that transformed the aerospace industry.”²⁰ Few imagined in 2007 that by 2020 a SpaceX rocket and spacecraft would carry two American astronauts safely to and from the International Space Station and restore the ability of the United States to launch humans from its own spaceports into orbit.²¹

¹⁴ I base this observation on my own participation in discussions with the DOD and NASA officials who conducted the review of the ULA transaction.

¹⁶ See Letter from Kenneth J. Krieg to Deborah Platt Majoras, *supra* note 4 (“While the Atlas V and Delta IV are currently the only launch vehicles capable of meeting current requirements, the Department is open to new U.S. competitors for the launch services. The EELV acquisition strategy provides an annual opportunity for new competitors to qualify for launch services contracts by responding to the annual Notification of Contracting Action, which sets forth the details of the qualification process and is published prior to each year’s Request for Proposals.”).

¹⁸ Press Release, January 21, 2022, <https://www.ulalaunch.com>

¹⁹ VANCE, *supra* note 11, at 217.

²⁰ Christian Davenport, *Ascendant SpaceX Plants Flag on Field Long Owned by Boeing*, WASH. POST, May 24, 2020, at G1. In another account, Davenport noted that SpaceX “has become one of the most improbable stories in the history of American enterprise, a combination of disruption, failure and triumph that has transformed it from a spunky start-up to an industry powerhouse with some 7,000 employees.” Christian Davenport, *As It Prepares to Fly Humans, SpaceX Faces the Biggest Challenge in Its History*, WASH. POST, May 17, 2020, at A1 [hereinafter Davenport, *Biggest Challenge*].

²¹ On May 30, 2020, a SpaceX Falcon 9 rocket launched NASA astronauts Bob Behnken and Doug Hurley into earth orbit from Cape Canaveral. Irene Klotz, *NASA’s New Era*, AVIATION WK. & SPACE TECH., June 15–28, 2020, at 22, 22–23. After spending sixty-two days at the ISS, Behnken and Hurley returned safely to Earth on August 2. Jacob Bogage & Christian Davenport, *NASA Astronauts Aboard SpaceX’s Crew Dragon Capsule Splash Down in the Gulf of Mexico*, WASH. POST (Aug. 3, 2020, 11:33 AM), <https://perma.cc/2S6X-YG6H>. This was the first time since the discontinuation of NASA’s space shuttle program in 2011, after the return of the Space Shuttle Atlantis in July of that year, that

The ULA case study underscores the importance of public procurement policy as an industrial policy tool and a mechanism for shaping the competitive environment. The ULA case study suggests how government procurement agencies can account for competition in ways that increase the number and quality of options available to government buyers and to purchasers in commercial markets.

Federal antitrust enforcement policy has reflected the primacy of innovation as a guarantor of U.S. supremacy in the design and production of weapon systems.²⁴ In taking this approach, antitrust agencies have embraced the view that the preservation of independent centers of inventive activity should be the foremost antitrust concern in reviewing defense mergers.²⁵ The prosecution of antitrust cases is but one way by which governments can foster competition and stimulate business rivalry. The ULA episode illustrates how public procurement policy—including the funding of private sector research and development and the acquisition of goods and services—can influence the course of competition.²⁷ In the ULA case, two government agencies (NASA and the DOD) facilitated entry into the space launch services market by SpaceX and other private firms. Through policies that can be correctly characterized as procompetitive, the government purchasers helped transform a sector seemingly destined to be the province of a single supplier.

This paper proceeds as follows. Part I recounts ULA’s creation and examines the competition policy reviews carried out by the DOD and the FTC. Part II sketches the modern framework for antitrust analysis of aerospace and defense industry mergers and describes significant analytical and policy trends. Part III reviews how the DOD and the FTC evaluated the ULA joint

Americans had ridden into space on a launch that originated within the United States. Christian Davenport & Jacob Bogage, *SpaceX Takes Historic Flight Headed for Space Station*, WASH. POST, May 31, 2020, at A1; Christian Davenport, *SpaceX’s Rockets Come Under Safety Experts’ Glare*, WASH. POST, May 6, 2018, at A1 [hereinafter Davenport, *Safety Experts’ Glare*].

²⁴ See, e.g., FTC, JOINT STATEMENT OF THE DEPARTMENT OF JUSTICE AND THE FEDERAL TRADE COMMISSION ON PRESERVING COMPETITION IN THE DEFENSE INDUSTRY (2016), <https://perma.cc/25BG-3S5M> (“In the defense industry, the Agencies are especially focused on ensuring that defense mergers will not adversely affect short- and long-term innovation crucial to our national security . . .”).

²⁵ See, e.g., William E. Kovacic & Dennis E. Smallwood, *Competition Policy, Rivalries, and Defense Industry Consolidation*, 8 J. ECON. PERSPS. 91, 102–03 (1994) (“Competition’s greatest benefit in weapons acquisition arguably is its power to spur firms to devise ingenious approaches for fulfilling DoD’s mission requirements . . . The main potential hazard of mergers is the danger that technological competition will diminish, and that specific technologies may become entrenched as the one or two remaining suppliers freeze out innovative design approaches that threaten their vested interests or defy conventional wisdom.”).

²⁷ The significance of these policy tools as stimulants for competition is examined in William E. Kovacic, *Government Support for Research and Development*, in THE SHRINKING INDUSTRIAL BASE: RESTRUCTURING THE DEFENSE INDUSTRY AND ENSURING AMERICAN COMPETITIVENESS FOR THE 1990s (Ann. Meeting Program, Am. Bar Ass’n, Section of Pub. Cont. L., 1990).

venture proposal and spells out the considerations that guided the FTC's decision to allow the transaction to proceed with few qualifications. Part IV recounts the impact of the ULA transaction on reliability and the development of rivals to ULA. Part V examines the industrial policy implications of the ULA experience.

In describing and interpreting the review by the DOD and the FTC of the ULA proposal, I am not a neutral observer. I was a member of the FTC from January 2006 through September 2011, and I participated in the agency's deliberations about the ULA joint venture from January 2006 onward. I supported the Commission's decision to approve the deal with conditions.

I. Formation of the ULA Joint Venture

In May 2005, following extensive consultations with the DOD and other government customers, Boeing and Lockheed Martin ("LM") announced plans to form the United Launch Alliance joint venture.³¹ The companies planned to combine engineering and administrative functions near LM's offices in Denver and to consolidate design and production work at Boeing's facility in Decatur, Alabama.³² The firms also would unify their launch site operations staffs at Cape Canaveral and Vandenberg Air Force Base.³³

The main rationale for the transaction involved scale economies. Falling demand for launch services for national security purposes and commercial applications had reduced production rates ("tempo"³⁷) for both firms.³⁸ Over time, a smaller number of launches was being subdivided between the two organizations.³⁹ Diminished experience reduced each team's proficiency and increased the risk of launch failures, which could deny the DOD needed access to critical communications and reconnaissance satellites.⁴⁰

The companies said the combination of all experience in a single, integrated team would raise capability and improve performance beyond what Boeing and Lockheed Martin could achieve independently.⁴¹ The companies hinted

³¹ See Press Release, ULA, *supra*.

³² *Id.*

³³ *Id.*

³⁷ See Letter from Kenneth J. Krieg to Deborah Platt Majoras, *supra* ("launch tempo" is "the number of booster cores built in the assembly line and launched per year").

³⁸ See The Boeing Company, Lockheed Martin Corporation and United Launch Alliance: Analysis of Agreement Containing Consent Orders to Aid Public Comment, 71 Fed. Reg. at 60,150 (reviewing concerns about falling levels of launches and the distribution of a declining amount of work across two workforces).

³⁹ *Id.*

⁴⁰ *Id.*

⁴¹ Press Release, ULA, *supra*.

that concerns about pricing for future launches would be alleviated through the application of the government's systems for monitoring costs.⁴³

In 2005, there was reason to doubt the sanguine assessment of the parties' executives about how harmoniously the new venture would function. For several years before the ULA venture was announced, Boeing and LM had engaged in bitter litigation involving competition to provide launch services to the DOD. LM had sued Boeing for alleged antitrust misconduct in competing for awards in the Air Force Extended Expendable Launch Vehicle Program ("EELV").⁴⁶

II. The Process and Substance of Antitrust Analysis of Defense Industry Mergers: Modern Trends

The review of mergers of defense contractors draws upon contributions from the federal antitrust agencies and the government purchasing agencies (e.g., the DOD). The defense buyers provide their views on competitive effects to the antitrust agencies. The question of whether the defense agencies will endorse or oppose the proposed transaction is crucial in determining how the antitrust agencies will proceed. Since the mid-1980s until 2005 (when Boeing and Lockheed notified their agreement to the US antitrust agencies), the DOJ and the FTC have reviewed numerous proposed mergers involving firms in the aerospace and defense industry.⁵⁷

By the time the ULA joint venture was announced in 2005, several trends had emerged in antitrust reviews by the DOJ, the FTC, and the federal courts. The federal agencies generally had challenged transactions that would reduce (from two to one) the number of suppliers for weapon systems or inputs to those systems. Few cases had been litigated to a resolution on the merits; in each of these decisions, the court enjoined the merger. In a few cases, the antitrust authorities had approved mergers to monopoly.⁶⁶ These rare approvals have rested heavily on DOD recommendations regarding the volume of future purchases of the system in question and the costs of sustaining two independent design and production teams.

The views of the national security agencies ordinarily have been decisive in antitrust reviews by the DOJ and the FTC.⁷⁵ The antitrust agencies

⁴³ *See id.*

⁴⁶ *See Lockheed Martin Corp. v. Boeing Co.*, 314 F. Supp. 2d 1198, 1199 (M.D. Fla. 2004).

⁵⁷ The most intensive period of activity took place in the 1990s. *See Kovacic, Postconsolidation Defense Industry, supra*, at 422–23.

⁶⁶ Spaceflight Now, *Two Engine Rivals Merge into Aerojet Rocketdyne* (June 18, 2013), <https://perma.cc/QQM2-YEB2>.

⁷⁵ *Id.* at 469.

understand that the DOD's views about what best serves the nation's security interests likely will be persuasive to the federal judge. In most instances, the national security authorities are aware of the benefits of competition in depressing prices and providing a larger range of design and product choices.⁷⁶ DOD officials have expressed concerns that consolidation will enable the survivors to gain substantial market power and wield it in ways that undermine the national interest.⁷⁷ Sometimes, however, the DOD has decided that other policy considerations are paramount. These considerations include ensuring the preservation of certain industrial assets (which may be retained with greater certainty through a merger than through a winner-take-all competition) and reducing the fixed costs of maintaining two or more centers of design and production capability.⁷⁸ The DOD's role as a monopsonist for many defense systems means that the antitrust authorities sometimes must use advocacy to convince the government buyer to weigh competition concerns more heavily.

III. The Government's Review of the ULA Joint Venture

Over the course of its investigation in 2005, the FTC decided that the transaction was a merger to monopoly for mid- to heavy-lift national security launches. The combination of these assets in a single supplier created a strong presumption that the merger would have serious anticompetitive effects by raising the prices that government purchasers would pay over time for launches and by depressing incentives for Boeing and Lockheed Martin to innovate in advancing the state of the art for launch vehicles.

The DOD had a different view. By early 2006, the Department informed the FTC that it supported the venture to improve reliability. The DOD acknowledged the FTC's concerns about the competitive dangers posed by the joint venture⁸⁶ but concluded that the superior reliability promised by the

⁷⁶ See Letter from Kenneth J. Krieg to Deborah Platt Majoras, *supra* note 4 (“Because the interests of the Department of Defense are usually best served by maintaining competitive markets for required products and services, it is our policy to oppose business combinations that severely reduce or eliminate competition or that may create unhealthy or unfair competition in those products or services.”); see also Department of Defense, Undersecretary for Acquisition and Sustainment, STATE OF COMPETITION WITHIN THE DEFENSE INDUSTRIAL BASE (Feb. 2022).

⁷⁷ See GREGORY SANDERS & ZACH HUITINK, CTR. FOR STRATEGIC & INT’L STUD., EVALUATING CONSOLIDATION AND THE THREAT OF MONOPOLIES WITHIN INDUSTRIAL SECTORS 4–6 (2019) (reporting concerns of DOD acquisition officials about excessive concentration in the defense supplier base).

⁷⁸ See Kovacic & Smallwood, *supra*, at 106–08.

⁸⁶ See Letter from Kenneth J. Krieg to Deborah Platt Majoras, *supra* (“Indeed, we have reviewed the Federal Trade Commission staff’s analysis of the proposed transaction’s likely effects, and acknowledge that the most negative view of the creation of ULA is that it will almost certainly have an adverse effect on competition, including higher prices over the long term, as well as a diminution in innovation and responsiveness.”).

transaction warranted accepting these risks.⁸⁷ As noted earlier, the declining number of launches had reduced the amount of work available for both the Boeing and Lockheed Martin teams.⁸⁸ This posed a serious possibility that the proficiency of each team would suffer and the rate of launch failures would subsequently increase.⁸⁹ To the DOD, the joint venture would concentrate design, production, and launch experience in a single integrated team and thereby sustain high levels of proficiency.⁹⁰ For the DOD, this was the primary consideration and warranted acceptance of a plan that would reduce the number of industry participants to one. Similarly, NASA also consulted with the FTC on the transaction and informed the Commission that “the cognizant mission directorates” with the space agency “neither support nor oppose the joint venture.”⁹²

A. *Resolution of the Pivotal Competition issues: Efficiency and Entry*

The FTC regarded the scale economy, quality, and reliability arguments to be genuine and significant.⁹³ There was considerable evidence (from prior production of launch vehicles and other defense systems) that subdividing a relatively small and declining amount of work between two teams denied both teams the experience base needed to be successful.⁹⁴ The agency

⁸⁷ *See id.* (“The transaction does . . . present very unique national security benefits that in the Department’s analysis clearly outweigh the loss of competition, even in the most extreme view of that loss.”).

⁸⁸ *See id.* (“The current and future commercial launch market, including the inability of U.S. firms to compete against foreign firms coupled with the low number of national security launches, makes it extremely difficult for two competing U.S. providers to maintain separate, competing, experienced workforces.”).

⁸⁹ *See id.* (attach. on Background Information on National Security Space for ULA) (“Historical data (1973 – 2003) for both Delta II and Atlas II launches demonstrate that the statistical likelihood for launch failure is reduced as launch rate increases. At current launch rates for the Delta IV and Atlas V systems, the launch rate for each team is in the zone where the failure rate is statistically unacceptable.”).

⁹⁰ *See id.* (“The single ULA workforce will benefit from a launch tempo, defined as the number of booster cores built in the assembly line and launched per year, that would be greater than could be expected for either of [the] two competing workforces.”).

⁹² Letter from Michael C. Wholley, Gen. Counsel, NASA, to Randall Long, FTC Re: United Launch Alliance (Dec. 16, 2005).

⁹³ *See* Kovacic Statement, *supra*, at 1.

⁹⁴ *See* THE CONGRESSIONALLY MANDATED NAT’L SEC. SPACE LAUNCH REQUIREMENTS PANEL, RAND NAT’L DEF. RSCH. INST., NATIONAL SECURITY SPACE LAUNCH REPORT xvi (2006) [hereinafter SPACE LAUNCH REPORT] (“[G]iven that the U.S. government is the only likely customer, the probability that launch demand may drop below a demand that will sustain team proficiency for two families is increased, giving rise to questions of reliability that often stem from low production rates.”); JEFFREY A. DREZNER, GILES K. SMITH, LUCILLE E. HORGAN, CURT ROGERS & RACHEL SCHMIDT, RAND, MAINTAINING FUTURE MILITARY AIRCRAFT DESIGN CAPABILITY 46–51 (1992); Kovacic, *Postconsolidation Defense Industry*, *supra* note 30, at 429; Letter from Kenneth J. Krieg to Deborah Platt Majoras, *supra* note 4 (attach. on Background Information on National Security Space for ULA) (“Fifty years of launch experience has demonstrated that increased launch tempo will reduce risk and increase space launch mission success rates.”). The benefits from cumulative experience can diminish when a program nears its end, and the producer shifts its best personnel to newer projects. I am grateful to Henry Hertzfeld for this point.

realized that raising the reliability rate for launches from, say, ninety-five percent to ninety-eight percent, could yield substantial national security benefits. And the agency was aware that in past transactions, when faced a recommendation to clear from the DOD, the FTC had permitted two-to-one mergers.

During deliberations over the transaction within the DOD and the FTC, SpaceX's chairman Elon Musk asked the FTC to impose conditions that would enable SpaceX to obtain government contracts that would allow the entrant to build the capability necessary to provide launch services to government. Musk's business model, if successful, would reduce the cost of sending payloads into space.⁹⁷ SpaceX had made substantial investments to develop its Falcon rocket, but had yet to make a successful launch.⁹⁸

There were many reasons to discount the company's prospects for success.⁹⁹ SpaceX had yet to demonstrate that its concept would work in practice. Even if the company's early, lighter version of the Falcon succeeded, it would be a long and laborious process to gain the confidence of government purchasers—especially the national security customers—and qualify to launch sensitive national security payloads. For decades, government buyers had placed great emphasis on the demonstrated capacity of a defense supplier

⁹⁷ In his biography of Musk, Ashlee Vance describes Musk's vision for SpaceX:

SpaceX was to be America's attempt at a clean slate in the rocket business, a modernized reset. Musk felt that the space industry had not really evolved in about fifty years. The aerospace companies had little competition and tended to make supremely expensive products that achieved maximum performance. They were building a Ferrari for every launch, when it was possible that a Honda Accord might do the trick. Musk, by contrast, would apply some of the start-up techniques he'd learned in Silicon Valley to run SpaceX lean and fast and capitalize on the huge advances in computing power and materials that had taken place over the past couple of decades. As a private company, SpaceX would also avoid the waste and cost overruns associated with government contractors.

VANCE, *supra*, at 114. This was the message that Musk conveyed to me during his visit to the FTC in connection with the ULA transaction.

⁹⁸ SpaceX would not accomplish a successful launch of its Falcon rocket into earth orbit until September 2008. *Id.* at 202–03.

⁹⁹ See Davenport, *Biggest Challenge*, *supra*, at A1 (“The company was never supposed to succeed. Even its founder gave it odds few gamblers would take - 1 in 10. But Elon Musk decided to go all in anyway, investing some \$100 million of his own money, over the protests of his friends, family and the basic logic that said a private entrepreneur with no experience in spaceflight shouldn't start a rocket company.”). After astronauts Behnken and Hurley landed in the Gulf of Mexico on August 2, Musk said the success of SpaceX was unforeseeable when he founded the company in 2002: “I thought we had maybe – when starting SpaceX – . . . a 10% chance of reaching orbit. So to those who doubted us I was like, ‘Well, I think you're probably right.’” Dave Mosher & Morgan McFall-Johnsen, *SpaceX Just Brought 2 NASA Astronauts Back to Earth in Its Crew Dragon Spaceship, Kicking Off ‘The Next Era in Human Spaceflight.’* BUS. INSIDER (Aug. 2, 2020), <https://perma.cc/RE6J-X5PF>.

to carry out difficult design and production tasks.¹⁰¹ Ease of entry can overcome competition concerns about a highly concentrative merger, but the SpaceX entry story seemed a long distance away from accomplishment.

B. *The FTC's Decision Not to Seek to Block the Venture*

Given the DOD's support for the merger, the FTC's options were severely constrained. Suing to block the transaction without the DOD's support seemed to be a formula for failure. It appeared unlikely that, given the choice between the DOD's and the FTC's disparate views on national security interests, a federal judge would embrace the FTC's position.

The FTC decided to close its investigation and clear the transaction with soft concessions from the government purchasers that they would consider new entrants, but without hard concessions embedded in an enforceable order. With the DOD, the Commission agreed upon settlement terms that would limit the ability of ULA to discriminate against future launch services entrants and to disadvantage rival suppliers of satellites.¹⁰⁵ The ULA parties agreed to these terms and the DOD established a compliance mechanism to see that the requirements would be fulfilled.

The Commission also attempted to make the terms of the resolution of the matter more transparent.¹⁰⁶ It sought and received from the DOD a letter that detailed the Department's reasons for endorsing the transaction.¹⁰⁷ In doing so, the FTC effectively pressed the DOD to put its cards on the table, go beyond vague assertions of a national security interest, and describe more fully how the formation of the ULA venture would serve national security goals. The DOD letter spelled out the economies of scale rationale for the consolidation and spoke (at a high level of generality) of being receptive to efforts by new entrants to qualify as suppliers to the national security customers.¹⁰⁸

Finally, the FTC engaged in extensive discussions with the DOD and with NASA about measures that could facilitate entry into the launch services business in the future. The FTC staff sought to test whether the aspirations of SpaceX to qualify as a supplier to government agencies had any genuine prospects of success. In conversations with the FTC's staff and leadership,

¹⁰¹ See Kovacic & Smallwood, *supra* note 25, at 106–07 (discussing importance to government purchasers of the contractor's track record in previous programs).

¹⁰⁵ The Boeing Company, Lockheed Martin Corporation and United Launch Alliance; Analysis of Agreement Containing Consent Orders to Aid Public Comment, 71 Fed. Reg. at 60,151. By the terms of the consent decree, this requirement terminated after ten years, in 2017.

¹⁰⁶ Kovacic Statement, *supra* note 5.

¹⁰⁷ Letter from Kenneth J. Krieg to Deborah Platt Majoras, *supra* note 4.

¹⁰⁸ See *id.*

the other government agencies expressed their openness to supporting new entry. Though uncertain about the durability and reliability of these expressions of interest, the FTC perceived that the government purchasers saw the value of developing a credible alternative to ULA, even if the alternative was not fully developed or complete—in the sense that the entrant could compete effectively to serve all of the national security community’s future needs. It was sufficient that the alternative be scalable such that the government purchasers could enhance its position if ULA lagged in fulfilling the reliability goals that motivated its creation. The give and take between the FTC and the DOD can be seen as a form of competition advocacy, with the FTC attempting to persuade another government department of how competition could improve the results—in quality and price—that public agencies can achieve through the procurement process.

IV. Experience from 2006 to the Present

The wisdom of the FTC’s decision to approve the transaction depended on its assumptions that the economies of scale efficiencies would prove to be real and robust, and that the possibilities for entry and expansion by SpaceX (or other firms) would be more than a mirage. Both assumptions that underpinned the FTC’s decision have been borne out. The most sanguine view of the Commission’s decision is that the agency exercised shrewd, farsighted judgment about what it would take to preserve competitive options for government buyers, and it took a well-calculated risk that SpaceX would prove to be the necessary competitive stimulant in the future. A more doubtful assessment is that the agency embraced the SpaceX entry scenario because it had no other choice—in short, that it capitulated because the parties would prevail in court with the DOD’s support.

A. ULA’s Reliability

ULA has achieved the reliability objectives that the parties offered as the major motivation for the venture.¹¹¹ As ULA’s Chief Executive Officer Tory Bruno has observed, reliability is the certifying characteristic of the joint venture: “We’re always on time . . . We always work. That’s the core of our company.”¹¹²

Would Boeing and Lockheed Martin have achieved a similar success rate had ULA not been approved and the two firms had operated independently? That is an unanswerable counterfactual. There is evidence, however, that the

¹¹¹ See *supra* note 18 and accompanying text (observing that from the time of its formation through July 30, 2020, ULA had accomplished 140 consecutive successful launches).

¹¹² Craig Mellow, *Tory Bruno, the Other Rocket Man*, AIR & SPACE MAG., June 2018, at 64, 69.

integration of capabilities advanced by Boeing and LM as a foundation for more efficient operations took place haltingly and incompletely. In a profile of Tory Bruno published in 2018, journalist Craig Mellow described the difficulties that ULA faced in melding the predecessor organizations into a cohesive team:

The original idea behind ULA was to reap efficiency by combining two formerly competing rocket families, Lockheed's Atlas and Boeing's Delta. It didn't quite work out that way. Under the joint ULA roof, the two clans remained separate, if not hostile, duplicating management functions and costs from top to bottom. "The staffs from the two product lines didn't really mix all that much," Bruno says. "They had their own cultures." He banged his subordinates' heads together, leaving "one-third fewer boxes on the organization chart."¹¹⁴

In retrospect, the FTC and the DOD should have been more skeptical about the efficiency claims that depended on the harmonious integration of the Boeing and LM rocket teams. The amalgamation of fierce rivals into a single enterprise, in almost any setting, ordinarily faces strong internal resistance. A full knitting together of the merging parties, and the subsequent creation of a collective spirit, may take years to accomplish (if it happens at all).¹¹⁵

B. *The Successful Development of SpaceX*

SpaceX has evolved into an credible supply alternative for commercial and government purchasers, alike, often in a disruptive fashion that has upset prevailing assumptions about rocket design, testing, and pricing. In the most general terms, SpaceX has embraced the role of a maverick, untethered by norms that discourage experimentation and innovation.¹¹⁸

With its disruptive entry into the space industry, SpaceX has become the antidote to any complacency on the part of ULA.¹²⁰ By some measures, SpaceX has become the preeminent US supplier of launch services.¹²¹ As journalist Irene Klotz observes, a new wave of entry spearheaded by SpaceX has given government purchasers a range of options that seemed improbable in 2006:

¹¹⁴ *Id.* at 67.

¹¹⁵ The examination of hundreds of mergers over the years should have given the FTC a keener awareness of the serious problems that post-merger integration poses, even for deals that ultimately are by some measure successful.

¹¹⁸ In describing the relationship between SpaceX and NASA, Christian Davenport has noted the "tension between the safety-obsessed space agency and the maverick company run by Musk, a tech entrepreneur who is well known for his flair for the dramatic and for pushing boundaries of rocket science." Davenport, *Safety Experts' Glare*, *supra*, at A1. Davenport adds: "In this culture clash, SpaceX is the daring, Silicon Valley-style outfit led by a man who literally sells flamethrowers on the Internet and wholeheartedly embraces risk." *Id.*

¹²⁰ *See id.* at 66–69 (describing how entry and expansion by SpaceX led ULA to alter its business strategy).

¹²¹ In 2018, SpaceX completed twenty missions, over sixty percent of the US launches for the year. Irene Klotz, *On the Ascent*, AVIATION WK. & SPACE TECH., Dec. 24, 2018–Jan. 13, 2019, at 80.

It is a problem the U.S. Air Force once wished it had: multiple companies competing to launch its mission-critical satellites into a range of earth orbits. Now, legacy contractor United Launch Alliance . . . is in a fight for its existence as it squares off against SpaceX—which in 2016 broke ULA’s monopoly on the military’s space launch business—and new offerings from Northrop Grumman and Jeff Bezos’ startup Blue Origin.¹²²

Among other effects, SpaceX and other launch vehicle producers have pressed ULA to reduce its price for government buyers and to improve its launch vehicles.¹²³

SpaceX has performed well in several areas, including:

**Technical Proficiency.* SpaceX has emerged as an innovative force in launch vehicle design, production, and operations.¹²⁴ Among the most notable achievements is the development of a reusable vehicle which, following a launch, can descend to the earth’s surface and land on a platform, which can be located either on land or on sea.¹²⁵

**Commercial Markets.* SpaceX has become an important supplier of launch services for commercial enterprises in the communications sector. Key milestones have included the successful launch in March 2017 of a communications satellite for SES and the launch of communications satellites for Iridium and for its own Starlink internet system¹²⁹ SpaceX has helped catalyze reductions in the price of commercial launch services and facilitated entry by a host of companies that are seeking to create new communications networks with low earth orbit satellites.¹³⁰

¹²² Irene Klotz, *Rocket Rivalry*, AVIATION WK. & SPACE TECH., June 3–16, 2019, at 32 [hereinafter Klotz, *Rocket Rivalry*]. See also Irene Klotz, *Game On*, AVIATION WK. & SPACE TECH., Apr. 9–22, 2018, at 44 [hereinafter Klotz, *Game On*] (stating that ULA “is in a fight for survival” in the competition to obtain contracts for the Air Force Launch Service Agreement program).

¹²³ See Frank Moring, Jr. & Lara Seligman, *Getting Up There*, AVIATION WK. & SPACE TECH., Apr. 17–30, 2017, at 20, 21 (reporting that as SpaceX has injected competition into launches for the Air Force Evolved Expendable Launch Vehicle program, “ULA has slashed the price of the workhorse Atlas V by about one-third, and says it will continue to drive down costs”).

¹²⁴ See, e.g., Davenport, *Safety Experts’ Glare*, *supra*, at A1, A13 (describing SpaceX’s application of novel techniques for fueling launch vehicles and industry experts’ debates about its benefits and hazards); Andy Pasztor, *Musk’s SpaceX Notches Another Milestone*, WALL ST. J., June 5, 2017, at B4 (reporting SpaceX’s success in reusing a cargo capsule).

¹²⁵ See Frank Moring, Jr., *Reusable Rockets*, AVIATION WK. & SPACE TECH., Apr. 17–30, 2017, at 31 (describing SpaceX’s progress in developing reusable launch vehicles); Andy Pasztor, *SpaceX Sticks Rocket Landing*, WALL ST. J., Apr. 9, 2016, at B4 (reporting SpaceX’s success in vertically landing part of a used Falcon 9 rocket).

¹²⁹ Moring, Jr. & Seligman, *supra*, at 21; Kenneth Chang, *SpaceX Launches 60 Starlink Internet Satellites into Orbit*, N.Y. TIMES (May 23, 2019), <https://perma.cc/V6TY-M8TR>; Aaron Pressman, *The Internet Space Race*, FORTUNE (Feb. 1, 2019), <https://perma.cc/E83K-PJQB>.

¹³⁰ Irene Klotz, *SmallSat Express*, AVIATION WK. & SPACE TECH., Nov. 26–Dec. 9, 2018, at 17.

**Government Non-Military Launch Services.* Since 2007, SpaceX has become an increasingly significant supplier of launch services for NASA. In March 2019, SpaceX sent a prototype of the Crew Dragon spacecraft to the ISS, setting the stage for the subsequent successful flight of the Crew Dragon and its astronauts to and from the ISS in 2020.¹³⁴

**National Security Launch Services.* SpaceX has become a more significant participant in the national security segment of launch vehicle services for US government agencies.¹³⁸ For example, in August 2020 the U.S. Space Force selected SpaceX and ULA to receive five-year contracts totaling \$653 million to launch satellites for the National Security Space Launch (“NSSL”) program.¹⁴⁰ Journalist Jeff Foust remarked: “Six years ago, SpaceX was the upstart launch company seeking to break United Launch Alliance’s monopoly on national security space launches. Now, it’s part of the establishment.”¹⁴¹

V. Policy Implications Going Forward

A. Government Procurement Policy as a Stimulus for Competition

The success of SpaceX has depended crucially upon the fulfillment by the government buyers of their soft commitment in 2006 to consider SpaceX as an alternative to ULA. NASA was the pivotal actor in this process. The agency encouraged the development of a new business model that relied principally on the private sector to devise, deploy, and operate space vehicles.¹⁵¹ Journalist Richard Waters well describes the significance of contributions of NASA and the entrants it helped inspire:

¹³⁴ Irene Klotz, *SpaceX and NASA Demo-1 Paves Way for Crew Flights to ISS*, AVIATION WK. & SPACE TECH., Mar. 11–24, 2019, at 46.

¹³⁸ See Irene Klotz & Jen DiMascio, *SpaceX Loses Out on U.S. Air Force Next-Gen Launcher Development*, AVIATION WK. & SPACE TECH., Oct. 15–28, 2018, at 38 (describing SpaceX’s inventory of national security launches through the fall of 2018).

¹⁴⁰ U.S. Dept. of Def., Contracts for Aug. 7, 2020, <https://perma.cc/KB2P-4NAU> (announcing Air Force contract awards). ULA received task orders for \$337 million for the NSSL Phase 2 contract, and SpaceX received task orders for \$316 million for the NSSL Phase 2 contract. The two companies beat Blue Origin and Northrop Grumman, which submitted bids for the NSSL Launch Service Procurements. See Sandra Erwin, *Pentagon Picks SpaceX and ULA to Remain Its Primary Launch Providers*, SPACENEWS (Aug. 7, 2020), <https://perma.cc/423E-ADEU>.

¹⁴¹ Jeff Foust, *With Pentagon Award, SpaceX Joins the Establishment*, SPACENEWS (Aug. 7, 2020), <https://perma.cc/39JA-C2QB>.

¹⁵¹ See Mosher & McFall-Johnsen, *supra* (quoting NASA Administrator Jim Bridenstine: “We don’t want to purchase, own, and operate the hardware the way we used to. We want to be one customer of many customers in a very robust commercial marketplace in low-Earth orbit . . . This is the next era in human spaceflight, where NASA gets to be the customer. We want to be a strong customer; we want to be a great partner. But we don’t want to be the only ones that are operating with humans in space”).

The emergence of a start-up space industry, led by Elon Musk's SpaceX and Jeff Bezos's Blue Origin, has led to a new symbiosis in space. The tech groups see Nasa as an important early customer as they pursue their grand long-term visions – while the space agency has found ways to ride on the back of their development work rather than create the technology for its programmes from scratch.¹⁵²

From 2007 onward, NASA gave increasingly strong signals that it would entertain offers from SpaceX to provide non-military launch services; it gave the company contracts for smaller launches that foreshadowed additional future work. From the initiation of the Mercury program through the end of the Space Shuttle program in 2011, the United States purchased hardware and services from external suppliers. NASA owned the space system assets and operated the facilities that launched them into space. The new approach anticipated that private firms would build launch vehicles and spacecraft and send them into space (often using launch pads leased from or acquired from the government).

An important move to enable entry by SpaceX and other private firms into the launch services sector was NASA's creation of the Commercial Orbital Transportation Services (“COTS”) program.¹⁵⁴ COTS anticipated that private firms would provide space transportation capabilities and provide, beginning in 2011, launches to supply the ISS.¹⁵⁵ This was the first of several measures that spurred the development of SpaceX and other new entrants, including Blue Origin (owned by Jeff Bezos, the founder of Amazon).

Encouraged by a largely successful series of launches, NASA in 2014 selected SpaceX (along with Boeing) to participate in its Commercial Crew Program, which relied on private firms to build and operate the next generation of human space transportation systems.¹⁵⁶ SpaceX was first to return US astronauts to space with an American-made vehicle launched from the United States. SpaceX is one of three firms (along with teams headed by Blue Origin and Dynetics) that NASA has chosen to compete to provide the space agency with a system to land humans on the Moon.¹⁵⁹

¹⁵² Richard Waters, *Which Company will Win the New Space Race to the Moon?*, FIN. TIMES (July 18, 2019), <https://perma.cc/2F5A-MSMT>.

¹⁵⁴ See Steven Mumma & Natalie Imfeld, *Advancing the Nation's Space Program Through Commercial Space Services Acquisition*, CONT. MGMT., Mar. 2014, at 16 (describing NASA's creation of COTS); Guy Norris & Madhu Unnikrishnan, *In the Dragon's Den*, AVIATION WK. & SPACE TECH., Nov. 29, 2010, at 28.

¹⁵⁵ *Id.* Over the past decade, NASA has used three firms—SpaceX, the Orbital ATK division of Northrop Grumman, and Sierra Nevada Corporation—to deliver cargo to the International Space Station. Irene Klotz, *Passing the Torch*, AVIATION WK. & SPACE TECH., June 18–July 1, 2018, at 58–59.

¹⁵⁶ Irene Klotz, *Crew Dragon Debuts*, AVIATION WK. & SPACE TECH., May 4–17, 2020, at 14; Tony Reichhardt, *Astronauts, Your Ride's Here!*, AIR & SPACE MAG., Aug. 2018, at 40.

¹⁵⁹ Irene Klotz, *Lunar Landers*, AVIATION WK. & SPACE TECH., May 18–31, 2020, at 14.

Through these and other measures, NASA repudiated the stereotype of government buyers as exceedingly risk-averse in program design and incapable of creative thinking that uses the power of public purchasing to stimulate competition among suppliers. Over the past fifteen years, NASA has consciously encouraged entry that expands the number and quality of centers of inventive and productive activity that can serve its needs. NASA also has shown patience in tolerating occasional failures that entrants must experience to gain capability and achieve dramatic design breakthroughs and improvements in performance. The NASA experience warrants close study by other government purchasing authorities as a model of how well-calculated risk-taking in the expenditure of public funds can facilitate procompetitive entry by new suppliers, even into unusually difficult technological domains.

B. *The Role of the Antitrust Agencies*

The ULA case indicates the value of cooperative interagency policy making that enables distinct institutions with shared or complementary policy duties to diagnose problems and devise solutions. The DOD collaboration with the FTC facilitated an informed decision-making process and helped both institutions apply their skills usefully to the problem. The analysis also profited greatly from the accumulation of relevant expertise in both agencies over time—in the DOD, greater knowledge about the substance and process of antitrust law, and in the FTC, greater knowledge about the aerospace and defense industries and about procurement decision making in the DOD.

C. *Meaningful Disclosure*

The ULA experience suggests the value of a transparent revelation of the reasons for decisions taken. The ULA decision made the DOD and the FTC nervous, and there were temptations to offer less informative, general explanations of the reasons for the outcome. A more complete description of the reasons for a difficult decision exposes a government agency to more second-guessing, but it injects needed discipline into the decision-making process itself. By setting out the key assumptions behind the ULA decision, the DOD and the FTC enabled students of competition law and defense acquisition to better understand what happened, to see what worked, to identify what failed, and to do it better the next time.

D. *Case Retrospectives*

The analysis used in this Article suggests a basic, useful approach that competition agencies can use to evaluate and improve their decision making in merger reviews. The essence of the approach is to examine the

assumptions and predictions that guided the agency's analysis, compare those assumptions and predictions to actual experience, and (where actual experience deviates from the predicted outcome or contradicts the initial assumptions) ask what the agency might have missed in its original assessment and what it should look for in conducting future reviews.

VI. Conclusion

By combining the nation's launch capability for US government missions into one enterprise, the creation of the ULA joint venture contradicted the basic presumptions that the federal antitrust agencies ordinarily brought to the analysis of transactions in the aerospace and defense sector. The agency responsible for the antitrust review of the transaction, the Federal Trade Commission, had strongly disfavored mergers to monopoly. Departures from this policy had been rare and had required exceptional justifications. The DOD endorsed the ULA venture and probably would have testified in favor of its approval had the FTC chosen to go to court to enjoin the deal. The DOD's support created powerful pressure for the FTC to acquiesce, and the agency allowed the transaction to proceed subject to conditions that addressed vertical features of the venture.

A plausible efficiency rationale supported the DOD's support for the ULA venture and influenced the FTC's assessment. A decline in the number of launches for US government customers threatened to deny the ULA partners, Boeing and Lockheed Martin, the level of activity needed to maintain the proficiency of their design, production, and launch teams at the highest levels. Thus, the continued subdivision of launches between the two companies could undermine their reliability and result in an unacceptable number of launch failures for government missions.

Before closing its inquiry, the FTC sought assurances from the DOD and the NASA that the government purchasers would seek to qualify other firms to provide launch services. The DOD and NASA acknowledged the dangers of relying on a single supplier (ULA), but they provided only spoken assurances—no written commitments—to exercise best efforts to encourage entry by other firms into this technologically complex and capital-intensive industry. No company appeared to be an especially attractive candidate to succeed as a new entrant, even with encouragement from the DOD or NASA. SpaceX made presentations to the FTC and predicted that it could use innovative rocket designs to surpass ULA if it received launch services contracts from the government purchasers. Yet, at the time of the FTC's antitrust review, SpaceX had yet to carry out a successful launch of its rocket, the Falcon.

Since its formation, ULA has achieved an unblemished record of successful launches since its creation, and SpaceX has thrived. On the basis of its success to date in launching human and non-human payloads, SpaceX arguably has drawn even with (if not surpassed) ULA in the race to become the country's (and the world's) preeminent launch services provider. There are many tests ahead to determine whether SpaceX or firms such as Blue Origin and Orbital ATK (now owned by Northrop Grumman) can demonstrate the sustainability of a new, more commercially oriented business model for launch services.

Especially noteworthy is the positive role that the government purchasers—first NASA and then DOD—played in providing opportunities for SpaceX to develop as a supplier of launch services for government missions. The government buyers understood the difficulties they would face if they did not encourage new entry as an option to ULA and a stimulus for innovation in the design of space launch systems. The establishment of a commercial space services sector has broader implications, as it demonstrates how creative procompetitive public procurement policies can diversify highly concentrated markets and catalyze unanticipated improvements in products and services.

NASA, in particular, embraced an entrepreneurial approach that required the agency to modify longstanding methods for obtaining launch services. This experience should motivate procurement policymakers, in Congress and in government agencies, to reassess existing views about government procurement and the benefits and costs of having public purchasing bodies experiment with novel techniques. The ULA experience suggests there is an untapped potential for public procurement to boost competition that improves the nation's wellbeing, but the realization of the potential will require the use of methods that are novel and, in some senses, riskier than traditional procurement approaches.