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Article 21.5 DSU Appellate Body Report United States—Measures Affecting Trade in Large Civil Aircraft (Second Complaint): Spillovers from Defense R&D Add to the Tug-of-War Between Panels and the WTO Appellate Body

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Abstract

The March 2019 release of the Appellate Body's compliance report in United States-- Measures Affecting Trade in Large Civil Aircraft (Second Complaint) marks yet another chapter in the ongoing Boeing-Airbus dispute. While raising numerous new and old subsidy issues, this paper focuses on one specific aspect, the evaluation of the financial contributions and benefits associated with the Department of Defense (DOD) R&D procurement contracts. The paper describes the differing views taken by the panels compared to the Appellate Body. It highlights two issues that led to an extremely lengthy proceeding: 1) the black or white nature of the decision regarding the characterization of contracts which have features of both purchases of services and joint ventures; and 2) the difficulty in demonstrating a financial contribution flowing from payments for R&D for military systems to Boeing's civil aircraft production. It concludes that this case represents a failure of the WTO dispute settlement system and underscores flaws in the ASCM in that after fifteen years of litigation, no determination was made as to whether or not the DOD R&D contracts examined here constituted impermissible subsidies.

Keywords

Civil aircraft, Boeing-Airbus dispute, subsidies, WTO.

JEL Classification: F13, L52

1. Introduction*

The Boeing-Airbus subsidy dispute, one of the longest running trade skirmishes in recent history, reached another milestone in March of 2019 with the release of the World Trade Organization's Appellate Body compliance report (*US--Large Civil Aircraft (2nd complaint)) (*hereinafter AB 21.5 report*)*[1] reviewing a panel's report on whether certain changes made to its subsidies programs had brought the United States into compliance with an original ruling finding that American subsidies for Boeing had caused adverse effects to Airbus. The stakes in this case could not be higher, and the outcome of the case will surely ratchet up trade tensions between the two trading partners as each side has now been authorized to take countermeasures against the other.

Boeing and Airbus are the two largest aerospace firms in the world, with revenues reaching $155.5 billion in 2019. In 2004, the United States terminated the 1992 US-EU agreement on support for Airbus and Boeing in the hopes of being able to limit financing for Airbus' new wide body model, the A350, a direct competitor to Boeing's 787 Dreamliner (Baschuk, 2020). Both countries filed Dispute Settlement Body (DSB) petitions in 2005, each claiming that the other was providing subsidies to their respective aerospace firms, and that these subsidies had "adverse effects" under the meaning of the Agreement on Subsidies and Countervailing Measures (ASCM). Fifteen years later, the landscape of the large civil aircraft industry has changed significantly; Airbus has delivered more than 360 A350 airplanes and Boeing announced delays in its Dreamliner production in 2020 due to production flaws. Nevertheless, over the past year WTO arbitrators concluded that the United States could take countermeasures against the EU for as much as $7.5 billion annually, while the EU was authorized to take countermeasures against the US to the tune of $4.0 billion annually, two of the largest awards ever set by the WTO.

Because of the length and complexity of the Boeing-Airbus dispute, both cases have significantly influenced the case law associated with the ASCM.[2] To briefly recap the European Union's case, *US--Large Civil Aircraft (2nd complaint)*, the original petition contended that a variety of subsidies provided to the sole U.S. large civil aircraft producer, Boeing, between 1989 and 2006 resulted in adverse effects to EU aircraft manufacturer, Airbus.

After its report was reviewed by the Appellate Body, the ultimate finding adopted by the Dispute Settlement Body (DSB) on March 23, 2012 was that two classes of subsidies (government contracts and tax breaks) caused adverse effects to Airbus, specifically: 1) certain NASA and DOD R&D procurement contracts and assistance agreements; and 2) federal Foreign Sales Corporation (FSC)/Extraterritorial Income (ETI), State of Washington business and occupancy (B&O) and City of Wichita tax concessions. The Appellate Body rejected other EU claims of improper subsidization. As a result of the DSB recommendation that the United States "take appropriate steps to remove the adverse effects found to have been caused by its use of subsidies, or to withdraw those subsidies," the United States modified or terminated a number of these programs, contending the changes brought it into compliance with the original ruling.[3]

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* The views expressed in this article are the personal academic views of the authors. All errors remain ours alone.

1 Article 21.5 DSU Appellate Body Report, *United States - Measures Affecting Trade in Large Civil Aircraft (Second Complaint)*, WT/DS353/AB/RW. adopted April 11, 2019.

2 Other legal-economic assessment of related disputes in this series include Howse and Neven (2002), Neven and Sykes (2014), Crivelli and Rubini (2018), and Hahn and Mehta (2013), along with ASCM-related assessments including Grossman and Mavroidis (2002), Horn and Mavroidis (2002), Sapir and Trachtman (2004-5), Crowley and Palmeter (2009), Davey and Sapir (2008) and Rubini (2015).

3 Para. 1352, Appellate Body Report, *United States-- Measures Affecting Trade in Large Civil Aircraft (Second Complaint)*, adopted March 23, 2012;https://ustr.gov/sites/default/files/DS353.US_.Sub1_.Non_.BCI_.Fin_.Public.pdf, p 6-7.

The EU disagreed. On October 11, 2012, the European Union requested the establishment of a compliance panel under Article 21.5 of the Dispute Settlement Understanding (DSU) claiming not only that the United States had failed to withdraw the subsides found to have caused adverse effects to Airbus, but that after the end of the implementation period, the U.S. had continued to grant the original subsidies and other subsidies similar in nature, along with granting a number of new subsidies to Boeing, including a package of incentives awarded by South Carolina in 2009, collectively known as Project Gemini, in order to induce Boeing to locate its 787 fuselage fabrication facility in the state.

As such, the EU's compliance complaint is lengthy and complex. It covers claims with respect to certain Department of Defense (DOD) contracts, on-going Foreign Sales Corporation/ Extraterritorial Income (FSC/ETI) tax credits, the specificity of City of Wichita and State of South Carolina tax measures, continuing adverse effects from original subsidies, accelerated development of technology, and the impact of subsidies on the delivery times of certain aircraft. The dispute also involved claims by the United States of panel error regarding tied tax subsidies, and certain calculations of the amount of subsidization. Many of the issues addressed in the compliance panel report and the Appellate Body's review of it are too fact-intensive to be of general interest. Therefore, in this paper we focus on one specific set of subsidies—the DOD R&D procurement contracts—and the legal and economic issues raised by those contracts throughout this long saga.[4]

The DOD R&D contracts at issue are complex, long-term contracts for R&D related to the development of weapons systems. As such, the contracts raised fundamental questions under the WTO's Agreement on Subsidies and Countervailing Measures (ASCM), particularly its Article 1 definition of a subsidy: a financial contribution by a government or public body that confers a benefit on the recipient. The concept of a financial contribution is further defined as payments falling into a number of specific boxes, including a "direct transfer of fund (e.g., grants, loans, and equity infusion)" or "government revenue that is otherwise due is foregone or not collected (e.g., ... tax credits)" or "government … purchases goods." Did these contracts represent a government purchase of research services, in which case they would not be expressly included within the scope of the ASCM which refers only to the purchase of goods? Or are they some form of a joint venture in which the government has provided the equivalent of an equity infusion and thus could be considered a "direct transfer of funds" that is subject to subsidy disciplines? Do they confer a "benefit" on Boeing, without which the payments, no matter how they are characterized, would not fit within the definition of a subsidy? In this paper we address both how the compliance panel and Appellate Body approached these questions, along with the implications of their answers for the ASCM and R&D procurement more generally.

2. R&D Contracts in United States--Measures Affecting Trade in Large Civil Aircraft *(Second Complaint)*

As alluded to above, the original panel and Appellate Body report considered three categories of federal R&D contracts: (1) NASA procurement contracts; (2) Department of Defense "assistance instruments"; and (3) Department of Defense "procurement contracts." NASA procurement contracts provide direct payments to Boeing, in addition to access to NASA facilities and personnel, for the development of what the EU claimed were "dual-use" technologies, i.e. those that advanced the mission of NASA *and* could be applied to the large civil aircraft industry. DOD "assistance instruments" provide funds to Boeing to undertake research for a "public purpose" and require Boeing to contribute their own funds on a cost-sharing basis; under these contracts, the US government actively collaborates in the research venture. In contrast, DOD "procurement contracts" are used by the federal government to directly acquire goods or

[4] There are several other papers that have analyzed other aspects of the case. Kennedy (2019), for example, provides an analysis of the Appellate Body's findings on whether the subsidies had an adverse effect because the technological innovations associated with these subsidies gave Boeing a head start in the development of large civil aircraft.

services, including research and development, of direct use to the federal government in exchange for a fee or profit.

One of the primary aspects of these contracts during the dispute was the allocation of intellectual property rights, including both patent rights and the right to use data resulting from research done pursuant to the contracts. Under the NASA contracts, Boeing retained all patent rights to technologies developed using NASA funding, while the government retained a royalty- free license to use the technology for government purposes. Similarly, for most NASA programs Boeing retained the rights to use any data resulting from the NASA funding, while NASA had unlimited rights to use and release the data. In a subset of NASA programs, those in which it was deemed that Boeing had contributed resources to the venture, the contract instead included a "limited exclusive data rights" clause which gave Boeing exclusive rights to exploit the data for five-years after the data was first reported.

In both types of DOD contracts (assistance agreements and procurement contracts), the patent rights were identical to those awarded under the NASA contracts. However, the allocation of data rights differed in the two types of contracts. In assistance instruments, Boeing was given limited exclusive data rights, and Boeing could negotiate the length of the period in which it could exclusively use the resulting data. In contrast, DOD retained unlimited data rights under its standard procurement contracts.

The allocation of intellectual property rights was significant because of the connection to the threshold question in the ASCM of whether a "financial contribution" conferring "a benefit" on Boeing could be found in any of the contracts at issue. The original panel developed a test to determine whether these contracts fell within the ASCM definition of a subsidy that focused on whether the research was principally for the benefit of Boeing or for principally for the benefit of the government. The original panel determined that if the contracts principally benefitted the government because their primary output was military technology, then the contract was properly characterized as the government "purchasing the service" of research and development. Because "purchase of services" is not included in one of the enumerated categories of financial contribution spelled out in Article 1 of the ASCM, the original panel found that such contracts were not within the scope of the definition of a subsidy. If, on the other hand, the contracts were principally for Boeing's benefit, those contracts were to be considered a "direct transfer of funds" to Boeing, and as such, they fit within the parameters of a subsidy. The distribution of the intellectual property rights was one of the factors weighed in determining the primary beneficiary of the contract.

Applying this test, the original panel found that the NASA contracts and DOD assistance instruments were principally for Boeing's benefit, so could be considered a "direct transfer of funds", while the DOD procurement contracts fell on the other side of line because they principally benefitted the government. This distinction was made both based on the difference in the allocation of data rights under the two types of contracts as described above and the description of the two types of contracts in the DOD Grant and Agreement Regulations. As quoted in the panel report, the DOD defines procurement contracts as those in which the "*principal purpose* of the instrument is to acquire property or services for the *direct benefit or use* of the Federal Government" (emphasis added by the panel). In contrast, the panel noted that many of the cooperative agreements between Boeing and the DOD included the clause "the principal purpose of this agreement is for the government to support and stimulate the recipient to provide reasonable efforts in advanced research and technology development and not for the acquisition of property or services for the benefit or use of the government."

Upon review of the original panel report, the Appellate Body rejected both the test and the findings under it, determining instead that the NASA procurement contracts and DOD assistant instruments were "akin to a species of joint venture" analogous to equity infusions that, in an analytical process criticized in Neven and Sykes (2014), was deemed to be a "direct transfer of funds" that conferred a benefit on Boeing and hence a subsidy.[5] For Neven and Sykes, the Appellate Body was too quick to jump to the

[5] *US — Large Civil Aircraft (2nd complaint), AB,* para. 597, 609.

conclusion that the contracts, many of which involved the government providing equipment, access to facilities and personnel to the R&D venture, could be viewed as a "direct transfer of funds" when actual funds were not necessarily involved. Nonetheless, the Appellate Body in the original case, on the basis of their determination that the DOD procurement contracts effectively created joint ventures declared the panel's finding that the contracts were "purchases of services" to be moot, but did not complete the analysis as to whether the DOD contracts constituted impermissible subsidies.

When the dispute entered the compliance phase, the EU again challenged the DOD procurement contracts as illegal subsidies. The compliance panel again found that the DOD procurement contracts are most appropriately characterized as purchases of services, but did not take the next step to determine whether that meant, as a legal matter, that they necessarily fell outside of the scope of the ASCM's definition of a subsidy.[6] Instead, the panel jumped ahead in its analysis and determined that, even if the DOD contracts did fall within the scope of the ASCM, the EU had not shown that they improperly benefitted Boeing. Upon review, the Appellate Body again faulted the panel for its determination that the DOD contracts were "purchases of services" and criticized its treatment of certain evidence related to the conferral of a benefit. However, the Appellate Body ultimately ruled that it did not have enough evidence to determine whether, as a factual matter, the DOD R&D contracts made a financial contribution to Boeing. So despite more than thirteen years of litigation, the basic question of whether these contracts constituted subsidies subject to the disciplines of the ASCM remained unanswered.

3. The Role of Article 21.5 Proceedings—Ensuring Compliance or Delay and Re-litigation?

This case marks the 25th dispute in which the Appellate Body has been called upon to review a panel's Article 21.5 compliance report. Compliance disputes arise when there is a disagreement between the parties to an original dispute as to whether the actions taken by the party found to be in breach of its WTO obligations are enough to bring it into compliance with the recommendations and rulings of the DSB. While virtually an afterthought when the DSU was negotiated, compliance proceedings have become a significant portion of the dispute settlement work being done at the WTO, with disputes over compliance constituting as much as one-third of panel and one-half of Appellate Body work in recent years (Pauwelyn and Zhang, 2018). While the DSU gives primary responsibility for compliance to the Dispute Settlement Body to regularly check up on actions taken by members to comply with panel and Appellate Body recommendations and rulings, it does contain a compliance dispute process set forth in a single paragraph (Article 21.5) of the lengthy DSU. However, Article 21.5 says little more than that compliance proceedings are, whenever possible, supposed to be given back to the original panel in the case and resolved within 90 days of filing. Appeals from compliance panel determinations are not even explicitly mentioned in Article 21.5.

Yet this dispute joins a string of cases in which the compliance proceedings have become nearly as long and complex at the original dispute itself. *US—Large Civil Aircraft (2nd complaint) 21.5* stands as the single longest compliance proceeding to date, with the compliance panel taking four years and eight months (1,702 days) and the Appellate Body taking one year and nine months (637 days) to complete its work. And at the end of the process, the Appellate Body did not reach a definitive conclusion as to whether the DOD R&D contracts had been shown to provide actionable subsidies to Boeing.

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6 The panel determined that procurement contracts should be characterized as a purchase of a service because (1) Boeing did not make a financial contribution to the efforts undertaken in the procurement contracts, but instead was reimbursed for their costs plus a negotiated fee; and (2) the allocation of intellectual property rights resulted in the "risks and rewards of the R&D as being principally for the DOD."

This dispute took far longer than others (the average Article 21.5 panel took 400 days to circulate it report, while the average Article 21.5 appeal lasted 164 days).[7] The nearly six and one-half years for this compliance process begs the question of whether the process is working to hold WTO members to their commitments or merely serving to delay compliance or provide opportunities for parties to re-litigate issues they may have lost during the original phase of the case. And it leaves no doubt that the compliance process has strayed very far from the notion of a fast (90-day maximum) up or down ruling on whether compliance has been achieved.

While the reasons for the length of this particular compliance process are many, two are relevant for this paper: 1) the difficult decision regarding the characterization of the R&D procurements contracts, which have features of both purchase of services contracts and joint ventures; and 2) the difficulty in demonstrating a financial contribution flowing from payments for R&D for military systems to Boeing's civil aircraft production.

4. Tug-of-War Between Panels and Appellate Body Opens Door to Re-Litigation Claims

It is the first issue—the back and forth between the panels (both in the original investigation and the compliance phase) and the Appellate Body—over the correct legal treatment of R&D procurement contracts that prompted a U.S. claim that the EU was using the compliance process to re-litigate an issue that it lost in the original proceedings. While it is well settled that compliance complaints are not allowed to raise new claims and are not supposed to re-open issues that were resolved on the merits during the original phase of a case, the issue of what is "new" and what was resolved "on the merits" can be very murky. Compliance proceedings focus on the measures taken by the offending party to come into compliance with rulings of the DSB based on the original panel and Appellate Body proceedings. The degree to which the measures taken to comply invite additional—and arguably "new'—claims related to compliance measures that did not exist (at least not in the present form) at the time of the original proceedings often turns on the nature and scope of the original ruling and amount of change introduced by the compliance measures. The question of whether an issue was decided on the merits often turns on the relationship between the panel and the Appellate Body in its approach to the factual and legal issues before it.

In this case, the US regarded the issue of whether the DOD procurement contracts were a "purchase of services" and therefore not subsidies as a settled question since the original panel found them to be purchased services. Because the Appellate Body did not complete the analysis to find the opposite—that the contracts were subsidies—the U.S. contended that the EU had no right to a second bite at the apple at the compliance stage. But both the compliance panel and the Appellate Body found that the original proceeding had not resolved the issue on the merits, so was fair game for the EU to raise again.

The decision about how to characterize these DOD R&D contracts is a particularly momentous one because of the black and white nature of the text of the ASCM and the original panel's analysis. If the contracts are considered services purchases, then they simply fall out of the definition set forth in Article 1 and there is no need for a panel to figure out the rest of the subsidy questions, including whether a benefit was conferred or whether the subsidy caused adverse effects to Airbus. If, on the other hand, they are characterized as falling within one of the financial contribution boxes, such as an equity infusion leading to a direct transfer of fund, then the entirety of the subsidy analysis must be undertaken. Both the substance of the determination and the sequence of the analysis matter. The original panel stopped its examination of the R&D procurement contracts once it reached its threshold decision that the contracts did not fit into one of the specifically enumerated types of financial contribution, leaving the Appellate Body with no facts or analysis to work once it disagreed with a panel's initial ruling. At the compliance stage, the panel sought to avoid this sequencing trap by doing the analysis of the other

[7] Data drawn from worldtradelaw.net, Case Statistics, http://www.worldtradelaw.net.proxygt-law.wrlc.org/databases/paneltiming1.php, Accessed November 13, 2020.

elements of a subsidy determination—particularly whether a benefit had been conferred—even though it still determined that the R&D contracts were purchases of services. At the compliance stage, the Appellate Body again disagreed with both the characterization of the contracts and the panel's decision to skip over a threshold ruling on whether the R&D contracts fit within the definition of a subsidy. Because the panels (both original and compliance) took a different view than the Appellate Body on the characterization of the R&D contracts, the door was left open for the EU to raise the issue a second time.

While the specter of re-litigation and the re-consideration of this one set of contracts was far from the sole cause for the proceedings to drag on as long as they did, it is one of a number of matters raising doubts about the ability of the ASCM to decisively discipline subsidies. When coupled with concerns over the Appellate Body's interpretation of another definitional phrase --"government or public body"-- and numerous disputes over the proper benchmark against which to judge whether a benefit has been conferred, the AB 21.5 Report underscores the tension between a dispute settlement system searching for definitive rulings that encourage compliance while interpreting a text that is filled with ambiguities and internal tensions of its own (Charnovitz and Fisher, 2015; Gagne and Roch, 2008; Horn and Mavroidis, 2005-6). Here, the dispute settlement system struggled (and arguably failed) to address contracts that did not fit neatly into the ASCM's definition or understandings about how to determine whether a benefit had been conferred.

The Airbus-Boeing subsidy disputes are outliers in many ways (length, complexity, amount and variety of types of subsidies at issue, levels of confidentiality, delays requested by the parties, attempts at negotiated solutions along the way, etc.). But those complications do not diminish the fact that this compliance process underscores the notion that a dispute settlement system that takes more than 15 years to produce a final result in a single case, still without a definitive ruling on whether DOD R&D procurement contracts do or do not constitute impermissible subsidies to Boeing, is not a system that encourages countries to take their WTO commitments seriously.

5. Military R&D Procurement as a Financial Contribution

The second of the two prolonging issues in this compliance appeal was whether and how the EU could prove that contracts for R&D for military applications conferred a benefit on Boeing civil aircraft operations in a manner that adversely impacted Airbus' efforts to compete with Boeing. One of the primary points of contention as to whether the DOD procurement contracts for military-only technologies could be considered a collaborate research initiative is the degree to which Boeing could profit from the resulting technology in the civil aircraft market.

The United States argued in its submission that the DOD R&D procurement contracts resulted in very few spillovers to the large civil aircraft market, despite the list of DOD-funded patents with civil applications submitted by the EU. Moreover, to the degree that there were some spill-overs to the civil aircraft market, these spillovers were too small to be meaningful in terms of conferring a benefit. This argument, however, seems to fly in the face of the general belief in economics that defense-related R&D will have positive spillovers on society and, in fact, it is these spillovers that justify the large expenditures on such efforts.

Some spillovers are simply due to the leakage of knowledge from research that all firms may be able to benefit from without any market transaction. Research collaborations such as those described in the *US-Large Civil Aircraft* complaint, however, may also involve the voluntary transfer of knowledge at no cost, including the direct transfer to commercial applications of specific designs. Avadikyan et al. (2005) finds that the degree of diffusion from military innovations to civilian uses will depend on a number of characteristics, including how generic the technologies are, how closely related the civil needs are to the military needs, and the degree to which the firms undertaking the innovations produce both civil and military technologies. Similarly, Sempere (2018) explains that process-oriented innovations

may generate higher spillovers than product innovations, as those same processes can be applied to produce multiple products.

Although a complete evaluation of spillovers from the DOD contracts to Boeing is beyond the scope of this paper (and, indeed, could be argued is the job of the panel in this dispute), there are some statistics suggestive of Boeing taking advantage of its defense related research in the civil aircraft industry. Using patent data between 2002 and 2011, Acosta et al. (2020) classify patents as military only, civilian only, or "mixed"—those that had both military and civilian applications--based on their International Patent Classification (IPC) codes. Based on this data, Boeing filed for 14 military only patents and 38 mixed use patents during this time period, accounting for just 0.33 and 0.88 percent of their total patent filings.[8] According to the Acosta et al. (2020) data, such a distribution across military and civilian technologies is quite common; of the top 15 defense contractors in the world, only 0.43 percent of their patents are military-only technologies and 0.46 percent of their patents have mixed use possibilities. However, it is worth noting that their data also shows that Boeing relies on a great deal of military or mixed use technologies in their civilian patents; Boeing has one of the highest "spin-off" rates in the sample of defense contractors, or the percentage of its mixed use and military patents cited in its civilian patent applications at 74 percent.[9] The European Union's submission in the case confirms such spin-off, as they cite a number of DOD-funded patents that explicitly discuss large-civil aircraft applications.

Intellectual Property Rights as a Financial Contribution

If the DOD procurement contracts are a collaborative research venture, the EU argued, then Boeing should share with the DOD the rewards of the R&D it conducts under these contracts, including the rewards accruing in the large civil aircraft industry. The AB 21.5 report noted that because the panel had characterized the procurement contracts as a purchase of services, it had failed to consider the EU's evidence that the allocation of intellectual property rights under procurement contracts, which they argued were more favorable to Boeing and less favorable to the DOD than private sector collaborators, constituted a financial contribution and conferred a benefit.

Note that to comply with the initial Appellate Body ruling, the United States negotiated a new patent license clause with Boeing that was included in the NASA procurement and DOD assistant instrument contracts. The revised clause gave the federal government a royalty-free license to use any resulting inventions not just for government use, but also for *commercial* use.[10] The revised license clause was not included in DOD procurement contracts as the Appellate Body did not complete the analysis as to whether these constituted actionable subsidies.

To assess the potential financial contribution associated with the NASA procurement contracts and DOD assistance instruments, the compliance panel reviewed a number of private R&D agreements as to how the intellectual property rights are granted to both the commissioning and commissioned parties, along with expert technology licensing testimony submitted by both the EU and US. Although this evaluation was not released by the panel for confidentiality reasons, there are several organizations that provide guidance as to best practices in structuring these types of contracts. For example, the EU's Research Area and Innovation Committee (ERAC) notes that a common arrangement in collaborative

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8 Airbus produced fewer patented military technologies, filing for just 12 mixed use patents (0.13 of their total filings).

9 Specifically, Boeing cited 172 mixed and military patents in its patent applications between 2002 and 2011; of these, 128 citations were made in civilian patent applications.

10 This revised clause prevented the federal government from sub-licensing this right or working with a third party to exercise this right. The EU argued that the US government, which does not produce large civil aircraft, would never actually take advantage of these licenses. In contrast, the United States argued that the new clause required Boeing to take a risk that the federal government could change its policy to produce large civil aircraft in direct competition with Boeing. The compliance panel ruled that the contract change did *not* constitute a withdrawal of the subsidy.

R&D arrangements is to assign the patent rights to one party while giving broad access and compensation rights to the other party.

Private-sector collaborators negotiate over the terms of the arrangement, essentially bargaining over return rates as a function of their respective contributions to the venture and the level of risk they are taking on. In research joint ventures, this bargaining would take place over the ownership of the resulting intellectual property and data, including compensation for the future use of that technology. In a well-functioning, competitive market with multiple potential investors/collaborators, the outcome of this bargaining process is the market-based return.

In the DOD procurement contracts, the resulting technologies are patented by Boeing while the DOD receives the ability to use these technologies free of charge. Compared to similar private-sector contracts, this may be considered a fair return on an investment if the R&D resulted in military-only technologies. However, if there are significant civil aircraft spillovers, the return on investment that the DOD receives is likely much smaller than what a private investor would earn as Boeing earns essentially all the returns in the civil aircraft market.

It is worth considering, however, whether private sector contracts are an appropriate comparison to evaluate the fair market-based return for an investment such as the DOD procurement contracts. Traditionally, public investment in R&D has been explained as correcting for market failures and, particularly, the public good nature of innovation. Recently, economists have considered alternative explanations for public investment in R&D. Consider, for example, the "entrepreneurial state" as described in Laplane and Mazzucato (2020). In this model, private firms may be unwilling to invest in extremely high-risk technologies in which the potential rewards only become clearer as the research progresses. The government's role, therefore, may be to take on early risks to encourage innovation that no private firm would undertake. If there is no private market for such high-risk investments in R&D, what is the appropriate benchmark under which to evaluate whether there has been a financial contribution or conferral of benefit? How can the United States potentially revise its intellectual property rights provisions in all three types of contracts to comply with the DSB recommendations?

The United States could create a market for such investments by reforming government procurement laws to allow for bargaining not just over the budgets and fees that contractors such as Boeing charge to undertake government sponsored research, but also over the intellectual property rights provisions. Laplane and Mazzucato (2020) note that the original Bayh-Dole Act, the 1980 law which governs federally-sponsored research, did contain a provision allowing for the federal government to recoup part of the profits resulting from the research, at least above a certain threshold. One can imagine revising the current law to encourage a more market-based approach to the assignment of intellectual property rights in government R&D contracts.

Intent versus effect of DOD R&D contracts

The analysis of the spillover effects of these R&D contracts was further complicated by the additional tug-of-war over the relative weight to be given to the intent of the government in contracting for this R&D. The United States claimed that the DOD R&D contracts should be treated differently than the NASA contracts or the assistance agreements (which were determined to be joint ventures) both because of the different allocation of intellectual property rights discussed above *and* because of the different stated intent of the government in entering into the contracts in the first place. As evidence of this sole military intent and its effect on outcomes, the United States emphasized that U.S. export control regulations (ITAR) and other legal restrictions on the use of military technologies and data prevent

Boeing from using technologies developed under the DOD contracts for commercial purposes.[11] The compliance panel agreed with the United States that the NASA contracts and DOD assistance agreements were designed as joint research ventures with "two partners work[ing] together to set research topics based on their aligned interest in the outcomes" (AB 21.5 report, para 5.84), while finding that the DOD R&D contracts were "solely directed to meeting the DOD's military needs"(AB 21.5 report, para 5.98).

The panel relied on a combination of the stated intent of the contracts (solely directed to meeting DOD's military needs), the balance of the sharing of IP rights (in favor of DOD), and conflicting evidence about how much, if any, of the technology developed pursuant to the R&D contracts was actually used by Boeing in civil applications to come to its conclusion that the contracts did not establish a joint venture but were instead a purchase of R&D services. In so doing, the panel relied on the *intent* that it found to be undisputed—that the primary purpose of the contracts was the development of military technology. The compliance panel agreed that while the R&D contracts may produce results with *potential* civil applications, Boeing's practical ability to exploit these technologies for civil uses was limited by export controls and other factors. With respect to the *effect* of developing technologies, the panel found that the evidence was mixed, with the EU presenting evidence of certain patents arising from R&D performed pursuant to the DOD R&D contracts that have explicit applications to commercial aircraft while the U.S. contended that fewer than 1 in 100 DOD contracts results in a patentable invention of potential application, that some of the patents cited by the EU were not relevant, and that, in general, few patents arise from the DOD contracts. The EU also presented three examples of civil applications of R&D developed by Boeing under DOD R&D contracts. The panel added it all up to conclude that there was insufficient evidence to establish that the R&D contracts produced research with civil applications to any meaningful degree. As a result, the compliance panel concluded that the R&D contracts were intended to primarily benefit the DOD, hence supporting the panel's determination that the contracts were purchases of services and its further conclusion that the contracts did not confer a benefit on Boeing since Boeing received adequate (but not excessive) compensation for the R&D services it performed.

The Appellate Body, on the other hand, found that more weight should have been placed on the actual technology outcomes of the R&D. The fact that the Appellate Body did not accept the panel's conclusion or weighing of the value of the intent compared to the effects of the contracts left it with no way to reach a final conclusion. The Appellate Body's decision further underscores the ambiguities in the ASCM over the proper balance between examining why a government decides to make a financial contribution (which may be "objectively" discernable from the documents establishing the measure) and examining the effects of a measure, which may be harder to determine in some cases, particularly ones such as the R&D contracts at issue here where the effects have to be determined through assessment of the degree of spillover from military to civilian use. As the panel and the AB 21.5 report makes clear, demonstrating the existence and amount of such spillovers can be very difficult.

Claims Pursuant to Lower Article 11 Standard Added Length and Complexity to Dispute

Because the panel's determinations regarding the R&D contracts—that the intent and the effect were primarily for the benefit of the government—were factual in nature, challenging them did not fall squarely within the limited jurisdiction (only issues of law and legal interpretations developed by the panel) of the Appellate Body (DSU Article 17.6). So the challenge from the EU was couched in DSU Article 11's provision that the panel should make an objective assessment of the facts of the case and conformity with the relevant provisions of the ASCM. The EU claimed that the panel had failed to make an objective assessment of whether the contracts were purchases of services, failed to properly assess

[11] The degree to which ITAR prevented Boeing from using the results from the DOD and NASA contracts in its civil aircraft designs was a point of contention in the Article 22 investigation, as the EU cited press reports that Boeing could use ITAR regulated data in civilian designs by recreating that data.

the evidence demonstrating that the R&D contracts established a joint-venture type relationship providing a financial contribution to Boeing, and did not provide adequate reasoning for rejecting the EU's allegations of Boeing's actual use of data and technology developed as a result of the R&D contracts for civil purposes.

The Appellate Body, in taking up each of the EU claims, fanned the flames of the fire that has been brewing for years over the proper role of the Appellate Body when examining a panel's findings of fact. The United States has consistently asserted that appellate review of factual determinations, even when alleged under Article 11's call for an objective assessment of the facts, is contrary to the express limitation in DSU Article 17.6 on the Appellate Body to review only legal, not factual, findings.[12] And in this dispute, the U.S. contended that each of the EU's claims amounted to a disagreement with the relative weight that the panel gave to certain facts or to a simple disagreement with the panel's conclusion, particularly its conclusions that the R&D contracts were different from the NASA contracts and DOD assistance agreements, that the R&D contracts were purchases of services, and that Boeing did not receive a benefit above normal compensation for the performance of research.

The United States is correct in its assertion that the number of claims under Article 11 has risen dramatically and that the standard applied by the Appellate Body in determining when it can consider a panel's assessment of the facts to be so limited (or non-objective) as to rise to a level appropriate for appellate review has varied considerably over time. Indeed, during the first 10 years of the WTO, few cases raised Article 11 claims and those that did asserted less than five claims on average. Fast forward to more recent years (2014-2018) and the average number of Article 11 claims rises to 37. Much of this rise in claims is attributable to the changing standards under which the Appellate Body entertains claims that a panel has failed to make an objective assessment of the facts. Initially, the Appellate Body stated that it would delve into a panel's factual finding only when the panel had committed "egregious error that calls into question the good faith of the panel" (*EC-Hormones (AB)(1988)*, para. 133). A dozen years later, the standard had become whether the panel had exceeded its authority as the trier of facts, had failed to provide a reasoned and adequate explanation for its findings, coupled with a requirement that a panel base its findings on a sufficient evidentiary basis and treat competing evidence even-handedly (*EC-Large Civil Aircraft (AB)(2011*) para. 881).

In the AB 21.5 report here, the Appellate Body followed a similar less deferential standard, faulting the compliance panel for failing to properly assess the EU's evidence of some civil applications of R&D developed pursuant to the DOD contracts in the face of U.S. assertions that the chances of a DOD contract producing an invention capable of civilian application was essentially zero. Similarly, the Appellate Body found that the panel had not adequately explained why it found Boeing's ability to use the R&D from the DOD procurement contracts to be more limited than under NASA contracts or DOD assistance agreements. Because the Appellate Body found that the panel had not adequately addressed certain evidence or adequately explained its conclusions in light of conflicting evidence, it found the panel to have violated Article 11. This finding contributed to the Appellate Body's ultimate inability to reach a final conclusion on whether or not the DOD R&D contracts provided a subsidy to Boeing. It also added significantly to the complexity and length of the dispute, as it required the parties to submit evidence, expert analysis and assessments of government intent and effects with respect to the R&D contracts. Given the highly-confidential nature of these contracts, such submissions required extra procedures so that this evidence and analysis could be submitted on a protected, confidential basis. It also required the parties to engage in extensive arguments over what had been properly resolved by the panel. In the end, the application of Article 11 allowed the Appellate Body to effectively overrule the panel's finding that the contracts were purchase of services agreements, and to negate the evidence that supported that conclusion, but leaving the Appellate Body without a basis to make an alternative

[12] For a full explanation of the United States contentions with respect to DSU Article 11 of findings of fact, see USTR's Report on the Appellate Body of the World Trade Organization, February, 2020, pp. 37-47.

determination that the R&D contracts resulted in a financial contribution that conferred a benefit to Boeing.

6. Conclusion

The *United States—Measures Affecting Trade in Large Civil Aircraft (Second Complaint)* dispute launched in 2005 and finally resulting in the authorization of over $4 billion of countermeasures 15 years later, making it one of the largest and longest-lasting disputes undertaken by the DSB. Although the dispute has clearly had an impact on the case law surrounding the ASCM, what it did not do is resolve one of the fundamental questions posed in the dispute: do Department of Defense procurement contracts constitute a subsidy under the ASCM?

In this paper, we argue that the failure of the DSB to resolve this issue stems from two characteristics. First, the characterization of the R&D contracts as either a purchase of services or a joint venture is essential under the ASCM and drives an either-or decision process, even though the contracts have the characteristics of both. Second, both the panels and Appellate Body in the case found it challenging to demonstrate a financial contribution flowing from payments for R&D for military systems to Boeing's civil aircraft production because of the uncertainties associated with the degree to which there are current or future spillovers from resulting dual-use technologies.

This dispute took far longer than others, with the compliance process alone taking over six years. Complexity and length were also added by the number of claims under DSU Article 11 contending that the panel had failed to make an objective assessment of the facts, which required the Appellate Body to do its own examination of a number of factual findings. All of this begs the question as to whether the compliance process is working to hold WTO members to their commitments, or merely serving to delay compliance and provide opportunities for parties to re-litigate issues they may have lost during the original phase of the case. We conclude that this case represents a failure of the WTO dispute settlement system to clarify ambiguities in the ASCM itself, to provide the security and predictability called for in the DSU or to provide a prompt settlement of claims under the WTO Agreements.

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